



Riparian buffers



Wind breaks



Silvopasture



Alley cropping

# Agroforestry

## A Primer



Forest farming

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Extension Forester, N. District



**Virginia Cooperative Extension**  
Virginia Tech • Virginia State University

## Why consider agroforestry?

*Not just "for fun" ...*

Over-yielding – Total production from combinations of crops & trees exceeds the production of just one of those crops grown alone on the same site.

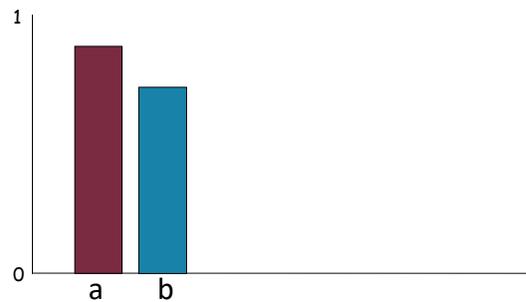
Different species utilize resources at different times, various rates of efficiency, and assorted vertical and horizontal layers.



## Agroforestry Principle

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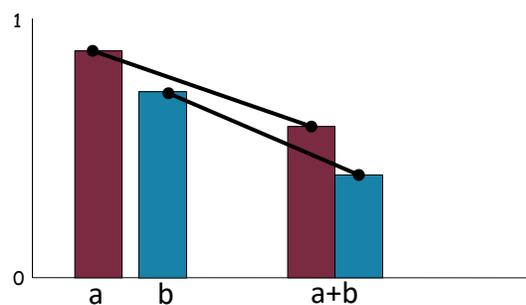
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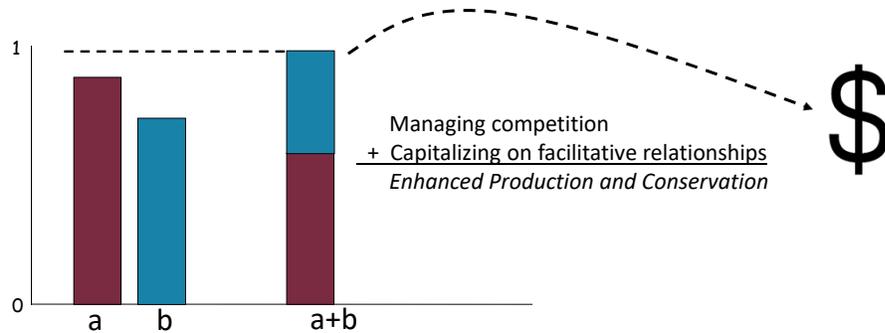
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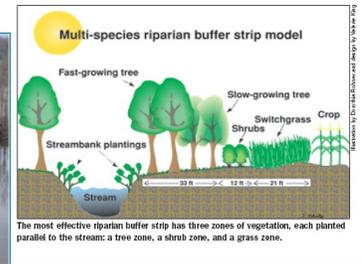
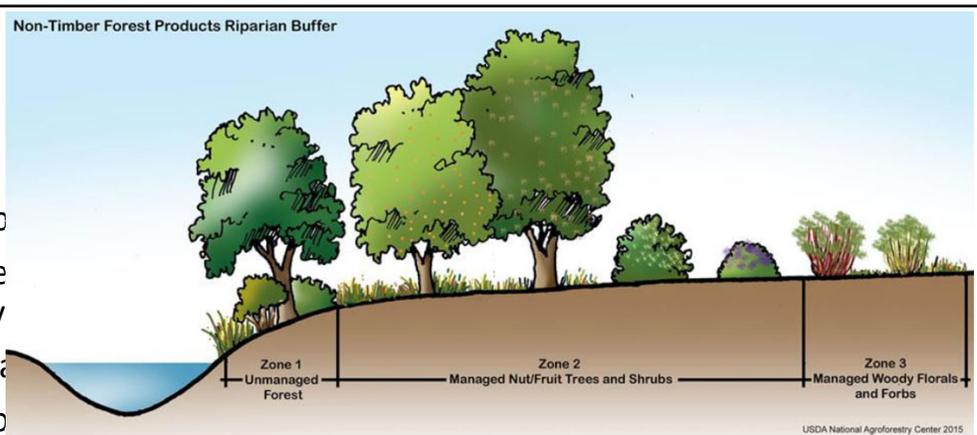
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## Riparian

