Inula japonica Thunb.

Common name: elecampane root
Pinyin name: xuan fu hua
Part used: flower
Family: Asteraceae

### Plant Description
This herbaceous perennial grows from rhizomes and can spread depending on conditions. The alternate species Inula britannica L. is reported as aggressive in Alabama; test and monitor for control. Branched stems to two feet in height bear bisexual disk and yellow ray flowers, the disk up to two-thirds inch in diameter, and a pappus of bristles. Lower leaves wither before flowering, median leaves are a narrow lance-shape about 4 inches long. Xuan fu hua “rotated upturned flower” is also known in traditional Chinese medicine as “the only flower that descends,” descriptive of its action. Flowers July to October, hardy to Zone 5.

### Propagation
Germination: surface sow, keep at 65-70°F. Conditions may favor vegetative propagation.

### Field Production
Plant in average well-drained soil at a 6-12 inch radius. The plants will spread by the following season to form a mass. Moist, warm conditions seem to promote expansiveness, but the plant may be managed easily as the root system is shallow. Estimated yield 2-4 pounds dry weight per 100 square feet.

### Pests
None noted.

### Harvest
Harvest fully open flowerheads including pappus on a sunny morning after the morning dew has dried. Dry in a single layer. The flowerheads will curl and dry to a half-inch spherical shape. The overall color should be golden with white hairs and few stalks.

### Notes
Inula britannica L. is the alternate species, I. hupehensis and I. helianthus-aquatica are substitutes for xuan fu hua. Another elecampane, Inula helenium L. (alternate I. racemosa Hook f.) is the source of the root herb tu mu xiang (“local wood fragrance”), which was the original mu xiang until Aucklandia (=Saussurea) lappa Clarke was imported from India beginning in the 19th century. Now Aucklandia is endangered and listed on CITES Appendix II.

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Isatis indigotica, Fort.

Common name: Woad
Pinyin: ban lan gen, da qing ye
Part used: Root and leaf
Family: Brassicaceae

Plant Description
A biennial herb forming in the first season a basal rosette of green leaves with a prominent white midrib. The individual leaves are 1” long; leaf margins are usually entire but can be notched. Another variable is the quantity of fine hairs, when these hairs are absent or glabrous the leaves often show a bloom. When crushed, the smell of the leaves confirms the familial relationship. Blooming occurs very early in the second spring on panicles to 3’; the flowers are bright yellow followed by 1” long flattish blue seeds. Isatis is heat tolerant and cold hardy to at least -10 degrees Fahrenheit. Often growing in disturbed soils it should be monitored for invasive properties.

Propagation
In the field, direct seeding is easy with these large seed. Place 2-3 per irrigation emitter, 1’ on center. Several database entries from the Chinese Medicinal Herb Farm history shows emergence in 7-14 days. The seeds are flat and rather brittle; take care not to break them when planting.

Field Production
To give the longest growing season, direct seed as soon as is it is possible to work the soil. Isatis plants are tough and can handle minimal care. As is frequently the case with drought tolerant plants do not water generously as this can cause the taproot to rot.

Pest
Pest pressures include aphids and cabbage loopers.

Harvest
Leaves and roots are harvested in the fall of the first season. The white roots are generally easy to dig. Leaves are washed clean in tubs and then dry quickly to a blue-green color. Do not layer thickly or the leaves will stick together; or layer thickly and frequently fluff the crop in the initial stages of drying. As with most leaf crops the best quality consists of unbroken leaves. Roots are washed by a power washer and cut lengthwise and dried.

Notes
Check to see if Isatis is considered invasive with the local Noxious Weed List, which can be found through your County Agricultural Commissioners Office. Isatis leaves are also a source of blue dye and a small market may be found; check for best harvest time as this may be different than for the medicinal market. Isatis tinctoria is commonly used instead of I. indigotica; however it is not listed in Chinese Herbal Medicine Materia Medica, 3rd Edition by Bensky, et al.
**Dolichos lablab**

**Common name:** Lab lab  
**Pinyin:** bai bian dou  
**Part used:** immature pod, bean  
**Family:** Fabaceae

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**Plant Description**
Mostly summer growing annuals or occasionally short-lived perennials; a vigorously trailing, twining herbaceous plant. Stems robust, trailing to upright to 6-12 feet in length; leaves trifoliate; leaflets broad and ovate, acute at apex, almost smooth above and short haired underneath. Petioles are long and slender. Inflorescence of many-flowered racemes on elongated peduncles. Flowers blue or purple on short pedicels. Pods 2-4 inches long, broadly scimitar shaped, smooth containing two to four seeds. Seed color can range from white or cream through to light and dark brown, red to black. Seeds can have a mottled coloring in some domesticated varieties and in all wild material. Seed weight 1,000-2,500 seeds/lb. (1)

**Hardiness:** Lab-lab is a tropical legume, grown as an annual in temperate climates, USDA Zones 5 and above. It is very frost sensitive, and prefers hot days.

