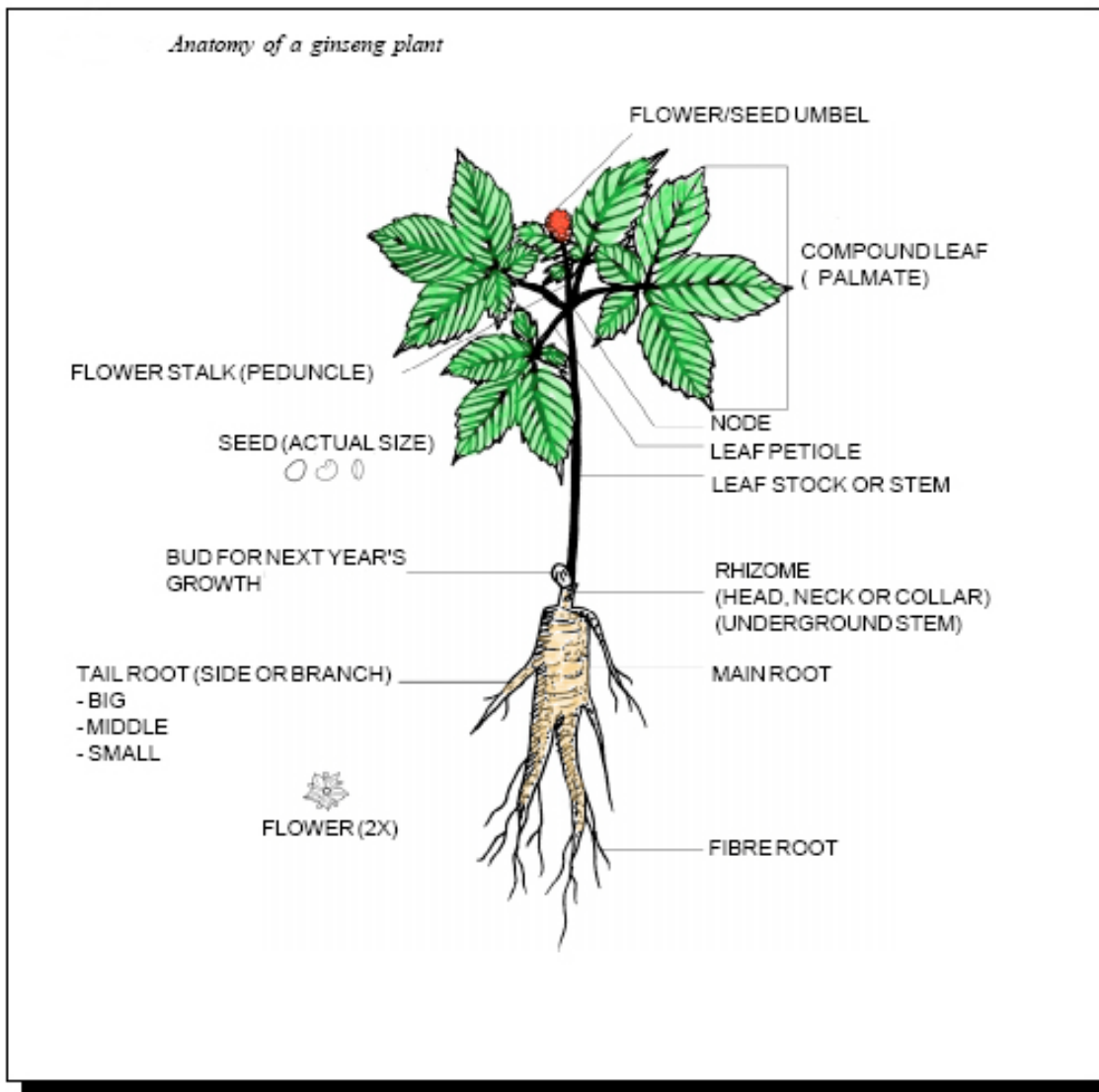


How To Grow Wild-Simulated Ginseng

The Best Retirement Business Available Today.



BulletProof Retirement Income

Your Best Opportunity For High Income With Very Little Work:

We believe that the very best retirement funding opportunity today- for most people -lies in producing wild-simulated American Ginseng for sale to the Asian markets. Traditionally, ginseng has been grown in “gardens” which were artificially shaded with wood or vegetative material, and where the ginseng was grown in densely planted beds. This is known as “field-cultivated” ginseng. An offshoot of this is to find an appropriate spot and plant the ginseng in a stand of trees which will produce suitable shade. This is known as “woods-cultivated” or “woods-grown” ginseng.

The premium ginseng product, however, is wild ginseng. The wild simulated grower is planting the ginseng in such a way as to imitate the wild process of plant propagation, but with better success.



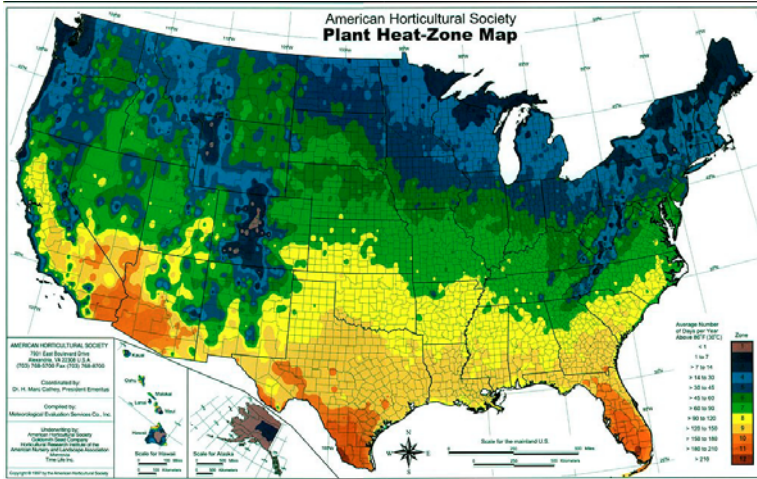
Asia, and specifically China, have traditionally been the buyers of the vast majority of the world’s ginseng supply. While there are dozens of grades and many very nebulous quirks in the Chinese process of grading ginseng, wild and wild-simulated ginseng command the highest prices and always have. Regardless of the chemical analysis, the older and wilder the root looks, the more valuable it is in China.

China is now self-sufficient in field-cultivated ginseng production, and is now exporting ginseng to the US. The photo at left is at a Chinese ginseng farm in the Jilin province. It is foolish to try to compete with the Chinese for low-grade ginseng when it is easy to produce the highest quality.

Because of the rapid industrialization in China and their subsequent rapid accumulation of wealth, Chinese people are able to spend far more money on premium items they want- such as ginseng. The market for wild-simulated ginseng looks very good for at least the next 30 years.

Is Ginseng the Business For You?

