

# From Wildcrafting to Intentional Cultivation: The Potential for Producing Specialty Forest Products in Agroforestry Systems in Temperate North America<sup>1</sup>

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**ABSTRACT:** Expanding the production of specialty products in agroforestry systems depends on intensification and innovation. The transition from wildcrafting to intentionally producing non-timber resources from forest environments requires increasing applications of management, labor and other inputs, together with skill in linking production activities and market forces through entrepreneurship. The financial opportunities and aesthetic and environmental service benefits of domesticating, cultivating and commercializing non-timber forest products in agroforestry systems are socially appealing. What incentives are needed to motivate landowners to invest in comparatively unfamiliar and untested land use, production and marketing practices, and how can these be brought to bear on the decisions of numerous landowners operating in a broad spectrum of socio-ecological contexts? These questions are addressed in a national assessment of the potential of growing specialty products in agroforestry systems by locating and characterizing existing pockets of innovation through networks of professional and practicing natural resources and enterprise managers.

The assessment reveals a wide range of present and potential products and practices. Only a few appear on the cusp of widespread expansion. Predictably, forest landscapes harbor the greatest diversity and opportunity for product development, compared with riparian, field or pasture-based systems. Market forces, driven by human and environmental health concerns, are interacting with land stewardship ethics and a growing plant conservation movement to motivate forest owners to invest in high value medicinal herb production. Woods cultivated or wild simulated American ginseng (*panax quinquefolium*) is of leading interest. There is also growing interest and informal experimentation with mushroom production, particularly varieties that are believed to have healing properties. Women often assume catalytic roles in medicinal based enterprises.

Landowners whose livelihoods are not solely dependent on agricultural and natural resources production appear to be the more innovative special forest product managers. Families attempting to balance diverse livelihood strategies are comparatively motivated to try new activities and engage in the knowledge and information sharing that is needed for success.

Landscapes in transition provide environments for innovations in agroforestry practice. Where such processes as agricultural land abandonment, forest fragmentation and urban/rural fringe formation are prominent, production needs and market opportunities that promote intensification and expanded production of forest products tend to arise.

Certain conditions appear to create "hotbeds of innovation" leading to intensification of production systems, and these deserve deeper study. Extension and research capacity in the special forest products arena need expansion. Developing learning systems that lead to more reliable markets and enabling institutional and policy environments is an important challenge in realizing the potential for producing specialty products in agroforestry systems.

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## Introduction

Not long ago a majority of farms in this country were small, diverse operations, offering a wide variety of products for sale, trade, or home consumption. These farms had high labor requirements, low energy inputs, and a strong interdependence with local ecosystems. Since World War II the dominant trend in agriculture has been toward extensive monocultures, low crop diversity, low labor, and high-energy use. Evidence is now mounting that our present farming system, though highly successful at producing some crops, fails to

recognize broadening consumer demand for variety and the effect of over-simplification on its own ill-health. Soil erosion, nutrient pollution, and increasing consolidation in the production and processing of farm products has left our rural areas in a diminished condition in many important respects, compared with 100 years ago. Because of the modern farming sector's dominance and clear productivity successes, it attracts most of the resources of our research institutions, extension systems, and agribusiness activities.

Hidden beneath this behemoth is a newly emerging

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trend, built perhaps on traditions that never really disappeared, that emphasize diversity, natural systems and small-scale technologies. These systems generally are smaller and often depend on the development of locally based alternative markets. No single name adequately describes them. Permaculture, home gardens, forest understory farming, non-traditional forest products, regenerative agriculture and agroforestry all capture some of the essence of this more complex and integrated approach to food and fiber production.

Cornell University's Department of Natural Resources, in cooperation with the National Agroforestry Center (NAC) is conducting a year-long assessment of an important element of this new trend. Our interest is to find ways in which a broader spectrum of products, many of which presently grow in the wild, may be integrated into agroforestry systems. Agroforestry land use is based on the deliberate integration of trees into agricultural or pastoral settings, or the integration of crops into forest environments, to improve the productivity and sustainability of the system. The NAC groups agroforestry systems into five types of practices: forest farming, alleycropping, silvopasture, windbreak and shelterbelt management, and riparian buffer zone management.

Special Forest Products (SFP), often called "non-traditional forest products", are produced from trees or within forest ecosystems. They are items with economic potential commonly ignored by standard forest management practices. Some SFPs such as black walnuts, huckleberries, ginseng, or pine boughs are commonly known. Others are less familiar such as reishi mushrooms that grow on old stumps or the understory herbaceous blue cohosh. SFPs generally are divided into four groups according to uses of the product: 1) craft materials such as pine rope, noble fir boughs, and small wood, 2) forest edibles including butternuts, huckleberries, berries, honey, and mushrooms, 3) botanicals and medicinals like pacific yew, goldenseal, and ginseng, and 4) decoratives of which willow and salal leaves are examples. Lists of particular items in each category vary by region and are expanding. So is the demand for many such products while the supply, for some, is dwindling as resources become over-harvested.

The task of this study is to gain a broad perspective of the status of SFPs at the national and at regional levels, and to assess the potential of expanding the production of these items within agroforestry systems. We are

examining the financial feasibility, social acceptability and environmental soundness of integrating SFPs into landowner production strategies through agroforestry. We are also identifying types of knowledge and information that landowners and small enterprise developers need for making sound choices about producing and marketing SFPs to support and expand agroforestry practice, with an aim to determine priority research needs in this arena.

We are approaching the study by identifying existing patterns of agroforestry practice, and of SFP production. Issues and opportunities for integrating and expanding these activities then are explored with landowners, entrepreneurs and professional natural resources management specialists who have relevant knowledge, interest and ideas. By examining such "pockets of innovation" we have sought to learn what motivates people to invest time and other resources in this type of activity, and what may be constraining others from doing so. Central to our strategy has been our reliance on co-investigators from different regions of the country, selected for their prominence in agroforestry and/or SFP arenas, who have been willing to develop and share information pertaining to characteristic or emergent practice in their areas. Specific methods have included face-to-face and telephone interviews with key informants throughout the nation, brief questionnaires administered to natural resources management professionals, and personal interviews with producers of SFPs and with people who buy and resell them as value-added products.

SFPs tend to cluster into certain agroclimatic zones and ecosystems. The regional divisions we present in this paper however, do not indicate the full range of the various plants, nor necessarily the ecosystem that best suits them. This must be done on a species-specific basis and beyond the scope of this effort.

## **The Status of Special Forest Products: General Trends**

Special Forest Products are not new. Some of our sources trace the use of certain products back to pre-Columbian times. Native Americans held and continue to hold an abundance of knowledge about native vegetation. They taught colonists about the wonders of sugar maple (Teel, 1989), the use of slippery elm, and the medicinal qualities of *Echinacea angustifolia* (Missouri DoC, 1993). It was the Indians who identified the value of black cohosh for treating the symptoms surrounding the onset of menopause that has since become the main ingredient in Remifemine,

an over-the-counter botanical packaged in Germany and sold in health centers.

Despite their history, SFPs are not recognized within our public research and extension system in any systematic way. During our investigation a survey was sent to Cooperative Extension agents, NRCS personnel, and state foresters, asking about their own work with SFPs. Our intent was to see who was involved in tree or forest management on farms, whether agroforestry played a role and if there was any conscious management for SFP production. Though the survey was not exhaustive or evenly distributed, it produced some revealing information.