**Propagation**
The percentage of hard seed is very low and no scarification is required, use seeding rates between 10 and 20 lb/A. Rows should be 24-36 inches apart, with 12-20 inches between plants. Plant seed to a depth of 1-3 inches. Lab-lab will establish readily when sown into subsurface moisture to a depth of at least 3-5 inches. If seed is of good quality, germination should be rapid and uniform. (1) Seed may be started indoors in peat pots or other biodegradable containers and transplanted outdoors after frost in short-season areas.

**Field Production**
Trellising is required, either of individual plants or using row trellises 6-8 feet high to keep pods clean and free of dirt or dust, and for ease of harvest. Moderate irrigation until flowering time increases production.

**Pests**
Insect pests include *Heliothis armigera*, *Exelastis atomosa* and *Maruca testulalis*. Lepidopteran pests can be controlled with applications of *Bacillus thuringiensis*. Bruchid beetles (*Callosobruchus* spp.) damage seed during growth and storage. Lablab roots are attacked by several nematodes: *Helicotylenchus dihystera*, *Meloidogyne hapla* and *M. incognita*. Anthracnose (caused by *Colletotrichum lindemuthianum*), leaf-spot (caused by *Cercospora dolichi*) and powdery mildew (caused by *Leveillula taurica* var. *macrospora*) have been reported. A stem rot caused by *Sclerotinia sclerotiorum* may attack the plant under wet conditions. (1)

**Harvest**
Pods and seeds ripen continuously during the summer, so repeated pickings are necessary. Immature pods may be picked for use as a vegetable crop, but mature dried seed are used medicinally. Allow seeds to dry on the vine, then pick and shell when the pod has turned dry and brown. Store seed in a cool dry place in sealed containers to prevent insect damage.

**References:** Tropical Forages, 2009. [http://www.tropicalforages.info/key/Forages/Media/Html/Lablab_purpureus.htm](http://www.tropicalforages.info/key/Forages/Media/Html/Lablab_purpureus.htm)
**Leonurus heterophyllus Sweet.**

Common name: motherwort  
Pinyin: yi mu cao  
Part used: entire plant  
Family: Lamiaceae

**Plant Description**

*Leonurus* is a biennial that initially forms soft green crenate leaves. Later the leaves become warm green, pointed and digitate, arranged oppositely on square stems and branches. Reddish-purple flower heads resembling other mints, form at the leaf axils beginning in June. Plants reach 3-6 feet high at maturity and grow best in average soil and full sun.

**Hardiness**

USDA Hardiness all zones.

**Propagation**

*Leonurus* grows easily from seed sown directly either in the fall or early spring. It will readily self-seed if seeded in flats, seeds germinate in about two weeks.

**Field Production**

Thin or transplant on 2’ centers. No inputs are necessary for this tough plant. *Leonurus* is quite drought tolerant but performs best with regular moisture.

**Harvest**

At least two harvests of leafed small branches can be made the first season. The second season may include another early harvest or just the main harvest of the entire plant in full bloom. Cut the entire plant just above the ground, remove the smaller marketable branches from the larger stems, and bundle them to hang for drying or spreading on drying racks. Compost the large unused stems. Also at this time, the roots are dug, washed and cut into sections of similar size for even drying under low heat. “Good quality has thin stems and is green in color.” (Bensky et al, 2004)

**Invasiveness**

Yi Mu Cao is a prolific seed producer and can easily escape cultivation and become a nuisance weed if allowed to go to seed. Hoe out unwanted plants the first season before they become established. Remove entire plant the second season before first seed production to prevent invasiveness.

**Notes**

The blooming stalks can be added to cut flower bunch sales.