Growing ginseng has some specific requirements, with respect to both the climate and regulatory environment. Ginseng does not grow in the warmer portions of the US. See the Plant Heat Zones map at the American Horticultural Society [shown below] <http://www.ahs.org/pdfs/heatmap.pdf> Zones 3-7 are appropriate for growing ginseng,



although it can be grown in zone 8 (the light yellow on the map). Ginseng also requires deciduous forest canopy with 75% to 80% shade to grow. These climate and habitat requirements tend to be the most limiting factors of ginseng horticulture.

In addition to the climate issue, there are the international

regulatory issues. There has been sufficient concern over Wild Ginseng in the United States such that the U.S. Endangered Species Scientific Authority banned its export during the 1977-78 season from all states except Michigan. Michigan was exempted because of its permit system governing the collection of ginseng.

Currently, American ginseng export is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) agreement. It can only be exported if it is shown to be legally obtained and determined not detrimental to the survival of the species. States are given control over the management and certification for export of ginseng within their boundaries and are required to develop and implement a ginseng management program. They are required to submit specific export findings on a three year schedule.



The map to the left shows which states have approved programs. Green states have no wild ginseng harvesting regulations, so export of wild (or wild simulated- for they do not differentiate) ginseng is not legal under the CITES treaty. This means that anyone growing in areas outside the Yellow states would be in a regulatory never-never land. Is it wild or is it cultivated?

As of 2004, the Yellow states have wild harvesting regulations and programs, and they qualify under the CITES treaty for

export licenses for ginseng.

Ginseng: An Overview

Ginseng is used mainly by people of the South East Asian Pacific Rim countries, although it is gaining popularity in other cultures. The use of ginseng dates back 3000 years or more in China where it is considered the most important herb in traditional medicine. It is called the “elixir of life” and some people believe that, if taken regularly, ginseng can reduce stress, increase physical stamina, quiet the nerves, enhance blood flow, help in blood sugar and cholesterol levels, help regulate blood pressure, strengthen the metabolism, vitalize glandular functions, slow the degeneration of cells and increase longevity.

Since wild forms of ginseng are rare in Asia, wild (or “wild-simulated”) *P. quinquefolium* from the U.S. is highly marketable there. Extension Specialty Crops Specialist Andy Hankins, who visited China in 1999, found perfect “hands” of U.S. ginseng being used as expensive gifts; he recommended that U.S. exporters pay more attention to protecting the “hands” from damage in shipment, rather than just shipping them in barrels as a commodity. (A “hand” is a complete, unbroken ginseng root with its branches resembling human body parts.) This advice is especially relevant to wild-simulated grower who are producing a premium product.

In keeping with his 1997 prediction that Chinese production of American ginseng would make China self-sufficient in farm-raised grades by the year 2000, Hankins reported in May 2000 that cultivated American ginseng is now imported via San Francisco from China. Manufacturers of ginseng preparations marketed in the U.S. prefer to use cheaper grades of imported Asian ginseng (*P. ginseng*), and now American ginseng (*P. quinquefolium*). The cheaper grades of both species are those produced quickly under shadecloth, like the Chinese ginseng farm shown below.



Ginseng is used in many forms. It is purchased as a whole root, root pieces, powdered root or extracts, to name a few, and is ingested in tea, soups, as pills or capsules, or may be chewed in small pieces. It is also becoming popular in various cosmetic products as shampoo, skin creams etc. Ginseng is the most widely used medicinal herb in the Asian Pacific Rim countries. The three commercial varieties of ginseng have many similar quantities but are considered to have different effects – the American ginseng giving a cooling or depressant effect and the Asian species a warming or stimulating effect as examples. The active ingredients are a group of closely related chemicals called ginsenosides, which are produced by and stored in the plant.

Ginsenosides fall into a group of related phyto-chemicals (plant chemicals) called saponins that are found in many plants. The ones in ginseng are called ginsenosides. The range for samples tested will be from one to five per cent. Asian and North American ginseng have different amounts of these chemicals in their structure causing them to do slightly different things, yet they are much the same. North American ginseng (*Panax quinquefolius*) has 29 different ginsenosides, which are a higher total percentage than the 20 ginsenosides found in Asian ginseng (*Panax ginseng*). This does not necessarily make North American ginseng better for all things, as the distribution of the individual ginsenosides is important; for example, Rb₁ is very high in North American ginseng, compared to Asian. Rg₁ is not absent in North American ginseng, but is found only in negligible amounts. The ginsenoside Rg₁ is considered to be the stimulatory chemistry in Asian ginseng making it more useful as a medicine.

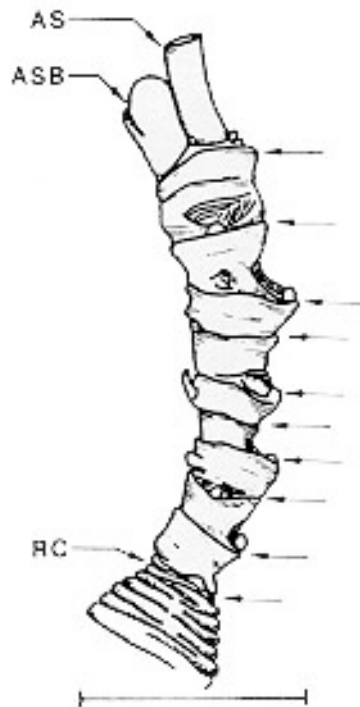


Figure 5.

In this illustration, AS is the annual stem and ASB is the annular stem bud. RC is the root crown, and each arrow points to an annular scar, indicating a year's growth.

The extra ginsenosides found in North American ginseng are thought to be the chemistry responsible for helping the body cope with stress, by means of adaptogens, which help the body to adapt to various stresses. The percentage of ginsenosides varies in ginseng. The age of the roots, how and where it was grown, the part of the root used, the genetic makeup of the seed as well as the species of ginseng all play a role.

Ginseng sprouts each year from the root, and every fall it forms a bud before the top dies. These buds form a series of scars on the top of the root, a special "neck" that is called the "vertical rhizome." The age can be determined by counting the scars on the neck of the root.

In the wild, Ginseng plants do not reproduce until they are at least 4 years of age. The flowers have both stamens and carpels, and are capable of self-fertilization. Cross-pollination does occur, and known pollinators of ginseng include halictid sweat bees (*Dialictus* spp.) and syrphid hover-flies (*Toxomerus geminatus*). However, these pollinators probably do not transfer pollen between distant individuals.

The seeds develop inside berries, which grow in a “head” that may produce 30 to 40 berries. Each berry tends to contain 2 seeds, although the actual number ranges from 1 to 4. The seeds of ginseng are highly perishable: if they dry out, they die. To germinate, seeds require an after-ripening process (warm-cold sequence of temperature changes) that averages 18-22 months. The embryo is inactive during the first winter, matures during the next growing season, and then endures a second winter before it is able to germinate.

Field research conducted by Lewis and Zenger found that **only 0.6%** of wild ginseng seeds germinated after 20 months, although the researchers found that the ginseng seeds that did germinate had a high probability (97%) of developing to maturity. **In contrast, where seeds were sown by humans, germination rates were 55-75%.**

Growing as it does under the shade of deciduous forest cover, ginseng is adapted to low light levels. Ginseng can reach light saturation at anywhere from 10% to 30% of full sunlight, and any further exposure to the sun after this point will reduce the development of chlorophyll and depress growth.