For a majority of technical service providers agroforestry has a relatively restricted definition. Initial reactions to the term conjure visions of alleycropping, and similar intensively managed systems that do not generate interest across a broad spectrum of land use situations. Stream buffer zones, windbreaks and shelterbelts, trees in pasture settings, and farm woodlots generally are not considered agroforestry practices, though the National Agroforestry Center includes all of these. Beyond the initial issue of defining agroforestry, very few land-use professionals have considered integrating SFPs into tree components of farming systems. So who meets the market demand for these items as it presently exists? And where does the interest in and demand for SFPs stem from?

Most non-traditional or “special” forest products, as viewed by the formal economic sector, are wildcrafted. These organisms are native to their respective ecosystems, reproduce naturally, and are collected on a seasonal basis from the forest. Ginseng hunters, matsutake mushrooms pickers, and floral gatherers, though working with distinct products, operate in the same basic pattern: 1) learning the ecological niche of their selected plants or bee colonies, 2) timing their collection activities, and 3) selling to the best market available, often through the informal sector. Wildcrafting activity historically has met market demand. During the past decade or so however, demand for many special products has climbed significantly, putting greater pressure on wild stocks and generating a need for more intensive management of the resource, especially on public lands (McLain and Jones 1997a).

### **Characteristics of Intentional SFP Producers**

Interest in SFPs is not generated within the

conventional professional development and training system for technical service providers and landowners, or through other primary information sources for North American agriculture. Our land grant institutions and other agricultural training centers concentrate on major economic crops such as corn, soybeans, and wheat, along with livestock such as cattle, pigs and poultry. Attention to fruit trees is provided through horticulture departments, and forest trees through forest departments, but there is no formal niche in academia for SFPs. Growing numbers of people however, are paying attention to them. Most of these enthusiasts fall into one of four categories. First are the wildcrafters, and their children who maintain connections with their personal traditions. Second are people who are formally trained or have direct experience with small-scale, diverse production strategies that characterize marginal or subsistence level farming, primarily overseas - i.e. former Peace Corp volunteers and development workers. Third, a strong interest is found within the alternative lifestyle communities that formed in the 1960s and their heirs, who have since diversified in a "back-to-the-land" movement where care for the earth and natural products are part of their philosophical center. Finally, there is interest among middle and upper middle class households that may have from 2 to 50 acres of land, perhaps more, and wish to produce something worthwhile as a hobby, or to develop an alternative way of life that seems healthier and more meaningful than what their current situation offers.

In addition to differences in types of people who have interest in SFPs there are differences in the types of farms, which appear to correspond with levels of innovation. We have identified three relevant categories of producer. First are those who farm as their principal means of livelihood. Most are landowners, though a few rent land that they use to produce agricultural crops. This group generally has a low availability of surplus labor and is relatively risk averse. For these primary agricultural producers SFPs would at best be a complementary income source derived from locations on the farm where an agroforestry system would benefit other forms of farm production such as a shelterbelt or riparian buffer.

Arguably the most innovative group for agroforestry and SFP development are secondary producers. These farms have diversified their livelihood strategies and tend to depend on at least one source of off-farm income. Farm income and revenue generated from SFPs stems from a complementary strategy developed through personal interest in specific activities, or

pursued to eventually replace off-farm income. People in this category prefer a rural, land-connected, moderately paced lifestyle, yet strive for a viable economic alternative, not simply resource substitution for home use. Because immediate income from agriculture often is not critical, the potential for this group adopting new products and production techniques is high. People in this group also are comparatively willing to process and market value-added goods. As a general rule they prefer organic agriculture and place a high value on natural products.

The same could be said for a third group of "hobby" producers. Often retirees or weekend farmers, many middle and upper middle class, small landowners fall in this category. They like organic farming and natural products. They enjoy raising foods and other products for themselves, but are not interested in high labor input or income generation. Enjoyment of the land, self-reliance and stewardship are primary values. This group can be highly innovative, though on a small scale, with production geared for home use or for friends.

### **Issues of the Market**

Because the goals and production strategies of people who are involved in managing land and natural resources for SFPs are diverse, and their locations diffuse, demand for extension information, research, and institutional support has not yet been broadly generated. However, a growing number of workshops and conferences on this topic suggest that the ascension of SFPs to the mainstream of agriculture and natural resources programming is not too distant. Some observations made during the course of this study should help focus attention on key aspects of SFP development.

Perhaps the key determining variable in SFP development is the presence of a market. When asked what is the major constraint to the expansion of production most growers and outreach providers identified markets. This economic variable directly impacts the status of most SFPs. Products with a strong market may receive some research and extension attention, while those without a market are generally ignored.

### *Ginseng: a Strong Market*

The SFP that receives perhaps the most attention is ginseng, particularly in its native range that

encompasses some 20 northeastern states. *Panax quinquefolius* or American Ginseng is an herbaceous perennial understory plant that regenerates each year from a swollen root that is the main target of wildcrafters. The plant is slow growing, intolerant of direct sunlight, preferring acid soils with a high calcium content (Andy Hankins, personal communication.) Ginseng is found from Georgia to Arkansas, north to Minnesota, Ontario, Quebec, and the Maritime Provinces. The Chinese have long considered ginseng to have excellent energy boosting capability, and wild ginseng has a very active market, with wild roots selling from \$200 to \$500 per dried pound, mostly to Chinese buyers. Attempts to cultivate ginseng have proven successful, though ginseng under artificial shade has less value and because of recent production success sells for only \$10 to \$15 a pound, not enough to make a profit for most farmers.<sup>4</sup>

Over the past decade efforts to develop wild-simulated production techniques have born fruit. Scott Persons, author of *American Ginseng: Green Gold* (1994) has been an active leader of this work, conducting informal research and selling seed from his Tuckasegee Valley Ginseng company in North Carolina. The recently formed Empire State Ginseng Association, together with Cornell University, promoting research and demonstrations on ginseng, in marketing, product development, and cultivation (Buck, 1999). Practiced growers are beginning to focus more on wild-simulated production techniques. This involves preparing seedbeds in the plant's natural habitat, sowing seed or one-year-old rootlets, and letting nature do the rest. Producers claim that the wild-simulated product will be comparable to wildcrafted roots and sell in that high-priced market (Beyfuss, 1998).

In many ways ginseng provides a model for the development of other SFPs. The partnerships of growers, entrepreneurs, extension agents and researchers, both through formal and informal means, show what can be done to move SFPs into the mainstream. Yet ginseng also provides a warning signal to promoters of SFPs. With such high demand for wild-grown ginseng, poaching for plants on private lands and over-harvesting on public lands has led to a major decline in wild stock. Managing ginseng is not easy, and wild-simulated production has not proven itself to the full satisfaction of the market. For one

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<sup>4</sup>John Scott, West Virginia Cooperative Extension, personal communication.

thing it takes a long time for the plant to reach market maturity during which numerous things may “go wrong”. Unless efforts are made to develop wild-simulated production systems with other plants, with comparable expanding markets, many could become endangered. Goldenseal (*Hydrastis canadensis*) and Pacific Yew (*Taxus sp.*) are just two examples of plants where economic incentives to harvest have outstripped efforts to reproduce them in wild-simulated or domesticated settings. United Plant Savers (UpS), a group devoted to the preservation of wild plant species through preserves and promotion of intentional plantings, is a key source of information and resources on this issue.<sup>5</sup>

### *Flora Pacifica: Developing Their Own Market*

Near the small town of Brookings, OR, just north of the California border and on the Pacific Coast, Don and Sherrie Mitchell started a small floral products business (Flora Pacifica.) They grow cut flowers, produce dried flowers, and are buyers for many of the greens coming from the forest and surrounding landscape. Wreaths are one of their biggest sellers. Made from a combination of evergreen boughs, evergreen understory species like salal, and dried, long-stem flowers, these wreaths are designed by a local artist, and manufactured by local people hired from a soft labor market due to the sagging of both timber and fishing industries. It has proven a successful enterprise, and they are convinced that this success can be repeated in other locations around the country.

