ISU FORESTRY EXTENSION

American Ginseng in Iowa: Producing

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Cultivate ginseng root on the left vs. a wild or wild simulated ginseng root on the right. Photo by B. Beyfuss.

The high value of American ginseng roots provides a great opportunity for non-timber income from forest lands across the Midwest. There is a variety of methods for producing and harvesting ginseng and these techniques can be divided into the categories of "woods grown" and "field grown", depending on the source of shade utilized. Woods grown production simulates natural forest conditions and can be further differentiated into the 'wild simulated' and 'woods cultivated' techniques, which are distinguished mostly by the practice of soil tillage. Field grown is synonymously referred to as 'shade grown' or 'field cultivated', and is characterized by the use of artificial shade, soil cultivation with mounded planting beds and intensive fertilization and pest management practices. Generally speaking, the cost of production increases and the price paid for roots decreases as one moves from a wild simulated to field cultivated production technique. Prospective growers are encouraged to start small with half a pound of seed or less, and to only expand production with successful growth of seedlings after 3 years. Keep in mind that ginseng production is not a guaranteed business venture, nor is it a fast way to earn a return on investment. Long rotation lengths and frequent failures of early plantings have disappointed many first time growers.

Wild Simulated	Woods Cultivated	Field Cultivated
Grown in forest soils	Grown in forest soils	Grown in field soils
Planted in untilled beds	Planted in tilled beds	Planted in tilled beds
Utilizes natural shade	Utilizes natural shade	Utilizes artificial shade
Grown for 9-12 years**	Grown for 6-9 years**	Grown for 3-4 years
Roots similar to wild ginseng	Roots of intermediate quality	Roots of lowest value**
Leaf and bark mulch	Leaf and bark mulch	Straw mulch
20 lbs of seed / acre*	48 lbs of seed/acre*	100 lbs of seed/acre*
160 lbs of harvested root/acre*	600 lbs of harvested root/acre*	2,500 lbs of harvested root/acre*

*Seeding rates and harvest yields from Carroll and Apsley 2004 F-65-04
**Rotation Lengths from Beyfuss 1999 Agroforestry Note 14

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Wild Simulated:

In the wild simulated technique, ginseng is grown in a forest environment to utilize the natural shade provided by the forest canopy. This method is done almost exclusively with seeds, which are planted ½ to 1 inch deep in untilled soils to mimic the stressful soil conditions that produce the extremely valuable gnarled roots of truly wild ginseng. Rotation lengths can vary from nine to twelve years or more depending on growing conditions. After raking back leaves and other detritus, seeds are planted by hand directly into the soil at a rate of four to five seeds per square foot before returning the raked leaves as mulch. Few tools are needed for clearing planting beds in this production technique; including leaf and garden rakes, pruning equipment, mattocks or shovels for digging competing weeds and harvesting roots. This method of production has the lowest cost and produces the highest valued roots, but a substantially lower volume of roots over a longer rotation. To reduce the occurrence of disease, desired stand densities at maturity are between one to two plants per square foot. Maintenance typically includes no more than an initial two to three years of weeding and slug control. Fertilization should not be used to ensure the slow development of roots that more closely resemble wild ginseng roots. Because very little pest management is typically utilized, success of plantings are more sporadic compared to the other techniques.

Wild simulated ginseng growing under natural canopy shade in untilled soils, usually in scattered plantings. Photo by B. Beyfuss

New woods cultivated ginseng beds tilled and formed for planting under natural shade. Photo by B. Beyfuss

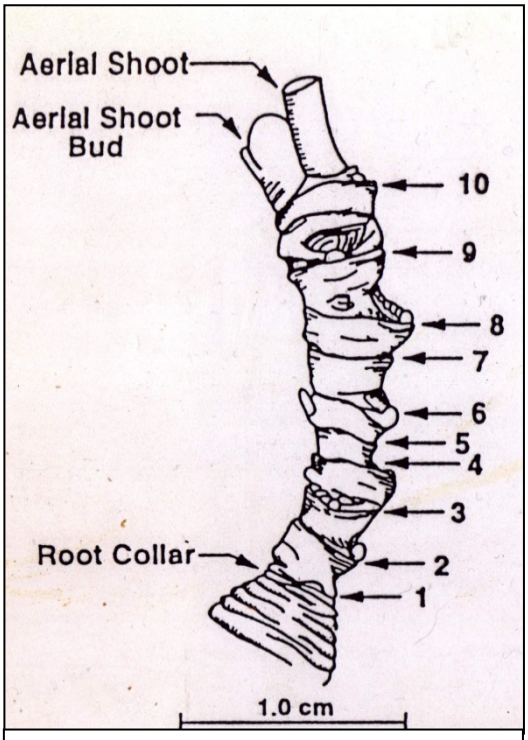
Woods Cultivated:

In the woods cultivated technique of production, ginseng is grown in a forest environment to utilize the natural shade provided by the forest canopy. Rotation lengths of six to nine years are typical and yield an intermediate volume of roots. Root quality and market price more closely approaches wild roots than cultivated roots. Planting sites are prepared by removing competing understory vegetation, small trees and rocks. Beds are then tilled to a depth of four to six inches. If soil tests show that available calcium is less than 1,000 pounds per acre, limestone or gypsum may be added at a rate of 50 pounds per 1,000 square feet. Limestone should be used on soils with an initial pH below 4.5 and gypsum should be used on soils with a pH from 4.5 to 6.