Growing Ginseng As A Business

As with other agricultural activities, this business requires land on which the crop can be planted, seed to plant, and a combination of time and management in order to survive and thrive. There are 3 main ways to make money growing ginseng:

- In fall, after the new growth-bud is set, the green leafy tops can be cut and dried for sale as tea. At least one study found that the concentrations of ginsenosides were up to ten times higher than in the tops than in the roots. The market for ginseng tops is still very small, however, and they really need to be chemical-free.
- After about 5 years, the mature ginseng plants will produce about 100 to 120 pounds of seed per acre that can be harvested, stratified and either used or sold the following year. The seed is easy to sell and will provide income while the roots continue to grow and gain value. Currently, wholesale seed prices range from \$35 to \$45 per pound, and retail prices range from \$50 to \$90 per pound.
- Finally, after anywhere from 10 to 12 years, the ginseng roots themselves are finally large and old enough to be worth premium prices. Wild-Simulated ginseng is indistinguishable from wild ginseng, and it brings wild prices. Currently wild roots over 10 years old will bring over \$400 a pound.

Growing ginseng is a flexible business. The longer the roots stay in the ground, the larger, older and more valuable they become. If your habitat is good, there isn't any reason you can't leave the ginseng in the ground until you feel like digging it out. There isn't a schedule you're required to keep. This flexibility is combined with producing a product at the top of the Asian quality ladder. All other grades of ginseng are considered inferior to wild ginseng, so the wild root always brings the best price. Even if the entire market for ginseng drops, the wild-simulated grower is still going to get the best price.

The only real question the wild-simulated grower has to answer is “how do I produce high quality (wild) ginseng of good weight and appearance in as short a period of time as possible?”

Ultimately, the ginseng grower is faced with the problem of trying to create a perfect growing habitat for an extremely valuable plant, with enough stress on the plant to give it a wild appearance and enough sunlight and nutrients to give it good growth. This is a difficult task. Mistakes will usually cost the grower time, and they can only be corrected with time. While this business will yield a nice income after 10 to 12 years, it should be looked at as a long-term business with 20 to 30 year horizon.

The long product cycle makes this an excellent prospect for an intergenerational family business, with the elder generation establishing the enterprise and the children moving onto the farm after the ginseng is established and generating income. This requires obtaining a larger quantity of land and planting several acres every year, but once the farm starts producing income the parents can turn the management (work) of the farm over to the children and grandchildren.

Would you like to live in an area with a low cost of living, a low crime rate, little or no government bureaucracy and regulation, a slower pace of living and a higher quality of life? Most people would say “yes, but... how would I pay for it?”

Long-term, the ginseng will pay the costs of living in the country, but it is a business. Like any other business, it has startup costs, and a product development lag-time. The trick is to find a way to make ends meet for the 5 or 6 years before your seed income starts coming in, and we have been working on that problem for years.

Would you willingly live with a very reduced income if it meant having a high income business later? Some people are willing, some people are not. Bulletproofretirement.com publishes very specific information on how to live on very little income in order to keep your ginseng operation going until it will support itself. As it turns out, these are exactly the techniques that ensure a comfortable retirement on very little income.

The search for a way to overcome the problems associated with the “perfect” business led us to develop the BulletProofRetirement.com website.

Planning and Preparation:

“Everything goes To the Man with the Plan...”

Before planting ginseng, you have to have a basic idea of what you want to do. It is axiomatic that if you do not have a plan to get where you're going, you probably aren't going to get there.

Growing wild-simulated ginseng is not a get-rich-quick scheme. At the same time, there are some elements that will allow you to have a great deal of flexibility. You do not need to be physically present or near your ginseng cultivation areas for a period of years at the beginning, which provides a great deal of flexibility in planning. During the later maintenance and seed harvesting years, you need to be living on or very near the land on which you grow ginseng to guard against pilferage and disease.

Growing ginseng has five distinctly different phases:

1. Business plan development and site selection.
2. Ground preparation and planting
3. Early years maintenance
4. Maintenance and Seed Harvest years
5. Final Harvest

The Business Plan Development phase is the most important, as this is when the grower decides just what they want and how they're going to go about it. If it's going to be “grow it and get out” then plan for it. If it's going to be a multi-generation family business, do the appropriate planning and find an appropriate farm. Some major issues to be discussed in the plan are the goals, the definition of what success is and a discussion of what the exit strategy is.

Growing ginseng is a lifestyle business once it's established, requiring a certain amount of care and husbandry, but allowing a great deal of freedom otherwise. During the growing season the majority of the “work” is walking through the plots, observing the crop and making sure it's not suffering. If seed is being produced, berries need to be harvested and processed. If seed production is not desired, the flowers need to be clipped in order to ensure that the plants focus their growth on root development.

It is possible to be an absentee grower for the first few years, but plan on having to live on or very near the property within 4 years after it's been planted. This gives you plenty of time to make an orderly transition.

The Ground Preparation and Planting phase can be a "one-shot" affair, or it can be an ongoing process. It depends on the goals and desires of the growers. The initial planting can be handled during the course of a month in the late fall, with site preparation taking place during the summer and fall preceding the planting.

The Early Years maintenance does not require much more than checking for disease, insect and rodent damage, and taking appropriate action if necessary. Keep in mind that you will lose plants, and the natural attrition of plants will thin out the rows to a sustainable and disease-resistant level. Seeds planted in fall of 2005 would not require any real attention until the summer of 2009, and possibly not until 2010 if growth is slow. The Early years will end when the plants start producing seed.

The Maintenance and Seed Harvest phase is the time when you must be diligent to regularly walk around in your planting areas. It is imperative that you know what you have and it's condition. If you begin to suffer pillage or disease, you must take appropriate action. When the berries mature, you have to pick the berries when they are ripe or you risk losing the seed crop. After the annual growth-bud is set, the tops can be cut, dried and sold for ginseng tea. When the ginseng is at this level of maturity it is a target for thieves, and it needs to be protected. Fortunately, the tops die back in early fall and after the leaves fall off of the trees, it is almost impossible to find the plants and dig the roots. The ginseng is safe in the ground until the spring, when it will send up a shoot again.

It is not necessary to maintain residence in your ginseng growing area over the winter, and it is possible to have a sun-state residence for winter, and a temporary residence in the north. Some might choose to migrate north in an RV, stay for the season and migrate back when the leaves fall. Others might choose to live in a "vacation cottage" or cabin, with their "real" home somewhere else. The ginseng doesn't care.

The final harvest phase will involve a lot of work, and you might want to start making plans for finding labor. It will be necessary to have a place to dry the roots, and you'll have to give consideration to selling them. It is also possible to do a limited harvest, turning over the farm to children and taking a portion of the harvest as an annuity for the rest of your life. Your children might be very interested in this business once it's already established and has cash-flow, but it calls for careful planning and good relationships.

