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Agroforestry Notes

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American Ginseng Production in Woodlots

Introduction

For the past 3,000 years or more the roots of a perennial plant called ginseng have been an important component of traditional Chinese medicine. The roots of wild American ginseng have been harvested, dried, and exported from the United States and Canada to China, since the mid 1700's. Today, American ginseng is also a very important part of traditional Chinese medicine. It is used as an "adaptogen" that allows the body to adjust to various types of stress. It is not used as a specific cure or remedy for any particular ailment but as a component of many medicinal herbal combinations that help people deal with the aging process and related disorders.

Presently there are dozens of over-the-counter herbal remedies, available in local drug stores, which contain ginseng or ginseng extracts. Ginseng has become one of the most popular herbs of the 1990's as Americans and Europeans seek alternatives to prescription drugs. Unfortunately many of the ginseng products available in local stores do not contain any American ginseng. Usually they contain extracts of either Asian ginseng, which is widely cultivated in China and Korea, or so-called "Siberian ginseng" which is a related plant, but not a true species of ginseng. According to the U.S. Department of Commerce, as long ago as 1858 the U.S. exported more then 350,000 pounds of dried wild ginseng roots. American ginseng has been cultivated in the U.S. since the late 1800's, primarily in the northeast, southeast and the midwest.

Types of Ginseng

American ginseng, (Panax quinquefolium) - is a native American herb with a range that extends from Southern Quebec to Northern Georgia and from the East Coast to the Midwest (Figure 1). It grows as an understory plant in the dense shade provided by deciduous hardwood tree species. In the Northeast it is most often found growing under sugar maple while in the Southeast it is often found under tulip poplar or black walnut. In the Midwest it occurs beneath several different hardwood species including oak.

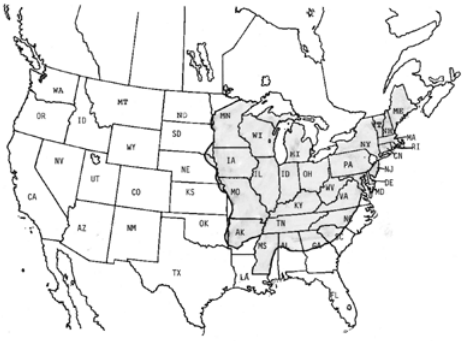

Figure 1 - Shaded area denotes ginseng's present wild range in the United States.

Field cultivated ginseng - is grown in raised beds in fields under artificial shade provided by either wood lathe or polypropylene shade cloth for a period of three to four years. In 1998 there were approximately 8,000 acres of "field cultivated" ginseng in production in North America.

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Woods cultivated ginseng - is grown in a forested environment in tilled beds under natural shade for a period of six to nine years.

Wild simulated ginseng - is grown in untilled soil in forests for a period of nine to twelve years or even longer. The dried roots of wild simulated ginseng closely approximate the appearance of truly wild ginseng.

Wild ginseng – is an internationally protected species. Its collection is either prohibited or strictly regulated in states where it occurs.

In recent years the world market price for field cultivated ginseng has dropped to near the actual cost of production. The prices of woods cultivated and wild simulated ginseng, on the other hand, have risen to levels that can be extremely profitable for landowners with suitable forest stands.

Constraints

Legal - Wild ginseng is an internationally protected plant. In order for it to be legally exported from any state it must be certified as being cultivated ginseng or, if wild plants are gathered, they must be harvested according to the rules and regulations of a state certification program, approved by the U.S. Fish and Wildlife Service. Currently, only 20 states have such a program (Table 1). Prospective growers should contact their local conservation district for information regarding any local rules and regulations that might affect cultivation, including pesticide regulations.

Table 1: States with a ginseng certification program
Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Missouri, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia, Wisconsin

Pests - Although woods cultivated ginseng is not often affected by many pest problems, occasionally they do occur. Very few pesticides are registered for use on ginseng in the United States. Introduced exotic or sometimes native slugs can be a major problem in woodland ginseng operations. Prospective growing areas can be surveyed for slugs by using baits made from grapefruit rinds.

Range - American ginseng is native only to the states shown on the map (Figure 1). It may or may not be feasible to cultivate it in forested areas of states other then those pictured. It absolutely requires a cold period during the dormant season equivalent to at least 1,000 hours at temperatures below 50 degrees F, therefore ginseng cannot be grown in the extreme southern U.S. Other obscure, but very important, microclimatic forest conditions also influence the growth of ginseng, even within it's native range.

Seed Dormancy

Ginseng seed has a complex dormancy requirement and is highly perishable if not properly handled from the time of harvest until it is planted. Typically the seed is extracted from the red, ripe berries in August or September by mashing the berries and floating the pulp off. The seeds are then mixed with moist, clean, coarse sand at a ratio of two parts sand to one part seed. The seed/sand mixture is put in a box with screen on top and bottom and buried underground for approximately one year. The box is dug up one year later and the seed is planted in the late summer or early fall. The seeds sprout the following spring, usually in mid April. Ginseng seed that has been stored for one year under outdoor conditions is referred to as "stratified seed."