Flora Pacifica has become profitable despite being located far from large markets, defying the general rule that marketing problems grow with increasing distance from large metropolitan areas. How did they do this? While there are a number of reasons for their success, four stand out as potentially replicable and cost effective.

First, they built their company around the local resource base. They did not depend on importing raw material or labor. They grow appropriate plants on their 11 acres and buy from collectors who gather from the immediate forest areas in both Oregon and California.

Second, they have good quality control that results in a consistent product and assures future production from

the land. They encourage diverse sources of the plant material they use rather than acquiring it all from the same site. They spend time training their collectors about the kinds of materials they require, how to collect and transport it without injury, and the ecology of the plants to enable recovery.

Third, they are people and community friendly. Even though Don and Sherrie originally came from the East Coast, they fostered close relationships with local capital (banks), business outlets, tourist centers, and the community at large. They accomplished the later by hosting community workshops and other educational activities on their land, and encouraging local people to grow for them. They also hired local people first rather than looking outside the community to find someone with precisely the right qualifications.

Lastly, they cultivated a market through a diverse set of strategies. They sell via a local tourist information center, and advertise there as well. As they developed a customer base they kept track of buyers and developed a catalog of products to send out. Mail order has become a major sales route. Perhaps most effective has been an intelligent use of local media, radio, newspapers, TV and the Internet. New products are introduced on-line, and the website is updated frequently as products change with the availability of plant material. Since their quality control is high, what you see on the web is what you get in your mail order package, and repeat business is frequent. They also offer their products as prizes or incentives in local money raising efforts, such as the public TV fund-raising appeal.

Because of their success the Mitchell's have been frequent speakers at conferences, which has also enhanced their market. The lessons they have learned are invaluable for those who wish to grow and market their own SFPs. The combination of growing their own product and buying from local wildcrafters and other growers is a model with potentially wide application.

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<sup>5</sup>For more information see the UPS website at [www.UpS](http://www.UpS)

## *Products with Potential, But Without a Well-Defined Market: Strategy Options*

Almost all the products identified in this paper have a "market", whether it be for home consumption, barter exchange, local "farmers" markets, niche markets, or the broader wholesale or retail markets. However, many of the products have low name recognition or no tradition of sale. Where does a person interested in opening a new enterprise begin, with production or market development?

The answer is probably as complex as the range of SFPs we have identified. Pawpaw (*Asimina triloba*) is a small, forest understory tree native to the eastern third of the US. It produces a fruit that has been compared in taste to a combination of pineapple, banana and mango. Kentucky State University has conducted considerable research on varieties, uses, and cultivation. The marketing question remains open.

Pawpaw grows well in the forest understory but produces only small quantities of fruit. When the tree grows in more open areas production increases, though it takes a number of years for the tree to establish before production begins. The fruit is perishable and must be marketed fresh rather quickly or turned into a product such as jam, preserves, juices, sauce or flavoring. In addition the tree has insecticidal and medicinal possibilities.<sup>6</sup> Now the question becomes, once you know the crop and its potential products, which is better to develop first, a market that can elevate demand above present production levels, or an orchard to grow for a presently theoretical market?

The orientation toward production is considered a "push" strategy, according to the terminology of Jim Chamberlain and Tom Hammett (1999). This approach stresses production first, maintaining that market development will almost certainly follow. The strategy may work in some cases, but it presents a high degree of risk to the producer, who has sacrificed some land for the development of an agroforestry system and is seeking a return on that investment as soon as possible. Since agroforestry systems take time to establish, the longer a delay in developing a market the greater the chance that a potential producer will decline to take the risk.

Chamberlain and Hammett (1999) advocate a pull

strategy where "market oriented agroforestry professionals and practitioners will begin a process of scanning the market environment for threats and opportunities that may affect agroforestry adoption and production." By doing a market analysis in advance, with the aid of professionals and experienced practitioners, the potential producer can make a better determination of product type and market demand. Creating demand in advance is considered crucial to the widespread adoption of agroforestry practices.

To date pawpaw advocates have spent a great deal of time on production, but relatively little on marketing of products. Extension agents and other professionals can perhaps do more to promote the expansion of pawpaw by creating demand for pawpaw products, rather than promoting variety trials or production system research. One pawpaw grower and buyer of pawpaw in Ohio (he purchases from neighbors for \$0.50 a pound) produces about 800 pounds of pulp a year, but had only sold about 300 pounds after 8 months. He expects to throw out a considerable portion of the remainder. Promoting pawpaw and developing market pull, as advocated by Chamberlain and Hammett, could have reversed this situation and eased the producer's present frustration with his lack of profits. He enjoys the pawpaw work and is unlikely to give up, but other potential producers may not be so persistent in the absence of market demand.

Another example of a potential "pull" strategy comes from the southern Catskill Mountains of New York. In this region there is a push for farmers and other landowners to establish riparian buffer zones for protection of the streams. Riparian degradation is often caused by animal access to streams, overgrazing stream banks and depositing manure. Fencing combined with tree and grass planting usually solves the problem, but farmers do not like to take land out of production and are commonly reluctant to put in a buffer system. Recent work by Bruno Moser and a team at Purdue University in Indiana shows that high value grasses, shrubs and trees that are used to supply raw material to the floral market can grow successfully in these buffer zones with relatively high rates of return. In the Indiana case, up to \$4,500 of product was harvested per acre of buffer per year. Instead of concentrating all of their effort on promotion and design of buffer systems in the Catskills, extension professionals could help most by investigating the floral market in New York City and the Metropolitan area. They could help in creating demand for floral materials, and then show landowners how they could meet the demand in buffer zone plantings, thus

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<sup>6</sup>Perhaps the best source of information on pawpaw is the Kentucky State University Cooperative Extension Program. Contact Snake C. Jones at snake@uky.campus.mci.net

"pulling" the development of buffer zones.<sup>7</sup>

## **Five Agroforestry Systems, Present Products, and Potential SFP Production**

Agroforestry, the deliberate inclusion of trees within the farm management structure to increase or stabilize productivity over the long term, provides an avenue for the inclusion of special forest products. Early concepts of agroforestry emphasized the benefits trees could provide in boosting crop production and conserving the natural resources base. Emphasis was placed on reducing erosion, increasing soil fertility, recycling nutrients, providing an alternative fodder source, or protecting crops, animals or farm structures from wind. A side benefit of such systems was the direct productivity of the tree for firewood, building materials, and in some cases food. Using a broader understanding of agroforestry we can expand the types of crops grown on the farm by diversifying the farm ecosystem. Shade tolerant and shade-requiring species that are presently harvested almost exclusively by wildcrafters, could be deliberately cultivated as well.

We shall illustrate each of the broad agroforestry strategies and the potential for inclusion of SFPs by using examples drawn from our assessment network. Though specific systems may fit within only one or two regions of the country, the core idea presented in each example has potential across a broader range of ecosystems, through changing a species, configuration or management activity.

### *Alleycropping*

No agroforestry system in North America has received more attention than alleycropping and the potential and limitations of these systems are comparatively well defined and documented. It is not necessarily the most widely adopted practice however, due to its intensive management requirements. The most thoroughly researched practice has been the black walnut systems promoted by H.E. Gene Garrett and his team at the University of Missouri (Garrett et al. 1991). Black walnut has a high value wood and produces a nut with a hulled, in-shell value of \$0.10 per pound (Personal Communication, Hammond Nut Company representative, 1998). Not all crops grow well with black walnut, but enough do to make the system financially viable for many landowners from

both short and long term perspectives.