The point to this chapter is that you cannot buy some seed and throw it out on the ground and expect there to be a fantastic harvest 10 years from now. That's fantasy. You have to decide what you want, where you want to be in 10 to 12 years, and what kind of income you want to get out of this. After that, you have to be willing to do the work necessary to get what you want.

Getting Started: Finding Appropriate Land To Grow Ginseng

In general, growing wild-simulated ginseng is going to boil down to a couple of points that you cannot work around. There are minor points like soil nutrients that can be worked around, but the major points are these:

Shade: 70 to 80 percent shade is needed to shield the plants from the sun. Without enough shade, the ginseng is burned and dies. However: with shade levels of 90% to 95% and above, the ginseng grows very slowly. The most common mistake a new grower makes is to plant under too much shade.

Second, the soil has to be moist enough to keep the ginseng growing but well drained enough to avoid problems with overly wet soil. Not enough moisture and the plants die in the heat of summer. Too much moisture and they get root-rot and die. Much is also made of growing on the cooler north and eastern facing slopes. This is an especially important consideration in dry areas.

The slope of the ground needs to be gentle enough that you can work on it. We've planted ginseng on slopes that could not be walked up, but rather had to be climbed. After years of experience at this, we've come to the conclusion that if we can't take our golf cart on the slope, it's too steep for us to plant to plant on.

Necessity, however, can dictate that you plant where you can. If you wind up planting on an extremely steep slope, do the best you can and pay attention to your crop.

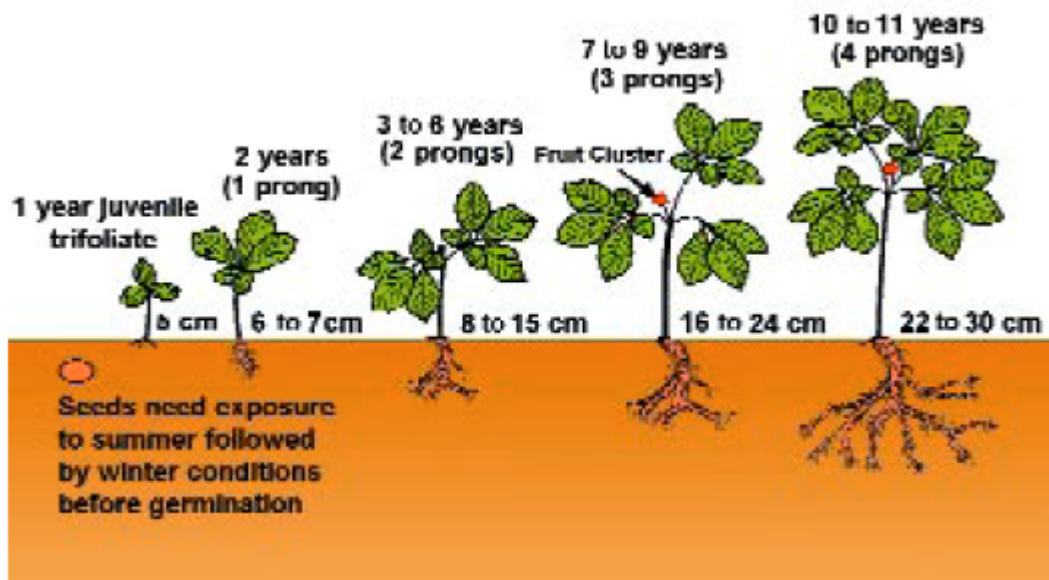
The quality of the shade is going to be the most important issue of all. In studies of wild ginseng, which often is growing in deep forest cover of 95% shade or more, Lewis and Zenger found:

"Our data show that on an average a one-pronged plant will be 4.5 (plus or minus 1.6) years before it develops a second prong, that a two-pronged plant will be 7.6 (plus or minus 2.4) years before developing a third prong, and that a three-pronged individual will average 13.5 (plus or minus 3.3) years before adding a fourth prong." Walter H. Lewis and Vincent E. Zenger, "Ginseng Population Dynamics," *American Journal of Botany* 69 (1982): 1485.



This photo was taken in May of 2005, and the seed for these plants was planted in November of 1999. This is the 6th growing year since planting, and the photographer's hand is in the photo to give you some perspective. There are no 2-prong plants visible in this photo, nor were there any within sight in this heavily shaded growing area.

The next illustration shows how the growth cycle of ginseng is supposed to progress:



The previous group of plants was planted on a north-east slope, in deep shade under the cover of young beech trees, and we estimate that the shade is about 98%. The “soft” hardwoods- the maples, poplars, walnut and sassafras trees are the better choices to plant under, as they



are often found down in the hollows where the soil is moist. The oaks and hickories are often found on the dry ridge-tops where soil moisture will be a problem in the heat of summer.

The photo on the left is looking up the hill at the canopy over the ginseng previously shown, at noon on a bright, sunny day. Note the almost total lack of sunlight shining on the ground.

Lest you think that this is a fluke, the following photo is another patch from the same year's planting- mostly 2-prong and 3-prong plants:



This is a much sunnier place to grow ginseng, and notice the dozens of ferns on the forest floor. The soil on this slope stays moist, but well drained. The only problem is the steep grade of the slope which makes it difficult to move about in the beds.



Grower's Tip

The point of all this is simple: if you want your ginseng profits to show up in 10 to 12 years instead of 25 to 30 years, **don't plant under heavy shade**. This is the most important point of this chapter. Your plants have to have enough shade that they are not burned by the sun, but they need enough sun to grow at a reasonable rate. Choose your site with care.

The simplest way to determine if any portions of your site might grow ginseng is to check and see if any wild ginseng is growing there now, or has in the past. Likewise, you can look for companion plants such as Jack-in-the-pulpit, bloodroot, Solomon's seal, wild ginger, wild yam, ferns, blue cohosh, trillium, sarsaparilla, black cohosh or goldenseal and see whether they can be found. Companion plants are frequently found living in the same areas that ginseng grows in, and often grow nearby.

If these plants are found you should also check the soil and its moisture content, the amount of shade, the soil nutrient levels and both the orientation and slope of the land. It isn't a single factor that makes for good ginseng cultivation areas, but rather a combination of factors.

Determining the amount of shade that the overhead canopy provides is as much an art as science. Get used to walking around noticing the amount of sun hitting the ground under the trees. You want to see a dappled effect of sunlight slowly moving across the forest floor.

If there is no ground level under-growth, there probably isn't enough sunlight to grow a good stand of ginseng. At 20% to 30% sunlight, a lot of grasses and other plants will grow on the forest floor. This is just another reason why we don't recommend tilling the soil: it encourages more growth and you wind up weeding just to protect your seedlings.

Land That Has Been Recently Logged

This will be an issue when looking for land to purchase. The reason is that much of the land sold at auction will be "split" with the timber rights sold separately from the land. The landowner is trying to maximize the value of their land, and traditionally this is the best way to do so.

