

Polyculture Production

Agroforestry and Other Diversified Farming and Forestry Strategies

John Munsell

VIRGINIA TECH

Photo courtesy of John Fike



Agroforestry

crops among trees, trees among crops

Photo courtesy of John Fike



Agroforestry

If you can't do one thing, you can always do something else

Photo courtesy of John Fike

Water Quality – Nutrient Credit Trading



World tour




Mediterranean Sea
MOROCCO
Casablanca
Rabat
Marrakech
Bechar
ALGERIA
Tripoli
Banghazi
LIBYA
Alexandria
Cairo
EGYPT
Western Sahara
El Aalun
Tamanrasset
Al Jawt
Aswan
Red Sea
MAURITANIA
Nouakchott
MALI
Lombouctou
NIGER
Agadez
Faya-Largeau
CHAD
Port Sudan
ERITREA
Asmara
Dakar
Nema
Khartoum
Banjul
SENEGAL
THE GAMBIA
Bissau
GUINEA BISSAU
Conakry
Freetown
SIERRA LEONE
Monrovia
LIBERIA
Bamako
Niamey
Zinder
Al Fashir
SUDAN
DJIBOUTI
Djibouti
Berbera
BURKINA
Ouagadougou
GUINEA
BENIN
TOGO
Porto-Novo
Lagos
Accra
IVORY COAST
Abidjan
GHANA
Kano
Maiduguri
NIGERIA
Abuja
N' Djamena
Addis Ababa
ETHIOPIA
Waw
Juba
CENTRAL AFRICAN REPUBLIC
Bangui
CAMEROON
Yaounde
Malabo
EQUATORIAL GUINEA
Libreville
GABON
CONGO
Brazzaville
Pointe-Noire
ANGOLA
DEMOCRATIC REPUBLIC OF THE CONGO (ZAIRE)
Kisangani
Kinshasa
Kalemie
Kananga
UGANDA
Kampala
KENYA
Nairobi
SOMALIA
Mogadishu
Kigali
RWANDA
BURUNDI
Bujumbura
Lake Victoria
Lake Tanganyika
Mombasa
Zanzibar
Dar es Salaam
TANZANIA
Mbeya
Lake Nyasa
MALAWI
Luanda
Malanje
ANGOLA
Lobito
Namibe
Menongue
Ndola
Lilongwe
ZAMBIA
Lusaka
Nacala
Harare
ZIMBABWE
Bulawayo
MOZAMBIQUE
Beira
MADAGASCAR
Antananarivo
Toliara
NAMIBIA
Windhoek
BOTSWANA
Gaborone
Pretoria
SOUTH AFRICA
Walvis Bay
South Atlantic Ocean
Indian Ocean