One farmer in Arkansas has developed a black walnut alleycropping system on his farm and is growing catnip as a cash crop between the rows of trees. The catnip is used in cat scratching posts and sells for \$3.50 a pound. There is a limited market for catnip, and the potential for expansion is limited, but this practice illustrates the range of possibilities if a farmer thinks creatively about combinations.

Alleycropping has limits. Tradeoffs are necessary between crop and tree productivity. The system is also relatively labor intensive, especially when compared with extensive mono-cropping systems that dominate much of our agriculture. At the same time there is room for creative thinking about roles for alley cropping on smaller farms where this type of practice could be a component. In the Northeast for example, some work has been done on the association between maple trees and strawberries (Emerman and Weidenhamer 1999) as well as maple and ginseng (Nadeau et al. 1999). The leakage of water from maple's shallow roots into dry shallow soils provides strawberries better access to moisture. This and other possible interactions between the tree and the strawberries could boost strawberry production (Emerman and Weidenhamer 1999).

An alleycropping system could be conceived of in which rows of maple trees, widely spaced, are interplanted with strawberries at the outer edge of the canopy, and toward the base of the trunk ginseng could be grown. In the open area between the rows of maple, hay or short season crops could be cultivated. The open land would shrink in size as the canopy expanded. Once the maples reached maturity they could be tapped for maple sap and syrup production. Bear in mind that widely spaced maples, with a denser canopy, produce a greater volume and higher sugar content sap than trees in a closed canopy woodlot (Teel 1989).

This envisioned system would require considerable time and effort to develop. Research on various elements is on-going however, and its development seems possible given both creative thinking on the part of the farmer and his or her ability to draw on resources from an informed extension system. This type of practice also shows income generating potential, since the understory crops, strawberry first in this case, then ginseng, could produce an income long before the maples were large enough for tapping. Many farmers in the maple producing zones of New

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<sup>7</sup>Based on personal communication with Bruno Moser in July and October 1998

York, Vermont and into Canada would consider these systems both for their economic viability and their social value.

### *Woodland Farming*

Farmers have always used woodlots and woodlands on farms as a resource for firewood, sale of timber, or supply of fenceposts. Special forest products tended to be extracted from this area only occasionally. Maple syrup is one of the few deliberately managed special forest products that is traditionally processed on farms. Often the wildcrafters of high value products like ginseng and morel mushrooms in the east, or matsutake mushrooms in the west, have been outsiders who gather with or without permission from the landowner. As farming systems became more specialized the wooded areas on farms were increasingly ignored. The value of products that can be grown in this setting has climbed.

Interest in natural medicinal and botanical products has soared in the last 15 years. Many products come from forests, either trees or understory plants. For example, Nature's Cathedral, Inc., a company that grows, processes and supplies certified organically grown botanical products in Iowa, has a 12-page list of products. These include forest grown species such as black cohosh (*Cimicifuga racemosa*), blue cohosh (*Caulophyllum thalictroides*), ginseng (*Panax quinquefolia*), goldenseal (*Hydratis canadensis* - including rhizomes for planting), slippery elm bark (*Ulmus fulva*), valerian root (*Valeriana officinalis*) and Virginia snakeroot (*Aristolochia serpentaria*) the latter selling for as high as \$52.85 for an entire root.

Presently, most of these products are supplied from native sources collected by wildcrafters. There has not been a tradition among these gatherers that promotes the reproduction of the plants they extract. Ginseng activity provides us with an alternative model. Wild-simulated production has the potential to relieve pressure on endangered or threatened plant species and provide a product for the market of a value equal to the wildcrafted plant material. American ginseng that is produced by artificial-shade methods does not meet the Chinese market demand for wild-appearing roots that are presumed to have a higher concentration of active ingredients (gincenocides). This factor combined with disease problems as well as over-production in recent years has caused a substantial devaluation of the intensively cultivated, artificially shaded product. At the same time the value of the wild-appearing, woods-cultivated root has climbed,

thereby offering woodland growers intriguing income-generation opportunities.

Perhaps the leading organization promoting and studying wild-simulated production of SFPs and other understory species is United Plant Savers (UpS). The organization is national in scope, having no established headquarters, but sponsoring and/or supporting a number of activities at various locations throughout the country. Rosemary Gladstar, founder of UpS, operates a 35-acre tract in Vermont where she teaches, gives seminars, and trains apprentices in the art of growing understory plants. Many of her students now grow botanicals on their own land and several were interviewed for this assessment. UpS's executive director, Richard Leibmann, lives in Hawaii and conducts research there. Another key UpS board member is Richo Cech, who runs HerbPharm near Williams, OR, growing and conducting research on understory herbaceous plants.

Still another board member of UpS is Paul Strauss, owner of Equinox Botanicals and a 700-acre farm in Rutland, OH. His is an example of a forest being turned into an agroforest through the move from wildcrafted to wild-simulated production of forest understory plants.<sup>8</sup> The effort involves a constant process of clearing, thinning and pruning of trees to encourage growth of valuable understory species. He is certified as an organic grower, using manure, compost, agricultural lime and rock phosphate as his main inputs. Most of his germplasm is produced on site, though his mushroom spawn comes from another local grower. Though many of his products are wildcrafted, he is working on cultivation systems for cohoshes and other plants that are heavily exploited in the wild.

Equinox Botanicals harvests, dries and stores nearly all the supplies for its products on site. Paul has two full-time employees and hires others on a seasonal basis. Products include The Golden Salve (from goldenseal), Immune Extract, Respiratory Extract, Iron Extract, Cleansing Formula, Female Tonic (from black cohosh), Nervien Formula, and Prenatal Uterine Tonic. They make and ship all products on-site. Demand is growing and he is making a living from the products of the company. His main fear is that the FDA will increase regulatory control over botanicals that will drive small producers like Equinox out of business.

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<sup>8</sup>Based on an interview with Paul Strauss conducted by Katariina Tuovinen on June 10, 1998

Paul Strauss' advice to other potential producers is worthy of note: "Don't base decisions only on money – know the soil conditions, the land, the species that are native, and the limits. Landowners should be realistic about what can be accomplished and should know where things come from and what the limits are." Pushing productivity beyond the innate carrying capacity only leads to problems.

### *Riparian Buffer Zones*

Probably no agroforestry land use has received more funding than the riparian buffer. Work by R.C. Schultz and J.P. Colletti at the Iowa State University (Schultz, et al 1993), Andrew Gordon of University of Guelph in Ontario (Gordon 1997) and Robert Tjaden of Maryland have contributed substantially to our knowledge of agroforestry-based buffer zone practice and potential. Such research is driven by the need to protect streams from erosion, nutrient loading, chemical pollution and other forms of degradation associated with agriculture and urban sprawl. The level of resources available to address these problems is large and growing (Tjaden 1998).

A number of organizations distribute these resources to farmers at the state and county level, especially Natural Resource Conservation Service (NRCS) personnel who provide both technical expertise and cost-share programs within counties. Farmers develop a Best Management Practice proposal, with NRCS input. If approved they may qualify for a number of cost share programs. Interviews with county level NRCS staff in Virginia indicate that the number of participating farms in these programs, including the Conservation Reserve Program and the Environmental Quality Enhancement Program, is growing, though at a slower rate than enabled by the available funding. Farmer reluctance is usually centered on three factors: 1) establishing and managing riparian buffers goes against the way they have always done things, 2) the buffers take land out of production, and 3) farmers still have to pay property taxes on this area. At the same time most farmers, when questioned, are concerned that they may be contributing to stream degradation and would like to do something about it. Their dilemma could be relieved perhaps by developing systems that contribute income to the farm, rather than simply withdrawing that land from production (Tjaden 1998).