**References**

**Lycium chinensis**, Mill.

Common names: Wolfberry, Matrimony Vine
Pinyin: gou qi zi, di gu pi
Part used: Fruit and root bark
Family: Solonaceae

**Plant Description**
Lycium is a deciduous perennial shrub to 5’ tall. The arching branches are multiple stemmed; 2” bright green leaves are simple, and ovate to linear-lanceolate. Some plants sport thorns. Pretty purple star-shaped flowers fade to a tan before falling off, yielding red fruit that is variable from plant to plant in its sweetness. Lycium grows well from -10 to +110 degrees Fahrenheit. Charles Martin reports that Lycium shows heat and drought tolerance and does well in alkaline soils.¹

**Propagation**
Seeds or cuttings are used to propagate Wolfberry. Remove seed from fruit if not already done so and sow seed in spring or fall in a heated greenhouse; germination takes place in about two weeks. Plant out the following season. Fruiting occurs when plants are 2-3 years old. Cuttings yield fruit more quickly, and if clonal material is desired to eliminate genetic variables then hardwood cuttings should be stuck in the fall. The stems are adventitious and layering in the garden happens wherever the branches touch the soil.

**Field Production**
Wolfberry enjoys a sunny to partly sunny location. Row cropping with 3’ plant spacing or a hedge row in a mixed planting work well. Pruning back to 2’ tall when dormant not only encourages fruiting but makes the plants manageable. Trellising may be used to hold plants upright to facilitate harvesting of fruit, and keep plants from layering and expanding out of control.

**Pest and Diseases**
Several species of birds eat the fruit. Charles Martin noted that Lycium is susceptible to powdery mildew, Phytophthora, and Fusarium.² These diseases do not appear to be major cultivation problems.

**Harvest**
Fruit has on-going ripening making weekly harvests for a month or so in the fall the best way to maximize yield. Drying fruit in a dehydrator works better than a passive drying system. Roots are dug from 3 year or older, winter dormant plants. Wash, peel and remove bark, cut into sections and dry.

**Note**
Plants may be invasive.

²Ibid.
**Ophiopogon japonicus**

- Common name: Lilyturf
- Pinyin: mai men dong
- Part used: tuber and root
- Family: Liliaceae

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**Plant Description**

*Ophiopogon* grows as a grassy thatch of shiny, blade-like green leaves that reaches about six inches above the rhizomes. In May, small whitish flower spikes appear within the foliage and form blue-black berries by fall. Several varieties are cultivated as ground covers for landscaping.

**Hardiness**

USDA Hardiness Zones 6-10.

**Propagation**

Tuber division at the time of harvest is the preferred method of propagation.

**Field production**

Lilyturf is adaptable to various well draining soils but requires regular moisture and prefers some shade during the day. Start plants on one-foot centers in a row system or consider planting as an understory ground cover adjacent to tree or shrub crops. It will also grow in wet areas and along streams.

**Pests**

None noted.

**Harvest**

Dig the tuberous roots in spring or early summer. Wash and then air-dry in the shade. “Good quality is thick, large, soft, aromatic, chewy, sweet and light yellowish white in color.” (Bensky et al, 2004)

**Invasiveness**

Harvest of the rhizome crop controls the natural expansion of the crop.

**Notes**

This plant is allelopathic.

**References**

**Pinellia ternata.** (Thunb.) Breit.

Common name: None  
Pinyin: ban xia  
Part used: Root  
Family: Araceae

**Plant Description**
Pinellia is an herbaceous tuber-forming perennial with bright green thrice divided palmate leaf. Air bulbils are frequently found on the petiole. The flowers are green spathes with black spadices and sit above the foliage to a height of 1’. There is a fair amount of genetic variation within the genus and *Pinellia ternata* can reach 2’ tall; spreading by the underground tubers. Pinellia is cold hardy to at least zero degrees Fahrenheit and possibly a bit colder.

**Propagation**
Easy to increase stock in the spring or fall by plant division or use of pea-sized bulbils. Slow growing, they hold well in pots.

**Field Production**
Transplant 6 month to 1 season old 4” pots on 8” centers in the shade. Keep moist, and do not allow to dry out.

**Pests**
Occasionally gophers will predate this herb.

**Harvest**
This important medicinal is grown at least two years, before harvesting while the plant is dormant. Using a box with a wire fabric screened bottom with a mesh of ¼” (hardware cloth), dig 8” deep below crop and sift the tubers from the soil. Finish the harvest by hosing off the screen to reveal the 3/8” white tubers. Expect a few ounces per plant.

