

possible for some growers to earn income earlier in the process by selling ginseng leaves and seed at the end of each growing season.

Site Security and Selection

Because of ginseng's high value, it is sought after by many. The biggest potential problem any grower will face is the risk of having their crop poached. There are numerous examples of growers who have nurtured their crop for 10 or more years only to have it wiped out by a poacher who steals thousands of dollars worth of ginseng. In some states the poaching of ginseng is a felony offense. In Ohio ginseng poaching is currently a third degree misdemeanor.

The first thing to consider when evaluating a potential ginseng site is security. How close is the site to your home? How close are neighbors, roads, or other accesses to your ginseng? How often do others use the land that you're considering planting? How often can you monitor the progress of your crop?

If you feel that you have a reasonably secure site the next thing you'll want to do is evaluate the potential of the site to produce American ginseng. American ginseng does require a very specific habitat in order for it to grow and thrive.

Ginseng prefers the north and east-facing sites on well-drained slopes under a forest canopy of approximately 70 to 90% shade. Certain species of trees, such as tulip-poplar, sugar maple, and black walnut are indicators of productive ginseng sites. The following understory plants can also indicate potential high-quality ginseng sites: goldenseal, bloodroot, trillium, wild ginger, jack-in-the-pulpit, spicebush, and ferns. Ginseng will often grow in areas where you find these species. Ginseng also does best under a relatively narrow range of soil conditions. Soil testing is highly recommended. See OSU Extension Fact Sheet F-58-13, *Growing American Ginseng in Ohio*:

Selecting a Site for more detailed information about site section. We also suggest that you consult your county's Ohio State University Extension office or Rural Action Sustainable Forestry for assistance.

Growing Methods

As discussed earlier, there are several methods for producing American ginseng, all with results unique to the method used. We will briefly discuss the more intensive field (or shade) and the woods growing methods and then focus on the recommended wild-simulated growing method (Table 1).

Field or Shade Grown and Woods Grown Ginseng

Current prices realized for field-grown ginseng are currently below the costs of production, although this fluctuates regularly. In this production system, the ginseng is planted in rows, much like a vegetable garden, in soil that is fertilized and cultivated regularly. This production method requires a large investment in artificial shade structures. Cost to install one acre of shade houses can run between \$10,000 and \$20,000. Growing ginseng under this kind of production system greatly increases the chance for disease, resulting in increased costs for disease control measures. Although one can produce a great quantity of ginseng roots in this system in about four years, roots are large and carrot-like in appearance and are much less valuable in the Asian market than the much smaller, gnarlier roots produced in the wild or with the wild-simulated cultivation method.

The woods-grown ginseng production method consists of growing ginseng in tilled, raised beds in the woods. This method produces a more valuable root than the field or shade grown method but not nearly as valuable as the wild-simulated method. This method will likely produce roots in a shorter time period because the

Table 1. Comparison of three growing methods—Approximated costs, yields, and profits. Figures will vary based on individual circumstances.

Method	Artificial Shade	Woods-Cultivated	Wild-Simulated
Time to first harvest	3–4 years	6–8 years	7–12 years
Seeds planted per 1/2 acre (\$85/lb.)	50 lbs.	24 lbs.	10 lbs.
Total labor per 1/2 acre (\$10/hour)	1,500	1,950	825
Tools, pest control, fertilizer, and other expenses	\$14,250	\$2,595	\$590
Total costs per 1/2 acre	\$33,500	\$24,135	\$9,690
Root yield per 1/2 acre	1,125 lbs.	300 lbs.	80 lbs.
Root price per dry lb.	\$12/lb.	\$100/lb.	\$450/lb.
Gross income per 1/2 acre	\$13,500	\$30,000	\$36,000
Net profit per 1/2 acre	–(\$20,000)	\$5,865	\$26,310

tilled soil will allow the root to grow more quickly, but it also increases your chances of disease.

Wild-Simulated Ginseng

Wild-simulated ginseng production is, as the name implies, simply growing ginseng under conditions that mimic those found in the wild. Although this can be accomplished in a variety of ways, we will focus foremost on the most efficient method of seeding a relatively large area. This method requires few initial inputs; all one needs to get started is a good rake, hand pruners, viable seed, a suitable site, and some labor.

Planting

The process of growing wild-simulated ginseng begins by planting seed in the autumn, around the time the trees begin to shed their leaves but before the ground freezes. Ginseng seed must go through a period of cold dormancy or stratification to ensure that germination occurs the following spring. We recommend that you acquire seed that has already been stratified from a reputable commercial source. Current cost of stratified seed is between \$85 to \$150 per pound.

Planting can be as simple as raking away the leaf layer, lightly scratching the soil surface to ensure a good seed-to-soil contact and broadcasting 4 to 5 seeds per square foot onto the bare soil and covering with leaf litter.

Planting wild-simulated ginseng can also be done by simply planting one seed at a time by hand on suitable sites. Although planting one seed at a time will substantially increase time planting, it can also dramatically increase germination rates and allow planting in areas that may be difficult to access with a rake (see OSU Extension Fact Sheet F-57-13, *Growing American Ginseng in Ohio: Site Preparation and Planting Using the Wild Simulated Method*).



Figure 2. Wild-simulated American ginseng. Photo courtesy of Rural Action Sustainable Forestry.

Maintenance

Most of the work takes place during planting and harvest; all that is normally required in the interim is regular monitoring of your ginseng patch for disease, pests, and poaching.