Tjaden (1998) lists a number of items that could grow in riparian zones for a profit. These include, in alphabetical order, aromatics, Christmas trees and

greens, cooking wood, decorative cones, ginseng (upper flood plain only), nuts, shiitake mushrooms, and weaving and dyeing materials. To this list we could add poplars and willows for harvest as fuel or wood shavings to use as animal bedding, various riparian florals like pussy willow or curly willow, and medicinal plants like slippery elm. The riparian zone itself can be an attraction for fisherman and hunters who will pay a fee to landowners for the privilege. This is being done on Mossy Creek in Rockingham County Virginia, and is organized by the local Trout Unlimited chapter. The Mossy Creek site is comprised of both old riparian growth dominated by sycamores, black walnut and willows, and newer plantings emphasizing willow and poplar cuttings, with other species like red osier dogwood.

The Bruno Moser (Purdue University) study of floral production in riparian areas suggests substantial potential for this type of activity, especially in areas within easy access of a large floral market such as Chicago, New York City or Washington DC. Moser, a horticulturist at Purdue University, together with wildlife specialist Brian Miller and agronomist Keith Johnson planted a filter strip comprised of orchard grass and three rows of horticultural shrubs at 660 per acre. Their third year of harvest yielded a potential return of \$5,000 per acre in the Chicago market. These strips have multiple benefits, including enhanced protection for wildlife, nutrient and sediment capture, economic returns, and improved stream health.

Areas more distant from these markets need products that have a longer shelf life. Black walnut, the predominant component of alley-cropping systems in Missouri and Arkansas, is a riparian tree. It likes a deep, moist soil common in the flood plain of streams. Its marketable nuts sell for \$0.75 a pound in Maryland (Tjaden 1998) and hulls, bark and leaves are used medicinally (Nature's Cathedral 1996 price list). Other nuts have potential as well including butternut, pecans, acorns, hickory, and filberts. Advantages of nut crops include their long shelf life and their potential for value-added processing (shelling and roasting the nut for example) during periods when on-farm labor demands are low.

Another nut with high potential is the hybrid hazelnut being developed by Philip Rutter at the Badgersett Research Farm in Minnesota. Presently, hazel nuts commercially produced in the US are the European hazelnut, grown primarily in the Willamette Valley of Oregon. The trees are susceptible to the Eastern

Filbert Blight, a disease that the native hazelnuts either resist or tolerate. By cross-breeding the American and European varieties Philip Rutter, & others have developed a bush with the resistance and cold tolerance of the former and some of the nut characteristics of the later.

Hybrid hazelnuts can be coppiced, they grow well in widely-spaced rows, do not suffer when waterlogged or even submerged in a riparian zone, and will come back to production after fire in only two or three years. As a large seeded species they do not tend to be weedy, though they compete well with weeds once their crown emerges from the grass cover. In fact, weeding in a row of bushes is only necessary in the first three years. After this the bush suppresses competition, requiring little maintenance.

A single hazelnut bush can produce anywhere from 1.5 to 5 pounds of nuts, commonly just under 3, when fully mature. Prices vary, as with any commodity, presently between \$1.50 and \$3.00 per pound in shell, rising and falling according to the production in the chief growing areas of Turkey (60% of global production) and the European Union (30%). Much of what is used in the candy industry comes from these two locations. Given its hardy nature, comparative productivity, and flood tolerance, hazelnuts maybe an excellent choice in riparian, alleycropping or other agroforestry settings.<sup>9</sup>

### *Windbreaks, Shelterbelts, and Field or Farm Borders*

The efficacy of tree rows planted perpendicular to prevailing wind patterns to reduce erosion is well established. Changing agricultural strategies however, such as the use of larger farm machinery necessitating a reduction in the number of turns in a field to reduce operating costs, or the switch to center-pivot sprinklers, has resulted in many windbreaks being removed (Kuhn and Bradshaw 1995). People who are re-establishing windbreaks, should consider including species that will provide direct income benefits as well as the erosion reduction and crop protection they afford. For example Kuhn and Bradshaw (1995) describe the incorporation of Robusta hybrid poplar and eastern redcedar in the Snake River Valley of Idaho, both of which can be harvested for wood

products.

In upstate New York wind erosion is less of a problem, but drifting snow can be a hazard and snow fences provide protection for roadways as well as maintaining moisture within the field (Dickerson, personal communication 1998). One farmer has established a snow fence with hybrid willow that substantially reduces the need for road clearing and improves his field moisture balance. The willow can then be used for fuel, pulp, or bedding. However, this system does not tap the potential to produce shade tolerant understory species in the shelterbelt.

Trees frequently border smaller fields and farms, especially in the eastern part of the country. In general these are not managed, yet such hedges may contain valuable species that could be exploited. Sally Kurtz who operates Water Ways Nursery in Loudon County Virginia has tapped this resource. She has 30 acres of fields surrounded by woods with a well-developed understory population. From these woods she has harvested seed from numerous species of plants including upland hackberry (shade tolerant, attractive to birds), American bladdernut (*Staphylea trifolia* – a favorite of field mice), wild hydrangea (local genotype as flowering plant), pawpaw, ginseng, black cohosh, catalpa to attract hornworms (used for fish bait), and many more. All these she has managed to propagate, grow under shade, and sell as shade tolerant native plants for the suburban Washington DC market. According to Sally, the woodland edge is the best place to grow pawpaw, as it produces more fruit with greater solar input, but is protected by the surrounding trees from adverse weather. Many windbreaks, shelterbelts and field borders could incorporate pawpaw without expansion into cropland. In addition, some of the species featured in Sally's Water Ways Nursery are SFPs that will grow in these areas under shade.

On hillside farms, where erosion is a problem, soil and nutrients tend to migrate down hill. Catching these nutrients before entering a stream is a major task of the riparian buffer. Further up-slope most farmers use strip cropping, often with rows of perennial hay, to solve this problem. Dean Hively at Cornell University is working on an experiment to test the effectiveness of combining tree and grass strips as a more permanent barrier to nutrient movement. Presently he is using willow with and without a grass strip. He speculates that it would be possible also to use other species and plant high value shade tolerant crops like ginseng and goldenseal under the canopy. The trees would capture

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<sup>9</sup>Most of the information on hazelnuts comes from talks by Philip Rutter given at the "Enterprise Development Through Agroforestry" Conference, sponsored by the University of Minnesota, October 4-7, 1998. The Badgersett Research Farm has a website: [www.badgersett.com](http://www.badgersett.com)

the nutrients, and their leaves would add organic material and nutrients back to the system. The full value of the system would be realized with the understory crops, which could be any combination of SFPs of interest to the farmer. By incorporating such items it should be possible to more than offset the value of land lost for crop production by the strip itself.

### *Silvopastoral Systems*

Cattle and SFPs do not mix in most cases. Anyone who owns woods where cattle, sheep or goats are free to graze recognizes their impact on understory vegetation and the lower layer of leaves in the forest canopy. However in some cases cattle and other animals can benefit from an agroforestry system and be of service to it.

