

Ginseng is one of the best-known medicinal plants in the world. It has been used in China for thousands of years and has been dug and exported from America for almost three centuries. In Kentucky, it was one of the first cash crops early pioneers used to help pay their bills. In today's tough economic times, ginseng still provides an opportunity for growers of virtually wild or wild-simulated ginseng to obtain much-needed cash. The unique forest-lands of Appalachia provide excellent growing conditions for this native perennial forest plant, American ginseng (*Panax quinquefolium*) see Figure 1. Kentucky is the leading exporter of wild ginseng (\$5 to \$8 million annually). Unfortunately, tough economic times and attractive root prices have increased the harvest pressure on ginseng and caused numerical declines in plant populations and the quantity of wild root exported to Asia (Table 1).

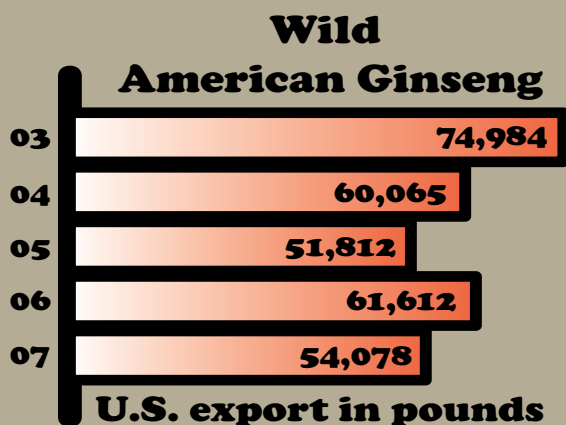


Table 1.

Site Selection

In Kentucky, the cooler and moister north- or east-facing slopes are preferred sites. The site should receive 70-80% shade and be well drained. Standing water or heavy soils are not suitable. The site should have some slope (20-40%) so that water will drain away from the site. Ideally, the forest understory should be fairly open and have good air movement. Plant species often associated with good sites include the following: black walnut, hickories, yellow-poplar, American beech, sugar maple, jack-in-the-pulpit,



Figure 1.
Ginseng is a small forest plant with very valuable roots.

Non-Timber Forest Products

Forest Production of Ginseng

by R. Terry Jones

Solomon's seal, mayapple, trilliums, wild ginger, bloodroot, goldenseal and blue cohosh.

Once you've selected your site, take a soil sample and have it tested. Ginseng prefers a soil pH level between 5.5 and 6.5, with plenty of available calcium (greater than 1,500 lb) and moderate to high phosphorus levels.

For beginners, about one-half acre is enough. This would require about 0.5 to 1 lb ginseng seed (Figure 2). If possible, it is best to use locally-grown seed because it produces plants that can be better adapted to the area. Be aware of the difference between stratified and green ginseng seed. Green seed is fresh from the plants and will not germinate for 18 months. Stratified seed is seed that has been stored in moist sand for 12 to 16 months and will germinate the spring following a fall planting. Stratified seed is more expensive than green seed.

Preparing Your Site for Planting

"Virtually wild" is probably the method of choice for ginseng because it is the easiest and least expensive method.

1. Make a seed planting device out of ½-inch pipe, a broom handle, and a hunting knife with a 6-inch blade. Construction and use of such a device is covered in *A Manual for Ginseng Growers and Trainers* by Fritch and Bamford.
2. Virtually wild ginseng is only planted in the most suitable sites on a 14- to 18-inch spacing.

3. Sow about ¼ to ½ inch deep. It should take ¼ to ½ lb, or 2,000 to 4,000 seeds/acre, and requires about 8 to 16 hours to plant.

When to Plant

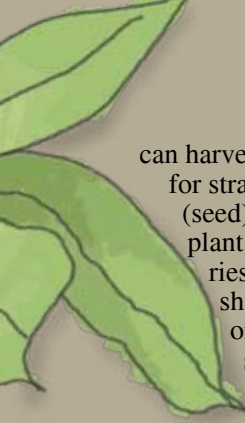
Ginseng is usually planted in the fall from October until freezing weather prevents further planting. Early spring (February/March) planting is also possible but must be done before the seed starts to germinate. Handling seed that has begun to sprout often causes damage to the young plant. Whether the seed is green or stratified, it should be carefully inspected when obtained. If the seeds are soft, moldy, or discolored, return them to the supplier for replacement.