DO NOT PURCHASE LAND SUBJECT TO LOGGING. Wait until the logging is done, examine it carefully and see if will still meet the needs of ginseng. If not, look elsewhere. Timber contracts vary, and the loggers may get in there and knock down two small trees for every saw-log they pull out. They may take everything down to 8 inches at the butt and haul the small stuff to a scragg-mill, and when they're done, the area will look like it was carpet-bombed.

As a rule, loggers get blamed for a lot. They do a lot of damage, it's true. However, we will now commit environmental heresy and tell the truth about land that has been logged:

Grower's Tip

THE LOGGER MAY BE YOUR BEST FRIEND. Our experience with land that has been selectively logged ranges from good to excellent. The selective logging will thin the forest and allow a lot more sun onto the forest floor. In some spots there might not be enough shade, but the thinning will prompt new growth in the canopy, and that will be a self-correcting problem.

When you amend the soil to increase the calcium, the trees shading the ginseng will also benefit, and they will increase their growth. It may be necessary to hang a large tarp in some

spots for a year or two, but the thinning will benefit the ginseng grower. There is another reason that you shouldn't throw rocks at the loggers.

Loggers leave the land looking ugly with hastily built logging roads and the tops of the trees laying about. Many people, especially folks from the city and suburbs, will not understand just how quickly the forest hides the evidence of logging. What they see is ugly land that often looks like it's been raped, even if it hasn't.

We are not discussing situations where the land was clear-cut or subject to "liquidation" logging. We are only referring to selective-cut logging.

Each piece of property is different. The best deals on rural land will be land that has been logged recently. Realtors know that it is very difficult to sell land that is freshly logged, and the price will reflect this. The value will still be low on land that has been logged within the last 10 to 15 years. Yes, it will be covered with trees, but there won't be any marketable timber on it.

Walk the land. Look at the trees, look at the ground, look at the slope. If you do not understand how big an area of ten acres is, find out. It will take several hours to walk over a 10 to 20 acre woodlot, carefully observing the land and its attributes. You may want to tell the realtor that you want to really look over the land and that it might take a while.

Do not tell the realtor or owner that you want land to grow ginseng on. Keep your thoughts and criteria to yourself, and if pressed tell them you're looking for a hunting farm that you can put a cabin on. Use the ugliness as a reason to beat the price down.

Soil Nutrients

Once a potential site has been identified, a soil test should be taken. Dig up soil from at least six spots on the slope, mix it together in a plastic bucket and take the soil to your local Extension office so it can be mailed to the state soil test laboratory for analysis. When the soil test results come back, the most important numbers to look at for ginseng are the soil pH, available calcium (Ca) and available phosphorus (P).

A typical pH from a soil sample taken from the forest floor from a north facing hillside in Virginia is 4.5 and in South Central Kentucky it is 5.1. In the past, growers have been told to treat soil with a pH that low with lime to try to bring the soil pH up to 5.5 to 6.0 for ginseng production. Recent research by Bob Beyfuss in Greene County in the state of New York calls this practice into question. Mr. Beyfuss is an Extension Agent with Cornell Cooperative Extension who has a very strong interest in ginseng. In 1996, he recruited a team of ginseng hunters to assist him in a soil research program with wild ginseng. He asked these wild ginseng diggers to take soil tests wherever they found patches of wild ginseng growing well out in the woods. He got back 70 soil samples from them.

Beyfuss was surprised at the soil test results that came from this study. He said in his report, "The most interesting and puzzling result of the analysis was the positive correlation of very low pH and very high levels of calcium. This is the exact opposite of what would be expected in mineral soils. The average pH for these samples was 5.0 + or - 0.7. Soils that are strongly acid such as this usually have calcium levels in the range of 1000 to 2000 pounds per acre or less. The average calcium levels in these samples (where ginseng was growing well) was 4014 + or - 1679. It is my suspicion

that this abnormality may, in fact, be the key to the limited range of healthy populations of wild ginseng. Duplicating this soil condition may be the key to successfully cultivating American ginseng in a forested environment."(Beyfuss, 1997)

At the same time that Bob Beyfuss was testing the soils under wild ginseng stands in New York, Jim Corbin, a Plant Pest Specialist with North Carolina's Department of Agriculture, was conducting similar research in the Great Smoky Mountains National Park in western North Carolina and East Tennessee. He conducted soil analysis from several wild ginseng stands and reported that, *"In ginseng, calcium deficiencies can be seen in stunted plants that lack general vigor. Growth buds are smaller and more fragile. In good ginseng stands, calcium on a per acre basis is consistently higher than in the other stand categories, and within these stands there was better plant diversity, less disease and a larger stem height in mature plants."* (Corbin, 1997)

These two reports have caused controversy among ginseng growers and researchers. The new idea is to apply gypsum (Calcium sulphate) to soils for ginseng rather than lime (Calcium carbonate) which has been used in the past. The reasoning behind this is that the gypsum will add calcium but will not raise the soil pH. Rates as high as 5 pounds of gypsum per 100 square feet of growing bed have been recommended to bring the calcium levels up to 4000 pounds per acre. There are strong suspicions among several ginseng experts that ginseng diseases, like Phytophthora root rot, may be suppressed by acid soil conditions. There are strong suspicions among the same group that applications of lime to bring the soil pH up may lead to increased disease problems. Unfortunately, these suspicions have not been tested by replicated research studies. Soil scientists have voiced a few concerns about heavy applications of gypsum. They are worried that growers may throw the soil fertility out of balance if they apply too much gypsum. Clearly, controlled research studies need to be conducted as soon as possible.

The other soil nutrient that ginseng growers should monitor is phosphorus. In 1978, Dr. Tom Konsler initiated a four-year study to measure ginseng root growth response to P additions to the low P soils found at the Mountain Horticultural Crops Research Station in Fletcher, N. C. Dr. Konsler found positive correlation of root weight with phosphorus additions. He also found that ginseng plants took up calcium more readily in soils that had available phosphorus so the interrelationship is important (Konsler, 1990). Growers should amend their low P soils so that at least 95 pounds per acre of actual phosphorus is available (Persons, 1994).

In the wild-simulated method, there is no tillage of the soil. Many persons recommend planting "woods grown" ginseng in tilled up, raised beds in the woods, under a natural canopy of shade. That method certainly can be used for production of ginseng but growers should not expect to receive high prices for roots produced in tilled beds. Ginseng roots harvested from tilled beds look more like cultivated roots than wild roots. Prices paid (2003) for this kind of ginseng range from \$30 to \$100 per pound of dried roots. Since there is no tillage of the soil with wild simulated ginseng crops, all soil amendments are applied on the soil surface. Applications of gypsum and/or rock phosphate may have to be made every two or three years. Soil testing should be done every year to monitor available soil nutrients.