- Generally pro
- Can be utilize water quality
- Lots of assista
- “Multifunctio



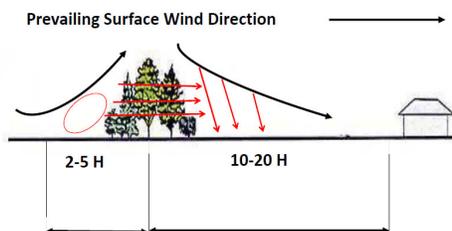
## Alley cropping

- Annual crop (Agro) + Multi-year crop (Forestry)
- Hay? Corn? Herbs? Wheat?
- Walnut? pine? locust?
- Evolving shade



## Wind breaks

- “Loose” 2-5% of field to trees -> maintain crop yield
- Buildings &/or livestock
- Mix of tree species (evergreen, shape & size variety)





## What might be gained?

**Crop tolerance to wind damage**

**High: Wheat, Oat, Barley, Flax**

**Moderate: Corn, Sorghum, Sunflower**

**Low: Alfalfa seedlings, Beans, Cotton, Flowers, Leafy Vegetables, Peas, Peppers, Soybean, Tobacco, Young Orchards**

**Yield increases from 6 to 44%**

Ogbuechi and Brandle (1982)

- soybean flowering 4-10 days earlier
- Peppers and cabbage reached harvest maturity 3-10 days earlier
- Increases in corn, cotton, and vegetable productivity are common





John Fike



National Agroforestry Center



## Why Silvopasture?



### PRODUCTION FUNCTIONS\*

- Increased forage production
- Improved forage nutritive value
- Improved animal performance
- Production of additional products

### ECOSYSTEM FUNCTIONS\*

- Increased biodiversity
- Greater soil fertility
- Reduced soil erosion
- Improved stream quality

## Getting to Silvopasture: Planting



Photo courtesy of NAC  
[http://www.silvopasture.org/Gallery\\_photo2.html](http://www.silvopasture.org/Gallery_photo2.html)

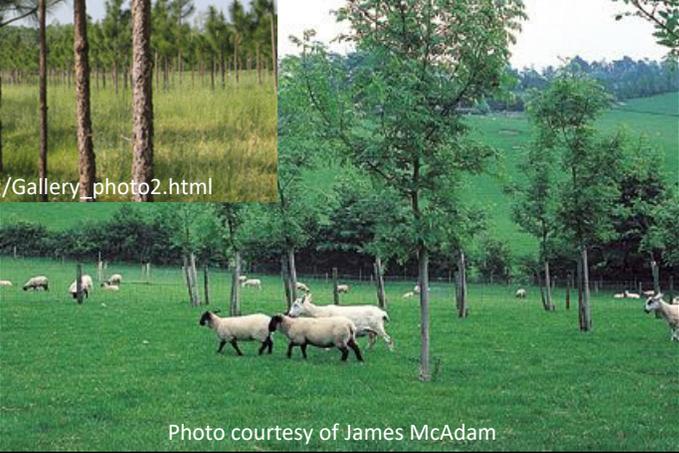


Photo courtesy of James McAdam

## Getting to Silvopasture: Thinning

*Creating valuable production systems from low quality forest stands – not vice versa.*