Ginseng Seeds

New growers should purchase their first seed until they have a planting old enough to produce seed for future use. There is a list of seed sources in the publication *Ginseng Goldenseal and Other Native Roots* available at the Attra Web site (see references). Once growers have their own seed source, they



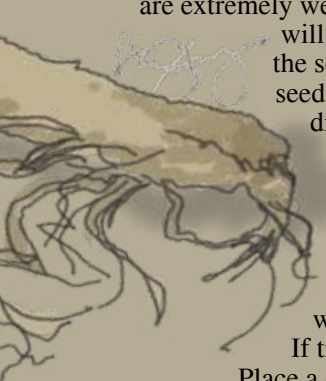
Figure 2. Stratified ginseng seed.
All photos courtesy: Terry Jones



can harvest the red ripe berries and collect the seed for stratification or planting. De-pulp ginseng (seed) berries in a sack and either stratify or plant immediately. Never plant whole berries. Fruits should be collected before they shatter, mashed lightly, and fermented for one to two days in a bucket of water. The seeds should never be allowed to dry out. Ginseng seed has an 18- to 21-month dormancy. Fresh ginseng seed requires a cold/warm/cold cycle in order to germinate. There should be 45 days of temperatures below 36°F to meet ginseng's cold requirement. During stratification, ginseng seed should never be allowed to dry out or to become too wet. Ginseng roots themselves will not sprout without 60 days below 49°F.

Stratification

A simple stratification unit for small quantities of seed is a pouch made from an old sock or a nylon stocking. For large quantities of seed, consider using a plastic bucket with 1/16-inch holes in the bottom and sides. Regardless of the size or construction, design the container to allow for good water drainage and to keep out rodents. Fill the container with alternating layers of seed and clean, moist sand, using at least twice the volume of sand as seed. Bury the bucket in a cool, shaded location (Figure 3) so that it is 2 to 3 inches below the soil surface. Mark the location well. Early the next spring open the container and check the seeds for decay, removing any that are soft. Stir the remaining seeds carefully to aerate them, make certain the sand is still moist, and rebury the container. If soil conditions are extremely wet or dry, check the stratification unit periodically. Many ginseng seeds will enlarge and begin to open after a year in storage. This is an indication that the seed is viable. In the fall, plant the ginseng seed as stratified seed. Keep the seed moist and protect it from drying during planting. Remember if it dries it dies.



Planting Roots

Although root prices are considerably higher than that of seed, small ginseng roots can be transplanted and used as "seed" stock. Transplanting ensures a more uniform stand and reduces the time from planting to seed production. Plant ginseng roots at an angle (30 to 45 degrees from the vertical) in well-prepared soil with the bud one inch below the soil surface. Mulch the transplant plot with leaf litter.

If transplanting requires several days, roots can be stored temporarily in a plastic bucket in a cool basement. Place a damp cloth on top and cover the bucket with a lid. Each day, stir the roots well or pour back and forth into a second container to aerate them and re-wet the cloth.



Figure 4. Washing and drying fresh dug ginseng.

Considerations for Raising Ginseng

- Produce wild simulated or virtually wild ginseng.
- Know the risks which include: crop failure, diseases, theft, drought, rodents, deer and turkey depredation, and market price fluctuations.
- Start small and gain experience.

Ginseng is most commonly propagated by seed harvested from red berries on the plant during July and August. The ginseng stalk dies down every year, producing a bud scar on the underground neck that reveals the age of the root. Older roots are more highly valued in Asian markets and command premium prices. Because ginseng is a threatened species, roots must be at least 10 years old to be legally harvested and exported.



Figure 3. Ginseng seed stratification bucket.