Ginseng is susceptible to numerous pests, from deer, rodents, and other animals that like to eat its foliage, berries and/or roots, to fungal diseases, which can pose a serious threat in dense patches. Regular monitoring, good site selection, proper mulching, and wide spacing between plants are all recommended preventive measures to reduce the likelihood of most problems.

Harvest

Wild-simulated ginseng will typically not be ready to harvest until it has had at least seven years of growth. Harvesting your crop will likely be the most time-consuming part of your ginseng production system. Harvesting is typically done in the fall of the year after the plants have dropped their seed for the season and always during the legal ginseng harvest season (in Ohio September 1 through December 31). Wild-simulated ginseng is harvested much like wild ginseng in that great care is taken to not damage the roots while digging. This is achieved by digging each plant/root individually and making sure not to break the stem or “neck” of the root off while keeping as many of the fibrous roots intact as possible. Most growers use a modified short handled mattock, known in some circles as a “sang hoe” to achieve this. A trowel or small spade can also be used. Seed, berry pulp, and leaves can also be sold, although markets are more difficult to access.

Washing

After harvest, ginseng roots must be properly washed before drying. Great care should be taken while washing ginseng roots. Avoid scrubbing roots clean since the outer layer or “skin” of the root can easily be broken or scraped off. This decreases the value of the root. It is best to use a very soft brush and wash gently. Do not wash the root so clean that it appears bright white in color. Rather, remove the excess soil from the root leaving soil in the “grains” or depressions of the root. For smaller batches of roots, spraying with a garden hose or swishing the roots in a bucket of water usually achieves this. Do not soak the roots.

Drying

Once ginseng roots are harvested and washed they are commonly dried before selling. Never dry your roots in the sun, in your car, or in an oven. Many growers choose to construct a drying box or closet. Depending on your situation this may or may not be necessary. The

two most important factors to consider in order to dry ginseng roots properly are: (1) good air flow around the roots; and (2) consistent temperature and humidity. In order to get sufficient airflow to the roots during drying, screens are often used. Roots should be placed on screens in a single layer, making sure they are not touching each other. This ensures that air can get to all sides of the roots while they are drying; it is also a good idea to use a fan to keep the air circulating around the drying roots. Optimal temperature for drying roots is around 90 degrees F but not more than 95 degrees F. Sufficient drying should take around 2 weeks. The roots are completely dry when they cannot be bent. They should break cleanly, revealing a white interior.

Marketing

As some people have said when speaking of wild-simulated ginseng, “It is hard to find any product that is easier to sell.” Currently there are 35–40 ginseng buyers in Ohio. Marketing ginseng can be as easy as going to one of these locations and seeing what they offer for your roots. Check multiple locations and do some research to be sure that you receive a fair price for your crop. Prices have varied over the last ten years from \$250 to \$800 per lb. for dry wild or wild-simulated ginseng roots.

Individual roots or plants have been marketed over the Internet and value-added products such as teas and tinctures have resulted in even higher prices for some individuals. Also, targeted marketing towards the Asian and ethnic markets can prove to be very cost effective.

Roots can be stored for another year if prices are low during the harvest year or are expected to be higher the following year. However, it is usually best to delay harvest and allow the roots to grow for a extra year if current market prices are down.

Summary

Growing ginseng can be a great way to earn additional income from your land. Many growers look at it as a retirement fund, their children’s education fund, or as a way to pay their property taxes. As with any venture, you should make sure you do your homework before you

start planting. Start small and make sure that you can successfully produce ginseng on your site before trying it on a larger scale. Also, it is a good idea to attend a ginseng workshop in your area and meet other ginseng growers to learn from them.

Acknowledgements

Thanks to David Cooke, West Virginia University Cooperative Extension; Greg Duskey, Wild American Ginseng Company; and Deborah Hill, University of Kentucky Cooperative Extension for reviewing this document and providing valuable suggestions for improvement.

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F-58-13

Growing American Ginseng in Ohio: Selecting a Site

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Before you attempt to grow American ginseng, it is important to understand the site conditions under which American ginseng typically thrives in the wild. Naturally occurring American ginseng has been found on a variety of sites; however, typically it is found on shady, rich, moist but well-drained sites. The purpose of this fact sheet is to provide you with information that will help you to select a site where you are most likely to be successful at growing American ginseng.

Topography

The first consideration when trying to locate good American ginseng sites is aspect. Aspect is the direction that a slope faces. North and east-facing slopes are most commonly associated with good ginseng sites (Figure 2).



Figure 1. American ginseng (*Panax quinquefolium*) is the only ginseng native to North America. Future mention of ginseng in this fact sheet will be referring to American ginseng. Photo courtesy of Rural Action Sustainable Forestry.

These sites typically have more shade and available moisture than other aspects. East slopes only receive morning sunlight, which is less intense than mid-day and afternoon light, while northern slopes receive less direct sunlight than all other aspects. Steepness of slope also affects the amount of light that is received on a site. Moist sites, suitable for ginseng production, can also be found on the lower 1/4 to 1/3 of the slope, on all other aspects. These lower slope positions are often well-shaded and have deeper soil and more moisture than is found higher up on the slope. It is important to avoid flat bottomlands that have poor drainage or a history of flooding.