Invaded woodlot



Mulching

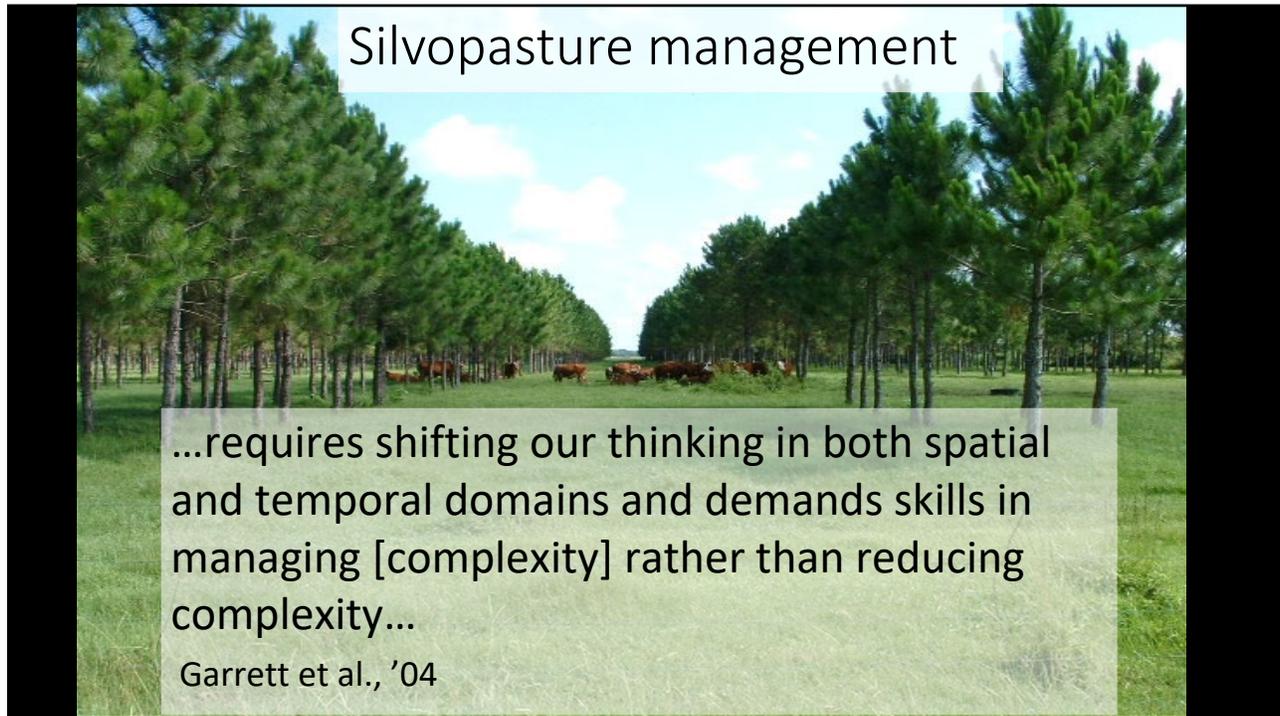


Early establishment

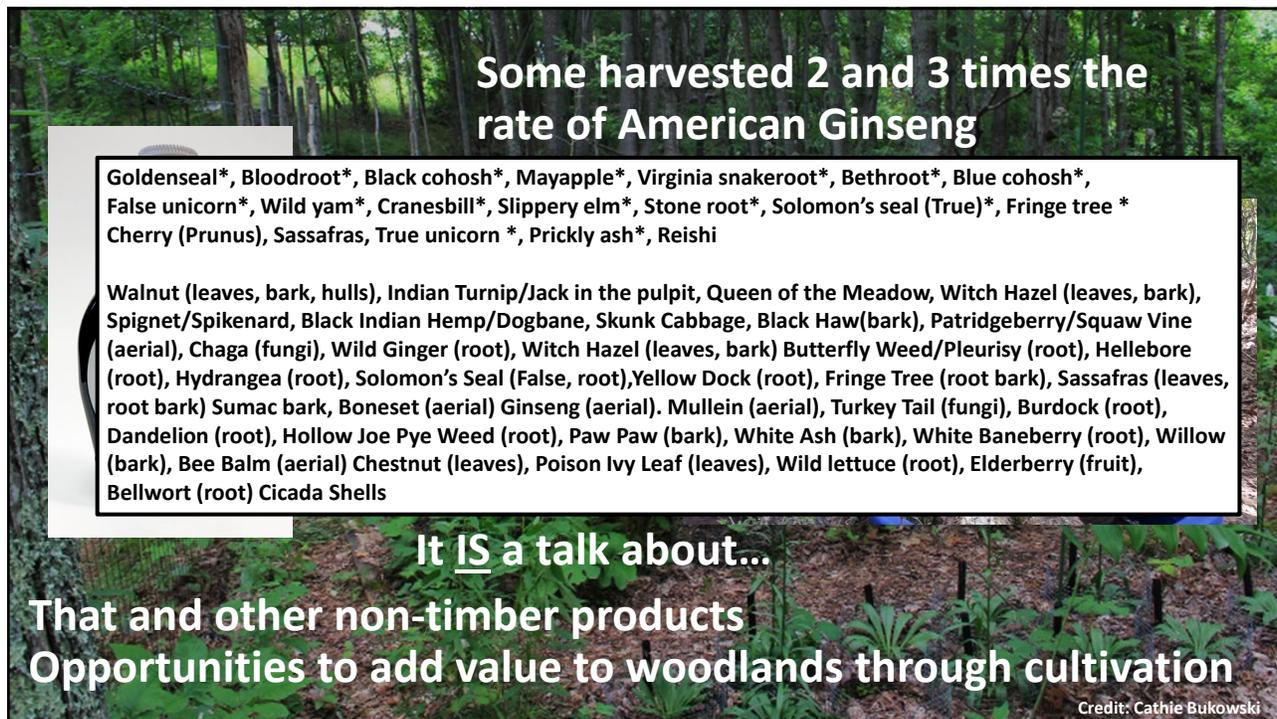


Four years later

Watkins Glen, NY. Photos courtesy B. Chedzoy







**Some harvested 2 and 3 times the rate of American Ginseng**

Goldenseal\*, Bloodroot\*, Black cohosh\*, Mayapple\*, Virginia snakeroot\*, Bethroot\*, Blue cohosh\*, False unicorn\*, Wild yam\*, Cranesbill\*, Slippery elm\*, Stone root\*, Solomon's seal (True)\*, Fringe tree \*  
Cherry (Prunus), Sassafras, True unicorn \*, Prickly ash\*, Reishi

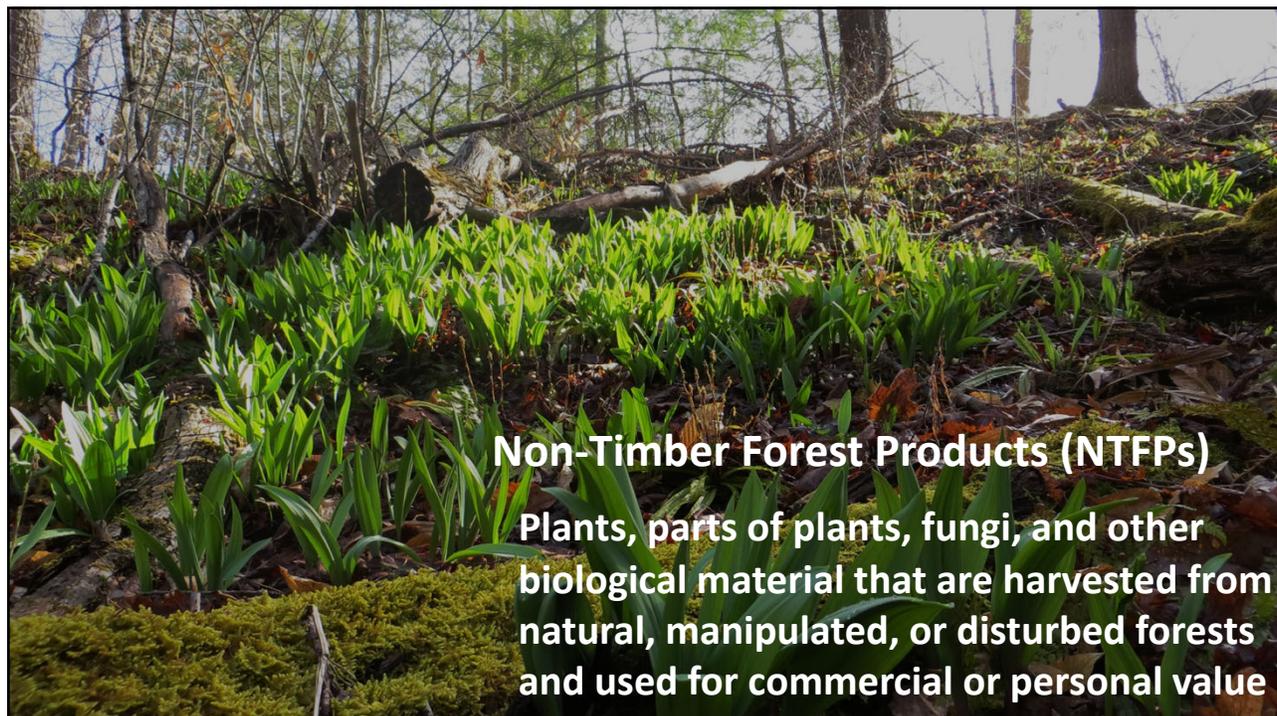
Walnut (leaves, bark, hulls), Indian Turnip/Jack in the pulpit, Queen of the Meadow, Witch Hazel (leaves, bark), Spignet/Spikenard, Black Indian Hemp/Dogbane, Skunk Cabbage, Black Haw(bark), Patridgeberry/Squaw Vine (aerial), Chaga (fungi), Wild Ginger (root), Witch Hazel (leaves, bark) Butterfly Weed/Pleurisy (root), Hellebore (root), Hydrangea (root), Solomon's Seal (False, root), Yellow Dock (root), Fringe Tree (root bark), Sassafras (leaves, root bark) Sumac bark, Boneset (aerial) Ginseng (aerial). Mullein (aerial), Turkey Tail (fungi), Burdock (root), Dandelion (root), Hollow Joe Pye Weed (root), Paw Paw (bark), White Ash (bark), White Baneberry (root), Willow (bark), Bee Balm (aerial) Chestnut (leaves), Poison Ivy Leaf (leaves), Wild lettuce (root), Elderberry (fruit), Bellwort (root) Cicada Shells