Digging and Drying the Crop

Fall-harvested roots will weigh more and will dry better. Wash the roots immediately after digging to remove dirt and debris. Ginseng should not be scrubbed because it lowers root value and causes the root hairs to fall off. After washing, allow the roots to drain on a screen for an hour or two, and then begin the drying process (Figure 4). Dry in a warm area where temperatures of 80° to 90°F can be maintained. Mature ginseng has 80 to 250 dry roots/pound. Try to preserve as many of the fibrous roots as possible. Roots will lose approximately 70 percent of their weight in drying.

Economics

Although ginseng root has a high price per pound, wild ginseng in a forested environment is not a "get rich quick" scheme for the reasons previously mentioned. A projected budget and expected returns for a one-half acre plot of "wild simulated" ginseng is included on the following page.

References -- Web Sites

- <http://attra.org/attra-pub/ginsgold.html> - Ginseng, Goldenseal, and Other Native Roots
- www.ces.ncsu.edu/hil/spcrop-index.html - Fact sheets on ginseng and other woodland medicinal.

Dickman, M.A. 1993. *How to Raise Two Cash Crops for Profit: Ginseng and Goldenseal*. Dickman Company, Willow Springs, Mo. 65793. 36 pp.

Fritsch, Albert J., and Sherman Bamford. *A Manual for Ginseng Growers and Trainers: How to Grow Virtually Wild Ginseng*. Appalachian Ginseng Foundation (AGF), A Project of Appalachia. Science in the Public Interest (ASPI), 50 Lair Street, Mount Vernon, Ky. 40456. 30 pp.

Konsler, T.R. 1986. *Woodland production of ginseng and goldenseal*. Pp. 175-178. *Proceedings, 1st National Herb Growing and Marketing Conference*, Purdue University, W. Lafayette, Ind.

Persons, W. Scott, and Jeanine M. Davis. 2005. *Growing and Marketing Ginseng, Goldenseal, and Other Woodland Medicinals*. Bright Mountain Books Inc., Fairview, N.C. 466 pp.

Pritts, Kim Derek. 1953. *Ginseng. How to Find, Grow and Use America's Forest Gold*. Stackpole Books, 5067 Ritter Road, Mechanicsburg, Pa. 17055. 150 pp.

Stoltz, L.P., C.R. Roberts, R.T. Jones, and W. Dunwell, *Extension Specialists in Horticulture*; Bill Nesmith, *Extension Plant Pathologist*; and Ric Bessin, *Extension Entomologist*. 1994. *ID-60 Cultivating Ginseng in Kentucky*. Cooperative Extension Service, University of Kentucky College of Agriculture. 12 pp.

Sturdivant, Lee, and Tim Blakley, 1999. *Medical Herbs in the Garden, Field, and Marketplace*. San Juan Naturals, P.O. Box 642, Friday Harbor, Wash. 98250. 321 pp.

About the Author:

Terry Jones, Ph.D. was a Horticulture Extension Specialist at the University of Kentucky. He is currently on a post-retirement appointment and is responsible for educational programs and applied research on small fruits, vegetables, and woodland medicinal herbs. He specializes in production practices and crops for limited-resource farmers.

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Projected 9-Year Budget for 0.5 Acre of Wild Simulated Ginseng ¹		
Seed	10 lb @ \$75/lb	\$750
Labor	Site preparation and planting (125 hrs @\$10/hr)	\$1,250
	Biweekly inspection (500 hrs x \$10/hr.)	\$5,000
Materials and equipment	Rakes and shovels	\$50
	Backpack sprayer (\$125), fungicides, and rodenticides	\$200
Drying	Addition of insulation and drying racks to existing room or shed	\$400
	Energy cost to heat (0.50/lb of dried root)	\$40
Total cost		\$7,690
Expected yield	80 lb x \$410/lb ²	\$32,800
Net revenue in 9 years		\$25,110
Net revenue in 2000 dollars for 0.5-acre plot, assuming 4% rate of inflation.		\$17,641
¹ Modified from USDA National Agroforestry Center: Agroforestry Notes: AF Note-5. Lincoln, Neb., July 1999. ² Note that price can change drastically. The price in 2008 dropped to around \$285/lb, cutting net revenues by 30% (\$10,000).		

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