Slopes are generally more conducive to ginseng production than flat areas since flat areas are often poorly drained. Gentle slopes are preferred over very

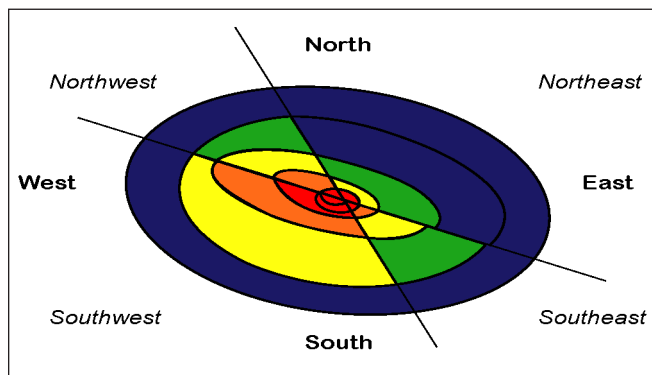


Figure 2. Aspect and slope position can have a big influence on potential ginseng production. Areas highlighted in blue are typically most suitable for ginseng production followed closely by those in green. Sites highlighted in yellow, orange, and red (poorest) are not recommended. Adapted from U.S. Forest Service publication NA-TP-03-97.

steep slopes for a couple of reasons. Steep slopes tend to shed water more quickly, and it is difficult to plant and maintain your ginseng plots on steep slopes. If your property primarily consists of steep terrain, focus your efforts on small benches or in areas with less severe slopes. These areas tend to have deeper soils, more leaf litter accumulation, and more moisture-holding capacity.

Forest Canopy

Next, look at the trees in the main canopy of the forest. Most tree species have a limited range of sites on which they most commonly occur. Occasionally, individual or small groups of trees occur on non-typical sites, so it is important to determine which species of trees are most dominant on the site that you are assessing. One of the tree species most commonly associated with good ginseng sites is yellow-poplar or tulip-tree. Sugar maple, American beech, American basswood, black walnut, and yellow buckeye are also good indicators of moist, well-drained productive sites. White ash, slippery elm, and an occasional northern red oak can also be found on good sites. Most of the trees mentioned above produce leaves that decompose rapidly into a litter layer that provides a proper balance of nutrition and moisture-holding ability that is suitable for ginseng production. Avoid sites with high percentages of oaks in the canopy. Oak litter tends to be fluffy, dries out quickly, and does not break down rapidly.

The other important site factor to look at is the amount of light that reaches the forest floor. Unlike most plants, ginseng thrives in dense shade. Most references indicate that ginseng does best in at least 70% shade. Ginseng growing on sites that are too sunny appears pale and unhealthy. The understory plants discussed in the next section also do best under shady conditions. The presence of these plants usually indicates that light conditions are appropriate for ginseng.

A quick method to approximate the amount of shade that is on a given site is to place 10 or more white paper plates at even distances on the ground at approximately noon on a sunny summer day. Count the number of plates that are at least half shaded. Next divide the number of shaded plates by the total number of plates placed on the ground. Multiply this number by 100. If this number is 70 or greater the site is probably shady enough to grow ginseng.

Understory Vegetation

The very best indicator of a good ginseng site is the presence of ginseng itself. A site that has a history of producing healthy reproducing ginseng is most likely to be a site which will produce ginseng in the future; however, since ginseng has been heavily harvested in most parts of Ohio, the absence of ginseng does not mean that it has not occurred at that location in the past. Spicebush and pawpaw are woody plants that are commonly found on good ginseng sites. However, pawpaw can also thrive on woodland edges that are usually less suitable for ginseng production. Other understory plants that are often indicators of good ginseng sites include jack-in-the-pulpit, blood-root, wild ginger, blue and black cohosh, trilliums, Solomon's seal, various ferns (particularly maidenhair fern), ramps, and goldenseal.



Figure 3. Jack-in-the-pulpit is an example of an understory plant that may indicate a good ginseng site. Photo courtesy of Bob Beyfuss, Cornell Cooperative Extension.



Figure 4. Maidenhair fern is another example of an understory plant that may indicate a good ginseng site. Photo courtesy of Bob Beyfuss, Cornell Cooperative Extension.

Soils

Less information is available on soil conditions suitable for ginseng production. Generally, soils that support the overstory and understory plants discussed above are suitable for ginseng production. Loamy soils, which are intermediate in texture and have a balance of sand, silt, and clay, are usually best suited for ginseng production. Soils with too much sand tend to be too dry for ginseng to thrive, while those with too much clay often do not provide proper drainage. Poorly drained sites can be prone to fungal diseases.

The literature varies on the soil nutrient requirements for American ginseng production, but most agree that ginseng does best on soils that are at least moderately acidic, pH 5.5 to 6.0. Calcium, magnesium, and phosphorous are most often listed as nutrients that may limit ginseng growth. Careful consideration should be given before applying fertilizers to ginseng sites. Adding too much or the wrong type of fertilizer or lime can be more detrimental than beneficial. This can result in an increased susceptibility to disease or conversely an over-stimulation of growth that often results in a decrease in the value of the ginseng root. Usually it is best to concentrate your efforts on sites with the proper nutrient balance rather than adding fertilizers or other amendments to soils that are less suitable. One relatively safe way to improve a borderline site is to amend with leaf litter, from tree species discussed earlier in this publication, thus increasing organic matter content and adding the proper balance of nutrients. It is also a good idea to consult your county's soil survey or a soil scientist for additional soils information.

Ginseng can be found on sites that are drier, sunnier, and that lack the indicator plants and soil conditions described in this fact sheet. In fact, in areas where ginseng harvest pressure is high, it may be more common to find ginseng on these "poor sites" than on "ideal sites." However, sites that most closely match the conditions described above are most likely to successfully produce ginseng.

Security Concerns

Last but definitely not least, you must consider security. Even if you have a site that has all of the indicators of an excellent site for growing ginseng, it may not be a great site to plant a ginseng plot. Since ginseng is such a valuable crop, the potential for theft is definitely something to take into consideration. You

can never completely eliminate the risk of theft, but there are a few common-sense steps that you can take to minimize the threat.