Site Assessment

Perhaps the most crucial aspect of forest ginseng cultivation is choosing a proper site. Ginseng thrives in cool, moist, densely shaded woodlands that have well drained soil. Wild ginseng is typically found in calcium rich forest soils well supplied with organic matter. It is often found beneath mature deciduous trees and will not grow in an exclu-

sively coniferous forest. In the South, Southeast, parts of the Northeast and Midwest, slopes that are north or northeast and of five to 20 percent grade seem to provide optimal orientation and facilitate both air and water drainage. In the far north, for example Vermont and Maine as well as Quebec, south or southwest facing slopes are preferred. The ideal ginseng-growing site is one that has a thriving population of wild ginseng or resembles such a site in terms of tree species and ground plants. Prospective growers would be wise to investigate the ecology of wild ginseng in their region (see references) before beginning. Ginseng is often found growing among other woodland plants that indicate rich, moist soil, high in calcium. Local foresters, soil scientists, and other resource conservationists often can be called on to identify rich, fertile soils within any given region.

Site Preparation

"Woods cultivated" ginseng site preparation begins with a general clearing of understory vegetation, small trees and as many rocks as possible. The next step is to till the soil to a depth of four to six inches either with a rototiller or by hand. Occasionally soil amendments are tilled into the soil if necessary (see maintenance section).

Planting

No fertilizer or lime is applied to potential ginseng beds unless the soil pH is below 4.5. If pH is 4.5 or less, 50 pounds of ground limestone per 1,000 square feet may be tilled in before planting. A one to two inch layer of well-rotted or shredded hardwood leaves from the forest floor may also be tilled in. Stratified seed are planted at the rate of 40 to 50 pounds per acre (one to one and a half pounds per one thousand square feet) in late summer or fall, but before the ground begins to freeze. There are approximately seven thousand seeds per pound. Seeds are randomly broadcast by hand or tediously planted one inch apart in rows spaced six to nine inches apart. Many growers make four to six foot wide beds to facilitate weeding. The seed is covered with a one half to one inch layer of soil, trampled on and mulched with two to three inches of either shredded or intact leaves from the surrounding trees.

Occasionally, one, two, or three-year-old rootlets are planted at a depth of one inch to two inches. These are spaced at one rootlet per square foot of bed. Rootlets for transplanting cost significantly more then stratified seed but save years of time in the production cycle. In New York state in 1998 one year old rootlets cost approximately 25 cents each. Two-year-old rootlets cost 50 cents and three-year-old rootlets cost $1.00.

"Wild simulated" ginseng planting involves similar site preparation without tilling the soil. In most cases the ground cover of decaying leaves and humus is simply raked away and seeds are pushed into the soil, trampled on and the leaf mulch is then raked back.

Maintenance

Annual maintenance of "woods cultivated" ginseng beds consists of hand weeding, removal or suppression of competing shrubbery, spraying of appropriate fungicides if needed, controlling slugs if necessary, and fall thinning of crowded stands to achieve a final population density of one plant per square foot. Weeding is most crucial during the first two growing seasons.

Occasionally calcium is applied in the form of gypsum at the rate of four pounds per 100 square feet, broadcast on top of the beds in early spring, prior to crop emergence, if soil tests indicate less then 1,000 pounds of calcium available per acre. Established ginseng beds should be tested for calcium levels every two to three years. Except for calcium, no fertilizer should be added to woods grown ginseng at any time. "Wild simulated ginseng" is usually left to grow on it's own after one or two seasons of weed control except for annual slug control if needed.

Ginseng roots growing in woodland sites are usually large enough to harvest after six or more seasons of growth. Harvest usually takes place in late summer or early fall. The freshly dug roots should weigh an average of at least one-quarter of an ounce each by that time. There is often great variability in the size and shape of the roots, even those growing next to each other. A "rule of thumb" is that from 100 to 300 dried ginseng roots are needed to produce a pound (dried ginseng loses 2/3 of its fresh weight). Ginseng roots are usually dug by hand, carefully, so as not to damage the root or the fibers that grow from the main taproot.

Harvesting and Drying

Freshly dug roots are washed with a strong stream of water from a hose, but never scrubbed. The roots are dried slowly in a well-ventilated attic or a commercial dryer that never gets warmer than 100 degrees F. They are carefully placed individually without touching each other on screens or in cardboard trays before drying. The drying process may take several weeks depending upon the prevailing weather conditions. Growers should talk to prospective buyers before attempting to dry the roots because some buyers prefer to buy the roots fresh. Freshly harvested and washed ginseng roots will keep for months in a refrigerator if stored in an open plastic bag. Fresh roots are preferred for making certain types of products.

Economics and Markets

Ginseng growing in a forested environment is certainly not a "get rich quick" scheme as it takes a minimum of five to eight years of growth before harvesting can occur. Prospective growers are encouraged to start with a very small investment, perhaps a few ounces of seed plus a hundred rootlets. Expand only if preliminary results are positive. Unlike many "alternative" agricultural commodities the market for ginseng is well established and easily accessed. See AF Note Forest Farming-4 for more information on marketing and the economics of ginseng. All of the references listed at the end of this fact sheet include sources of seed, rootlets for transplanting, ginseng buyers and consultants.

Additional Information

"American Ginseng Production in New York State." Beyfuss, R.L. Cornell Cooperative Extension of Greene County, HCR 3, Box 906, Cairo NY 12413

"The Practical Guide to Growing Ginseng." Beyfuss, R.L. RR 1, Box 126 N, Freehold NY 12431

"American Ginseng, Green Gold." Persons, W.S. Tuckasegee Valley Ginseng, Box 236, Tuckasegee, NC 28783

"The Challenges of the 21st Century, Proceedings of the International Conference-Vancouver 1994." Bailey, W.G., Whitehead, C., Proctor, J.T,A., and Kyle, J.T. " Simon Fraser University, Burnaby, British Columbia, Canada

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