Pine straw, the dried fallen needles of long-leaf pines that grow mainly in the south and southeastern US, has become a major product and area of research. The build up of these needles can create a fire hazard in dry years, and though removal does have an impact on soil structure and fertility; it may be beneficial to harvest a part of the total (Megalos, no date.) Pine straw is marketed as mulch for gardens. It can be baled in the forest if planting density permits, using a standard square baler. Experiments are presently in process to increase pine straw value by adding color (Dr. Catalino Blanche, personal communication).

Most pine straw is produced in the long-leaf pine plantations of the south and southeastern US. These plantations are designed for the production of pulpwood and are not readily accessible or “clean” enough for baling using agricultural balers. Cleaning means removal of branches, cones, and woody plants like scrub oak that thrive in the same dry, sandy slightly acid soil preferred by the pines (Megalos, no date.) It is also possible to use the pine growing areas as pasture. In this case the density of trees is reduced to increase the productivity of the forage (Pearson 1991). The animals in turn will reduce the weed population and control the scrub oak. The combination of animals and trees increases the total productivity of the system without measuring the productivity of pine straw (Pearson 1991). No data are available on the economics of the system when pine straw is included.

In the southwestern US range is the principal land use, and mesquite (*Prosopis species*) are dominant plants. In most cases mesquite grows as a shrubby weed

which is disliked by ranchers and frequently mowed. However, it is possible to turn this weed into a multi-product silvopastoral centerpiece (Felker 1999). Mesquite is nitrogen fixing. It produces a long, sugary pod with good protein content which sometimes is ground into flour by indigenous people of the SW US and Mexico, and is a favorite browse of animals. Its wood is very hard, shrinks less than oak or hickory and has high value for flooring or furniture. According to Peter Felker (personal communication) the wood is valued at \$1.00 per board foot, with a possible production of 7,000 board feet on a thirty-year rotation. With its potential for food, fodder, nitrogen fixation, charcoal and hardwood, it is hard to understand why the tree has not been exploited more than it has. Felker (1999) says that the main drawback has been the lack of mechanical harvesting. In Mexico and Brazil, where labor is less expensive, use of the mesquite pod for food and fodder is correspondingly greater.

Ranchers do not like mesquite because of its thorns and shrubby growth. With proper management, mature trees are more widespread, grow taller with thick trunks, and associate well with grasses, increasing nitrogen and carbon in the soil as well as the quality and quantity of available forage (Felker 1999). The key to developing mesquite is to think of it as part of a system producing a number of products, rather than maintaining a narrow focus on one product, beef, which is how most southwestern US land-managers tend to think at present.

### **Regional Differences in Special Forest Product Systems**

The United States is a land of climatic, altitudinal and political diversity. Recognizing that any system of dividing the country into regions has its limits, we have cautiously identified six of them, using guidance from the NRCS’s regional classification scheme. The divisions exclude most of Alaska and Hawaii, and include Canada in certain areas.

Attempting to do each region justice in our treatment of special forest product potential within this brief space is not possible. Each deserves a review of its own, and hopefully this effort will provide a spark to do just that.

Despite the obvious regional differences there are common threads that connect them. Wildcrafting by local residents, whether Native Americans or immigrants, most of whom may be defined as resource

poor, is found throughout. These harvesters of naturally growing plant materials have an understanding of the ecology of the plants that comprises an under-utilized resource for developing management systems (see McLain and Jones 1997b and Emery 1998). Riparian buffer zones are a national priority. In every region the need for these zones, driven by concern over clean water and non-point source pollution, is recognized and funds are available. The potential for special product development in the buffers is high, but the level of research devoted to developing and marketing SFPs from them has been minimal.

Another commonality of note is the overwhelming need for market research to help “pull” the development of SFP production systems (Chamberlain and Hammett 1999). Our survey and interviews placed this clearly at the top of regional priorities for research and extension. Many growers have a primary interest in the land. Selling has not been, and is unlikely to be considered a priority focus of their activity. If the market is there, they will grow the product. Without the market, no amount of pushing production will generate a response.

A trend noticed across regional boundaries is that proximity to large markets reduces demand for marketing assistance. For example, producers of Christmas trees, ornamentals and understory flowering plants in Loudoun County Virginia, close to Washington D.C., did not rank marketing as a major problem. Growers in SW Virginia by contrast felt that producing perishable special products like mushrooms was not worth their while because there was no market. The same pattern occurred in the Pacific Northwest, where bough producers on the coast, near markets in Seattle and Portland, had little trouble with marketing, while sources in northeast Washington and Idaho named market development as their main problem for the same product.

### *Southwest*<sup>10</sup>

The dry, extensive land area from Eastern Texas to Southern California poses a special challenge to the development of special forest products. Much of the land is federal, primarily under the control of the Bureau of Land Management (BLM) or the USDA Department of Forestry (USFS). Wildcrafting occurs but is widely spaced and has limited development potential throughout much of the region. For most of

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<sup>10</sup>Information on the SW comes largely from Dr. Pete Ffolliot of the University of Arizona, Department of Natural Resources.

this landscape agroforestry involves silvopastoral systems. New developments in the area of Holistic Resource Management (Savory 1988) open up potential for special forest products on these large landholding, but presently the emphasis remains more narrowly focused.

Climate and soil conditions have long confined agricultural activities to relatively small patches of land in this region. These tend to be places where deeper soils and better moisture conditions, sometimes assisted by local irrigation, make the development of home gardens a possibility. Home gardens, recognized in early agroforestry literature in Africa, are areas near or surrounding homesteads where processing of plant materials and disposal of these, plus animal and household wastes, increases the fertility of soils creating an environment where a diversity of plant species can thrive. By managing this area intensively the farm household often can produce a major portion of their household needs on a relatively restricted piece of land. These home gardens of the SW, where fruit and vegetable production are concentrated, comprise the single best environment for promoting a variety of special forest products such as mushrooms, honey, nut trees, dried flowers, and native medicinal plants (Peter Ffolliot, Personal Communication, 1998.)

These home garden settings are commonly located in or near riparian zones. Their development could be combined with riparian buffer zone protection and integrated within a wider silvopastoral management strategy. Riparian zones in these arid environments are considerably narrower than corresponding areas elsewhere in the country. This limits the potential of the zone, pushing efforts toward the home garden and silvopastoral practices. Considerable work remains to be done on different crops as well as market development. It is likely that the tourist industry will help to expand market demand for some special products.

### *Pacific Northwest*<sup>11</sup>

Most SFPs from the Pacific Northwest (PNW) are wildcrafted from public lands. Again the two principle agencies are the USFS and the BLM in addition to

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<sup>11</sup>Much of the information in this section comes from conversations with Jim Freed, Washington State University Cooperative Extension who devotes a majority of his time to SFP development throughout the state. Special mention also goes to Richard Hallman in British Columbia, who works on SFPs with the Department of Forestry in the Provincial Government.

some state forests. How to manage this activity is a major concern, both to conserve the resource and to protect those involved. High value products, like the matsutake or pine mushrooms (*Tricholoma magnivelare*), create competition for picking in prime growing sites, forcing the forest service to regulate and provide places for pickers. The market in this case is primarily oriental, either from Japanese residents on the Pacific Coast or for export to Japan. How should it be decided who has rights to harvest a particular product from public land (McLain and Jones 1997a)?