The location of the site is the most crucial factor that can affect the potential for theft. Sites that are near a grower's primary residence tend to be the most secure. This affords the grower the opportunity to check their ginseng crop often and to react to threats before losses are severe. Another common-sense approach is to plant small plots of ginseng over as large of an area as possible. In other words, "don't put all of your eggs in one basket." A poacher may find some of the small plots but it is unlikely all plots will be found. Sites that can be seen from an isolated road or trail may be in greatest jeopardy. Ginseng is especially vulnerable to poaching when the berries ripen. An experienced ginseng hunter can spot ginseng berries from a great distance, especially on a "typical" ginseng site. Some growers remove the fruiting stems and the leaves in late July or early August to help to conceal their ginseng during this critical period.

Other approaches to dealing with the threat of theft can vary greatly. Most growers maintain secrecy and let only their closest friends and family know about ginseng sites. Others enlist neighbors to provide an additional layer of protection. Some post their property to let outsiders know that the ginseng and other medicinal herbs are cultivated and that poachers will be prosecuted to the fullest extent of the law. Security measures ranging from guard dogs to a wide array of electronic devices have been used with varying degrees of success. Every situation is different, and a prudent grower is constantly monitoring their ginseng crop and responding to the changing threats.

Summary

American ginseng is a very site-sensitive species. It has a relatively narrow range of light, moisture, and soil conditions under which it will thrive. To further complicate matters, poaching is often a major threat. Before you invest your time, money, and energy on a ginseng planting, it is a good idea to do your homework. It is also a good idea to contact your county Extension educator, a Rural Action Forestry representative, a professional forester, a soil scientist, or an experienced ginseng grower in your area to help you to determine if your site is suitable for growing ginseng. The success or failure of your ginseng planting will be largely dependent on the site that you choose.

Acknowledgements

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Growing American Ginseng in Ohio: Site Preparation and Planting Using the Wild-Simulated Approach

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Growing American ginseng has been a popular income-generating pastime for over 200 years. Many people throughout Appalachia and beyond have experimented with growing ginseng or have tended wild patches of ginseng in the woods over many years.

In the early days of ginseng cultivation, most plants were simply transplanted out of the wild and into beds where one could keep a closer eye on them and tend to them more easily. Due to the limited availability of ginseng seed outside of the wild, most prospective growers started with transplanted roots. Today an aspiring ginseng grower has many options to get started. In addition to seed, 1-, 2- and 3-year-old rootlets are readily available for planting.

In this fact sheet we will be focusing on growing ginseng in the wild-simulated fashion. Wild ginseng from the Appalachian region in particular, is the most highly valued ginseng in the world. In the wild, the ginseng plant begins to produce seed after about 3 years of age. In the fall before the vegetation dies back for winter, ginseng seeds fall to the ground and lay dormant for 16–18 months before germinating (Figure 1). Upon germination, the root must negotiate obstacles such as rocks, twigs, and leaves to become established. Growing under these natural conditions tends to make the root take on interesting shapes as it grows into the soil, working its way around pebbles, neighboring roots, and other obstacles. The slow grown root with unique characteristics is highly valued in the Asian market.

The goal in growing wild-simulated ginseng is to produce a root which is virtually wild in appearance. This allows the grower to receive wild ginseng prices when it comes time to market the product. Growing in this method is almost always done exclusively from seed.

Wild-simulated ginseng production requires little capital to get started; however, you must have a



Figure 1. Life cycle of American ginseng. Photo from: American Ginseng GREEN GOLD courtesy of W. Scott Persons.

woodland with suitable ginseng sites in order to produce wild-simulated ginseng. To ensure adequate drainage, ginseng is usually planted on slight to moderate slopes. If terrain is flat, be sure to avoid areas with poorly drained soils. Some indicators of a good ginseng site include sugar maple and tulip-poplar trees with spicebush, ferns, goldenseal, jack-in-the-pulpit, and blue cohosh as understory vegetation. Every site varies; refer to Ohio State University Extension Fact Sheet F-58-13, *Growing Ginseng in Ohio: Selecting a Site* for information about selecting the proper site. A few simple tools such as a leaf rake, steel garden rake, pruners, and mattocks, as well as good seed are all that are needed to get started.

Site Preparation

Before preparing any site one should consider many factors, foremost is security. Be sure to pick a site that isn't frequently used by others and that you can monitor regularly. Ginseng's biggest pest is the poacher, and due to its high value, many poachers covet ginseng. Poaching is a serious problem and many growers have thrown in the towel after seeing many years of work go down the drain after being poached.

It is important to remember that ginseng (particularly ginseng under cultivation) is a plant prone to many diseases. The cause of many of these ginseng diseases is too much moisture and not enough air movement through the plants. Stagnant air in a moist setting can create serious disease problems, which can be very hard to control. Overcrowded plantings tend to have many more disease problems than well-spaced plantings. Usually the first step in preparing a wild-simulated ginseng growing site is to remove the necessary understory trees and shrubs in order to create an environment where air can flow more freely over the ginseng plants.

This usually means going out with some hand pruners and pruning the lower branches off of small trees and shrubs such as pawpaw and spicebush that may be growing on your ginseng site. Typically, you do not want to remove these trees and shrubs altogether. Performing selective pruning allows increased air flow while maintaining proper shade levels. These small trees and shrubs will provide habitat and protection for your ginseng if managed properly. Pay attention to what direction the wind tends to blow on your site and clear accordingly to allow for maximum air flow over your ginseng plants. This will require yearly maintenance and some pruning to maintain good air circulation.

