

## Goldenseal

### Introduction

Goldenseal is a perennial woodland herb that is highly valued for its many medicinal uses. The dried roots have been used for the treatment of eye, skin and digestive disorders. Goldenseal has also been marketed as an immune system stimulant. Its natural range, which includes Kentucky, is similar to that of ginseng.

### Marketing and Market Outlook

Kentucky is a major harvester of wild goldenseal. Unfortunately, a decline in native populations has occurred as demand and harvesting pressure has increased. Unlike ginseng, however, the market does not distinguish between wild and cultivated goldenseal. That is, goldenseal roots bring the same price regardless of production method. Fortunately, cultivation of this herb is easy and should be encouraged. Leaves and stems also have commercial value when harvested while still green.

The same state-licensed dealers who purchase ginseng, also buy goldenseal, along with a number of other woodland medicinals. Kentucky growers could also explore various alternative marketing opportunities, such as health food stores where it is sold as a tea or in powder or capsule form. In addition, co-ops or herbalists might be interested in purchasing dried or fresh roots. Direct sales to consumers may also be an option.

### Production Considerations

#### *General*

Goldenseal is often grown under the same wooded conditions or



shade structures as ginseng. In fact, because of the similarity of cultural requirements, goldenseal makes the ideal succession crop for ginseng growers.

Plants must be provided with growing conditions similar to those present in wild sites. This includes moist, well-drained soil high in organic matter. This herb responds well to organic fertilizers; however, it does not show a positive response to synthetic fertilizers. Goldenseal is more tolerant of light than ginseng and prefers 60 to 80 percent shade. Goldenseal does better in a higher pH (6.0 to 7.0) and will die out if the pH level drops below 5.5.

The selected site should have a slight slope, preferably facing north or east. The best wooded sites are those with long-lived, deep-rooted deciduous trees, such as oak, hickory, beech, tulip poplar, sugar maple and walnut. Wild plants that indicate good goldenseal growing conditions include jack-in-the-pulpit, mayapples, trillium, wild ginger, bloodroot and cohosh.

#### *Propagation*

Goldenseal plantings may be



started from seed, rhizome divisions or one-year-old seedlings. Seeds should be harvested when the berries turn dark red and soften. Ideally, seeds should be depulped and planted immediately or stored in a stratification box only until a planting site can be prepared. Goldenseal seed does not store well and may rot or fail to germinate if held for very long prior to planting.

Seeds and root pieces should first be sown outdoors into a prepared seed bed in the fall, with 1 to 2 inches of mulch applied immediately after planting. Rhizome pieces can be planted directly into permanent beds. Once the tops have died down, either after the first or second growing season, goldenseal (from seed or rootlets) can be transplanted to permanent beds.

#### *Production methods*

**WILD** goldenseal grows naturally without human influence. However, since goldenseal is considered a threatened species, its collection and sale is strictly regulated.

**WILD-SIMULATED** goldenseal is grown in untilled soil in a favorable forest location. Little site-preparation is required other than raking away the leaf litter down to the topsoil. Once goldenseal is planted, the leaf litter is raked back into place. No further labor is required until harvest when plants are hand-dug.

**WOODS-GROWN** goldenseal is cultivated in tilled beds under the natural shade of hardwood trees. Site preparation includes clearing away rocks, understory growth, and undesirable trees. Well-rotted organic matter may be added to the beds. Maintenance can include hand weeding, the continued removal of competing understory plants, and thinning seedlings.

**FIELD-CULTIVATED** goldenseal is grown in well-tilled raised beds in an open area. Leaves, rotted sawdust or woodland soil may be added to the beds. Artificial shade is provided by wooden lath houses or black polypropylene shade cloth. Rhizomes are planted in furrows and mulch is

added immediately after planting. Maintenance consists of weeding, adding more mulch, and fertilizing.

#### *Pest management*

Under natural conditions, especially in small isolated plots, diseases and insects do not pose a serious threat. Disease problems, such as Botrytis blight, Rhizoctonia and root knot nematode, are usually worse under shade structures. Deer, which will feed on ginseng, generally leave goldenseal alone. Rodents, such as field mice, can do a great deal of damage, particularly in wooded sites. Slugs can also be a problem. Weed control, generally by hand, will be necessary in some plantings. As with ginseng, human theft will be one of the major concerns of the goldenseal grower.