**Notes**
Small tubers have a tendency to persist in the soil even after thorough harvesting, making this plant a good candidate for planting in a permanent location. If sufficiently content Pinellia may be invasive. Also note that Pinellia must be processed before ingestion; it is considered a low-dose herb or has toxic attributes. Legally, this herb can only be sold to practitioners.
**Platycodon grandiflorum**, (Jacq.) A.DC.

Common name: Balloon Flower  
Pinyin: jie geng  
Part used: Root  
Family: Campanulaceae

**Plant Description**
With the characteristic Campanula family bell-shaped flower, when in bloom, Platycodon is a showy treat. The species form of this popular garden flower grows to 1-2’ tall and is a prolific summer bloomer. Deep blue flower buds swell before opening giving the plant its’ name. Perennial and herbaceous, erect plants form clumps of foliage with simple 2” ovate, serrate, alternately arranged leaves. Balloon flower is cold hardy to at least -10 degree Fahrenheit. If bruised when handling the stems exude a white sticky latex.

**Propagation**
Seeds are sown very early in the spring or in the fall before planting out. Germination is 2-3 weeks in the heated greenhouse. No special requirements for germination.

**Field Production**
Grow Balloon flower in a sunny location in well drained, average sandy loam soil. Average fertilizer and compost needs. Transplant 1’ apart in rows 1’ apart.

**Pest**
Gophers eat the roots.

**Harvest**
Roots are dug while dormant in the fall after at least 2 years growth. The white taproots grow about 8” long. Washing should be uneventful; slice roots lengthwise and dry easily to a yellow-tan color.

**Note**
When sourcing seed or planting stock, choose unselected species and not cultivars or named varieties. Much work has been done in the nursery trade to modify the height, flower etc., of this plant for ornamental purposes – potentially at the expense of the medicinal properties.
**Polygonum multiflorum Thunb.**

Common name: processed fleeceflower root and vine, fo-ti
Pinyin name: zhi he shou wu, ye jiao teng
Part used: tuber, vine
Family: Polygonaceae

**Plant Description**
This herbaceous perennial vine with heavily branched, twining stems may in warmer climates cover the side of a fence or building. The stems are woody at base and below ground to the tuber; this portion serves as the medicine ye jiao teng. The leaves are smooth, narrowly heart-shaped and 3-4 inches long including petiole. Small greenish white panicle flowers are held on axial stems about six inches long. Bloom time can vary from June to October depending on climate, followed closely by seeding. Hardy to Zone 6, monitor for invasiveness in Zones 7 and higher.

**Propagation**
Cover seed lightly with potting medium. Germinates in 7-14 days at 70°F. Root propagate in early spring from pieces with several nodes and side roots.

**Field Production**
Plant in full sun or part shade using a trellis, fence or tree as support. Grows on wooded mountain slopes. Soil should be rich and well-drained, also light or sandy enough to permit deep digging for harvest. Although the plant can spread aggressively in warmer climates, the tuber seems to be found only below the original planting point. Spacing should be 24-36 inches at minimum. Yield estimates are unavailable at this time.

**Pests**
None noted.

**Harvest**
The root tuber, black-brown on the outside with a reddish-brown interior can grow to football size or larger after several years, and will be found two to three feet below ground. Smaller tubers can be used; slice into thin (eighth-inch) pieces. The unprepared root has no tonifying properties but is used to moisten the bowels. For zhi (prepared) he shou wu, mix slices of cleaned raw root with yellow rice wine and a juice made by boiling black soybeans (*Glycine max*) for several hours. The mixture is then steamed until all the liquid is absorbed, then the slices are allowed to dry.

**Notes**
*Fallopia multiflora* (Thunberg) Haraldson is the preferred synonym used in Flora of China.
**Prunella vulgaris L.**

Common name: self-heal  
Pinyin: xia ku cao  
Part used: Flower, stem, leaf  
Family: Lamiaceae  

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**Plant Description**  
*Prunella* is a low growing perennial plant. Its roots spread laterally in the manner of common mints. It has dark green ovate, opposite leaves and bears purple flower spikes from late summer into fall. Stems are square. Both leaves and flowers are fragrant.  