The next step in site preparation is picking up any large rocks or sticks that may be lying in the area you wish to plant. Consider using the larger rocks and sticks to line the bottom or downhill side of your planting area

to help catch debris or soils that may be blown or erode off of the site.

Site preparation work can begin any time throughout the spring and summer of the year, but it must be completed prior to planting in the fall. Now that the site is prepared you are ready to begin the planting process.

Planting Wild-Simulated Ginseng

The process of growing wild-simulated ginseng begins by planting seed in the autumn around the time the trees begin to shed their leaves, but before the ground freezes (in Ohio this is usually done between October and November). Ginseng seed must go through a period of cold dormancy (also known as stratification) before it can germinate the following spring (Figure 2). To ensure success we recommend that the novice ginseng grower acquire stratified seed from a reputable commercial seed source. Cost of good quality, stratified ginseng seed is around \$85 to \$150 per pound.



Figure 2. Stratified American ginseng seed. Photo courtesy of Rural Action Sustainable Forestry.

It is a good idea to spread your plantings out over many years for a variety of reasons. Planting over a number of years will eventually allow you to harvest mixed aged roots on a yearly basis rather than having one entire crop come into maturity all at once. Planting over a number of years can also help ensure that you won't have a complete loss of your crop due to weather, rodents, or other environmental factors that can wipe out a young planting in one season.

Ultimately you want no less than one and no more than two mature ginseng plants per square foot upon maturity. This density helps to ensure minimal disease problems and maximum growth. Normally planting four to five seeds per square foot ensures proper density

at maturity, since germination will not be 100%, and mortality in the first two years is often high. The first year plants will emerge the following spring and do not resemble a mature ginseng plant at this stage. They can be easily overlooked if you're not familiar with their appearance (Figure 3).



Figure 3. One-year-old American ginseng seedling. Photo courtesy of Rural Action Sustainable Forestry.

Some novice growers have even mistakenly weeded out all of their first-year ginseng seedlings.

Begin the planting process by raking back the leaf litter along the bottom of the slope you are going to plant. You will want to rake the leaf litter off of an area about 5 feet wide and 40 feet long if possible. This is best done with a large heavy-duty leaf rake. This 5 × 40 foot area is equal to 200 square feet and will require approximately two ounces of seed. One pound of ginseng seed contains approximately 6,400 to 8,000 seeds (400 to 500 seeds to an ounce). Therefore, each ounce of seed should cover approximately 100 square feet at the optimal seeding rate. Once this area is clear of leaves, go back and scratch the soil surface with your rake to loosen the soil up to about ¼-inch deep. This helps the seed to make better soil contact and increases your seed germination rate. The site is now ready to be seeded. Try to spread the seeds evenly over the plot by walking along the top of the plot and sprinkling the seeds by hand. Although it may take some getting used to, this should become a comfortable technique to use for seeding your ginseng. Remember you want to seed at a rate of four to five seeds per square foot. The next step is to move upslope and begin the process over again. This time you will use the leaf litter that you are raking downhill off of the next area to be seeded to cover the previously seeded plot. Make sure to cover the seeded plot entirely with leaf litter, but do not exceed more than 3 inches of leaf litter over the

seeded plot. Once you've raked the leaf litter down onto the seeded plot, your next plot should be ready to seed. Repeat the process and continue until you have seeded your whole area.

On sites where raking and other site preparation would be difficult, ginseng can also be planted by hand one seed at a time. Although this method will substantially increase the time spent planting, it will dramatically increase germination rates and will also allow you to plant areas that may be more difficult to plant with the technique described above. Many growers like to use a variety of techniques to seed their wild-simulated ginseng. You should experiment and determine what works best for you on your sites.

Summary

Growing wild-simulated ginseng can be a relaxing and rewarding experience. You should take time to do research on growing ginseng and on the laws that govern ginseng harvesting and sales before ever planting a seed. Currently in Ohio it is illegal to market a ginseng root under five years of age. This law also applies to wild-simulated ginseng growers because wild-simulated ginseng is typically not distinguished from wild ginseng in the marketplace.

In Ohio, ginseng is regulated under Ohio Revised Code Chapter 1533.87 (Ohio Ginseng Management



Figure 4. Raking to remove leaf litter in preparation for planting of American ginseng seed. Photo courtesy of Rural Action Sustainable Forestry.

Program Laws). Administrative Rules for The Ohio Ginseng Management Program are available through the Ohio Department of Natural Resources, Division of Wildlife and should be obtained, read, and understood before taking up this pastime.

Acquiring Seed and Planting Stock

Contact the Rural Action Forestry Program for information about how to obtain seed and planting stock of ginseng and other medicinal herbs:

9030 Hocking Hills Drive

The Plains, OH 45780

(740) 677-4047

<http://ruralaction.org/programs/forestry/>

The Roots of Appalachia Growers Association (RAGA) is another resource for ginseng growers. They can be contacted through Rural Action Forestry.

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Growing American Ginseng in Ohio: Maintenance, Disease Control, and Pest Management

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People plant ginseng for a variety of reasons including income generation, personal use, as a hobby, or for restoration of the environment. Planting the first seeds is enjoyable, but there is nothing more rewarding than watching your plants grow and mature. In order to ensure that your growing experience is successful, you must closely monitor and regularly maintain your plantings throughout their life cycle.