Grower's Tip

We have found that applications of drywall scraps cut in long, narrow strips are useful for supplementing calcium as well as marking rows in new plantings. This method, while wonderfully unscientific, represents a recycling effort, a soil amendment effort and an attempt to reduce labor through application of a "time release" gypsum board. As such, it is placed on the ground in much larger quantities than the normal (powdered) gypsum or lime, and gradually dissolves under rain and snow over the course of years.

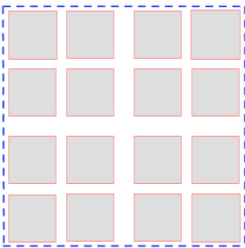
Planting Ginseng:

All the talk in the world won't get your ginseng planted. It takes getting out into the woods and doing some work. There are people who are willing to do the work, but the problem most growers have is a lack of conceptual overview of what they're doing.

There are farms all over the country growing ginseng, but it is only very rarely that you will find a ginseng growing operation that has enough ginseng to be provide a decent retirement income. The way the ginseng is planted will determine everything else, and so, we begin.

Getting The Concept

If it takes about 100 10-year-old roots to make a (dried) pound of wild ginseng, and our target yield is about 250 pounds per acre, then we need to have about 25,000 plants per acre. Not only that, but this acre needs to be organized in such a way that we can get in and observe it, weed it if necessary, harvest the berries and finally, dig it up. Organization is needed in order to accomplish a 10 acre planting of ginseng.

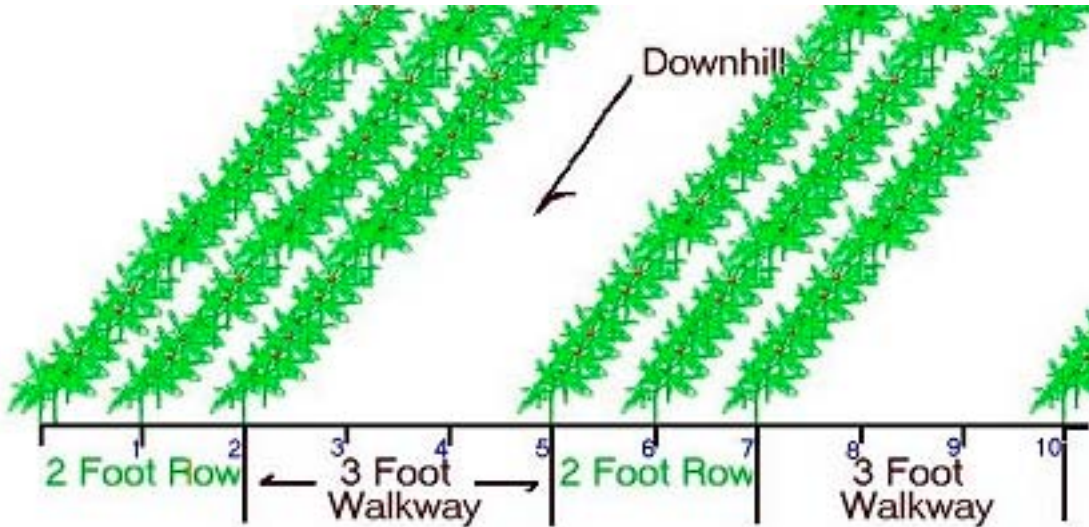


The layout at the left shows a square, roughly 220 feet by 220 feet. That's a bit more than an acre, but we grow this stuff in the woods-not on a football field. The extra space here is taken up by the roads and paths between the growing beds. There are sixteen 50-foot by 50-foot plots in this acre.

Between each quarter-acre area, we have a 10-foot wide roadway and between each 50-foot by 50-foot plot we have a 6-foot wide path that will allow a golf-cart to pass.

We plant rows in each of the plots. The rows are 50 feet long, 2 feet wide and 3 feet apart. There are three rows, 1 foot apart, in what we call a "row." Then, a 3-foot space, and another three rows 1 foot apart. This repeats itself over and over again. The picture will explain.

The illustration below gives a “birds-eye-view” of what it looks like. The rows are 50 feet long, and if the ginseng plants are spaced about a foot apart in the rows, there will be 50 plants in each row. The 3-foot walkways allow you to tend the plants and harvest berries, as well as helping to control disease with more distance between rows.



50 plants times 30 rows gives us 1500 plants in a 50-foot by 50-foot plot of ground.

This is the basis of our ginseng-planting plan. 1500 plants on a sixteenth of an acre is 24,000 plants on an acre, which is right about what we need to make our target goal of 250 pounds of ginseng per acre.

Like many business operations, growing ginseng is a numbers game. In order to get the numbers, you have to do the work and plant the land. As of May, 2005, we can order seed for fall planting in 100 pound lots (5 acres worth) for \$35 per pound, FOB Madison Co., Minnesota. It works out to be \$750 an acre for seed.

Grower's Tip

Remember: it's just a numbers game. Plant the seed at 20 pounds per acre. When in doubt, plant more, but not more than 25 pounds per acre. **Plant your ginseng by the acre, not by the half-acre or quarter-acre.** Do not be fooled into thinking that small plots of ginseng will produce large amounts of money. They will bring nothing but frustration and heartache. Many things could happen over the course of 10 to 12 years. Plant at least 3 or 4 acres in total.

- If you are in your 40's or younger, plant several acres to begin with, plant several acres the year after that, and then keep planting an acre or more each year until you run out of land or energy. After 8 to 10 years, you've got income for life.
- If you are 50 years old, you have time to make a few mistakes, but not many.
- If you are 60 and this is a retirement plan that has to yield a large amount of money in 10 years, you must plant as heavily as possible the first year. Take the time to ensure that your habitat is as suitable as you can possibly find, and do everything you can to ensure the success of your plantings. There is no substitute for good habitat.

Life is not simple, and neither is the topography of good ginseng habitat. We have rarely seen spots that allowed a "textbook" layout of a planting grid like that pictured previously. Our standard planting plot is the 50-foot by 50-foot plot, which we can measure out in almost any wooded area. We figure 16 of these plots to be an acre of ginseng cultivation, and this is how we keep track of our progress. It takes 1 and 1/4 pounds of seed to do one of these plots

With a planting plan in place, the next step is to measure and mark the planting areas. We use engineer tape, which comes in red, pink and yellow. It's handy for marking the beds and keeping the rows straight. If you don't mark the plantings, you'll be lost in no time. There is no reason to remove the tape the first year, and we advise leaving it up in order to find the seedlings when they come up in spring. Otherwise, you may have extreme difficulty finding the rows you planted.

Grower's Tip

Using the tape, you'll get an idea of what the germination rate was because you'll be able to follow the rows and find the plants. If you have very little germination, don't tear it up and start over. First, try planting in a different spot. If it's not possible to do a spring planting, wait until fall and plant another plot of ground. Then, the second year, go back and see if anything else came up on the site that didn't do well. **Sometimes, storing the seed in a refrigerator will cause it to stay dormant for an extra year.**

Planting Methods

There are several methods of planting that are used by the wild-simulated ginseng grower. Some growers take a very minimalist approach to clearing up the forest floor before planting. We are far more mechanistic, and we like our planting areas to be cleaned up, with the dead limbs and trees removed. We actually use the fallen limbs and trees as boundary markers for each 50-foot by 50-foot plot.