**Hardiness**  
USDA Zone 4  

**Propagation**  
Start seed indoors in early spring and transplant after danger of frost is past. *Prunella* may be direct seeded in April. Division of rootstock is also easily done in the spring.  

**Field Production**  
Set plants at 1’ centers and allow to fill into a ground cover. Keep plants evenly moist and prune the margins to control the roots. *Prunella* can withstand neglect but the roots and seed can be invasive without management. Hand weeding is required for solid-seeded stands in wide beds.  

**Pests**  
None noted.  

**Harvest**  
Stems are cut when plants are in full flower, throughout the summer and early fall. Place on drying racks to air dry or in a dryer at very low heat. “Good quality is dark reddish purple with large spikes.” (Bensky et al, 2004)  

**Invasiveness**  
Harvesting of the flowers as the crop should avoid the opportunity of self-seeding and seed dispersal. Spreading of the roots must be controlled by regular edging and/or root barriers.  

**References**  
Rehmannia glutinosa, Libosh.

Common name: Chinese Foxglove
Pinyin: Di Huang
Part used: root
Family: Scrophulariaceae

Plant description
This creeping herbaceous perennial has attractive muted pink tubular flowers on spikes to 1’ and hairy, textured or crenate leaves arranged in a basal rosette. Rehmannias spread by pale orange adventitious rhizomes. Hardy to at least 10 degrees Fahrenheit.

Propagation
Plants are more easily grown by root division, rather than by seed. Plants that are more than 1 year old and have rhizomes with several eyes can also be sectioned off and replanted in the spring, summer or fall. It is important to note that a fungal disease can destroy a planting in a very short time. To guard against loss keep stock in several locations, as well as nursery stock held back. It is also important to note that after division nursery stock should be placed on bottom heat or entire crops may be lost.

Field Production
Full sun in cooler climates or part shade where there is summer heat. Extremely well-draining soil is necessary. Plants should be frequently irrigated as they are not drought tolerant. Naturally growing in waste areas, they do not require much fertilizer or manure. Transplant in spring from 4” nursery pots to 1’ on center. Careful not break the rhizomes. They will spread into a groundcover by fall. Cultivation of this valuable crop is not suitable in areas with high rainfall. When growing well, they return in late spring or summer and seem to thrive until the next rainy season, when they frequently tend to have die-off due to the rather ubiquitous fungus.

Pest
Thrips and spider mites can be problematic. See note about fungal disease above.

Harvest
The brittle rhizomes can be harvested in the late fall if planted out the previous spring; however two seasons yield better roots. If growing in a wet winter area, harvest just after the plants go dormant to avoid crop loss to rot. Save the rootlets and replant at this time to increase next season’s stock.

Notes
This herb is widely cultivated in China and occurs naturally from sea level to 3500’ and as far north as Mongolia.¹

**Latin name** *Rheum palmatum* L.

<table>
<thead>
<tr>
<th>Common name: Turkey rhubarb</th>
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<tbody>
<tr>
<td>Pinyin: da huang</td>
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<tr>
<td>Part used: root</td>
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<tr>
<td>Family: Polygonaceae</td>
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**Plant Description**

This is a close relative of common garden rhubarb, *Rheum rhaponticum*. It is an herbaceous perennial, growing to six feet in height when it flowers. It flowers from June to July, and the seeds ripen from July to September. The flowers are hermaphrodite (have both male and female organs) and are wind-pollinated. (1)

**Hardiness**

It is hardy to zone 7. In more northerly climates the tender leaves and stems die back to the ground.

**Propagation**

The seed is best sown in autumn in a shaded cold frame. The seed can also be sown in spring in a cold frame or in seedling trays. When large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse or cold frame for their first winter, planting them out in the spring. Divide roots in early spring or autumn. Divide up the rootstock with a sharp spade or knife, making sure that there is at least one growth bud on each division. Larger divisions can be planted out direct into their permanent positions. (1)

**Field Production**

The plant prefers loamy soils, requires well-drained soil and can grow in heavy clay soil. The plant tolerates wide range of pH. It can grow in semi-shade or full sun and requires moist soil. Mulch with well-rotted farmyard manure in late winter or spring. The greatest commercial production is in milder climates. (1)

**Pests**

None observed.

**Harvest**

Dig up mature roots and crowns when dormant. Wash, slice diagonally and air dry.

**Notes**

Warning! The leaves are toxic to both animals and humans. The stems can be eaten like garden rhubarb.

**References**