The issue goes beyond mushrooms to other non-traditional products of high commercial value like boughs of Noble Fir (*Abies procera*) or understory decorative and medicinals like salal or pacific yew (*Taxus sp.*) How does a forest manager allocate access to such resources when the primary management goal is timber production? Part of the answer may lie in establishing cooperatives in conjunction with the Forest Service as modeled by Trinity Alps Botanicals (TAB) in Northern California (Johnson 1998). Trinity County is a large, sparsely populated region with a high level of unemployment. The TAB founders recognized that the diversity of SFPs in their forest, 80% of which is federally owned, is high, but the income from these products derived solely for their raw export value would be too low to be sustainable. They designed their cooperative to produce value-added medicinal products and they regulate their harvest in conjunction with Forest Service managers. TAB offers training in “sustainable and ethical harvest techniques”, uses a permitting system, and has written a set of Guidelines entitled “*Standards and Guidelines for Harvest of Selected Medicinal-Use Non-Timber Forest Products.*” With these tools and their partnerships with the Forest Service, tribal gatherers, and other forest workers, they have had success in both income generation and resource conservation (Johnson, 1998).

In some cases demand is sufficient and markets well enough established to begin moving from wild-crafted to wild-simulated production. Bough production for the decorative market is one such example. Primarily based on noble fir, with some use of incense cedar and other evergreens, the bough market is quite large, and prices are high enough to generate grower interest. Bill Batstone grows noble fir and other species on former pastureland near Shelton WA. The trees surround a driving range he owns and manages. Golf balls are occasionally hooked into a nearby bough. With 20 acres of trees he produces a significant amount of high quality boughs that sold for \$0.31/lb

during the 1997 holiday season.

Mark Savage, employed by the Washington State Department of Forestry, has worked to develop production guidelines for growers of Noble Fir boughs, and has examined the bough production systems in Denmark. Farmers in Denmark are growing Noble Fir, a plant native to the PNW, in rows four or five trees wide along the edges of crop fields. They are the main suppliers of the European market. PNW growers are looking at both their genetic stock, improved by the Danes, and their production system for possible adoption. Land pressures are not as great in the PNW as in Denmark, but the system lends itself to combination with agriculture in certain locations since the labor demands for bough production and farming are complementary (Savage 1996).

Movement from wildcrafting in forest to production in agroforestry systems is relatively slow in the PNW. Because of the high degree of public land and relatively dispersed markets it is unlikely that major developments will take place anytime soon. Only for relatively high value products, where stocks in the forest are low, will there be sufficient incentive to move to wild-simulated or agriculturally based production.

### *Northern Plains*

It was not a surprise to find that the great plains of Eastern Colorado north to Montana and east to the Dakotas and Kansas have the least activity in SFPs. This region was once dominated by medium and short stem prairie vegetation that has now been converted to wheat and other grains. In the drier parts of the region, ranchers “who consider the tree to be weeds and want to get rid of them”, as one survey respondent stated, are unlikely to consider SFPs. However, there are pockets with potential like the Black Hills of South Dakota, along rivers and streams, and in windbreaks, snow fences and shelterbelts.

Some of the species commonly used in windbreaks, such as the Saskatoon Berry, produce fruit suitable for jams and jellies, and many of the species provide fence posts. Riparian areas again provide the best environment for SFPs, but in such extensive farming operations it seems unlikely that sufficient labor will be mobilized to produce, process, and market these products. Perhaps a way that this SFP potential may be realized in the plains is if land in riparian or windbreak areas is rented or otherwise turned over to non-farm owners or managers. This idea could apply in other

extensive farming areas further east as well.

### *Comments On The Three Eastern Regions*

In the west, climate and geography give some credence to regional divisions. In the east the distinctions are fuzzier. Products like ginseng grow from Wisconsin to Quebec and Maine, and south to N. Carolina and Tennessee. Maple syrup is big in Quebec and Vermont but is also produced in Kentucky and Virginia, states with a southern character, but more northern climates in the Appalachian Mountains. In this part of the country a key distinction among regions may be in the way land is managed. Corn and soybeans dominate the Midwest, from Missouri north to Minnesota and east to Ohio, with large dairy operations replacing crops in the north. The northeast has more private woodlands, commonly in smaller holdings, and much closer access to large markets. The south and southeast, from Arkansas and East Texas to Florida and Virginia have a checkerboard of land uses, nearly impossible to briefly characterize, and the greatest diversity of SFPs of any region in the country, though not the most developed.

#### *The Northeast*

Unlike the west there is little government-owned land in this part of the country, except in some state parks. Here the private forest land owner dominates. Farmland and farming in general has been in steady decline since the 1930's. Though there are some large holdings, the focus of interest for this discussion is the small forest and the farm forest owner. Islands of innovation with SFPs are emerging throughout the Northeast. The back-to-the-land ideals exemplified by Helen and Scott Nearing over 50 years ago have inspired a number of land-owners to investigate the possibility of making a living by combining SFPs with subsistence agriculture, motivated by health issues and concern for the environment. An example from one of many interviews conducted in the region is Bramblewood Herbs and Gardens, owned by Barbara Nardozzi. Though very small in scale, Barbara grows a number of forest herbs, including black cohosh and blue cohosh, and has a large garden producing food for home consumption. Her main interest is health, both for the environment and personally. She took a training course in herb crafting from Rosemary Gladstar, founder of United Plant Savers, then started

her own herb garden and production activities.<sup>12</sup>

Though Barbara Nardozzi grows and produces herbal medicines, sometimes from products purchased from other growers, her main income comes from education. She offers an eight-month program where students learn about various aspects of herbology such as plant identification, holistic health and wellness, how to make herbal preparations, and much more. She teaches approximately 25 apprentices a year for a fee of \$750 each. In addition she teaches courses on the subject at the University of Vermont.

The success of this educational initiative is indicative of the high degree of interest there is in alternative medicine and lifestyles. While the leadership in developing SFPs in the Northeast tends to be found in small producers of such items as ginseng and maple or birch syrup, these activities appear to be expanding to more traditional farms. With prices low for many conventional crops, and farm incomes low as a result, farmers are interested in crops for field borders, marginal lands, riparian zones, or redesigned hedgerows. The question for these potentially larger producers is what are the best options and are there stable markets for them?

#### *Midwest*

Generalizing about the Midwest is especially difficult. The 2000-acre corn and soybean farms of Iowa and other states bear little resemblance to the dairy areas of Wisconsin, or the smallholdings on the Upper Peninsula of Michigan. On the larger operations farmers are virtually certain not to adopt SFPs in any significant way. A more likely scenario, proposed by Mike Bolin of Cooperative Extension in Illinois, is that these farmers will rent land to others in return for a share of the gross revenues. For example, a farmer who sets aside land for riparian buffers may allow someone to rent this area for the production of floral materials for 20% of the gross sale.

Smaller farms and other forest owners who do not farm are more likely to get involved. For example in SW Wisconsin a group of woodlot owners have started the Sustainable Woods Coop for the purpose of improving woodland health. Instead of high-grading their forest for timber they are "low-grading" or

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<sup>12</sup>Rosemary Gladstar teaches these courses independently of UpS, though some of the course material comes from or has been enhanced by them. UpS does not operate courses, rather it serves as an information exchange and action-stimulating network for saving endangered plants.

culling poorer trees, letting healthier ones with better form grow, and working toward a sustainable yield system of high-quality timber. They do not use skid loaders or other forms of intrusive, extractive management; rather they haul harvest wood with horses. The disadvantage of this system is the temporary reduction of forest income. As a result the cooperative is pursuing development of SFPs as a part of their overall management strategy. Goldenseal, ginseng, mushrooms on small diameter culled timber, herbs and other items are being investigated. Goldenseal production in some of these forest farms is already significant. Coop members are now dealing with marketing and diversification questions.<sup>13</sup>

*Minnesota Wild* is a Minnesota company that has addressed some of the marketing questions that arise in areas characterized by a widely dispersed population, dependent on its natural resources and tourist industry. The tourist are attracted to the product by, “marketing geared to the old-style feel of fresh bread and homemade jam,”<sup>14</sup> according to Jay Erchenbrack founder of Minnesota Wild. Minnesota Wild now produces jams made from chokecherries, wild cranberries, blueberries and wild plum. Though drawn almost entirely from wild grown plants, Jay predicts that they will move toward intentionally cultivated suppliers who can offer more consistent production. Since many of these plants grow well in fencerows, hedges, forest edges or windbreaks they have a high potential for being produced in agroforestry systems. This is another example of how development of an agroforestry system could be pulled by market forces.

