Photos by John McCormick

Tom Hammett, forest products marketing professor at Virginia Tech

There is More to a Forest than Trees

There is immense profit potential in the deep forests of Appalachia – *without destroying a single tree.*

Non-timber forest products (NTFPs), as a market sector, is growing rapidly – nearly 20 percent per year in recent years.

Working hard to spread the word on how to manage and market these products, and prevent plants already at risk from being wiped out, are Virginia Tech's Department of Wood Science and Forest Products, the USDA Forest Service Southern Research Station, and the Top of the Ozarks Resource Conservation and Development Council of Missouri.

"There is a shortage of information about these products and their markets, so we are working hard to disseminate the information necessary for the sustainable management and marketing of non-timber forest resources. We are trying to fill the void," says Tom Hammett, forest products marketing professor at Virginia Tech.

Non-timber forest products are any plant-based material of commercial value, other than trees, harvested from forests. Such products have specialty or niche markets, and many are valuable commodities with the potential to generate significant economic activity at the community level. But to realize their value, the ecosystems in which these plants thrive must also be valued.

The Appalachian region is rich in biodiversity, offering great potential to support a flourishing non-timber forest product industry. Most of the 130 plants indigenous to the United States that are used as medicinal or dietary supplements are found in the southern Appalachian Mountains.

Medicinal plants, such as St. Johns wort or ginseng, have the highest profile. Traditionally, they formed the basis for medical care in rural southern Appalachia. With the advent of inexpensive synthetic and manufactured medicines, natural healing became less common, but knowledge of plant properties is still passed down and many people continue to gather herbs for their own use.

Knobit photo above by Rick Griffith

Planting Ginseng

Several of the high value medicinal and herbal plants can be cultivated. Research plots of goldenseal and wild ginseng indicate there are excellent opportunities for significant income to Southwest Virginia in cultivating these and other herbal plants.

Now, NTFPs are also an important source of income, says Hammett. Residents of Southwest Virginia provide medicinal and herbal products in raw material form to cosmetic, pharmaceutical, health supplement, and other industries throughout the United States and to many internationally based manufacturers.

Local dealers usually require that collectors clean, dry, and sort medicinal and herbal products. Some dealers dry and sort the items into bigger batches for sale to other buyers. Value added for the collector is limited because local processing violates the Pure Food and Cosmetic Act, which prohibits the sale of patent or proprietary medicine.

Natural medicinal and herbal products involve the use of leaves, stems, roots, bark, seeds, fruit, flowers, and buds to make teas, tonics, powder,

snuff, poultices, salves, tinctures, lotions, and smoke inhalers. Plants provide treatments for pain and such diseases as cancer, leukemia, and heart disease. More than 40 percent of prescription drugs – translating into $25 billion in sales for 1997 – contain at least one natural element. Moreover, the demand for natural health supplements is skyrocketing. "The soaring demand is creating an environmental tension as growing consumer interest jeopardizes these products' sustainablity in the wild," Hammett says.

In 1998, a coalition of scientists, conservation organizations, botanical gardens, and museums released the results of a 20-year global assessment of plants at risk, which established a conservative estimate that 29 percent of America's 16,000 plant species are at risk of extinction due to overharvesting and loss of habitat to development.

In addition to the medicinal and dietary supplements, the other popular non-timber forest products include edible forest products, such as mushrooms, herbs, and spices. The decorative or floral sector encompasses pine boughs, grapevines, ferns, flowers, Spanish moss, and other plant products used for floral arrangements, dried flower decorations, and ornaments. Specialty wood products include baskets, carvings, turnings, utensils, containers, furniture, and musical instruments.

Ginseng an NTFP model enterprise

But, it is hard to find any product that is easier to sell than Virginia's wild ginseng, the darling herbal cure-all in Asia and the most famous medicinal plant. The burgeoning Chinese market has Andy Hankins, Virginia Cooperative Extension specialist for alternative agriculture at Virginia State University, working with Hammett to encourage more Virginians to get a slice of this enormous market.

Planting Goldenseal

In partnership with the Craig County (Virginia) Rural Partnership and Total Action Against Poverty of Roanoke, Va., Hammett has organized workshops around the state to teach entreprenuers how to grow and market a variety of non-timber forest products, including the well-known ginseng. The program also helps first-time growers develop business plans and obtain a forest planting site. More than 250 people from five states have attended the workshops.

"The turnouts have been great, revealing heightened interest in this $140 million industry," Hammett says.

All that is needed to cultivate "sang," the old Appalachian term for ginseng, is a rake, a hoe, and a pick. In the hands-on sessions, where participants do the actual soil preparation and planting work, Hankins demonstrates the proper planting techniques for wild-simulated ginseng and goldenseal beds.