**It IS a talk about...**

**That and other non-timber products**

**Opportunities to add value to woodlands through cultivation**

Credit: Cathie Bukowski



**Non-Timber Forest Products (NTFPs)**

Plants, parts of plants, fungi, and other biological material that are harvested from natural, manipulated, or disturbed forests and used for commercial or personal value



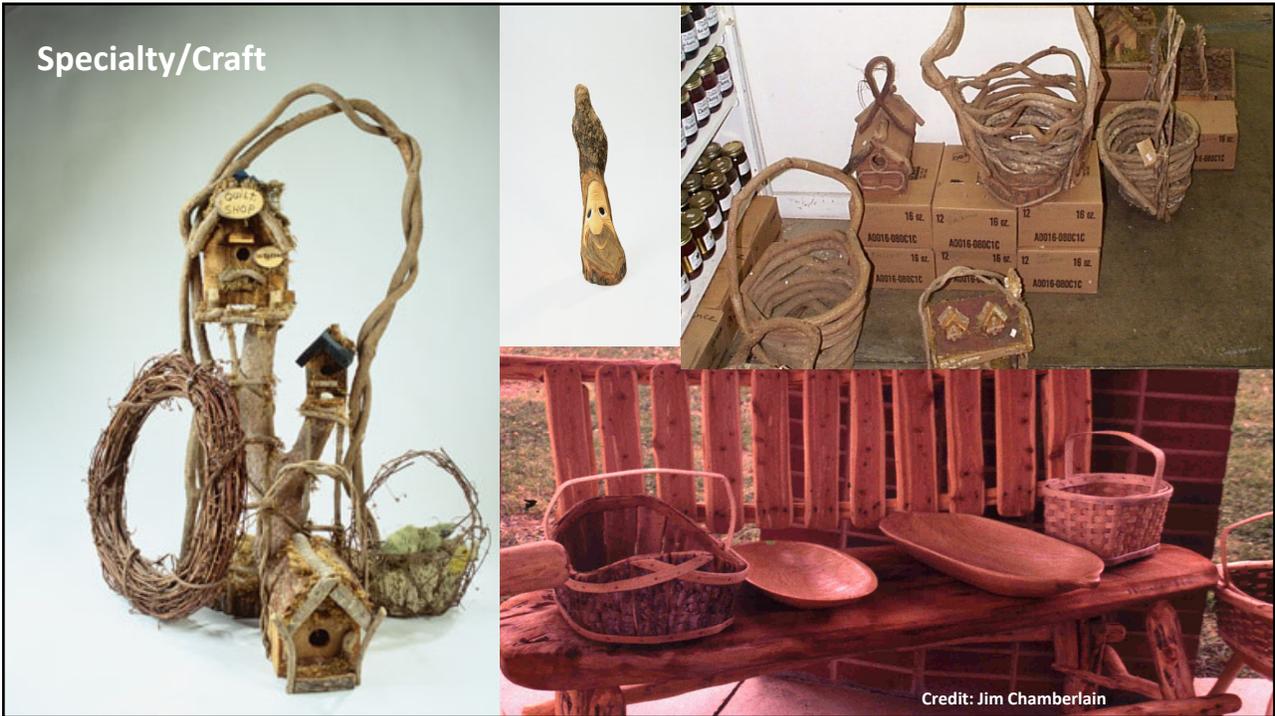


### Floral and Decorative

- Greenery (galax)
- Tips (balsam fir)
- Berries (holly)
- Flowers (rhododendron)
- Straw/cones (pine)