#### *Harvest and storage*

Goldenseal roots can be harvested after 3 to 5 years. Roots are dug after the tops have died down in the fall. Harvesting from raised beds can be done by hand, with a potato fork or with a mechanical digger. Wild-simulated root is usually dug with a potato fork, a modified hoe or a trowel.

Wash, but do not scrub, the roots immediately after digging in order to remove the dirt. Roots should then be allowed to drain on a screen for an hour or two before beginning the drying process. Dry slowly at temperatures between 90° F and 110° F, keeping the relative humidity low so that the rhizomes will not mold. The roots can then be stored in a dry, rodent-proof area until sold.

If the leaves and stems will be marketed, they should be cut while still green and then dried. Harvesting tops will reduce root growth, thus, should be delayed as long as possible.

#### *Labor requirements*

Labor requirements for goldenseal production vary considerably depending on the intensity of cultivation. Intensively cultivated woods-grown goldenseal in Kentucky may require as much as 670 hours per acre for land preparation and

planting, a total of 1,800 hours of maintenance per acre during the 4 to 5 years of production and 1,120 hours per acre for harvest and drying operations. On the other hand, the same size field planting cultivated under artificial shade can require 875 hours planting and cultivation labor and 125 hours of harvest labor over the same period of time.

### **Economic Considerations**

Commercial goldenseal production can be quite profitable; however, it requires an enormous commitment of time and money. Risks include crop failure due to diseases, drought, rodents and theft, as well as price fluctuations. Growers should start small (e.g. with 1/10<sup>th</sup> of an acre) in order to gain experience.

Generalized budgets are very difficult to establish due to variations in production methods. The time value of money (interest costs) should be considered if a large investment in shade-grown production is under consideration. The lowest investment and production costs can be expected for wild-simulated goldenseal, while the greatest expenses are required for intensively cultivated field-grown goldenseal under artificial shade. Woods-grown goldenseal can yield 35 to 45 pounds dry weight per 1,000 square feet. Presuming a price of \$40 per pound, returns of \$1,360 to \$1,800 per 1,000 square feet can be expected. These figures are based on a 5-year production cycle.

### **More Information**

- Medicinal Herb Seed and Root Sources for Planting in Kentucky (University of Kentucky, 2001)  
<http://www.ca.uky.edu/agc/pubs/ho/ho73/ho73.htm>
- Selected Internet Resources for Herb Marketing (University of Kentucky, 2005)  
<http://www.uky.edu/Ag/NewCrops/herbmarketing.pdf>
- Woods Production of Ginseng and Goldenseal (Robinson Station, University of Kentucky, 2003)  
<http://ces.ca.uky.edu/robinsonstation/Horticulture/Medicinal%20Plants.pdf>
- Commercial Goldenseal Cultivation (North Carolina State University, 2000)  
<http://www.ces.ncsu.edu/depts/hort/hil/hil-131.html>
- Farm Enterprise Budget for One Acre of Organic Goldenseal Grown Under Artificial Shade (North Carolina State University, 2003)  
[http://cals.ncsu.edu/specialty\\_crops/medherbs/budgets/Goldenseal\\_Three\\_Varieties.xls](http://cals.ncsu.edu/specialty_crops/medherbs/budgets/Goldenseal_Three_Varieties.xls)
- Farm Enterprise Budget for Organic Goldenseal (North Carolina State University, 2003)  
[http://www.cals.ncsu.edu/specialty\\_crops/medherbs/budgets/2003goldensealbudget2.xls](http://www.cals.ncsu.edu/specialty_crops/medherbs/budgets/2003goldensealbudget2.xls)
- Forest Production of Goldenseal (USDA Forest Service, 1999)  
<http://www.unl.edu/nac/agroforestrynotes/an16ff05.pdf>
- Ginseng, Goldenseal, and Other Native Roots (ATTRA, 2004)  
<http://attra.ncat.org/attra-pub/ginsgold.html>