

Woods-Grown Ginseng

West Virginia University
Extension Service



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"Though practice will soon make a man of tolerable vigour an able footman, yet, as a help to bear fatigue, I used to chew a root of ginseng as I walk't along. This kept up my spirits and made me trip away as nimbly in my half Jack-Boots as younger men cou'd in their shoes.

This plant is in high esteem in China, where it sells for its weight in silver...its vertues are, that it gives an uncommon warmth and virgour to the blood and frisks the spirits beyond any other cordial. It chears the heart, even of a man that has a bad wife, and it makes him look down with great composure on the crosses of the world.

It promotes insensible perspiration, dissolves all phlegmatick and viccous humours that are apt to obstruct the narrow channels of the nerves. It helps the memory and would quicken even helevetian dullness.

Tis friendly to the lungs and much more than scolding itself. It comforts the stomach and strengthens the bowls, preventing all colicks and fluxes. In one work, it will make a man live a great while, and very well while he does live. And what is more, it will make old age amiable, by rendering it lively, cheerful and good-humour'd."

Col. William Byrd

Late 1700s to early 1800s

Printed in *History of the Dividing Line*

Introduction

This information is meant to be a starting point for your interest in growing ginseng. Concepts of woods-grown ginseng are covered to give you an idea of the production techniques and areas needed for your ginseng. You definitely should explore other resources and compare thoughts and suggestions of other growers.

As we researched books, articles, pamphlets, and guides, and interviewed growers, we found a major characteristic. Those growing ginseng or digging wild 'sang' love the "hobby." They enjoy describing their experiences and can tell you unusual stories of hunting and growing 'sang.'

However, another point you need to understand is that ideas and methods of growing and caring for ginseng are diverse. Everyone seems to have had different success rates while using the same practices. Individual location is of utmost importance.

Therefore, we encourage you to read, study, and by all means experiment with new concepts that you think may work. Also, if your research proves worthwhile, let use know what works. By doing so, we can develop new and better methods of growing "Green Gold," as Scott Persons describes ginseng in the revised edition of his book, *American Ginseng--Green Gold*.

Good luck on your experiences with growing this unusual wild plant.

Ginseng

Ginseng is a fascinating herb that was discovered in China around 5,000 years ago. It is a unique plant to grow commercially. Unlike many other crops, the plant never has been domesticated. Therefore, ginseng must be grown under wild or simulated wild conditions. In this country, ginseng grows wild from Quebec to Georgia and west to the Mississippi River.

American wild ginseng is so much sought after that much of it has disappeared. Dried wild ginseng has sold for as much as \$350 per pound. Now, over \$70 million worth of ginseng root, both wild and cultivated, is exported annually. Therefore, commercial production can be an excellent opportunity to earn income. However, ginseng is a very sensitive plant requiring close observation and care.

Use of Ginseng

Ginseng, especially the root, has a long history of use as a medicinal plant. Some people believe ginseng acts as an antidepressant, increases resistance, and improves both physical and mental performance. It also has a reputation as an aphrodisiac. The use of ginseng may cause headaches. Many claims about the power of ginseng are exaggerated, but it is certain that ginseng is a unique plant.

Site Selection

A northern or eastern exposure is best to protect plants from the heat in summer and the freezing and thawing problems in late fall, winter, and early spring. The site also should also be sloping to ensure adequate soil drainage. Large rocks should be removed.

Presence of certain plants in a location gives a good indication that ginseng will grow there also. Look for ferns, Solomon's seal, cohosh, wild ginger, snake root, jack-in-the-pulpit, and spleenwort.

Oak forests can cause slight problems because the leaves are thick and tough. The young plants have a difficult time growing through them in the spring. If oaks are present, keep this problem in mind. Shred the leaves in the fall or help the plants get through them in the spring. A possible problem with wild cherry and maple trees is their abundant production and germination of seeds. Much additional work will be needed to remove cherry and maple

seedlings from your patch. Another problem with maples is that their roots are close to the surface, and they compete with the ginseng plants for moisture and nutrients. Also, the tree roots make digging ginseng planted under maples much more difficult.