Harvested and dried, wild ginseng has sold for as much as $640 a pound. Once sent to China, where it is sorted and processed, Appalachian ginseng fetches as much as $1,000 an ounce. The Chinese, who have been using the plant for more than 2,000 years, have been known to buy a root no bigger than a person's thumb that had been growing in the wild for 40 or so years for $30,000. The more twisted the root, the higher the value.

The revered root is considered a cure for many ailments and thought to have antitumor, antiviral, antioxidant, and metabolic effects. The Chinese have touted ginseng as good for the nervous, glandular, immune, and reproductive systems. American folk medicine claims the herb will relieve stress and boost the libido.

However, wild harvest has depleted the natural population to such an extent that it has become threatened with extinction in some countries. The future lies in "wild simulated" cultivated harvests, says Hankins, whose experience with growing the plant has become well known throughout the southern Appalachias. His methods are designed to maximize profits from special forest products while preserving the forests.

Photo by A. L. Hammet

Sarah Greene, a former graduate student, with slippery elm.

American ginseng prefers a cool, temperate climate, and is found only in the mountainous regions of the Eastern United States and Canada. "It takes seven or eight years for this tender perennial to grow to maturity in its natural woodland habitat," Hammett explains.

"American ginseng is an opportunity for forest farmers, but complicated to understand because there is a great variation in market demand and prices paid for the various grades of dried roots, and markets tend to be distant," Hammett says. He is investigating grading and certification as ways to add value to the Appalachian product.

While ginseng can bring top dollar to a grower or distributor, there are some barriers. Rodents, fungus, insects, and weeds can diminish a crop. The plant is not easy to grow (few seeds sprout into plants). And the market is disorganized. Some dealers try to buy ginseng at low prices and sell at exorbitant prices. But the greatest difficulty is often theft – poachers steal a grower's crop, often carelessly disturbing the site so that natural self-seeding no longer can take place.

A carefully managed stand of naturalized American ginseng in the right conditions can produce income for several decades. Hankins teaches the method of wild simulated cultivation to grow ginseng without fungicide sprays or expensive establishment costs. His "virtually wild" method spaces ginseng seeds on the forest floor in a random fashion that imitates nature, thus inhibiting disease and offering some protection from theft. Woodland cultivation is the only possible way to grow ginseng organically.

It costs about $3,800 to grow half an acre of wild simulated ginseng, with seeds being the highest expense at $80 and up per pound. It takes nearly three hours to dig up three pounds of fresh roots, which shrink to one pound of dried ginseng. About 400 mature plants make one pound of dried ginseng. The prices paid for such ginseng can be similar to those paid for wild ginseng roots.

Because most of the forests in China have been harvested or degraded, the country is not capable of establishing naturalized populations of American ginseng, which it prizes most.

In additon to potential health benefits, today's significant profits add impetus for continued scholarship about the traditional uses of special forest products in many cultures and for research on the plants themselves and their ecosystems. To develop and safeguard the economic viability of non-timber forest products and the communities they support, researchers' goals are to preserve the hundreds of years of plant heritage that is part of the heart of Appalachia. "Products that are underutilized represent an opportunity, but those that are overutilized and endangered must be better managed," says forest products faculty member Tom Hammett.

Beeswax
A secondary honey-bee product, beeswax is used to make candles, furniture polish, batik dying, cosmetics, waterproofing materials, crayons, candy, chewing gum, and wax for industrial needs. The demand for beeswax in the United States is higher than the supply.

Black cohosh
An Indian word meaning "rough," black cohosh is also known as bugbane, black snakeroot, bogwort, fair candles, rattleweed, rattleroot, and squaw root. It's used as a treatment for symptoms of menopause, PMS, and painful menstruation.

Black walnut
Prized for its wood, the native hardwood is now somewhat scarce. Its nuts, shells, and bark also have huge markets. The shell of the black walnut is one of the most difficult shells to crack. While this creates a challenge for nut processors, it also creates market opportunities. The hard shell can be used for metal cleaning and polishing. When ground up, the eastern black walnut shell becomes a soft grit abrasive that is well suited for air blasting, de-burring, de-scaling, and polishing operations because of its elasticity and resilience, giving great durability. Non-toxic and dust free, the shells are used in cleaning jet engines, electronic circuit boards, ships, and automobile gear systems, leaving the surfaces smooth without scarring. Explosive manufacturers use black walnut shells as a filler in dynamite.

Catnip
Catnip is a stimulus for cats but can be relaxing for humans, and relieves indigestion. It is also used as a dietary supplement to treat colds and flu.

