

Managed Production of Woods-grown and Simulated Wild Ginseng



Ginseng root

Project Summary

Willis Runck and his family have been growing woods-grown ginseng since 1974. There is little information available on this production system. This project will demonstrate establishment, maintenance, and harvesting techniques as well as seed production and stratification methods.

Farm Description

Our family farm operation has a total of 440 acres of land located in the Minnesota River Valley. Approximately 290 acres are used for the production of corn, soybeans, and spring wheat. The other 150 acres consist of dense hardwood forest.

We planted our first plot of woods-grown ginseng, about 5,000 ft², in 1974 with the intention of making more productive use of the woodland. Today, the total managed woodland area planted to ginseng is about six and one-half acres plus one third acre of cultivated ginseng under artificial shade. Our ginseng beds are separated based on age of the plants; we have some new plantings as well as some that are 20 years old. Except for spraying for disease control, all work is done manually.

Project Description

Ginseng (*Panax quinquefolius*) is a slow growing, perennial plant. It is a medicinal herb cultivated for its root. Ginseng develops from seed planted in the fall.

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Project Duration

1999 to 2001

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Plants emerge when temperatures reach about 50°F. Plants reach a height of about 1 ½ to 2' after three to four years. A ginseng root can grow for 70 to 90 years or more but woods-grown ginseng is harvested after 8 to 12 years of growth; older roots are more valuable. Woods-grown ginseng more closely resembles wild ginseng and is more valuable than cultivated ginseng (grown in cultivated fields under shade cloth).

Successful woods-grown ginseng production requires an intensive management system with techniques that differ from cultivated ginseng production. We developed our methods and techniques from trial and error. There is limited public information available on growing woods-grown ginseng, much of it adapted from cultivated ginseng production methods. We wanted to demonstrate our techniques because many of the cultivated techniques will not result in high quality woods-grown ginseng roots. Many farmers have wooded lots where ginseng could provide additional income while reestablishing this native plant to its natural habitat.

The most critical decision that a woods-grown ginseng grower will make is the selection of a site. Ginseng prefers moist but well-drained soils with high organic matter content and a pH between 5.5 and 6.5. It requires only 20% sunlight and will die if light intensity is above this level. If a flat, forested area is chosen, it must have mature hardwood trees. Otherwise, only sloped, wooded terrain facing to the north or east should be chosen. These sites will have cooler ground temperatures during the growing season which results in less disease incidence, particularly less *Phytophthora* root rot. Sloped areas facing to the south and west should be avoided.

Disease is the single most limiting factor for successful ginseng production.

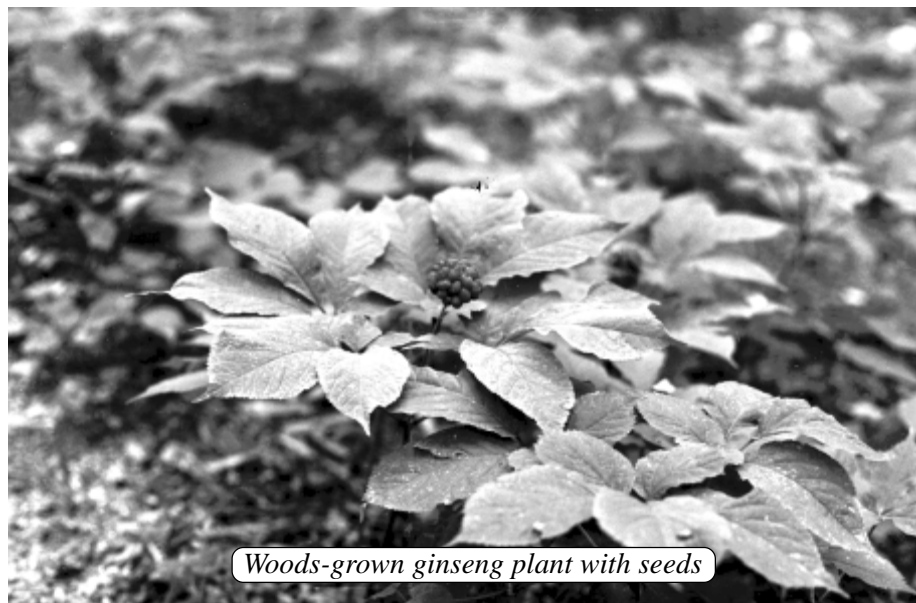
Because ginseng roots won't be harvested for several to many years, it is essential for long-term survival and quality of the root that diseases are controlled. Cultivated ginseng growers use 15 to 18 applications of fungicide each season to prevent *Alternaria* blight. Woods-grown plots will normally see six to eight applications of fungicide. Plots on my farm have cartways, or trails, around them to allow access for sprayer equipment that blows the fungicide onto the plants.