The ideal growing site is a mixed hardwood forest with a lot of poplar and walnut. Ginseng grows well under these trees.

Soil

Ginseng requires a well-drained soil having high amounts of organic matter. The soil can be developed for ginseng by adding woodland soil decomposed from hardwood forests. Conifer area soils and highly sandy soils are not recommended. Adding shredded leaves is also helpful in building the soil.

If you plan to apply fertilizer or lime, test the soil first to determine exactly what is needed. Raise the pH with lime to 5.5 to 6.0.

Recheck the soil fertility and pH late in the first growing season. Apply any needed lime or fertilizer.

Moisture

Ginseng hates wetness, but needs moisture. When squeezed, soil with the proper moisture for growing ginseng should not adhere to your skin or ball up in your hand. Moist sites can be identified by the number of plants on the forest floor. Solomon's seal, cohosh, wild ginger, and snake root are examples of plants that thrive only in moist, but well-drained soil. Also, most ferns will grow only in soil containing sufficient moisture.

Shade

Ginseng requires a hardwood shaded area. The shade should be 70 percent to 80 percent. When preparing the site, do not eliminate canopy trees that supply the shade. Again, ideal tree species are poplar and walnut.

If enough shade is not available, construct "artificial shade" by building an arbor from poles and use brush or vines to furnish the shade. Place these either overhead or make lean-to fixtures over the plants.

Preparing Beds

Bed preparation can be elaborate or simple. Some growers till the ground to a 4- to 5-inch depth, make rows, and plant. Others simply plant the ginseng and leave the ground undisturbed. Removing the underbrush and lower plant growth will make it easier to plant, mulch, and harvest ginseng. Use approved herbicides to kill all small growth. Then remove brush and small, dead growth that would be a problem when planting and harvesting. Keep the beds 4 feet wide to ensure enough space to reach all weeds and plants from both sides. Leave 2-foot walkways to allow room to work the plants.

Planting

Planting can be done with seeds or roots in the fall. September and October are the best months to plant. Roots should be used for seed production. Initially, roots cost more; however, they produce seeds and can be ready to harvest before most plants grown from seeds. Plant roots when you desire seed production.

Density of planting is very important. There needs to be enough space to ensure air flow, to reduce competition for moisture, nutrients, and sunlight, and to help control the spread of diseases.

When using seeds, make sure you purchase stratified seeds or stratify them yourself. Before planting, soak the seeds for 10 minutes in a solution of 1 part household bleach and 4 parts water. Remove floating seeds because these will not germinate. Rinse seeds in clean water. Then, just before planting, place the seeds in a bag with several tablespoons of Captan fungicide. Shake the seeds to put a coating of Captan on all seeds. This will assist in preventing early fungus diseases, such as damping off.

Seeds should be planted 2 to 2 ½ inches apart in 4-inch spaced rows. Make each row only 1 inch deep. Then, with your hands, cover the seeds with ¼- to ½-inch of fine soil. Mulch the area immediately. Transplant the roots at two years of age.

Planting beds with roots is much the same as seed planting. Soak roots for 15 minutes before planting in a solution of 2 tablespoons of Captan per gallon of water. Do not rinse after soaking. However, the rows should be farther apart and deeper. The roots should be planted 9 inches apart in all directions and 1 to 2 inches deep. Place the root in the row with the bud up and cover with 1 to 2 inches of soil. Be careful not to damage the bud as this is the growing

point. Make sure the buds are pointed up in the same direction throughout the row. This will prevent the tops from growing into each other and competing for nutrition and moisture. As with seeds, keep them moist because dry roots will die. Also, mulch right after planting.