Although American ginseng is a relatively hearty plant, it is susceptible to a number of disease and pest problems. In addition, ginseng's high value makes it particularly vulnerable to theft by poachers. Maintenance, disease control, pest management, and theft prevention can be much easier if you have properly established your planting on an appropriate site. More information on establishing ginseng can be found in the first three fact sheets in this series (OSU Extension Fact Sheets F-56, F-57, and F-58).

Regular Visits

Throughout the ginseng growing season (in Ohio this is typically mid-April to late April through October) it is important to frequently inspect ginseng for overall vigor and to inspect for signs of disease or pest problems. It is also essential to monitor plantings in the fall when the bright red fruit makes them particularly vulnerable to theft.



*Figure 1. Healthy, fruit-producing ginseng plant.
(Photo courtesy of Bob Beyfuss, Cornell
Cooperative Extension)*

Frequent inspections of your plantings are essential for the early detection of problems before they cause extensive damage. Some growers will take time each day to inspect their ginseng; others do it on an irregular basis in order to ensure that potential poachers can not easily determine a pattern of inspections to work around. Whether you choose to inspect your plantings on a regular or irregular basis, it is recommended that you inspect on at least a bi-weekly (preferably weekly) schedule to identify problems early.

Periodic Maintenance

Once ginseng is planted, there is relatively little maintenance needed during the first four years. Maintenance needs during this period will vary by site, and may include thinning, pruning, or removing competing vegetation to increase airflow, and removing branches or other debris.

Target spacing for wild-simulated ginseng should be 8 to 12 inches between plants at maturity (approximately 1 to 2 plants per square foot). When a seeding rate of 4 to 5 seeds per square foot is used, hand thinning is typically not necessary. Some natural thinning commonly occurs as a result of seed failing to germinate or being consumed by animals, and mortality of young seedlings. However, areas should be thinned if they become too crowded during the first four years. Since ginseng rootlets are a valuable resource, consider carefully digging and transplanting any healthy ginseng plants removed during the thinning process. In Ohio this is typically best done at the end of July after the plants have set bud.

Maintenance requirements generally increase once ginseng plantings reach their fifth year. As the plants mature, they often become more susceptible to diseases and theft. Regular inspections of plantings become more critical at this time.

Ginseng commonly achieves reproductive maturity in the fifth year and begins to produce seed. If seed is to be collected for planting the following year, expect to spend considerable time picking, depulping, and stratifying seed. Seeds may also be planted 3 inches below the soil surface, which enables them to stratify naturally.

Poaching

Since American ginseng is such a highly valued crop, the biggest threat to most wild-simulated ginseng plantings is theft.

Some growers keep secret the fact they are growing ginseng; others enlist the help of neighbors to watch for suspicious activity. It is recommended that ginseng growers invite their local county Extension educator or wildlife officer to visit their growing sites. They can then validate your operation if you ever experience a loss due to theft. Growers should also document all of the costs associated with their venture by saving receipts and keeping appropriate records. Photographing or videotaping ginseng plantings regularly is also advisable. Include landmarks such as big trees or fence

lines in your photographs to make it easier to document the location of the plantings. In some instances, it may be possible to obtain insurance coverage to protect ginseng plantings from loss due to theft.

Since ginseng berries are bright red and highly visible, most growers harvest ginseng seeds as soon as they ripen to avoid detection by poachers or feeding animals. Where poaching is a major concern, growers often harvest all of the aerial portions of the plants before ginseng harvest season begins on September 1. This makes finding ginseng roots very difficult for poachers. Although harvesting tops before they die back naturally may compromise root growth and even the medicinal properties of the roots, it may be necessary in order to reduce poaching problems.

The Ohio Department of Natural Resources (ODNR) maintains a 24-hour hotline (1-800-POACHER) to report poaching activities. This toll-free number connects to a wildlife officer who will respond to your complaint. Providing detailed information (such as license numbers, vehicle and/or person descriptions, and location) is critical to help officers investigate the crime.

Disease

Although diseases are typically more common when ginseng is grown under artificial shade or in other intensive production systems, growers of wild-simulated ginseng will likely encounter some disease problems while growing ginseng in the woods. While there are dozens of potential diseases that can infect ginseng, this fact sheet will focus on three of the more common—*Alternaria* leaf blight, damping-off, and root rot.

For more information on these and other ginseng diseases, refer to the ginseng diseases section (pages 113–125) of *Growing and Marketing Ginseng, Golden-seal and Other Woodland Medicinals* by Scott Persons and Jeanine Davis.

Alternaria Leaf Blight

The most common ginseng disease in Ohio is a leaf blight caused by the fungus *Alternaria panax*. *Alternaria* thrives under warm, moist, stagnant air conditions and is fairly common in Ohio. Symptoms of *Alternaria* include dark, yellowish circles or “bull’s eyes” on the leaves or stems of ginseng plants. In severe cases, it will move from the leaves, down the stem, and possibly even into the root.



Figure 2. *Alternaria* leaf blight on ginseng foliage.
(Photo courtesy of Bob Beyfuss, Cornell
Cooperative Extension)

Young ginseng plants can and occasionally are killed by *Alternaria*. However, mature plants infected by *Alternaria* commonly respond by entering dormancy earlier and resprouting in good health the following spring. *Alternaria* often overwinters on dead plant material and reemerges the following growing season to begin its cycle again.

Damping-off

Damping-off, another fairly common ginseng disease, can be caused by a variety of fungal organisms including *Pythium*, *Phytophthora*, and *Fusarium*. Damping-off usually affects 1- to 2-year-old plants, attacking the plants near the soil surface, causing initial leaf discoloration and ultimately resulting in the collapse and death of the plant. Unlike *Alternaria*, damping-off prefers cold, moist environments and is usually seen around the time plants are emerging in early spring. Damping-off should not be a major concern if the growing site has adequate soil moisture drainage; it is more commonly a problem on poorly drained sites, on heavy clay soils, and in low-lying areas.