Photo credit: National Geographic




Blended…



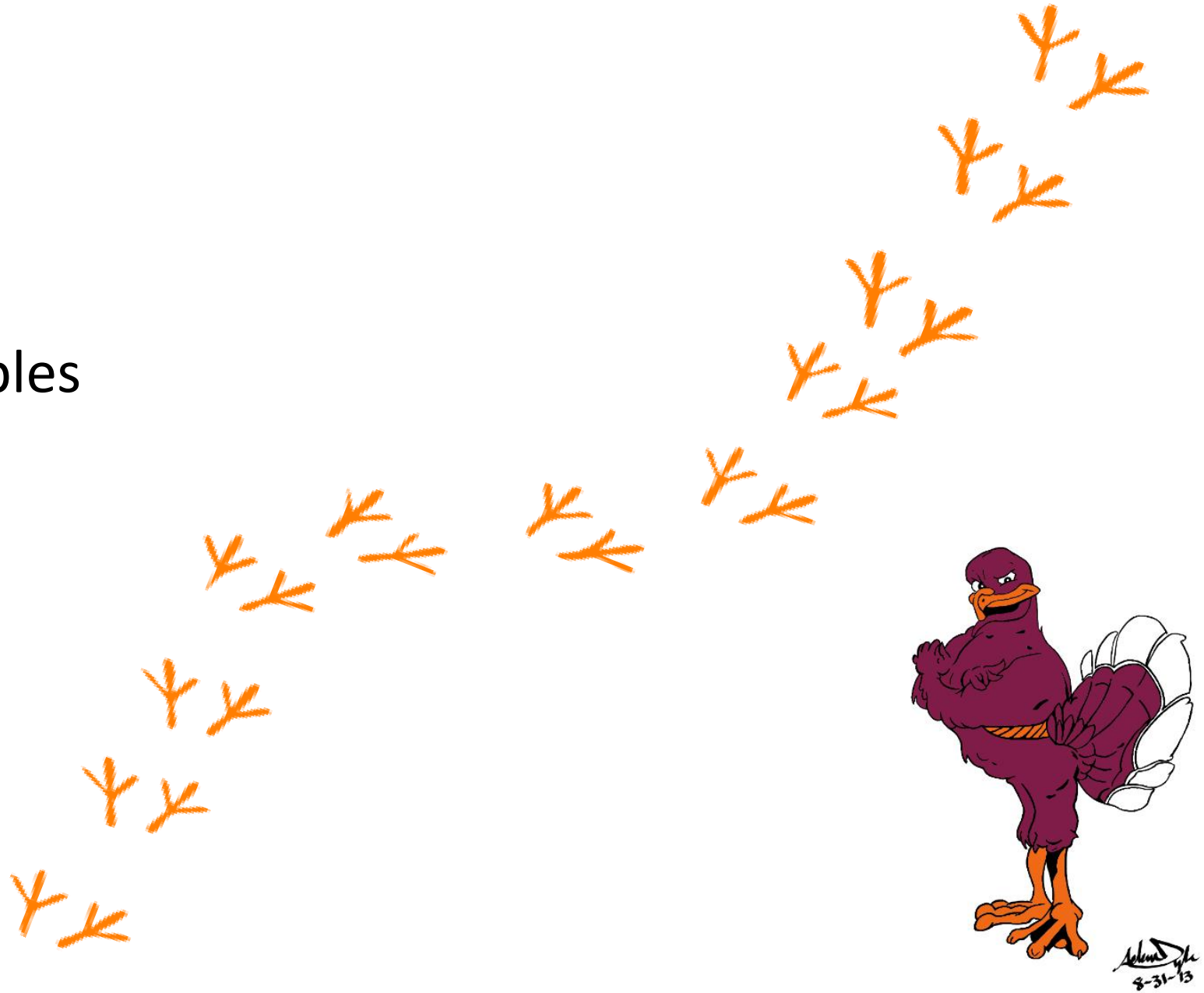
Cathie Bukowski



Agroforestry Principles

Agroforestry Practices

Applications and Examples



Agroforestry.....

an intensive and holistic land-management practice that optimizes the benefits from biological interactions created when trees are combined with crops and/or livestock (Garrett 1997)



Agroforestry

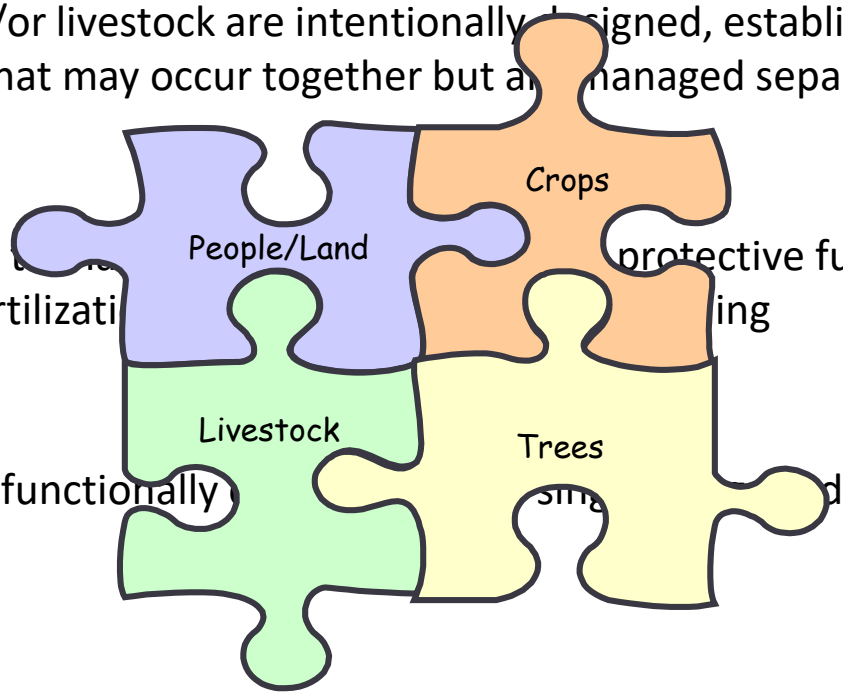
“if you can’t do one thing, you can always do something else”

Intentional

Combination of trees, crops, and/or livestock are intentionally designed, established, and/or managed to work together rather than individual elements that may occur together but are managed separately