Seeds and roots also can be planted in the wild. To plant seeds, go into an area where ginseng will grow wild and rake back the leaves. Then, thinly rake the seeds into the soil and cover them with leaves. It is important to make sure that they are completely covered. Roots are planted in a similar way. Use a trowel or spade to lift up the soil, drop in a root, and gently cover it. This will give you true wild ginseng at harvest.

It is important that the seed does not dry out. If it does, it will not germinate. This problem, however, is eliminated by applying mulch.

Never plant in low places or ditches because leaves will gather in those areas and prevent the ginseng from growing the next spring. Also, root rot is a real threat.

Mulching

This is a very important step that serves two purposes. First, it provides protection for the bed. Moisture will be retained for a longer period of time and the temperature of the soil will remain cool (< 65 degrees F). Second, since mulch decays constantly, it leaves a natural fertilizer in the soil. Mulch should be applied to beds immediately after planting. Cover roots with 1 to 2 inches of mulch. The more severe winters require deeper mulch. Cover seeds with 1 inch of mulch. Materials to use include leaves, shredded leaves, shredded tobacco stalks, straw, mixtures of hardwood bark, and hardwood sawdust. If you use oak leaves, shred them. Whole oak leaves are very tough and difficult for plants to grow through.

Maturity and Digging

Ginseng grown from seeds requires 5 to 7 years to obtain a size suitable for harvesting. Dig the roots during ginseng season in the fall (August 15 to November 30). The older the roots, the higher the prices. When digging, be very careful not to damage the root. Leave soil on the roots if it cannot be removed easily. Wash roots to remove excess soil. Place them on a screen and gently rinse them.

Drying

Place roots evenly in a single layer on a screen-bottomed tray. Do not allow the roots to touch

each other. Keep roots in a dry location with a temperature of at least 70 degrees F and no more than 90 degrees F. If the roots dry too fast, then the exterior will darken, reducing their value. Keep away from mice. Allow some air flow to eliminate mold. Some growers use dehumidifiers or ventilation fans to remove moisture from the drying room. Roots are adequately dry when they break with a snap. Natural drying will require several weeks. Since drying is such an important step, it would be wise to find out more about proper drying methods. Improper drying can destroy the value of the roots. Carefully follow the best drying techniques.

A precise method described by one grower involves starting the roots on trays at a temperature of 85 degrees F with 30 percent to 40 percent humidity. Then raise the temperature 5 degrees per day until the temperature reaches 105 degrees F. Keep the humidity at 30 percent to 40 percent. Do not add wet roots after the drying process has started. Improper drying can lower the price of your ginseng by half.

Transplanting

Transplanting can be done in the spring or fall. Fall is the best time to transplant wild roots.

When digging roots, be sure to get the entire root. Once a root is removed, hold the stalk in both hands and break it off an inch or so above the bud. Then put the root in a wet canvas or burlap bag. It is important to keep the roots moist until they are planted. Also, one should inspect the roots for disease, poor growth, etc., before planting them.

Stratifying Seeds

The first harvest a ginseng grower will get will be the red, seed-filled berries, which form in late July through September. Generally, ginseng plants do not produce seeds until their third growing season. Each berry will contain two seeds. Ginseng seeds do not sprout until the second spring after they are picked. After picking the berries, the next step is to de-pulp the berries. Once that is done, you are ready to stratify. Stratification requires exposure to a cold/warm/cold sequence of temperature changes.

The most common method of stratifying seeds is to mix the seeds with fine sand in a wooden box. The box is usually no more than a foot deep, and the bottom is covered with wire or screen mesh to allow good drainage. The sand and seeds should be placed in the box in thin alternating layers, beginning and ending with sand. Use at least twice as much sand as seed by volume.

Select a burial site for the box where ginseng probably would grow well. As in planting, moisture is an important consideration. Dig a hole a few inches deeper than the depth of the box and cover it with no more than 2 inches of sand. Next fall, simply dig up the box, separate seeds from sand by washing the sand through a screen, and you're ready to plant.