Greenery
One decorative product with major potential is greenery. Materials gathered from the American forest have been used for holiday decorations and floral arrangements for hundreds of years. In the 1900s, ivy, holly, and evergreens were used increasingly in Christmas wreaths, roping, swags, and sprays. Today's popular greenery come from white pine, Fraser fir, Norway and blue spruce, mountain laurel, boxwood, ivy, grape vine, juniper, Douglas fir, incense cedar, noble fir, holly, and eucalyptus. In the Central Appalachians, harvest and sale of white pine tips and other greenery materials provide an excellent opportunity for additional income for forest landowners and income from abandoned agricultural lands. The major constraints in marketing are the seasonal nature of this business and that greenery does not store for long periods of time.

Echinacea
Three species of daisylike plants — narrow-leaf purple coneflower, pale purple coneflower, and purple coneflower — were used by the Plains Indians for more medicinal purposes than any other plant group because they possess antibiotic properties. Today the plant is marketed as a dietary supplement to fight colds and flu. Caution: another herb, *Rudbeckia laciniata*, is also called "coneflower" and has been reported as toxic.

St. John's wort
Derivatives from this plant are used as an anti-bacterial to help heal wounds. It is also known to reduce anxiety and mild to moderate depressive moods. Many other claims are made as well, such as antiviral activity. Non-medicinally, it's used to dye fabrics.

Tree and shrub pollen
While tree pollen production will be a potential income source for only a few forest landowners, it is one that fits unique situations. Most processors are associated with large pharmaceutical companies, but they also purchase some raw material from some trained collectors, who receive $5 to $40 per pound of dried tree flowers.

Plants that are highly sought as medicine and herbs that are on the United Plant Savers AT RISK list:
Black cohosh root
Bloodroot
Blue cohosh root
Catnip herb
Ginseng herb and root
Goldenseal herb and root
Lobelia herb
Mayapple
Pink root
Slippery elm bark

Other common forest plants with market value:
Red clover blossoms
Sassafras leaves, bark, and root
Solomon seal root
Star grub root
Sweet gum
Wild cherry bark
Wild ginger root
Wild hydrangea
Witch hazel bark and leaves

Photos by Rick Griffith

Research and development goals

In additon to potential health benefits, today's significant profits add impetus for continued scholarship about the traditional uses of special forest products in many cultures and for research on the plants themselves and their ecosystems. To develop and safeguard the economic viability of non-timber forest products and the communities they support, the NTFP researchers' goals are to preserve the hundreds of years of plant heritage that is part of the heart of Appalachia, encourage forest landowners to include non-timber forest products in their management plans, and ensure that economic development for this industry is sustainable.

"We are looking at how and why people grow various plants, where and how they extract products, and what they use them for," says Hammett. "There's a big market and we need to know more about it.

Hammett's forest products marketing research addresses forest-based enterprise development, expanding export markets for forest products from the southern United States, and developing community-based market information systems. He says that a major obstacle to sustainable development of non-timber forest products is the lack of information on the scope and value of markets. Hammett and his partners are developing an information system network to demonstrate potential revenue to landowners and economic benefit to Appalachian communities. NTFPs can provide viable employment and income opportunities for Appalachian residents.

Finding buyers is the easiest part of the enterprise, says Hammett. In Virginia, there are 45 certified ginseng buyers. Because the plant is listed by the Convention for International Trade for Endangered Species, it is monitored by the Virginia Department of Agriculture and Consumer Services and Office of Plant Protection. Seasonal harvesting is regulated and buying documented to help ensure sustainability of the resource.

Maple syrup is a significant non-timber forest product.

Buyers sell to a well-developed network of ginseng brokers, who export the product to Asia or sell within the United States. Some cooperatives have formed, and research is ongoing to pinpoint value-added possibilities for marketing ginseng.

Some growers sell directly to large herb companies who buy for export to Asia. Hankins has visited China to see the markets first-hand. "The imported ginseng roots are laid out on the floor of a large warehouse and separated into as many as 40 grades according to root shape, color, taste, and age for ultimate end uses," he explains. In general, age and appearance determine the price received by the grower.

"The Chinese have specific uses for particular roots, so I am hoping to identify a market niche for Virginia growers to enhance returns," Hammett notes. "If we can cut out the middle man and sell directly to China, then growers can profit even more."

The Virginia Tech researcher is also working to educate the stakeholders about ecologically sound resource management practices and guide economic development that reflects community needs. Lessons learned in Southwest Virginia and Central Appalachia will be shared with other collaborators and regions, become part of classroom instruction, and be an increased focus of graduate student research. Several masters degrees and one Ph.D. in this area have been completed. NTFPs are becoming an important new focus for an old resource – the forest – and a vital growth area of the wood science and forest products program at Virginia Tech.

For more information about these special forest resources, visit the first web site developed as a clearinghouse of information for harvesters, growers, marketers, processors, and end-users: *www.sfp.forprod.vt.edu/*. The site includes direct links with other researchers.

– Lynn Davis
College of Natural Resources

Workshop photos, pages 18-19, were provided by Tom Hammett and Lynn Davis. Maple syrup photo above by Rick Griffiths.