Intensive

Created and intensively managed [illegible] protective functions, and often involve cultural operations such as cultivation, fertilizati[illegible]ing



Integrative

Components are structurally and functionally [illegible] d management unit tailored to meet the objectives of the landowner

Interactive

Agroforestry actively manipulates and utilizes the biophysical interactions among system components to yield multiple harvestable products, while concurrently providing numerous social and ecological benefits

Creative

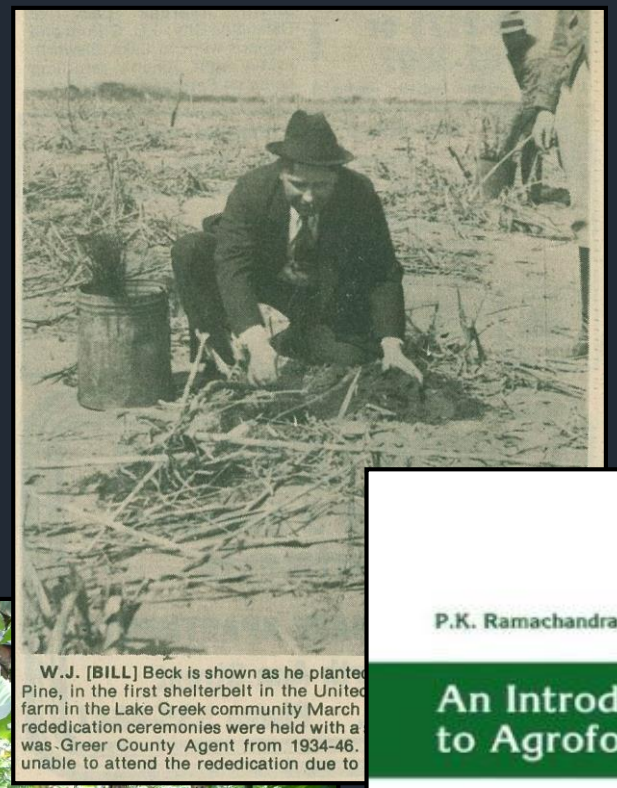
Framework for optimizing production across a landscape, working with as opposed to against variable conditions