Today, cultivated ginseng is being over produced while wild ginseng is becoming extinct. The Chinese have always placed the highest value on American wild ginseng since it was first exported to China in 1717. The North American continent has the only remaining wild ginseng in the world. As a result, woods-grown ginseng will continue to gain in value as it replaces the wild roots. The latest market values for the three types of ginseng root are:

Cultivated roots, 3 to 4 years old	\$10 to \$20/lb
Woods-grown, 8 years old	\$150 to \$190/lb
Wild roots, unsorted	\$450 to \$500/lb

Project Results

1999 had an unusually wet growing season. Even though woods-grown ginseng plots have lower disease incidence, we still used nine fungicide applications on older ginseng plots. Seven of the nine sprays contained copper sulfate, also called Bordeaux Mix. Copper sulfate is also classified as a fertilizer or food additive and would qualify for use in organic farming. This was the second year we used copper sulfate. It provided excellent control against *Alternaria* blight and possibly provides some protection against other fungal diseases such as *Botrytis* blight and *Rhizoctonia* crown and root rot. But we also noticed negative factors associated with copper sulfate applications. Copper sulfate is very caustic (pH 4) and must be mixed with lime to neutralize the solution. This requires a good filter



Woods-grown ginseng plant with seeds

system on the sprayer to prevent the spray nozzles from plugging and it also requires non-corrosive sprayer parts. This spray can cause a slight bronzing, or burning, of the leaves. Spraying in the evening when the air temperature is below 80°F can diminish this problem.

We estimate start-up costs for establishing one acre of woods-grown ginseng at about \$12,000 for new growers. As an established grower, I can start a new one-acre plot for about \$7,000. Ginseng production is very labor intensive and, at the same time, requires the investment in labor-saving equipment. Our labor inputs range from 1,000 to 1,100 hours annually to plant, maintain, and harvest the six and one-half acres of ginseng. Younger plantings require more time, mainly for weed control that is done by hand. Three to six year old plantings require thinning and transplanting to attain proper spacing. We also spend time each year spreading wood chips in the plantings to help hold leaf mulch in place as well as providing ground cover themselves. All root harvesting is done by hand.

In our experience over the years, we've found how important it is to control mice and moles in woods-grown ginseng plots. Mice eat the berries containing the newly formed seeds and moles dig tunnels in the plots causing the uprooting

of plants. We use poison set in approved containers to control the mice and find that setting traps in mole tunnels is the best way to control moles. We've had little success with mole poisons or gas pellets.

We harvest seed as well as roots. When seed is harvested, the ginseng embryo is immature and small so seed must go through a stratification process that lasts about 18 months. Seed is depulped by fermentation then the green seed is washed and mixed with clean sand. The seed/sand mixture must be kept moist after depulping or the embryo will die. Seed should be stratified between 60 and 70°C. Our seed/sand mixture is placed in seed boxes and buried in the soil until late summer following the year it was harvested.

Management Tips

1. Site selection is the most critical decision that a woods-grown ginseng grower will make. Make sure the site is well drained, provides 70 to 89% shade, preferably an east, northeast or north facing slope.

2. Growing ginseng is very labor intensive. Start with small plots and increase your plantings as you gain experience.

3. Proper stratification of seed is essential. Watch out for poor quality seed.
4. Stay ahead of mice and moles. Use poisons in approved containers for mice and traps in tunnels for moles.
5. Be aware that ginseng plots are attractive to thieves. A good, loud guard dog helps with security.

Cooperators

Bruce Potter, Southwest Research and Outreach Center, Lamberton, MN
Dr. Brian Hudelson, Dept. of Horticulture, University of Wisconsin
Wayne Schoper, Brown County Extension, Sleepy Eye, MN

Project Location

Contact Willis Runck for directions to the farm.

Other Resources

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