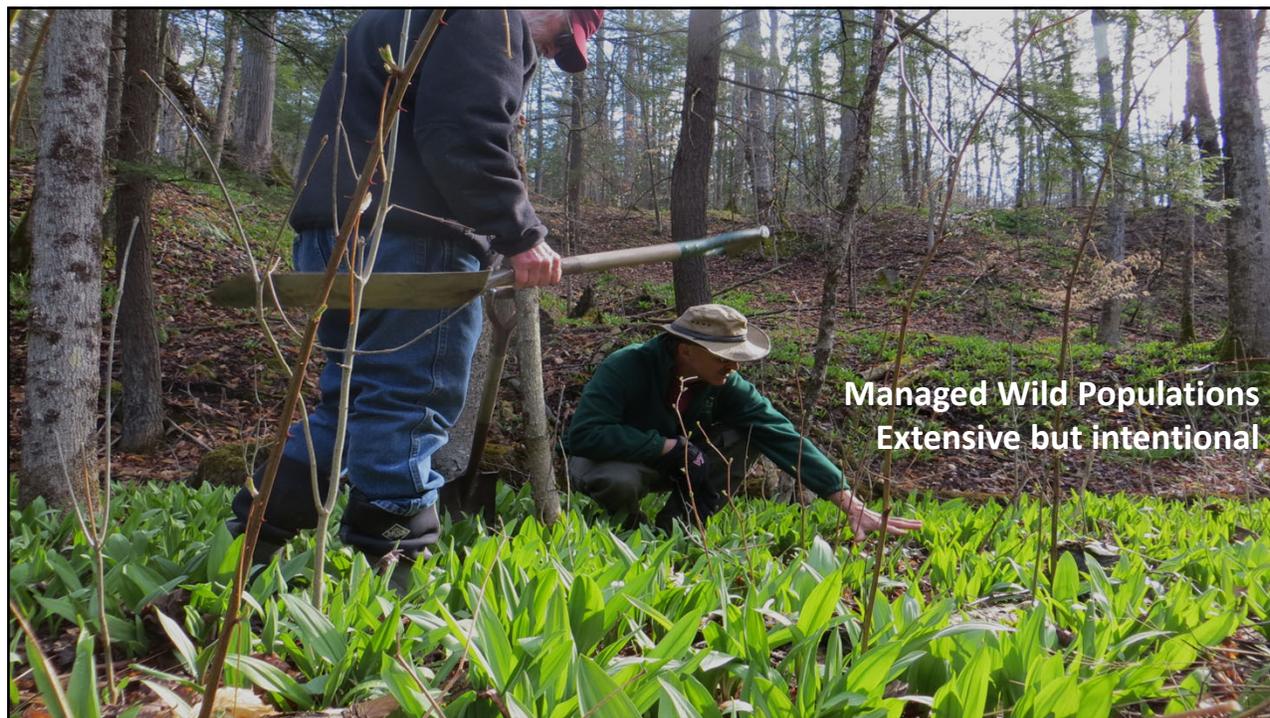


### Specialty/Craft



Credit: Jim Chamberlain







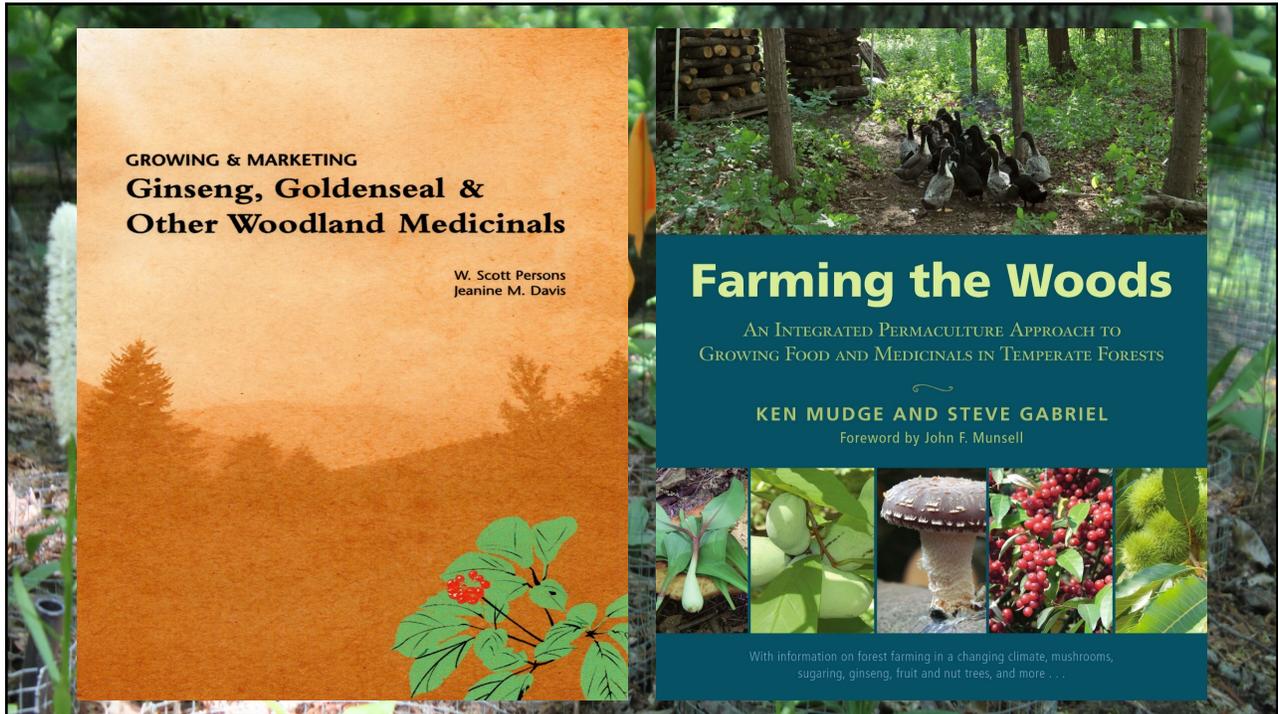
## Why farm in Virginia's forests?