Agroforestry has…

History

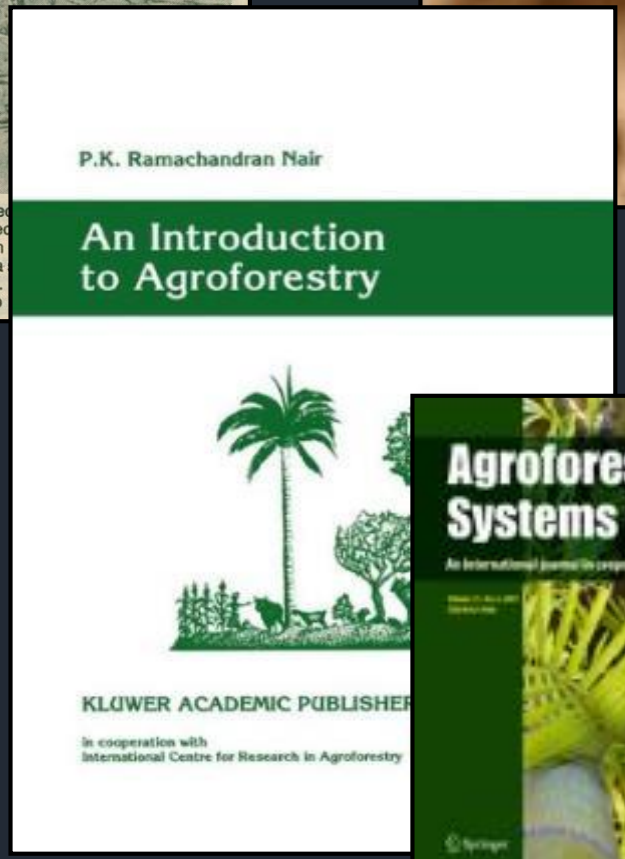
Is…

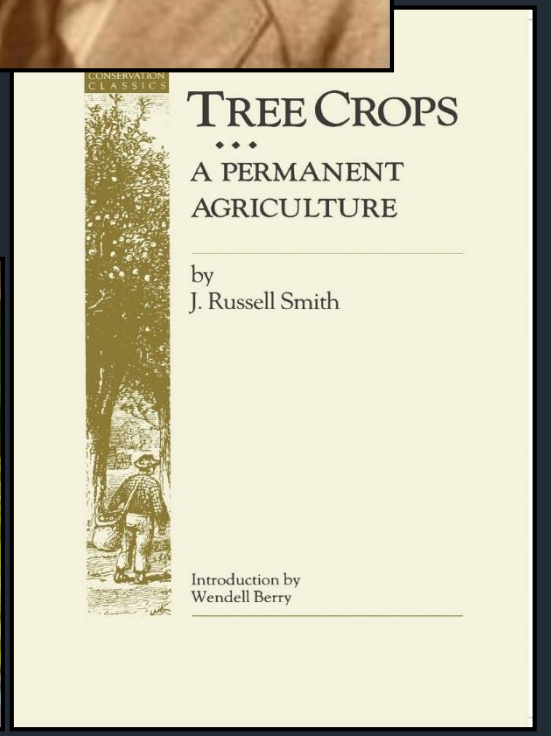
Systematic












Not…
Zoner photo studio


Not…
John Fike



Is…

National Agroforestry Center


Not…

Definitely not…




Is…
Cathie J. Bukowski


In the field…


Along creeksides…


In the woods…


Big farms…


Small farms…


In places near…



Greg Frey

Long in rural areas…



Long in rural areas…







The Community Food Forest HANDBOOK

How to Plan, Organize, and Nurture Edible Gathering Places

Catherine Bukowski and John Munsell



easingly in towns and cities…

Catherine J. Bukowski

Agroforestry Principle

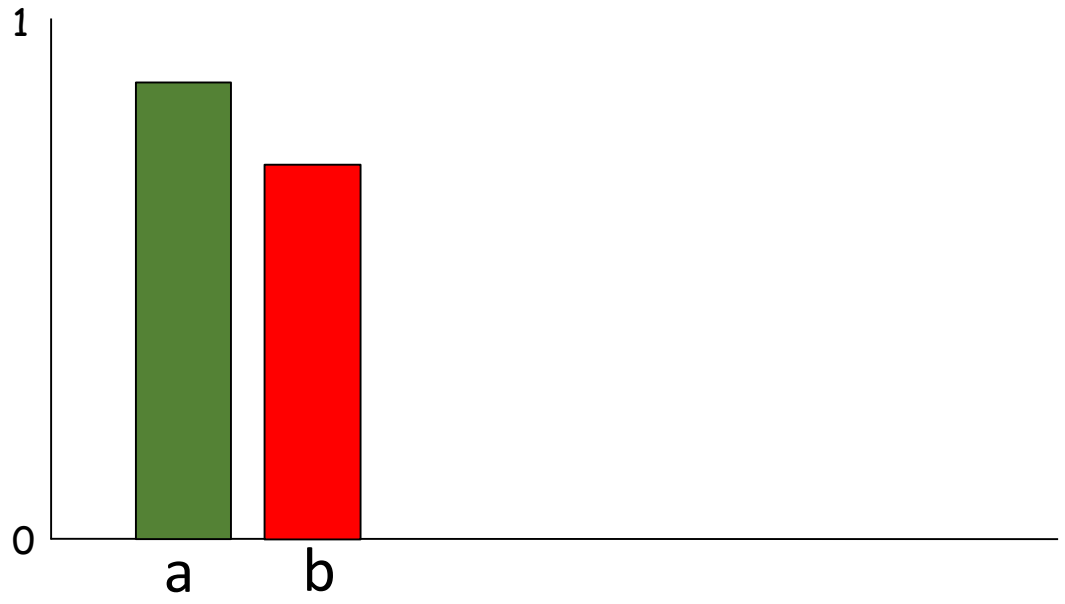
Over-yielding – Total production from combinations of crops and trees exceeds the production of just one of those crops grown alone on the same site

