

Goldenseal *Hydrastis canadensis*



Goldenseal is a highly valued medicinal herb which has been collected from the forests of North America for hundreds of years. Known by the names: yellow root, ground raspberry, eye-balm, yellow paint, and wild turmeric, goldenseal is known for its anti-fungal, antibiotic, and anti-bacterial qualities. Overharvesting and loss of native habitat have caused a serious reduction in native populations.

Goldenseal is an herbaceous perennial which emerges in early spring from a perennial rootstock. The root system, used for medicinal purposes, is composed of a bright yellow, horizontal underground stem, that is covered with bright yellow fibrous roots and rootlets. These roots are gathered, dried and marketed. The plant grows to a foot in height with two or more erect hairy stems usually ending in a fork with two leaves. Small, white flowers open as the leaves unfold. Plants produce a single, green raspberry-like fruit which turns red and ripens in July. The plant dies down slowly after the fruit matures.

SITE SELECTION

Goldenseal grows best in a rich, moist, well-aerated, loamy soil with good water drainage. Areas with tall, dense canopies of poplar, beech, maple, dogwood, or oak are preferable. Watch for the presence of spring companion wildflowers such as mayapple, black cohosh, maiden hair fern, jack-in-the-pulpit, trillium, bloodroot, and false solomonseal.

Goldenseal can be propagated from rhizome pieces, root cuttings, one year old seedlings, or seed. ► **Planting takes place in the fall, prior to the first freeze.** Woodland sites should be tilled with added organic matter such as rotted leaf mulch and compost. Rootlets are planted in narrow trenches 2-3" deep with a spacing of 5-6" apart in rows 6-8" apart.

It takes 5 to 7 years to grow harvestable roots.

Roots are dug in the fall after the tops die down and are carefully washed and dried. Roots will lose about 70% of their weight during drying. Prices for goldenseal fluctuate, depending on supply and demand. **Average prices:** \$8-11 per pound fresh; \$40 per pound dried

Sources of Information and Propagation Material:

- www.ncgoldenseal.com
- United Plant Savers www.unitedplantsavers.org
- www.ces.ncsu.edu
- www.ginsengseed.com
- Burkhart and Jacobson. NTFP's from Pennsylvania: #2—Goldenseal. Penn State University School of Forest Resources. 2006.

Elderberry *Sambucas canadensis*



Elderberries are hardy, native shrubs that have great ornamental and fruiting value. They produce beautiful, large, white flower heads in the spring that are followed by large clusters of blue-black berries in late summer. Elderberry fruit makes incredible juice, wine, jam, syrup, pies and jellies that have wonderful flavor and are very high in Vitamin C; the flower clusters can be dipped in batter and fried.

Elderberries are edible when cooked.

Uncooked berries have a dark purple juice that can be astringent and inedible. All parts of the elderberry plant are considered to be valuable in many folk medicine traditions. To the Native Americans and American settlers, it was considered "**the medicine chest of the common people**". Uses include: coughs, colds, flu, headache, burns, bacterial and viral infections, improves vision and heart health, and is an immune system booster. Poultices made from leaves and flowers are good for wounds, sprains and bruises.

Elderberries are an important source of summer food for numerous species of songbirds including the indigo bunting, yellow-shafted flicker, ruby-crowned kinglet, mockingbird, robin and cedar waxwing.

SITE SELECTION

Elderberries fruit more heavily when two different varieties are planted close together. They do well in sun or part shade and prefer moist, well-drained soil. ► **Seedlings can be planted in early fall before soil temperatures are below 45°F or in the spring.** Space plants 6' to 10' apart. Elderberries are shallow rooted, so keep them well-watered during the first season. Control weeds around young plants by mulching.

Elderberries send up new canes each year that usually reach full height in one season and develop lateral branches in the second. Flowers and fruit develop on the tips of the current season's growth, often on the new canes but especially on laterals. **Second-year elderberry canes with good lateral development are the most fruitful.**

Harvest elderberry fruit in late August through early September, depending on the cultivar. When ripe, the entire cluster should be removed and the berries stripped from the cluster for use.