Root Rot

Although root rot diseases are less common in ginseng, they can inflict serious damage to your crop. Root rot, like damping-off, can be caused by a wide variety of fungal organisms including *Phytophthora*. Often the first indication of root rot disease is wilting or discoloration of foliage. Infected roots will often be discolored and show signs of deterioration. Digging the suspect plant and carefully examining the root is

the best way to confirm the presence of a root rot disease. Roots that are infected often will contain black, spongy sections or are mushy. If left untreated, root rot diseases can spread throughout a ginseng bed. Under extreme conditions, it may be necessary to dig all the infected roots before their value is completely lost.

Disease Treatments

Once a disease has been identified, depending on the disease, there are a variety of treatment methods available ranging from the removal of infected plants to the use of modern fungicides. Consult pages 113–125 of *Growing and Marketing Ginseng, Goldenseal and Other Woodland Medicinals* for various treatment strategies for specific diseases. When the treatment involves a fungicide, the importance of careful, proper application according to label directions cannot be overstressed. Not only will this minimize personal and environmental risks, but it will maximize effectiveness.

Proper selection of planting sites plays an important role in minimizing ginseng diseases. As noted above, specific diseases are often associated with specific environmental conditions (e.g. warm, moist conditions or cool, moist conditions). The common environmental condition encouraging many ginseng diseases is excessive moisture. To give ginseng the best chance of avoiding and surviving these diseases, it is crucial that a planting site with good soil drainage and adequate airflow be selected (See *Growing American Ginseng in Ohio: Selecting a Site*, Ohio State University Extension Fact Sheet F-58-13).

Again, it is important to emphasize that many of these diseases appear and inflict their damage quickly. Regular monitoring of plantings is critical to minimizing the effects of disease.

Rodents—Mice, Moles, and Voles

Rodents, such as mice, moles, and voles, are another fairly common problem for ginseng growers. These animals do damage by consuming the foliage, stems, roots, and seeds of ginseng plants. Often the first sign of damage is the presence of wilting plants as a result of feeding, but since wilting can also be a symptom of disease, it is important to closely inspect wilted plants to determine the cause of the problem. Dig up a wilted plant and inspect the root for signs of damage such as bite marks and areas that have been gnawed away. Often this will not kill the plant and may even add

some “character” to the roots. However, if the problem becomes severe, mortality can result.

There are several methods available to deal with excessive rodent damage to ginseng. Rodent populations, and therefore feeding, can often be reduced by sustained trapping or killing with a rodenticide containing bait. If a rodenticide is to be used, check with the appropriate regulatory agency for permitted chemicals and methods.

Some growers establish a barrier impenetrable to rodents around the perimeter of the planting. Barriers typically consist of metal flashing that, when installed, extend at least 12 inches above the ground and to a depth of about 12 inches. While this may be a practical solution for a small-scale grower, it often is not practical for large-scale operations. Planting goldenseal (*Hydrastis canadensis*) around the perimeter of your ginseng beds may also provide a natural deterrent to rodents.

Watch for an increase in rodent activity around the time plantings begin to produce seed, as the seed is a highly preferred food. Often rodents will stow away seed for later consumption, thus acting as ginseng planters themselves, dispersing seed throughout the forest.

Other Pests

Several other animals occasionally cause damage to ginseng plantings including white-tailed deer, rabbits, wild turkey, songbirds, insects, slugs, and snails. White-tailed deer and rabbits browse the tops of ginseng, particularly when other food sources are limited or where deer populations are high. Wild turkeys scratch in freshly seeded beds, consuming seeds and/or uprooting newly established seedlings. Some songbirds and most squirrel species also consume ginseng seed. There is still much to be learned about which animals consume ginseng seed and how they affect ginseng populations. For specific treatment options,

contact Rural Action Sustainable Forestry or your county Extension office.

Rural Action Contact Information:

9030 Hocking Hills Drive
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Growing American Ginseng in Ohio: Harvesting, Washing, and Drying

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Harvesting your crop of American ginseng will undoubtedly be the most labor-intensive and time-consuming part of your ginseng enterprise. Fortunately, it will also be the most financially rewarding and can also be the most fun. If your planned harvest is large, you will need to prepare ahead and solicit help or begin harvesting earlier in the year in order to ensure enough time to get your crop out of the ground before the tops die back for the year. In Ohio, this is usually in September and October. If you wait until later in the season, finding your plants to harvest is a difficult challenge at best.

Before harvesting, it is always a good idea to check state and federal laws affecting ginseng harvests to make sure there are no recent changes that could affect the harvest. Also, if you are planning to sell your harvested ginseng, research your marketing options prior to the harvest, and develop a plan to maximize your profits. Finally, consider leaving a portion of your crop

in the ground to further mature and to produce seed. This can result in increased value and provide added enjoyment. In addition to the financial rewards, harvesting can be an excellent opportunity to spend time in the woods with friends and family.

Laws

State and federal laws are constantly evolving to reflect trends in ginseng production and to protect wild ginseng from overharvesting. A June 2006 finding by the U.S. Fish and Wildlife Service supports the legal export of wild and wild-simulated American ginseng roots harvested in the 2006–2008 growing seasons that are at least five years old (i.e. a minimum of four bud scale scars on the root). Again, it is crucial that you check the current state and federal laws regarding ginseng harvest and exportation before you perform a harvest of your own.