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

Agroforestry Principle

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

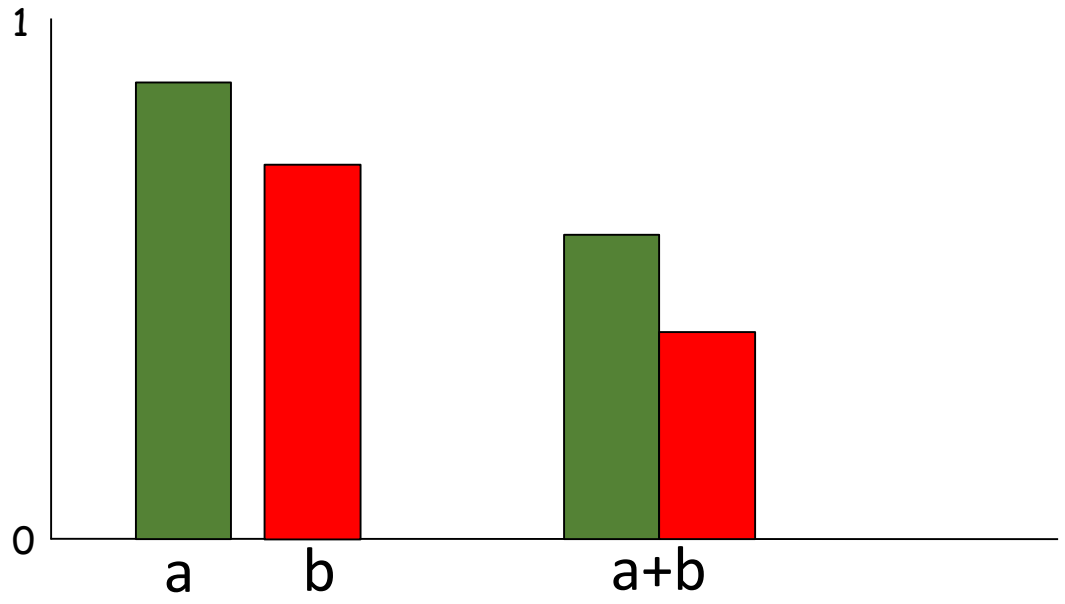
Different species utilize resources at different times, various rates of efficiency, and assorted vertical and horizontal layers



Agroforestry Principle

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

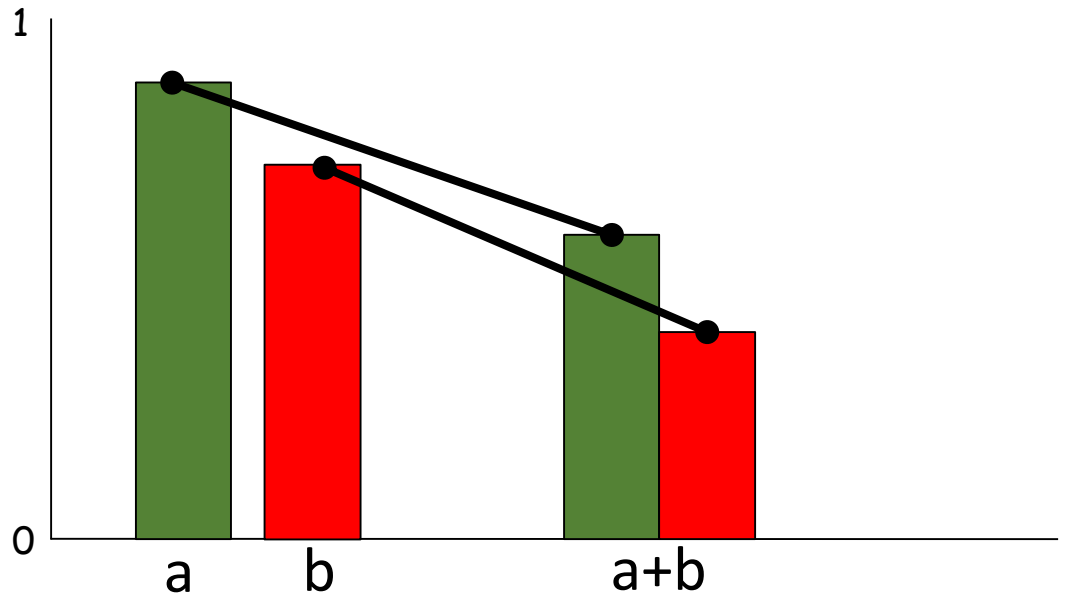
Different species utilize resources at different times, various rates of efficiency, and assorted vertical and horizontal layers