Predator Control

Predators, both animal and human, are one of the two main limitations to growing ginseng. In areas where deer, wild turkey, and livestock are a problem, fencing may be required. Use a low, woven-wire fence topped with a strand or two of electric fence. Leave alleys every 100 feet to allow deer and turkey passageways. Fencing also may help keep human predators from digging the crop.

In seed production, watch the seeds when they begin to turn red. If you have squirrels in the area, they can rapidly destroy your seed crop. Look for seed hulls on the ground and entire seed heads destroyed. You may have to eliminate the squirrels. Also, wild turkeys can be a real problem during seed production. Woven-wire fence will eliminate most turkey problems.

In areas where livestock graze or could graze by accident, make sure to fence your patches. Livestock damage comes from the animals eating the ginseng and trampling the plants.

Security

Security is very important. A major problem with security from humans in West Virginia is the attitude that many people have concerning the ownership of ginseng. Many feel that since ginseng is a wild plant, they have the right to hunt and dig it on anyone's land. Even law enforcement officers are reluctant to arrest trespassers or thieves in ginseng territory. With this prevalent attitude, security is a real problem.

First, tell no one you are raising ginseng. Also, you may want to cut the leaves and stems off in the fall before hunting season. This may help keep people from accidentally finding your patch.

Some growers are experimenting with video cameras, alarm systems, guard dogs, and high tensile electric fencing. Most rely on being around the premises. However, this is false hope. Ginseng has been stolen from patches on the edges of home lawns.

Another strategy is to give roots to neighbors to plant so they also will be alert to strangers or

suspicious people in the area. This places everyone in the area as growers of ginseng, no matter how small the patch.

One big problem with security is the time required to grow ginseng. Other people can watch your patch develop and dig it before you do. Therefore, when the patch is of harvest age, you must dig it first.

As you develop your ginseng, check with your Farm Service Center or insurance company to see if crop insurance is available. Also, a grower can call all dealers when a significant amount of roots are stolen and ask them to contact him or her when the roots show up. Most diggers will try to sell roots for wild. This tactic is very easy to detect. Wild-simulated roots are all the same age, and woods-cultivated roots can be easily identified by characteristics and a soil test. Some buyers can tell who produced the roots by just looking at them.

Also, remember that law enforcement officials will do very little if your land is not posted. Make sure you place the posted signs correctly, that they have the necessary information, and that they are spaced at proper distances.

Many growers are planting totally in the wild situation in order not to disturb the forest; this may conceal the location better. Others are planting a large area and are willing to allow some to be stolen.

There is no miracle security cure-all. One must deal with the problems associated with security.

Pest Control

Mice are a real problem in growing ginseng. They use mole holes for runways and eat the ginseng roots. The mulch makes an ideal home for them. Use mouse baits and check ginseng patches frequently. Mouse traps placed in blocks or other hiding places may help.

Voles, also known as field mice or orchard mice, are small rodents that cause serious damage to ginseng. Voles burrow into a ginseng bed and eat the roots. There are no repellents available for controlling voles; however, the use of rodenticide and baits is effective. Baits seem to be the best method. An example of a bait is to place a poison in the holes of a brick, cover the brick with a plastic bucket, and then cut holes in the rim of the bucket for access on all sides. This way, the poison is kept dry and away from larger animals. Growers report fish-flavored Rami Green to be the vole bait of choice. Some growers use plastic tubing, rodent barriers, and traps; others simply have cats or owls around. These methods will work

for mice, too. Study your environment and determine what tactic works best for you.

Slugs are also detrimental to growing ginseng. They like to work under the mulch and multiply by the millions in a short period of time. Always check under the mulch for small nests of white gelatinlike egg masses. The slugs also may be visible in early evening. A few slugs under the mulch in the fall will multiply and completely wipe out a garden by spring. Mesuol is a known chemical control for slugs. It does not eliminate them, but offers some control. It can be bought in pellet form from supply houses in Wisconsin. Organic control using beer and cornstarch has some effect. Diatomaceous earth applied on the mulch during dry spells works in flower gardens and vegetable gardens. Using the type for gardens, apply a complete covering over the area.