Currently, Ohio's legal harvest season runs from September 1 through December 31. Federal and state laws do not distinguish wild-simulated ginseng from truly wild ginseng. The rules and regulations that govern ginseng in Ohio can be found at <http://www.dnr.state.oh.us/Portals/9/pdf/pub007.pdf> or in the Ohio Revised Code sections 1533.86–1533.99. The federal regulations that pertain to ginseng can be found at <http://international.fws.gov/animals/ginindx.html> (Note: federal regulations are updated each year. Check regularly to ensure you are in compliance).

Harvesting

Typically, growers allow ginseng to reach a minimum age of 9 to 10 years before harvesting. Assuming that the market price does not decrease significantly,



Figure 1. Freshly harvested, large ginseng root. (Photo courtesy of Bob Beyfuss, Cornell Cooperative Extension)

the value of ginseng should increase significantly each year it is allowed to mature. However, the threat of loss to disease, theft, and a variety of other problems must be considered when determining the optimum time to harvest.

Harvesting will likely be the most rewarding aspect of working with American ginseng. Harvesting ginseng can be compared to a treasure hunt, since each root you dig is worth about \$1. Individual roots or “prize roots” with specific characteristics can be worth far more if you successfully locate niche markets for them.

There are a variety of tools that can be used to harvest ginseng roots including hand trowels, picks, mattocks, and soil knives. Many growers fashion their own digging tools out of hoes, picks, or even screwdrivers. The only limitation to personal preference is that the harvesting tool must allow the roots to be removed from the soil intact.

If you’re growing ginseng in the wild-simulated fashion, harvesting the crop will be much like hunting and digging wild ginseng. It is likely that between the time you planted seed and the time you harvest roots, your plants will have produced offspring from seed. Therefore, you will likely find yourself working in an environment that has many mixed-aged plants, and you will need to select only the mature plants for harvest, allowing the younger ones to continue to grow.

Wild-simulated plantings most often allow you room to move among plants, since the plantings tend to be much thinner than more intensive methods of producing ginseng in the forest. In essence, harvesting involves working through the planted area, digging the mature roots one at a time. Some growers also save the “tops” or the vegetative, leafy portion of the plant to dry and market as well. It takes approximately 300 fresh wild-simulated roots to equal one pound

of dried ginseng, and it takes several hours to harvest each pound.

Washing

Once the roots are harvested, the next step is to wash them. Since ginseng roots should always be washed when they are fresh, it is preferable to wash roots as soon as possible after harvest. There are as many ways to wash ginseng roots as there are tools to dig them. The most important thing to keep in mind is not to overwash the roots. Too vigorous washing will damage the fragile “skin” of the root.

The simplest root washing method is to fill a 5-gallon bucket with water and wash the roots by hand, swishing them in the bucket and gently rubbing (not scrubbing) to remove any loose soil. A little dirt in the grooves of the roots is preferable to a completely clean, white root, which can be far less valuable, particularly if it is damaged.

While many people simply hand wash their roots, others spread them on a screen and spray them with a hose. There are commercially available pieces of equipment specifically designed to wash ginseng roots, which typically consist of a barrel that is mechanically rotated as water jets spray the roots. Some mechanically inclined growers have even modified old wringer washers for washing roots.

After you have washed the roots, it is a good idea to lay them out on a screen to air dry for a couple of hours. Do not expose the roots to direct sunlight for a prolonged period of time at any point during the washing and drying process.

Drying

Numerous successful drying techniques have been employed to dry ginseng roots, ranging from dehumidifiers and heaters to wood stoves and fans. Drying in an oven, microwave, or in a car window is definitely not advisable. No matter what drying method is used, it is critical that the roots not be dried too quickly, as that will lower the overall quality of the finished product.

It is important to maintain a consistent air temperature and adequate airflow around the roots while they are drying. Most growers construct racks with screens to dry their roots, thereby ensuring that the entire root is exposed to adequate airflow. Roots should be spread out so they are not in contact with each other, and should be rotated occasionally to make certain that air and heat is getting to all sides of the root. Variables such as temperature, weather, humidity, and type of heat will all affect how long roots take to dry. Safe tem-



Figure 2. Typical “sang hoe” tool used for digging ginseng.

perature ranges for drying ginseng are between 70°F and 100°F. Depending on conditions and technique, it may take from 1 to 2 weeks for roots to completely dry with an air temperature around 70°F.

It is important to regularly inspect roots throughout the drying process. Any discoloration or mold on the roots indicates a problem, suggesting the need for adjustments in the temperature, humidity, or airflow. As ginseng roots dry, they will begin to shrink, but often will remain spongy at least partway through the drying process. To determine if roots are completely dried, sample a few roots by breaking them. Properly dried roots snap easily into two pieces. Carefully inspect the inside of the root for any discoloration; a properly dried root should be entirely white inside. Drying too quickly will often create a brown ring inside the root, while drying too slowly will create moldy sections.

There are a variety of commercially available herb dryers on the market, which are adequate for drying small quantities of ginseng. However, dryers capable of handling large quantities of ginseng can be quite expensive. Depending on the size of the anticipated annual harvest, you may need to consider modifying a room, shed, or other space into a drying facility. Before initiating such a project, visit other growers to determine what size and design will best satisfy your needs.

Summary

Wild-simulated ginseng production can be an enjoyable and financially rewarding experience. Harvesting, washing, and drying are critical steps in the



Figure 3. Homemade ginseng drying rack.

process. When properly employed, these steps can help to ensure a considerable return on the investment of time and money required to produce this unique and valuable crop.

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