Agroforestry Principle

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

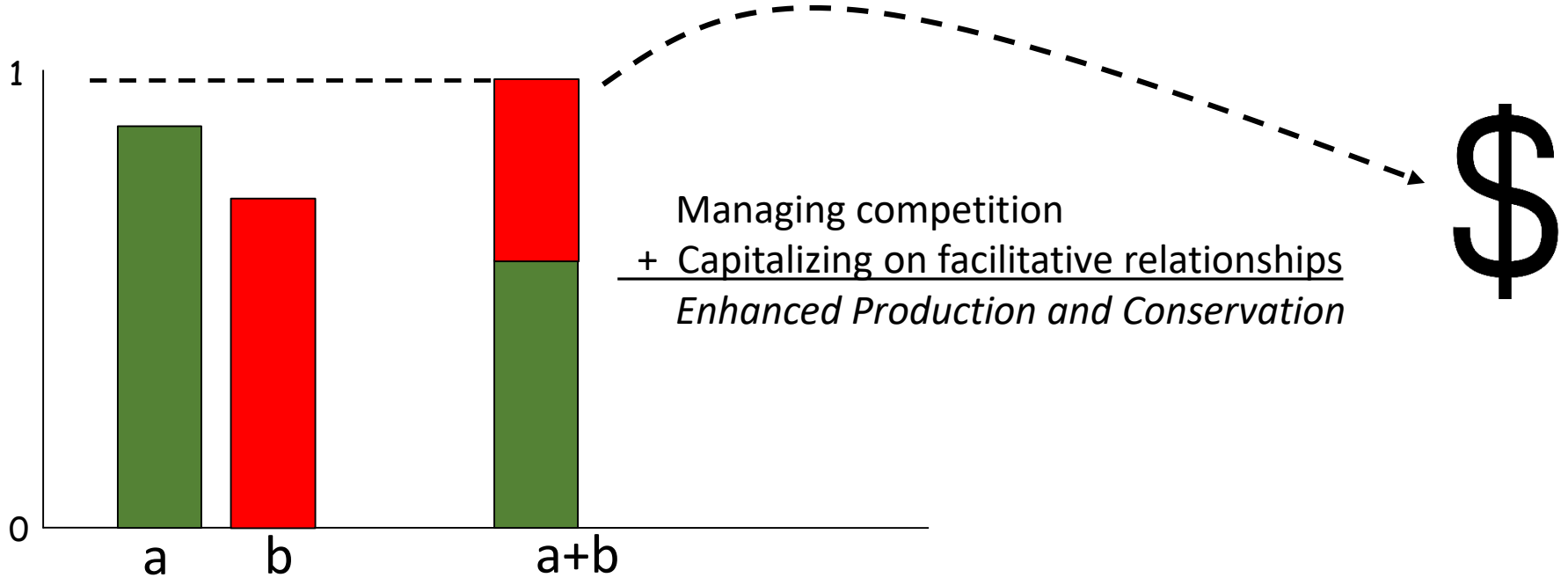
Different species utilize resources at different times, various rates of efficiency, and assorted vertical and horizontal layers



Agroforestry Principle

Over-yielding – Total production from combinations of crops and 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





Why is agroforestry important?

Forest Ecosystem Mimicry



Why is agroforestry important?

Population growth, climate, water, air, pests and disease



Why is agroforestry important?

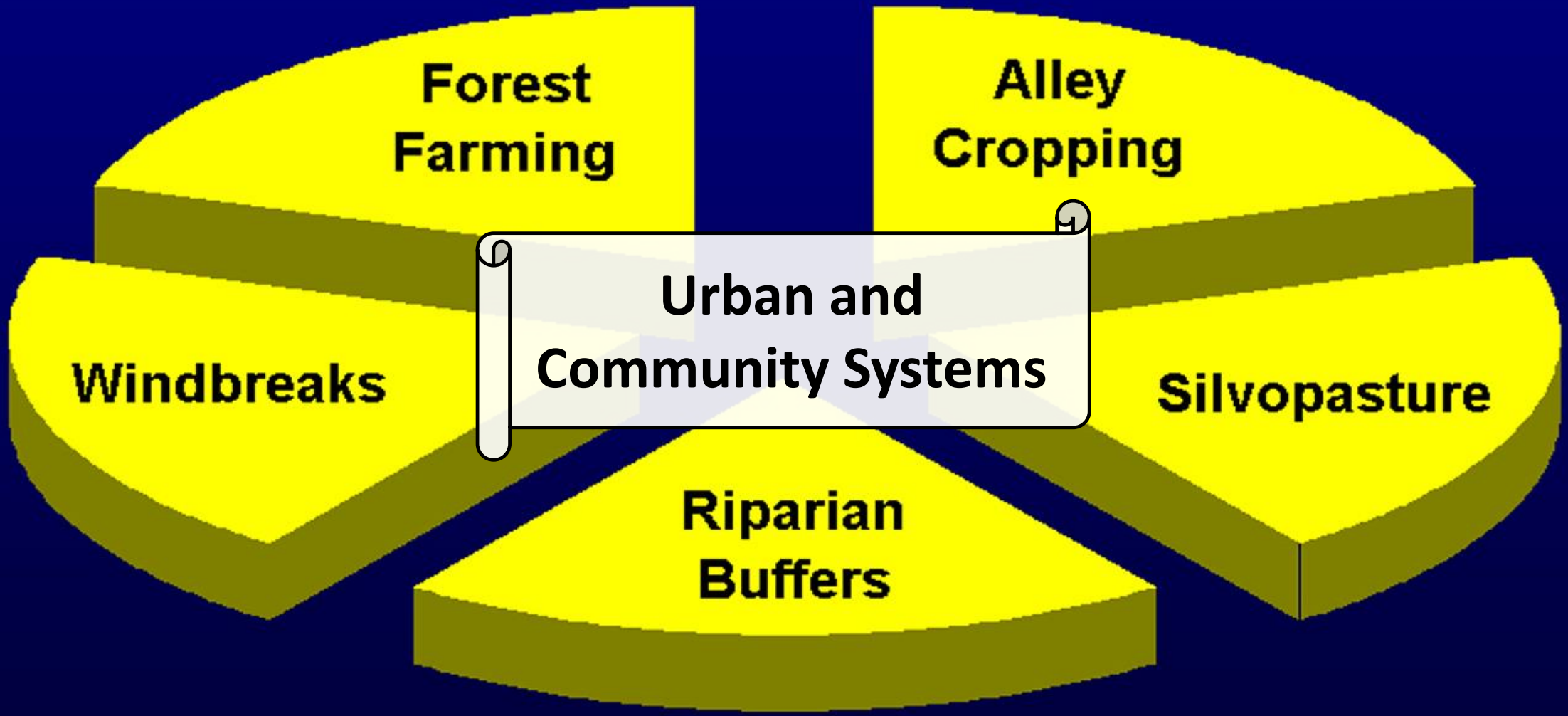
Opportunities to improve revenue and/or yield

