

Forest Farming–Forest Gardening

Growing Alternative Crops Under a Forest Canopy

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Forest settings can provide an ideal location for cultivating many valued plants that prefer shaded conditions. Several non-timber forest products, including mushrooms and edible and shade-tolerant plants, can be intentionally cultivated or promoted to reproduce in forests using specific management practices. When considering alternatives for forested land, various elements need to be considered to identify how feasible forest farming will be given the available resources, site characteristics and plans for the land. Ideal forest crops have a relatively high value and are capable of producing profitable volume over the preferred time frame. Georgia and Southeastern growers can improve their income by being part of the ever-increasing supplements and wild crops markets.



Shiitake mushroom cultivation on hardwood logs.

What is Forest Farming?

Forest farming can be defined as cultivation of plants under a forest canopy (as opposed to wildcrafting, the practice of collecting wild plants and products from a forest). Forest farmers can manage different layers in the forest structure to increase sustainable harvests of non-timber forest products from natural forests or tree plantations. The canopy trees provide timber, nuts and fruits like pecans or persimmons; the middle layer may be full of mayhaw, vines, berries or ornamentals; and the forest floor can be cultivated for medicinal and culinary herbs, roots, mushrooms and landscaping or florist products like flowers and ferns. The multilayered structure of a farmed forest improves wildlife habitat and may also increase the aesthetic and recreational value of the property.



Cultivated oyster mushrooms.

If forested land is managed for a diversity of non-timber forest products (NTFPs), longer tree rotations and selective logging, *small acreages can be species-rich systems providing a multitude of commercial and noncommercial values.*

Eastern forests have been a major supplier of marketed NTFPs and wild crops for more than a century. We have hundreds of commercial species growing in great abundance in our rich temperate forests. Wild crop industries are growing with infrastructure to support small NTFP businesses and wild crop cultivation. An investment in these businesses is strategic because it can bring greater stability to the herbal and medicinal plant industry and increase the availability of living-wage green jobs for the long term. Industries that currently generate hundreds of millions of dollars annually are collectively beginning to generate billions. Markets for non-timber products are diverse and depend greatly on the demand for the product and its availability. We are fortunate to have reputable brokers and buyers for medicinal plants in our region of the country.

Suggested herbs, depending on site conditions (shade, soil etc.)

<i>Actaea racemosa</i> (Black cohosh)	<i>Eschscholzia californica</i> (California poppy)	<i>Polygonatum biflorum</i> (Solomon's seal)
<i>Aralia nudicaulis</i> (Wild sarsaparilla)	<i>Eupatorium purpureum</i> (Gravel Root)	<i>Rosmarinus officianalis</i> (Rosemary)
<i>Aralia racemosa</i> (Spikenard)	<i>Gelsemium sempervirens</i> (Yellow jasmine)	<i>Sambucus nigra</i> (American elder)
<i>Arisaema triphyllum</i> (Jack-in-the-pulpit)	<i>Geranium maculatum</i> (Wild geranium)	<i>Sanguinaria canadensis</i> (Bloodroot)
<i>Arnica montana</i> (Arnica)	<i>Gillenia trifoliata</i> (Bowman's Root)	<i>Scutellaria lateriflora</i> (True skullcap)
<i>Asarum canadensis</i> (Canadian wild ginger)	<i>Ginkgo biloba</i> (Ginkgo)	<i>Smilacina racemosa</i> (False solomon's seal)
<i>Asclepias tuberosa</i> (Pleurisy root)	<i>Helianthus tuberosus</i> (Jerusalem artichoke)	<i>Tanacetum parthenium</i> (Feverfew)
<i>Astragalus membranaceus</i> (Astragalus)	<i>Hydrangea arborescens</i> (Wild hydrangea)	<i>Urtica dioica</i> (Stinging nettle)
<i>Baptisia tinctoria</i> (Wild indigo)	<i>Hydrastis canadensis</i> (Goldenseal)	<i>Vaccinium myrtillus</i> (Bilberry)
<i>Centella asiatica</i> (Gotu kola)	<i>Hyssopus officinalis</i> (Hyssop)	<i>Valeriana officinalis</i> (Valerian)
<i>Chamaelirium luteum</i> (False unicorn)	<i>Iris versicolor</i> (Blue flag)	<i>Veratrum viride</i> (American hellebore)
<i>Chionanthus virginicus</i> (Fringe tree)	<i>Lespedeza capitata</i> (Round-headed bush clover)	<i>Verbascum thapsus</i> (Mullein)
<i>Cichorium intybus</i> (Chicory)	<i>Monarda didyma</i> (Oswego tea)	<i>Veronicastrum virginicum</i> (Culver's root)
<i>Collinsonia canadensis</i> (Stoneroot)	<i>Monarda fistulosa</i> (Wild bergamot)	<i>Virburnum prunifolium</i> (Black Haw)
<i>Dioscorea villosa</i> (Wild yam)	<i>Oenothera biennis</i> (Evening primrose)	<i>Withania somnifera</i> (Ashwagandha)
<i>Echinacea angustifolia</i> (Narrow-leaf purple coneflower)	<i>Panax quinquefolius</i> (Ginseng)	<i>Yucca glauca</i> (Yucca)
<i>Echinacea pallida</i> (Pale purple coneflower)	<i>Parthenium integrifolium</i> (Wild quinine)	
<i>Echinacea purpurea</i> (Purple coneflower)	<i>Passiflora incarnata</i> (Passion flower)	

*Product list from <http://www.strategicsourcinginc.net/products.aspx>



Wild ramps and mayapple in a forest plot.