Because the ground isn't mechanically tilled (or at least not much), the methods for planting have to get the seed into or onto the soil in such a way as to get the ginseng to grow in the spring. There are several different methods of doing so.

1. **Rake and Broadcast:** The easiest is to use is to rake back the leaf-litter on the forest floor and broadcast the seed directly onto the ground, step over it and rake the leaves from the next seeding area on top of the seeds you've just "planted."

This isn't a bad method of planting, and we've had good success with it. We think it works even better if combined with lightly raking the soil prior to scattering the seed onto the ground. The object is to get the seed into contact with the moist ground where it won't dry out over the winter, and then cover it with the fallen leaves.

The drawback to this method is the seed is at risk of being eaten by rodents over the winter. Further, if the leaf cover is too heavy, the seedlings might not make it through the leaves when they germinate in the spring.

2. **Rake, Trench, Seed and Cover.** Andy Hankins advocated this method in his publication "Producing and Marketing Wild Simulated Ginseng in Forest and Agro-forestry Systems" Here is how he puts it:

The only tools needed to plant wild simulated ginseng are a rake and a garden hoe. Rake the leaves on the forest floor away from the 5 foot wide bed right down to the topsoil. Using one corner of the hoe, make three narrow furrows 18 inches apart, all the way down the length of the bed. The furrows should be one inch deep and three inches wide. Plant ginseng seeds, by hand, 3 inches apart in each furrow. About one ounce of seed will be needed to plant three furrows, at this spacing, in a bed that is 5 feet wide and 50 feet long. Cover the seeds with 3/4 inch of soil. After planting, carefully step down each row to firm the soil around the seeds. Once the seeds are in the ground, gypsum or rock phosphate may be applied over the surface of the bed as needed. To finish the planting, rake one inch of leaves back over the bed as a mulch. After a couple of rain storms, no one will be able to detect that any planting has occurred. The site will look completely natural.

The problem with this advice is the roots from the trees and other plants make digging those trenches quite difficult. It is extremely frustrating and difficult work in rocky and rootbound soil. We would only recommend it for very small plantings (1/2 acre or less).



3. **Rake, Scratch and use a Mechanical Seeder.**

When you start trying to plant larger quantities of seed, you begin to want a more efficient way of planting. Our solution was to rake the leaves back, scratch 3 rows about a foot apart, and use a mechanical seeder to drop the seed in the slightly loose dirt.

The plates have to be worked with until you get a good seed distribution. The problem is that the root system in the ground makes it difficult to use the seeder without working up a row in the dirt first. This would seem to defeat the purpose of a wild-

simulated planting, but it does not. The ground is not tilled, but rather scratched up for an inch or two deep, enough for the seeder to get the seed into the ground and cover it with dirt before raking the leaves back over them.

The advantage of this system is speed. A two-man team can plant a half-acre in a day without much problem, and two acres in a week (which allows time for Mr. Murphy to pay a visit). Murphy's rule, for those that don't remember, is that everything always takes longer than it should, and if anything can go wrong, it will, at the worst possible moment. Plan ahead and Mr. Murphy won't visit as long and won't stay as long when he stops by.

The Early Years:

This is a shot from the head of a row in mid-spring after the seedlings have come up. You can see the 3 rows of seedlings in the leaf-litter of the forest floor with ease because we took pains to pull out the other plants prior to taking the picture. Otherwise, it would have been difficult to spot the plants.



Other than basic observation and note-taking for your own personal experience and edification, there isn't any reason to visit the seedlings. With the wild-simulated method of planting, the sprouts are far enough apart that disease should not be a problem. Animals and insects are going to take a toll, and that is to be expected: The loss is part of the natural thinning process. It is only a problem when the thinning goes too far and you no longer have a plant every foot in the row.

The first year is a learning time. Observe to see what effect the overhead shade has on the plants, what germination rate the seed and seeding method produced, and what planting methods worked best for you. It is possible that mistakes will be made. Learn from them.

The second and third year aren't really different, because the ginseng is growing slowly, and it's still small. If your soil nutrient amendments have done their job and your shade is enough to keep the plants from being burned but not so much as to retard the growth, your plants should grow as fast as any wild plant could be expected to grow.

This is the time to focus on building roads and trails, and fencing in your ginseng growing areas and property lines.

Security Issues.

Fear of theft is the major issue that deters most rural people from becoming ginseng growers. Inflammatory articles published in magazines and newspapers exacerbate this fear and lead people to believe that there is a ginseng thief behind every bush just waiting to clean a grower out. This fear is unreasonable for a serious ginseng grower.

The fourth year will probably be the point you have to start monitoring the crop for theft. You should walk in the woods at least twice a week during the growing season and look at your growing areas. If someone comes in and starts to dig your ginseng, they will be back. They can make more money in an afternoon stealing your ginseng than they could make in an entire week at their job (assuming they have one), and after the money is spent the temptation to return will be overwhelming. Plan your action accordingly.

The first defense against theft is simply to plant enough ginseng to yield a good retirement income. Think about this. If a single person can dig 1 root per minute (that's fast!), then they're getting 60 roots an hour. We recommend planting 10 acres with 24,000 plants to the acre. It will take them 400 hours, or 40 long 10-hour days of hard work to get the plants from 1 acre.

Grower's Tip

Build a fence around the growing areas, and put signs on it every 50 feet or so with wording something like this:



Build another fence around the perimeter of the property with NO HUNTING and NO TRESSPASSING signs properly posted at regular intervals. The purpose of the fences and signs is to ensure that a thief has no excuses. In Kentucky, the theft of over \$300 worth of ginseng is a class D felony. Conviction will result in not being able to own a gun (among other things), which is a serious blow to country people who like to hunt.

The perimeter fence needs to have some gates in it at intervals, and at least some of the gates should be positioned to provide a concealed point of entry or exit for people who are trying to sneak in to steal your ginseng. Yes, you read that correctly. Position some gates along likely avenues of approach back in the woods. Neglect to lock the gates.

Your goal is to channel the intruders and make it easier to photograph them as they enter and exit your property. If you have a problem with theft, set up cameras to get photos of the people stealing your ginseng. Give the photos and a signed affidavit with details of the theft to the sheriff and let him do the dirty work- it's what he's paid to do.

Dealing With Local Officials

Getting law-enforcement officials to do their job is often a major problem. We were shocked when the sheriff said "NO" after we asked if he would arrest a ginseng thief. He claimed that with drug dealing, meth cooking and general violent crime on his hands, he didn't have time or personnel to spare chasing ginseng thieves. That was the official story.

Reality is somewhat different: A ginseng thief will probably be related to half the county by blood or marriage (or both). You will probably be an outsider. Does the sheriff want to be the one who arrested ole' Joe-Bob? These people have to run for re-election. There is also the laziness factor, and it's hard to get excited about a crime that is difficult to prosecute and convict on. It's easier for elected officials to focus on stuff that makes them look good.

