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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 diversify and improve their income with rising economic and public interest in wild foods, natural medicine, and sustainable farming by supplying forest-farmed crops.

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 ***foraging***, 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 nontimber forest products (NTFPs) from natural forests or tree plantations. The canopy trees provide timber, nuts and fruits like pecans, hickories, oaks, or persimmons; the middle layer may be full of hazelnuts, muscadines, 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 NTFPs with longer rotations and selective logging, small acreages can be species-rich systems providing numerous economic and environmental benefits.

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 supports a growing public interest in wild foods, can bring greater stability to the natural medicine industry, and can increase the availability of long-term, living wage green-industry jobs. Markets for NTFPs are diverse and depend greatly on the demand for the product and its availability. We are fortunate to have reputable brokers and buyers for wild-grown crops and medicinal plants in our region of the country.

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

- *Actaea racemosa* (black cohosh)
- *Allium tricoccum* (ramps)
- *Amelanchier arborea* (serviceberry)
- *Aralia nudicaulis* (wild sarsaparilla)
- *Arialia racemosa* (spikenard)
- *Arisaema triphyllum* (Jack-in-the-pulpit)
- *Arnica montana* (arnica)
- *Asarum canadensis* (Canadian wild ginger)
- *Asclepias tuberosa* (pleurisy root)
- *Asimina parviflora* (small-flowered pawpaw)
- *Asimina triloba* (common pawpaw)
- *Astragalus membranaceus* (astragalus)
- *Baptisia tinctoria* (wild indigo)
- *Callicarpa americana* (American beautyberry)
- *Carya illinoinensis* (pecan)
- *Carya* spp. (hickory)
- *Castanea pumila* (Alleghany chinquapin)
- *Centella asiatica* (gotu kola)
- *Chamaelirium luteum* (false unicorn)
- *Chionanthus virginicus* (fringe tree)
- *Cichorium intybus* (chicory)
- *Collinsonia canadensis* (stoneroot)
- *Corylus americana* (American hazelnut)
- *Crataegus* spp. (hawthorn)
- *Dioscorea villosa* (wild yam)
- *Diospyros virginiana* (common persimmon)
- *Echinacea angustifolia* (narrow-leaf purple coneflower)
- *Echinacea pallida* (pale purple coneflower)
- *Echinacea purpurea* (purple coneflower)
- *Eschscholzia californica* (California poppy)
- *Eupatorium purpureum* (gravel root)
- *Fagus grandifolia* (American beech)
- *Gelsemium sempervirens* (yellow jasmine)
- *Geranium maculatum* (wild geranium)
- *Gillenia trifoliata* (Bowman's Root)
- *Ginkgo biloba* (ginkgo)
- *Helianthus tuberosus* (Jerusalem artichoke)
- *Hydrangea arborescens* (wild hydrangea)
- *Hydrastis canadensis* (goldenseal)
- *Hyssopus officinalis* (hyssop)
- *Ilex vomitoria* (yaupon)
- *Iris versicolor* (blue flag)
- *Lespedeza capitata* (round-headed bush clover)
- *Malus angustifolia* (southern crabapple)
- *Monarda didyma* (Oswego tea)
- *Monarda fistulosa* (wild bergamot)
- *Morus rubra* (red mulberry)
- *Oenothera biennis* (evening primrose)
- *Panax quinquefolius* (ginseng)
- *Parthenium integrifolium* (wild quinine)
- *Passiflora incarnata* (purple passion flower)
- *Polygonatum biflorum* (Solomon's seal)
- *Prunus angustifolia* (Chickasaw plum)
- *Prunus americana* (American plum)
- *Prunus umbellata* (Flatwoods plum)
- *Pycnanthemum* spp. (mountain mint)
- *Quercus* spp. (oak)
- *Rosmarinus officianalis* (rosemary)
- *Rubus* spp. (blackberry)
- *Sambucus canadensis* (American elder)
- *Sanguinaria canadensis* (bloodroot)
- *Scutellaria lateriflora* (true skullcap)
- *Smilacina racemosa* (false Solomon's seal)
- *Tanacetum parthenium* (feverfew)
- *Urtica dioica* (stinging nettle)
- *Vaccinium myrtillus* (bilberry)
- *Vaccinium* spp. (blueberry)
- *Valeriana officinalis* (valerian)
- *Veratrum viride* (American hellebore)
- *Verbascum thapsus* (mullein)
- *Veronicastrum virginicum* (Culver's root)
- *Virburnum prunifolium* (black haw)
- *Vitis aestivalis* (pigeon grape)
- *Vitis rotundifolia* (muscadine)
- *Withania somnifera* (ashwagandha)
- *Yucca glauca* (yucca)

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* (https://projects.sare.org/sare_project/fnc07-669/). 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 *List of Alternative Crops and Enterprises for Small Farm Diversification* 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. Photo: J. Holly Campbell.

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://doi.org/10.32473/edis-fr144-2003

Workman, S., Long, A., Mohan, S., & Monroe, M. (2002). *Agroforestry: Options for landowners* (Publication No. FOR 104). UF-IFAS Extension. https://doi.org/10.32473/edis-fr136-2002

Forest farming: https://forest-farming.extension.org/

Nontimber forest products website: https://www.ntfpinfo.net/ (species database, business directories, management resources, etc.)

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/

Mushroom Cultivation

Kaiser, C., & Ernst, M. (2021). *Gourmet & medicinal mushrooms*. University of Kentucky Cooperative Extension Service. https://ccd.uky.edu/sites/default/files/2024-11/ccd-cp-079_gourmet-and-medicinal-mushrooms.pdf

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

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

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.

The permalink for this UGA Extension publication is fieldreport.caes.uga.edu/publications/C1029/

Circular 1029 **Revised October 2025**

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