Only minor damage to ginseng plants is caused by insects. Leafhoppers and aphids occasionally have been observed, but should not cause serious concern. Wireworms and grubs sometimes cause damage, especially in patches prepared from sod areas.

Diseases

Ginseng was believed to be a disease-free plant when first cultivated. Today, however, it is known that plant diseases caused by fungi are one of the primary limitations to ginseng production. Prevention of diseases is better than trying to control them after an outbreak. The fungi can be borne by soil, air, or water. Prevention involves site location and proper soil drainage. Also, one should not move through the patches when the foliage is wet because this can spread the disease-causing organisms.

PHYTOPHTHORA ROOT ROT AND PHYTOPHTHORA LEAF BLIGHT

These two diseases are the same. Both are caused by the common soil-borne fungus, *Phytophthora cactorum*. This organism is carried by water movement through the patch.

The first sign of a problem is a wilting plant. Once dug, the diseased roots are beige and rubbery instead of white and brittle. The roots become musky and disintegrate rapidly. Dried roots with the disease have gray-black discolored areas.

Leaves with the disease have dark, greenish black areas on their ends. Symptoms may appear to be **Alternaria blight**. **Phytophthora** coincides with wet, cool periods; therefore, it is unlikely to occur during hot, dry periods.

Spores of the disease overwinter easily and resist drought. They can survive many years, even

without ginseng. The spores become active zoospores during wet soil conditions. After infection, plants wilt and collapse, and the roots disintegrate. This releases spores that infect the soil for years. Since this fungus is waterborne, the disease spreads rapidly during rainy weather because the spores splash on the foliage.

Prevention and Control

Choose a well-drained site. Add rotten bark to increase soil drainage. Always plant in areas that have never grown ginseng before or rotate beds with yellowroot or similar crops. Rotation does not eliminate the possibility of **phytothora** problems.

All equipment, clothing, boots, and tools used in infected fields must be sterilized. Use a solution of 1 cup household bleach to 9 cups of water (10% solution). Remove diseased plants and include a 1-foot section next to the diseased plants. This helps stop the spread of the disease.

Correct diagnosis is vital because fungicides used for **Alternaria blight** do not control **Phytophthora leaf blight**. Fungicides such as Ridomil are effective for **Phytophthora blight**. Soil fumigation before planting is effective for such a short time that it is not recommended. Using fungicides as a preventive measure is best.

RUSTY ROOT

This disease appears as rust or rusty root and may be caused by the fungus *Cylindrocarpon*. This disease first appears at the tip of the taproot. The small fiber roots die first, followed by the main root stem. Rotten areas are dark red to brown, firm, and dry.

Late in the season, the diseased plants turn yellow and wilt. The next spring, the plant does not grow. Symptoms appear especially in hot, dry weather. The disease affects both seedlings and older plants. Areas on the taproot appear as raised, rusty colored lesions which expand. The rot progresses slowly and the stem breaks off at the root. The affected roots are disfigured or discolored. Plant growth is slowed. The dried roots are of much less value.

Prevention and Control

No known control is available. Always sanitize equipment and plant in new soil.

ALTERNARIA BLIGHT

This disease attacks the leaves and stem. It is caused by the fungus *Alternaria panax*. It is the most common and most destructive disease of ginseng. The fungus attacks all parts of the ginseng plant, but is most often found on the stems, leaves, and flower stalks. Symptoms are easily visible. Lesions can be from 1/4-inch to 2 inches long.

Leaf spots are circular or wedge-shaped. The light to dark brown lesions often are surrounded by a yellow halo. Infected flower or fruit stems will fall off.