Sources of Information and Propagation Material:

- www.elderberrylife.com
- elderberries.ning.com

For more information about Forest Botanicals contact ASD
asd@asdevelop.org or call 276-623-1121
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Shiitake Mushrooms

Lentinus edodes



The market for mushrooms continues to grow due to their culinary, nutritional and health benefits.

SITE SELECTION

► **Hardwood logs (white or chestnut oak is best) are cut green during the winter when the sap is down.** Logs are cut in 3 to 4 foot lengths in diameters from 2 to 6 inches for easy handling.

Harvest logs carefully to avoid soil contact and damage to the bark. Torn bark can allow other organisms to enter the log and compete with the shiitake for nutrients.

Inoculate logs with shiitake sawdust spawn by drilling 1/2" diameter holes approximately 1" deep into the log with holes 6" to 8" apart in a row. Rows can be 3" to 4" apart. Pack holes with the spawn using your fingers and the end of a pen or pencil. Seal with wax or foam plugs to retain moisture and keep out competing organisms. Label each log with date of inoculation and type of spawn used.

After inoculation, spawn develops a mat of white strands called mycelia that grow throughout the log to collect the nutrients necessary for fruiting. It takes between 5 to 24 months for fungus to colonize a log.

Logs are stored in a shaded area. Lean logs with one end on the ground and the upper end against a rail, fence, shed, etc. They can be fairly close but there should be room for air to circulate each log. Logs can also be stacked log cabin style with air circulating each log.

To induce fruiting, soak logs for 12-36 hours then re-stack. Mushrooms should appear 4-7 days later. If logs fail to produce, soak again after 3 weeks. If logs do produce allow log to rest for 6 weeks before another soak.

The best grades of shiitakes have caps that still have a slight curl at the edge. Harvest often if you want to earn the best price for your mushrooms. Pay attention to post-harvest storage, packaging, and shipping.

Local Buyers for Fresh Shiitake Mushrooms

Restaurants	Bed and Breakfasts
Vacation Resorts	Organic Markets
Supermarkets	Farmers Markets

Sources of Information and Propagation Material:

- Northwest Mycological Consultants
www.nwmycol.com
- Hardscrabble Enterprises, Inc.
hardscrabble@mountain.net

Ramps

Allium tricoccum



Ramps, or wild leeks, are native to eastern North America. In early spring, ramps appear as smooth, broad, lily-of-the-valley like leaves that disappear by summer before their white flowers appear. Ramp bulbs are prized for their spring onion taste and strong garlic-like aroma.

Traditionally ramps were consumed as the first edible "greens" providing much needed vitamins and minerals following long winter months without fresh vegetables. Today, annual "ramp festivals" are considered major tourist attractions. In many areas intensive harvesting is seriously damaging wild populations of ramps. That, and the interest of high-end restaurants serving ramps in season, are increasing the demand of ramps thus, the need for growers to consider ramps as a profitable, marketable crop.

SITE SELECTION

Ramps grow naturally under a forest canopy of beech, birch, sugar maple, poplar, buckeye, basswood, hickory and oak. Wildflowers such as trillium, toothwort, nettle, black cohosh, bloodroot, trout lily and mayapple can help identify suitable location sites for growing ramps. Ramps can be grown under shade structures if forest sites prove unsuitable.

Ramps prefer a well-drained site with rich, moist soil, high in organic matter. Soil moisture is one of the most important environmental conditions for the survival and growth rate of the plant. Adequate moisture must be maintained throughout all seasons not just the active growing season.

► **Late August thru September is the best time for sowing ramp seeds.** Seed requires a warm moist period followed by a long cold period to break seed dormancy. Lack of adequate warm/cold periods can result in slow seed germination. **Production from sowing seeds to root harvest can take 5 to 7 years.**

Many growers prefer planting bulbs instead of sowing seeds. **Planting large bulbs (greater than 1/2" diameter) can provide harvestable ramps within 2-3 years.**

► **Bulbs are planted in late February to early March** and mulched with a thick layer of hardwood leaf litter. Mulch helps to maintain proper moisture levels and creates an insulation to protect plants from excessive hot and cold temperatures. Mulches suppress weeds and can protect seedlings from wildlife.