Lots of forestland and forest owners  
Iconic herbal products species in Appalachia

Forest farmed material historically small component of supply  
Price point problem?

Growth and change in herbal products markets  
Quality, sustainability and discriminating consumers game changers

Mr. A. P. Russell, deceased, sits beside a 1700-pound shipment of ginseng in his general store at Buckhannon. All the fabled roots were destined to China



**GROWING & MARKETING**  
**Ginseng, Goldenseal &**  
**Other Woodland Medicinals**

W. Scott Persons  
Jeanine M. Davis

## Farming the Woods

AN INTEGRATED PERMACULTURE APPROACH TO  
GROWING FOOD AND MEDICINALS IN TEMPERATE FORESTS

**KEN MUDGE AND STEVE GABRIEL**

Foreword by John F. Munsell

With information on forest farming in a changing climate, mushrooms, sugaring, ginseng, fruit and nut trees, and more . . .

**2011 consumer sales of herbs and botanicals in the U.S. reached \$5.28 billion, raw materials \$500 million – Nutrition Business Journal**  
**Herbal products industry grown for 13 years straight – \$7+ billion 2017**

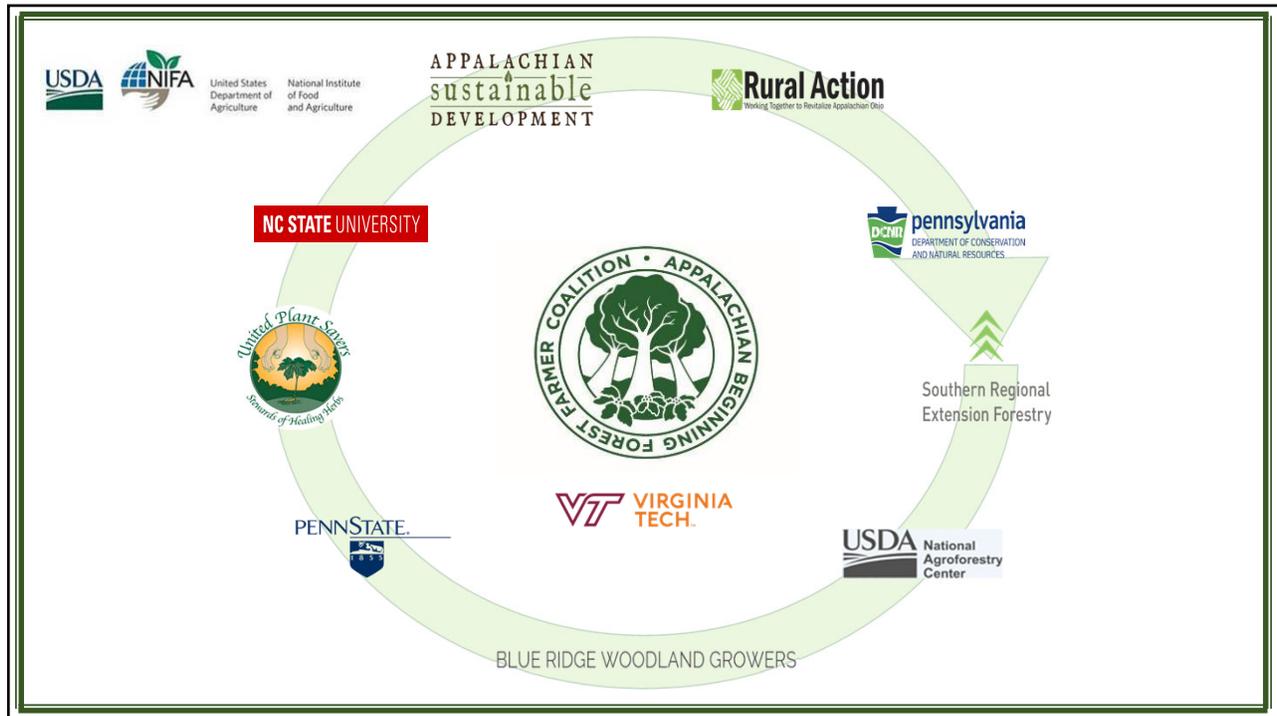
**Sourced for decades almost entirely through wild harvesting...**