### *Southeast*

The Southeast is arguably the most diverse region of the country. From sugar maple production in the highlands of Kentucky, Virginia and Tennessee, to pecans growing along streams in Alabama, the variety of SFPs is greater in this region than any other in the nation. At the same time the tradition of wildcrafting in Appalachia is as secretive in many ways as moonshine production was 60 years ago. People will not divulge their favorite ginseng patch, but if a wildcrafter finds your wild-simulated production site it is virtually certain to disappear. The tradition of

harvesting SFPs in this region is strong. Learning from Native Americans, early settlers quickly caught on to the value of SFPs in the market, producing pine tar for shipping, growing American chestnuts and pecans, and collecting medicinal herbs. Only in the last 50 years has this part of the local economy gone “underground”, with Naval Stores disappearing, and wildcrafters favoring “untaxable” sale options.<sup>15</sup>

Paralleling the recent trend, larger scale operations like Wilcox Natural Products have begun to arise. This is a subsidiary of a Swiss pharmaceutical company that deals with large product volumes that hopes to produce many forest herbs with medicinal value on a commercial basis by contracting farmers to grow the crop. Ed Fletcher of Boone, NC is in charge of the company’s production research facility. He and his team examine ways to grow plants such as goldenseal on a large scale. Once a production system of some promise is identified they will use contract growers, in much the same way as a vegetable packing company like Birdseye does, to grow a certain quantity of the plant for a pre-set price. This promises to be a way for tobacco farmers to find alternative crops as that industry shrinks.

These examples do not begin to exhaust the possibilities in the southeast. One more will suffice though to impart a flavor of the potential. In Grayson County, SW Virginia, Roger and Teresa Roberts began a small pine-rope operation designed to provide decorative material for the Christmas market. Their stock comes from white pine, with some boxwood and Frasier fir thrown in for looks, all of it harvested from trees normally trimmed for Christmas trees or thinning in forest plantations. They began 20 years ago. Now their business has grown to include 88 roping machines, 3 million pounds of pine, up to 300 employees during peak roping season (November) and all the trimmings they can find within 100 miles of the manufacturing site. In addition they make wreaths and other decorative products from the pine rope. The operation is now a \$1.5 million a year company. Not all SFPs in the SE has this type of potential, but if the market, product, and value-added manufacturing line up correctly a success like Roberts Evergreens is

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<sup>13</sup>From an informal talk by Gigi La Budde of the Sustainable Woods Coop, given at the University of Minnesota’s “North American Conference on Enterprise Development Through Agroforestry: Farming the Agroforest for Specialty Products.” Oct. 4-7, 1998

<sup>14</sup>From a talk given at the “North American Conference on Enterprise Development Through Agroforestry: Farming the Agroforest for Specialty Products.” Oct. 4-7, 1998

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<sup>15</sup>From a talk by Tom Hammett, Ph.D. Department of Forest Products, Virginia Tech, at the University of Minnesota’s “North American Conference on Enterprise Development Through Agroforestry: Farming the Agroforest for Specialty Products.” Oct. 4-7, 1998

possible.<sup>16</sup>

## Conclusion

No single special forest product has the potential to change the face of American farms or forests. A few may have sufficient market potential to be grown widely on a regional or national level. These will be the exception though, rather than the rule. Most special forest products will be produced for niche markets at local or regional level. With many of them the true value of the plant will not be realized by producers unless they are willing to invest time, and perhaps money, into post-harvest processing and marketing of the product. The majority of the value comes when the plant (root, foliage, branch or fruit) is transformed into a product that meets a perceived consumer demand.

As of this writing most SFP activity in the US and Canada occurs outside of formal institutional structures, i.e. research organizations, government agencies or large corporations. Public land management agencies, like NRCS, land-grant college extension programs and businesses are just beginning to examine the potential in these products and put out feelers for where, how, and how much research needs to be done. There are at least three areas where the formal sector can provide significant positive support to the development of SFPs; marketing, domestication, and quality control. An area that could prove highly counter-productive however is regulation.

Marketing is the dominant constraint for most producers around the country, whether from a lack of understanding about how to market, or simply a failure to realize that cultivating a market is part of the process. Creative growers often dislike selling. They would rather spend time alone or with friends in the woods or fields than make the effort to meet potential customers face-to-face. How do we market SFPs? How does marketing differ for each type of product? To whom should we direct our energies? Producers commonly need input and guidance on these questions. In some cases a cooperative, trade association or other form of marketing organization will need to be formed to do this work for producers. As shown earlier, the best strategy may involve working on the market side of questions to generate demand prior to stimulating production.

Domestication involves development of cultivation techniques for SFPs, whether it is in the open, within the forest, or in an agroforestry setting. Some plants, like ginseng and goldenseal are already endangered in the wild. Only by developing successful cultivation strategies can pressure on wild stocks be reduced. Wildcrafters will reduce activities when prices drop. A few organizations have already started on this effort including the Jeanine Davis at the North Carolina State's Agricultural Experiment Station in Fletcher, NC, Wilcox Natural Products, and Richo Cech's HerbPharm in OR. Much of the knowledge in the area of domestication once again is being generated outside of formal organizational structures. Although healthy in some respects, the approach lacks the credibility granted to refereed research and extension materials. In many cases the knowledge and experience gained by the informal sector has no way of reaching the formal sector and does not reach those who could use it in a timely way.

As the herbal and forest botanicals markets grow, an increasing number of small companies are entering production. Unlike the decorative market, or even the edibles market, there is little a consumer can do to determine the quality of what they buy. A tincture of Oregon Grape root from Trinity Alps Botanicals may have quite a different content than one produced by a new, start-up company. Helping these small companies control the quality of their product and measure it against an established standard will be essential in keeping these companies alive. Otherwise, unethical ones could take advantage of the vacuum, sow distrust in the industry, and enable a known quantity like Wilcox Natural Products or another pharmaceutical company to dominate the field. Voluntary quality control standards, if widely accepted and used, could go a long way to reassuring the public before these problems proliferate. At the same time the one fear that small producers share is the imposition of standards by a regulatory agency like the Food and Drug Administration. Most botanicals are presently not regulated by the FDA because they are not considered medicine but rather "dietary supplements". That could change if quality control by smaller companies begins to cause problems with consumers. If the FDA regulates in its conventional way a great deal of expense could be incurred by these small companies to either meet the standards or prove to the FDA that they do. Many fear that regulation will drive them out of business. A voluntary system, developed with the participation of the formal sector, that compares a product to a known standard and grants a stamp of approval, will permit and perhaps

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<sup>16</sup>From an article by A.W. Hauslohner, Landmark New Service, Roanoke Times, December 10, 1997 titled, "Couple builds green empire with pine-ropping outfit."

even encourage the small producers to continue in spite of competition from larger corporations.

Special forest products are coming into the open as a notable part of the North American economy based on renewable natural resources. They deserve more attention by research and extension institutions than they have received to date. It is hoped that this report will contribute to this process.

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