Sources of Information and Propagation Material:

- www.ces.ncsu.edu/depts/hort/hil/hil-133.html
- www.hort.purdue.edu/newcrop/ncnu02/v5-449.html

Ginseng

Panax quinquefolium



American ginseng is a deciduous perennial native to cool, shady hardwood forests east of the Mississippi River. "Digging sang" has been a profitable activity for mountain people for generations. Sold to the Chinese market as a medicinal, ginseng can be a profitable, although difficult crop to grow. Wild harvest has depleted the natural population to such a degree that it has become threatened with extinction in certain regions. Threat of human theft has made ginseng production impossible in numerous areas. The market value of ginseng fluctuates significantly. Wild ginseng can sell for over \$500 per pound while cultivated roots sell for only \$30 per pound. Experienced buyers can easily tell the difference between wild and cultivated roots. Wild roots are often forked, dark tan in color, gnarled in appearance and show many concentric growth rings. Cultivated roots are most often shaped like a carrot, cream colored, smooth, fat and exhibit few concentric growth rings.

SITE SELECTION

Ginseng prefers to grow in cool, damp, well drained, dense shaded conditions. Choose north, northeast mountain sides under hardwood trees; preferably yellow poplar and sugar maple. Wild ginseng grows in sites with maiden-hair fern, black cohosh, bloodroot, Solomon's seal, hepatica and mayapple.

► **Stratified ginseng seed is planted in the fall during peak leaf drop,** ensuring that seeds are not planted too deep under leaf litter. If you plant too deep, they won't come up. Be cautious about buying cheap seed; seed producers who do their jobs right are not likely to sell their seed at low prices. Approximately 1 oz of seed is needed to plant a 10'x10' area.

Ginseng roots are dug 6 to 10 years after planting. Deer and turkey love them as do rodents such as mice. Human theft is the greatest threat to a crop of ginseng.

There are numerous ginseng buyers across the region. A list of Licensed Buyers can be found by contacting your state's natural resources agency.

Sources of Information and Propagation Material:

- Apsley and Carroll. *Growing American Ginseng in Ohio: Planting Using the Wild-Simulated Method.* Rural Action and Ohio State University Extension
- Chamberlain, Munsell, Vaughn. *Growing American Ginseng in Forestlands.* VA Coop. Extension. Publication 354-313. 2011.

Pawpaw

Asimina triloba



The pawpaw is a small to medium deciduous tree with uniquely flavored fruit, resembling a combination of banana, mango and pineapple.

Pawpaw fruit can be processed into juices, wines, ice creams, yogurts, and baked goods. The fruit is very nutritious, containing high levels of vitamins, minerals, and amino acids. Natural compounds in the leaf, bark, and twig tissue have insecticidal and anti-cancer properties which may present a lucrative opportunity for small farmers in the future.

The flavor of a pawpaw fruit intensifies as it ripens, similar to a banana, resulting in pulp that is excellent for use in cooking. Tree-ripened fruits have a shelf life of 3 to 5 days at room temperature, but can be stored from 1 to 3 weeks if refrigerated. The skin and seeds should not be eaten. Pawpaw pulp freezes well and is commonly sold in 2 pound packages.

On average 1 tree can produce about 10 pounds of fresh fruit which can be sold @ \$1.00-\$2.00/#. This of course depends on the market. Frozen pulp can be sold for \$6/#. Specialty products such as pawpaw jam or chutney can be sold for \$6.50/8oz jar.

Pawpaws are relatively disease-free and have few insect pests, which could make this an excellent crop for organic production.

SITE SELECTION

- For good fruit production the trees should be grown in **full sun**. While it is true that pawpaws are shade tolerant, they will fruit much less in the shade.
- Because of the large size of the leaves, windy sites are damaging and should be avoided.
- Excessively dry sites should be avoided. Moist soils are ideal.
- Pawpaws appreciate organic mulch. Copy conditions in a natural forest ecosystem; use layers of decomposing leaves as a mulch.

► **Pawpaws transplant better in the spring.**

Grafted trees may bear fruit in as few as 3 years.

Sources of Information and Propagation Material:

- www.pawpaw.kysu.edu
Kentucky State University hosts a broad range of information about pawpaw production including Pawpaw Planting Guide, Cultivars, Nurseries, FAQ, Pawpaw Research and more.
- www.hort.purdue.edu/newcrop/cropfactsheets/pawpaw.html