Offers an opportunity to achieve conservation and biodiversity goals

Annual and perennial production through polyculture

Diversify production and buffer operations

Agroforestry Practices





Practices


Silvopasture



Silvopasture

Photo courtesy of the National Agroforestry Center


Plant in field


Thin existing woodlands


Thin existing woodlands


Many cool and warm season grasses and legumes yield high levels of quality forage when under as much as 50 percent shade


Using mast producing trees increases overall production


Walnuts


Forest Farming

Non-Timber Forest Products

Medicinal
Edible
Floral and Decorative
Specialty



Bloodroot – Sanguinaria canadensis credit: Jeanine Davis

Medicinal

Nutraceutical

Holistic

Ethnobotanical

Wood (cedar oils)
Bark (slippery elm)
Buds (cottonwood)
Leaves (catnip)
Roots (goldenseal)
Fruit/flowers (St. John's Wort)
Pollen (ash)



Edible

Mushrooms
Nuts
Honey
Syrup
Fruit, leaves, roots of plants and ferns
Berries for jams, jellies, juices, wines



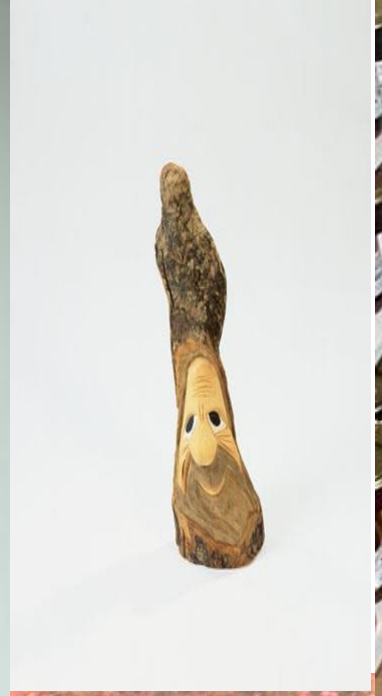
Floral and Decorative

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



Specialty/Craft









Credit: Jim Chamberlain



Forest Farming Methods

Woods Grown
Wild Simulated
Managed Wild Populations


Woods Grown


Wild Simulated


Wild Simulated


Wild Simulated


Managed Wild Populations



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

Virginia leading the way



Cultivating Forest Medicinals, Creating Healthy Economy

By Eliza Laubach

Appalachia's forests feature an especially concentrated diversity of medicinal plants. From the famous ginseng to lesser-known false unicorn, many of these plants are valued in today's herbalism industry.

A traditional culture of harvesting plants like ginseng and ramps from the region's expansive forests has long helped to sustain area families. Now, a movement called forest farming is emerging to grow these plants in private forestland to decrease strains on plant populations and strengthen the market for Appalachian botanicals.