Ginseng seedlings in a forest.



Plot prepared for goldenseal.



Goldenseal leaf.

Few of Georgia's forest landowners manage for or harvest NTFPs, leaving an untapped income opportunity for landowners. Improving diversity of native plants used as food or medicines in forests can create opportunities for landowners to conserve plants that are overharvested or rare in the wild (for conservation; e.g., pink lady slipper orchid), and to benefit financially from both harvest and from emerging markets for ecosystem services such as carbon credits.

Forest farming of medicinal plants has tremendous potential to relieve pressures on natural plant populations and improve forest management while providing small-scale forest landowners alternative income sources. A good example of wild crops on-farm is the SARE project (Project Number: FNC07-669) *Demonstrating Organic Wild Crop Utilization and Certification as a Profitable Model*. Growing under a shaded canopy can be accomplished just as well on a suburban acreage under trees in the backyard as on the forestland of a working farm. Put some native medicinals under your trees and harvest them to supplement the income

gained from your other farming efforts. Small land areas can be used to grow commercial products and provide non-commercial (environmental) values. Check out USDA's *Agroforestry: Alternative Crops and Plants* and links there for more information about agroforestry practices. An example close to home is *Cultivating Ramps: Wild Leeks of Appalachia* (in *Trends in New Crops and New Uses*, ASHS Press).



Pawpaw, a native fruit in Eastern hardwood forests. Deborah B. Hill, Extension Forester UKY (retired)

Resources for selecting plants and cultivation techniques

Nontimber Products Information

Becker, B., & Workman, S. (2003). *Farming the forests of Florida* (Circular 1434). UF-IFAS Extension. https://www.researchgate.net/publication/319127982_CIR_1434_Farming_in_the_Forests_of_Florida

Workman, S., Long, A., Mohan, S., & Monroe, M. (2002). *Agroforestry: Options for landowners* (Publication No. FOR 104). UF-IFAS Extension. https://www.researchgate.net/publication/270219602_Agroforestry_Options_for_Landowners

Forest Farming: <https://forest-farming.extension.org/>

Nontimber Forest Products website: <https://www.ntfpinfo.net/> (species database, business directories, management resources, etc.)

USDA Forest Service Southern Research Station: <https://www.fs.usda.gov/research/srs>

USDA National Agroforestry Center: <https://www.fs.usda.gov/nac/practices/forest-farming.php>

North Carolina State Extension

New crops and organics: NCherb.org

Herbs: <https://newcropsorganics.ces.ncsu.edu/herb/>

Homegrown Medicinal Plants: <https://homegrown.extension.ncsu.edu/2021/12/growing-medicinal-plants-in-the-home-garden/>

Specialty crops: <https://newcropsorganics.ces.ncsu.edu/specialty-crops/>

Medicinal Herb Seed and Plant Sources

Medicinal Herbs and Nontimber Forest Products:
<https://newcropsorganics.ces.ncsu.edu/herb/medicinal-herbs-and-non-timber-forest-products/>

Organic Herbs

ATTRA Sustainable Agriculture: <https://attra.ncat.org/>

Value-added products (e.g., essential oils, herbal tinctures and extracts, field-grown medicinals)

Local Harvest, sources of materials and growers:
<https://www.localharvest.org/search.jsp?jmp&scale=8&lat=33.974834&lon=-83.363891>

Artemisia annua L.: A Promising Aromatic and Medicinal: <https://www.hort.purdue.edu/newcrop/proceedings1990/V1-522.html>

Mushroom Cultivation

Kaiser, C., & Ernst, M. (2021). *Gourmet & medicinal mushrooms*. University of Kentucky Cooperative Extension Service. <https://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/gourmet.pdf>

Sabota, C. (1998). *Shiitake mushroom production on logs* (Publication No. ANR-1076). Alabama Cooperative Extension System.

Przybyłowicz, P., & Donoghue, J. (1988). *Shiitake growers handbook*. Kendall Hunt Publishing Co.

Books by Paul Stamets: <https://hostdefense.com/blogs/host-defense-blog/books-by-paul-stamets>

Note: There are many online guides for growing mushrooms. If you learn the basics of what conditions make the fungus thrive (substrate, temperature and moisture), select a supplier and give it a try.

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