You, the grower, must provide a "package deal" for the prosecutor with everything necessary to show the jury that the accused knew that he was stealing cultivated ginseng. **This is why we recommend the multiple fences and signs.** Some on the jury might have gone "sang diggin" when they were younger, and don't consider digging wild ginseng to be a crime. The prosecutor has to overcome that bias and show that the accused knew it wasn't wild and intentionally chose to steal it. Make it easy for them. The easier you make their job, the more likely it is that they will support you.

Advice Concerning Guns

A gun is a tool: Nothing more, nothing less. Do not confuse the use of a tool with making a political statement. In public, weapons should be carried concealed. It is easy to get a permit to carry concealed in almost all of the areas we recommend for growing ginseng. The point of carrying is to have the ability to protect yourself and others. Creating a disturbance by having a monstrous hawg-leg strapped to your thigh and parading around in public is stupid. Be discrete, be polite, and carry anonymously.

On your own property, within reason, we believe that the same standards apply. If you aren't hunting or target shooting, there isn't any point in carrying the weapon except to intimidate someone. Do not ever brandish a weapon or point it at someone in order to threaten or frighten them. It is EXTREMELY STUPID to fire a "warning" shot if someone is in your woods. You might be charged with attempted murder or attempted manslaughter.

In fact, the best choice of action is to not confront a thief at all. Get photos and let the sheriff handle it.

Grower's Tip

Waving a gun around will get you arrested when the thief files a complaint. If you catch a thief and hold them at gunpoint, at the very minimum you will have created an enemy for life. There is a high likelihood that the thief will seek revenge against you, and that includes charging you with assault with a deadly weapon or some other related crime. If you are the outsider, you are on thin ice. Remember, the local law-enforcement officials run for election, and ole' Joe-Bob is related to half the county... and he has a big mouth.

If you wind up in an armed confrontation, the odds are that you will lose. You may get shot, and you may get killed. If you shoot someone and they aren't armed, you are almost certainly going to jail. Even if they are armed, the prosecutor will probably want to charge you with something, simply because they don't like armed citizens with the temerity to actually use deadly force. Even if you are clearly in the right and come out on top, your injured intruder or their surviving family members can still sue you for damages suffered as a result of you defending yourself and your property.

It is foolish to create enemies if it can be avoided. If the sheriff arrests and the prosecutor gets a guilty verdict, the thief won't blame you (the victim) as much as the officials who enforced the rules. Growing ginseng is a long-term project, and you have to live there, so don't create conflict if it can possibly be avoided.

Keep Things In Perspective

Your most critical security issue will be at harvest time. The ginseng is very valuable, and while out in the woods it is difficult to steal because it has to be dug up out of the ground. What better time to steal it than when you or your employees have dug it up and dried it? Give much thought to the security of your drying shed and transportation to the buyer.

A cargo-van or truck can haul away a tremendous amount of ginseng, especially if you have already dug and dried it. People rob banks, don't they? This is something to think about, and an excellent reason to keep quiet about harvest plans and schedules.

Some growers argue that it's better to contract for a large group of migrant workers and get the farm harvested in one week or so, and have security on hand during harvest and while the roots are drying. Others argue that keeping a very low profile is the best way. Ultimately, you will have to decide how to handle it, based on the conditions you have when you're ready to harvest.

Security isn't just dealing with people, however. There are also insect and animal problems, as well as the threat of disease. Phytophthora and Alternaria blight will be the biggest threats.

Diseases Of Ginseng



Alternaria stem blight on three-year-old ginseng.

in a garden, the fungus can survive in diseased ginseng debris, and there produce spores that cause new infections. Warm, humid conditions favor the development of this disease.

How do I save ginseng with Alternaria leaf and stem blight? Preventative fungicide treatments are critical for control of leaf and stem blight. If available and legal to use, Dithane DF is the preferred fungicide for Alternaria leaf and stem blight control. Other, less effective fungicides such as a combination of Rovral and copper hydroxide, or Aliette may also be used. Whenever possible, use these products in combination with Dithane DF. Check with your county Extension agent about current product availability, as well as for information on appropriate rates, timings and methods of application.

What is Alternaria leaf and stem blight? Alternaria leaf and stem blight is the most serious foliar disease of American ginseng (*Panax quinquefolium*) in the US. Left untreated, this disease can totally defoliate a ginseng garden in a few weeks.

What does Alternaria leaf and stem blight look like? Ginseng leaflets with leaf blight have irregularly-shaped necrotic (dead) areas, often surrounded by a yellow halo. Necrotic areas expand to destroy the entire leaflet. Ginseng stems with stem blight collapse and are brownish-orange, with a layer of black soot (spores of the causal fungus) that can be rubbed away.

Where does Alternaria leaf and stem blight come from? Alternaria leaf and stem blight is caused by the fungus *Alternaria panax*. This fungus first enters ginseng gardens as windborne spores. Once



Alternaria leaf blight lesions on three-year-old ginseng leaves.



Typical symptoms of foliar *Phytophthora* on a three-year-old ginseng leaf.

caused by *Phytophthora cactorum*, the same fungus that causes *Phytophthora* root rot. This fungus is common in soil and can be splashed onto ginseng leaves during rains. In Wisconsin, foliar *Phytophthora* is most common during May and early June.

How do I save ginseng with foliar *Phytophthora*? Once *Phytophthora cactorum* infects the foliage of a ginseng plant, it often moves into the root system and little



Healthy (left) and *Phytophthora cactorum*-infected (right) ginseng roots.

What is foliar *Phytophthora*?

Foliar *Phytophthora* is the above ground phase of *Phytophthora* root rot. Left untreated, this disease, along with *Phytophthora* root rot, can destroy large sections of a ginseng garden.

What does foliar *Phytophthora* look like?

Watch for ginseng leaves with a papery, transparent appearance, the typical symptom of foliar *Phytophthora*. Often papery leaf areas are separated from healthy tissue by watery, blackish-green tissue. Infected leaves and stems disintegrate rapidly and often *Phytophthora* root rot follows as the pathogen moves from the leaves and stems into the roots.

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can be done to save the plant. If infected plants occur in patches, attempt to localize the area by carefully removing a 1 to 2 ft. wide swath of healthy plants, about 5 ft. from the edges of the affected area.

How do I avoid problems with foliar *Phytophthora*?

Cultural methods that are useful for controlling *Phytophthora* root rot can also be useful for controlling foliar *Phytophthora*. Any activity that reduces soil moisture is important for control because *Phytophthora cactorum* tends to be less active in drier soils. In addition, adequate mulching of ginseng beds is very important. Mulch appears to provide a physical barrier that helps prevent splashing of the fungus from the soil onto leaves and stems. Finally, during wet periods, fungicide treatments can be critical for management of foliar *Phytophthora*. Alternating applications of Aliette WDG and Dithane DF (when available) provides the best control of this disease.