## Market Situation

Changing NTFP market focusing on traceable, predictable supply and with teeth in terms of revenue potential and monitoring for sustainability

Forest farming provides an opportunity to add value to NTFP supply chains through chain of custody which meets the needs of industry and consumers







Post-harvest processing equipment and sales assistance nested in certified food handling facility

Aggregates supply from forest farmers that are Forest Grown Verified

**2017 1 herbal products** company purchased 50 pounds of 1 species;

**2019 8-10 companies** seeking thousands of pounds of 4 species

**10-15+ times average price for wild**

Companies beginning to explore contracts, standing up planting stock supply programs

**Demand currently exceeds supply, there is room to grow**

**Revenue?** Tracking NTFPs and mapping markets



Annual volume, trade location, and average prices?  
 Primary buyers of iconic Eastern forest herbal plants

Species	Total Pounds	Mean Dry Price	% of Total Value	Total Value USD\$
Black cohosh	264,455	\$3.62	22%	\$957,327
Bloodroot	21,991	\$10.39	5%	\$228,486
Blue cohosh	3,701	\$2.62	0%	\$9,697
Cranesbill	581	\$2.73	0%	\$1,586
False unicorn	6,143	\$72.14	10%	\$443,156
Goldenseal	106,105	\$22.38	55%	\$2,374,630
Mayapple	13,616	\$3.14	1%	\$42,754
Slippery elm	78,121	\$2.68	5%	\$209,364
Trillium	1,338	\$3.11	0%	\$4,161
VA snakeroot	201	\$84.65	0%	\$17,014
Wild yam	16,675	\$2.44	1%	\$40,687
Sum				\$4,328,864

**Some preliminary comparisons indicate a 30-fold increase from first point of sale to retail**



<https://ext.vt.edu/natural-resources/forest-farming.html>

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Agriculture Community & Leadership Family Food & Health Lawn & Garden Natural Resources

## Silvopasture

**Related Topics**

- Beef Cattle
- Diagnostic and Laboratory Services
- Forest Farming
- Sheep

**Events**

- Animal Agriculture events calendar

**Program Supporters**

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**SARE**  
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**NRCS**  
Natural Resources Conservation Service

Silvopasture, one of five agroforestry practices, is of growing interest in Virginia. While trees have benefited Virginia livestock for eons by the shelter they offer, the purposeful integration of trees and forage, which both are important to...

**Forest Farming**  
17.1K subscribers

HOME VIDEOS PLAYLISTS COMMUNITY CHANNELS ABOUT

**The Appalachian Beginning Forest Farmer Coalition**  
Forest Farming • 7:15 (viewed 2 years ago)  
What is the ABFFC and who is involved? This video explores the coalition, its partners, goals, and outcomes. Please watch and consider becoming a member!

**Sustainable Harvest of Goldenseal and Yellowroot** ▶ PLAY ALL

- Sustainable Harvest of Goldenseal 4:17
- Washing and Drying Goldenseal 2:04
- Washing, drying, and packaging Yellowroot 6:28
- Sustainable Yellowroot Harvest 3:28

virtual farm to table virginia

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# VIRTUAL FARM TO TABLE

Shiitake Mushrooms

**Acknowledgements**

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**Dr. John Munsell, VT Dept. of Forest Resources and Environmental Conservation**