Seeds are planted at a depth of ½ to 1 inch either by hand in 6 to 9 inch rows one inch apart or by broadcasting and raking in (AFN14). Seed should be planted in the fall to allow for overwinter stratification and is typically done in five to six foot wide beds that allow access for maintenance. Alternatively, one to three year old rootlets may be transplanted to a depth of one to two inches at a rate of one rootlet per square foot once they have set bud in late July. Rootlet plantings ensure a higher probability of success and allow for shorter harvest rotations, but are considerably more expensive and require more labor to plant. A two or three inch layer of leaf and bark mulch should be left on top of all plantings. Maintenance during the life of the planting bed should include weeding, pest control, mulching and thinning as plantings become crowded. Soil testing and additional calcium fertilization may be needed every two or three years. If available calcium reduces below 1,000 pounds per acre, 40 pounds per 1,000 square feet of gypsum or ground limestone can be surface applied before plants emerge in the spring.

Field Cultivated: In the field cultivated technique, ginseng is grown under artificial shade provided by polypropylene shade cloth or wooden lathe. Seeds are planted in four to six foot wide raised beds of cultivated fields. Rotations lengths of three to four years are typical and yield a high volume of lower quality roots that resemble carrots. With recent prices for field cultivated ginseng on the global market, the cost of production is approaching expectable revenues and necessitates high density plantings with short crop rotations. Aggressive pest and pathogen management is essential with field cultivated ginseng.

Field cultivated ginseng under artificial shade cloth with deep soil tillage and raised planting beds. Photo by B. Beyfuss



Numbers 1-10 indicate annual growth bud scale scars used to age plants. Graphic by B. Beyfuss.

Harvesting and Aging Ginseng Roots: Roots are harvested during the late summer or early fall depending on state regulations (Sept 15th to October 31st in Iowa). Roots should be dug by hand to prevent damage to the main root and to keep the fine roots intact. Hand digging also ensures that the root neck is undamaged, allowing for proper identification of the root's age. Each year a ginseng plant grows an above ground stem that produces a visible bud scale scar where the new stem initiates its growth the following year. Aging ginseng can be difficult but with some practice one can get good at counting the scars. Most people use a short handled mattock, commonly known as a "sang hoe" to loosen the soil 8 to 12 inches from the base of the stem in a wide arc around the plant. Carefully remove the loose soil around the plant with your hands to keep all the fine root hairs attached to the ginseng as buyers prefer the fine roots to be attached to the main root. If you dig a ginseng root that does not have the 5 bud scars required by Iowa law, you must replant the ginseng root in its original location. If you must replant the ginseng, it is best to replant at the same depth and in the same direction that it was originally growing. Be careful when handling the root as the next years bud shoot can be easily damaged.

Processing: After being dug, roots should be washed with running water, but not soaked. Roots may be softly brushed, but should not be scrubbed so that they appear white in color or the outer "skin" is rubbed off. Removal of any skin and dark cream coloration will lower the paid price of roots. If dried roots are desired, they can be slowly dried for about two weeks in a well-ventilated area. Good air circulation around the roots with consistent humidity and temperatures below 100° F are optimal. Place roots on screens in a single layer without touching each other. Allow them to dry until they are no longer pliable and break crisply. Root sizes and shapes vary, but average roots weigh 1/20th of an ounce each and will lose 2/3 of their weight as they are dried. Roots are typically sold on a dried pound basis, although some buyers may be willing to accept unprocessed green roots for a lower price to adjust for the weight lost during drying. Check with prospective buyers before harvesting to ensure that you process roots properly. If fresh or "green" roots are desired, they can be stored in a refrigerator in open bags for a few months' time after they are washed. Do not seal them in plastic bags as this will promote rot and decay.

Drying ginseng roots spread on window screen racks with constant air circulation. Photo by B. Beyfuss

Markets: The most common and certainly the most valuable portion of the ginseng plant that is harvested is the root. Prices for a single pound of dried American ginseng roots can range from $500-$750 for wild roots to as low as $10 for cultivated roots. Ginseng roots are sorted into over 40 grades determined by their age, taste, shape, color and intact condition. Higher prices are paid for old, gnarled shaped, dark skinned, bitter tasting roots with many fine roots left attached. The market for ginseng roots is relatively accessible and developed compared to most other non-timber forest products. Demand for ginseng roots continues to increase as the growing middle class in China and throughout Asia can afford the expensive herb. It is unlikely that supply will meet the demand in the near future as additional markets are created by a wider use of traditional medicine in western cultures. A list of licensed ginseng buyers in Iowa and commercial seed dealers can be obtained from the ISU Forestry Extension website at http://www.extension.iastate.edu/forestry/.

Additional Products: Because ginseng is rather long lived, plants may not reach harvestable maturity for 9 to 12 years after planting. To offset some of the early expenses of planting, other products from a ginseng crop such as the seed, berry pulp and leaves may be sold. Ginseng leaves and de-pulped berries are used to make herbal teas and extracts which are believed to have some of the same medicinal effects as the roots. Seeds can begin being harvested in years 3-5, depending on the cropping system utilized and are sold at a range of prices from to $80 to $140 per pound, with 6,500 to 8,000 cleaned seeds per pound. Properly harvesting, de-pulping, stratifying and storing seeds can be very difficult and beginners may find it best to start on seeds they intend to keep for personal use, as they expand their own production, before selling to others. Make sure your state regulations do not prohibit you from harvesting, stratifying, and/or selling ginseng seed from raised ginseng parent material. In Iowa it is illegal to harvest and sell ginseng seed from wild harvested parent plants.

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