This disease is very severe in cultivated gardens under artificial shade. It is less severe in woods-grown ginseng. Better ventilation and less humid conditions exist in woods-grown ginseng because the plants are spaced farther apart.

This fungus is airborne. The most severe conditions appear in warm, humid weather. Spores overwinter in the fallen stems and leaves.

Prevention and Control

Fungicides are effective in preventing alternaria blight. Use cooper sulfate, Dithane M45, or Manzate 200. Make sure to mix the copper sulfate (Bluestone) properly. Apply the fungicide weekly when weather conditions are favorable for alternaria blight.

Plant in small gardens and increase the space between plants. Since this disease is airborne, sanitation is impractical.

Why Not Cultivated Ginseng?

With today's production and pricing situation, growing cultivated ginseng is not recommended. Intense cultivation under artificial shade and fertilization is a production method used widely in Wisconsin. Plants are grown in large prepared beds with shade built from wood lathe or polypropylene. This system is very expensive to establish, requiring much labor and high-tech spraying, harvesting, and drying equipment. Investment cost can be over \$25,000 per acre.

However, another important reason not to grow cultivated ginseng is the market situation. Cultivated ginseng does not develop the concentric growth rings as wild-simulated or wild ginseng does. The root is a different color, also. Wild ginseng is dark tan with many concentric rings. The cultivated ginseng root is cream colored, fat, and smooth with few rings.

Oriental buyers and users of ginseng believe the longer and slower ginseng grows, the more medicinal qualities are contained in the root itself. Therefore, they will pay very little for quick-grown roots. Prices can vary from \$20 per pound for cultivated ginseng to \$150 to \$200 per pound for woods-grown and \$350 for wild ginseng. The object is to grow either woods-cultivated or wild-simulated ginseng.

Sources of Seeds and Roots

When buying seeds, keep in mind that the amount of seed per pound varies greatly. Usually, seeds are sold by weight. One rule to remember is 8,000 seeds per pound or 500 per ounce. Stratified seeds cost about \$50 per pound depending on supply and demand. Green seed, a seed that should be stratified before planting, is almost half that price. When harvesting your own seeds or getting them in the wild, look for red, kidney-shaped berries. Each berry will contain two seeds. Green seeds usually take 19 to 20 months to germinate. Stratified seeds planted in the fall will germinate the next spring.

Marketing

Many agriculture producers work extremely hard to grow the finest products in the world, only to lose money in marketing. Ginseng is sold at various stages of the marketing cycle. Buyers at all levels must be registered dealers of ginseng who keep records of purchases, amounts, dates, and other required data.

To obtain the highest price for your ginseng, know the current prices given by dealers or received at auctions. An excellent sale is the West Virginia Fur and Root sale held the first weekend of January, March, and September. This sale offers a large amount of high-quality ginseng to numerous dealers from all over the United States. This sale gives you a close connection to Asian buyers. Also, there are honest dealers who give prices close to auction sales. Make sure you shop around for the best prices.

Also, it is very advantageous to check on the benefits of selling the tops and stems. With the use of ginseng in such products as chewing gum and drinks, all parts of the plant are in demand. Ask dealers how they want the products dried and packaged for best prices.

Growers of wild-cultivated ginseng should always consider growing specialty crops (i.e., goldenseal, wild ginseng, sassafras, etc.).

To become a dealer of ginseng, the first step is to get a West Virginia business license. Then,

contact the state Division of Forestry and obtain an application to sell ginseng. If the application is approved, then you are certified to buy and sell ginseng. Every 30 days, however, a report must be turned in stating how much ginseng was bought and from whom. Also, if the ginseng is to be sold and is to leave West Virginia, then a certificate indicating the state of origin must accompany it. Ginseng can be bought and sold from August 15 through March 31.

This information was prepared by John A. Scott Jr., Sam Rogers, and David Cooke, WVU Extension Service Agents; and Bobbi Lynn Fry, Research Assistant, Mercer County.

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