Cultivators Coalesce

Shafts of afternoon sunlight dapple the forest floor. A path bordered by partly rotten branches

Crops Research and Extension Center in Mills River, N.C., is a learning tool for extension agents, graduate students and members of the WNC Medicinal Herb Growers Club. All work together to plant the seeds and track the health of Appalachian forest medicinal plants.

Lorri Burra, a member of the club, first planted ginseng on her land seven years ago in an old box spring frame. For two years, she saw nothing, so she stopped looking. Then last year, she saw the ginseng.

"The plants move around," she says, "you can't even weed." Sure enough, a ginseng plant grows outside of the box.

Jeanine Davis, extension specialist and a teacher to Burra and many others, specializes in research and development for growing new crops,



Michelle Pridgen, above, dug black cohosh last fall. This autumn, she plans to harvest it again. Photo by Priya Jaishanker. Other plants are commonly misidentified as black cohosh, left. There are 23 temperate species in black cohosh's genus, Actaea. *Photo by Eliza Laubach*

the U.S. Department of Agriculture and consists of 14 partners: universities, nonprofit organizations, governmental agencies and a regional extension program. Members include herbal medicine processors and growers.

The most commonly tended roots like ginseng and black cohosh

woodland coves and is heavily dug in the fall harvest season. It has several lookalikes and is not always correctly identified when wild harvested.

Black cohosh often fetches a lower price than stinging nettle, according to Pennsylvania State University ethnobotanist and coalition partner Eric Burkhart. Even though

Warner Secures More than $590,000 for Project to Expand Forest Farming Coalition Efforts in Appalachia

Oct 18 2019

oth D-VA) announced $593,056 in federal funding for a Virginia Tech
Farmer Coalition (ABFFC) by increasing membership and improving
llows a strong push by Sen. Warner, who has urged continued
ulture (NIFA). The funding was awarded through the Beginning Farmer
s grants to support education, mentoring, and technical assistance

t Virginia, I know the importance of forest farming for both our econom
secure this funding, which will foster leadership and further strengther

they face and how I can support their work at the federal level. One big
ant to farm. I'm excited that this federal funding will help train the next

le, decorative, and handicraft non-timber forest products (NTFP) under
abitats that favor growth and enhance production. Forest farming allow
ated, and sustainable. In 2016, consumers spent an estimated $7.45
illion from 2013.

ental and non-governmental organizations that share a common goal o
ilities among forest farmers. The project, "Seeded and Growing:

MARK R. WARNER
VIRGINIA

COMMITTEES:
FINANCE
BANKING, HOUSING, AND URBAN AFFAIRS
BUDGET
INTELLIGENCE
RULES AND ADMINISTRATION

United States Senate
WASHINGTON, DC 20510–4606

May 15, 2019

Dr. J. Scott Angle
Director
National Institute of Food and Agriculture
305-A Whitten Building
Washington, DC 20024

Dear Director Angle:

I write today in support of Appalachian Sustainable Development's (ASD) grant proposal to the United States Department of Agriculture's (USDA) Beginning Farmer and Rancher Development Program (BFRDP) for the project titled "Seeded and Growing: Sustaining Appalachian Beginning Forest Farmer Education and Engagement."

I understand this project would continue a multi-state collaborative effort supporting education, mentoring, and technical assistance programs designed to foster and expand production and market opportunities for non-timber forest products (NTFPs) in Central Appalachia. The Appalachian region has some of the richest, most diverse forests in the country, capable of growing a valuable array of botanicals including ginseng, goldenseal, and black cohosh. The proposed work will mobilize essential resources to help increase raw material supply chains in the region, which are currently undervalued and underdeveloped.

This project furthers ASD's mission to create a more diverse and resilient economy in Appalachia through its support of local agriculture initiatives. The Appalachian Beginning Forest Farmer Coalition, funded in part through the USDA BFRDP, has played an instrumental role in improving agroforest production opportunities in Appalachia by educating the public and creating a strong forest farming network in the region. However, continued investment in this initiative is needed to ensure that this project is able to reach its full potential. I am highly committed to finding ways to mobilize and sustain advancement of this agricultural opportunity in Appalachia.

I ask that you give this proposal every appropriate consideration. Should you or your staff have any questions, please contact Micah Barbour at 202-224-6291 or Micah_Barbour@warner.senate.gov.

Sincerely,

Mark R. Warner
United States Senator

MARK R. WARNER
VIRGINIA

COMMITTEES:
FINANCE
BANKING, HOUSING, AND URBAN AFFAIRS
BUDGET
INTELLIGENCE
RULES AND ADMINISTRATION

United States Senate
WASHINGTON, DC 20510–4606

March 19, 2019

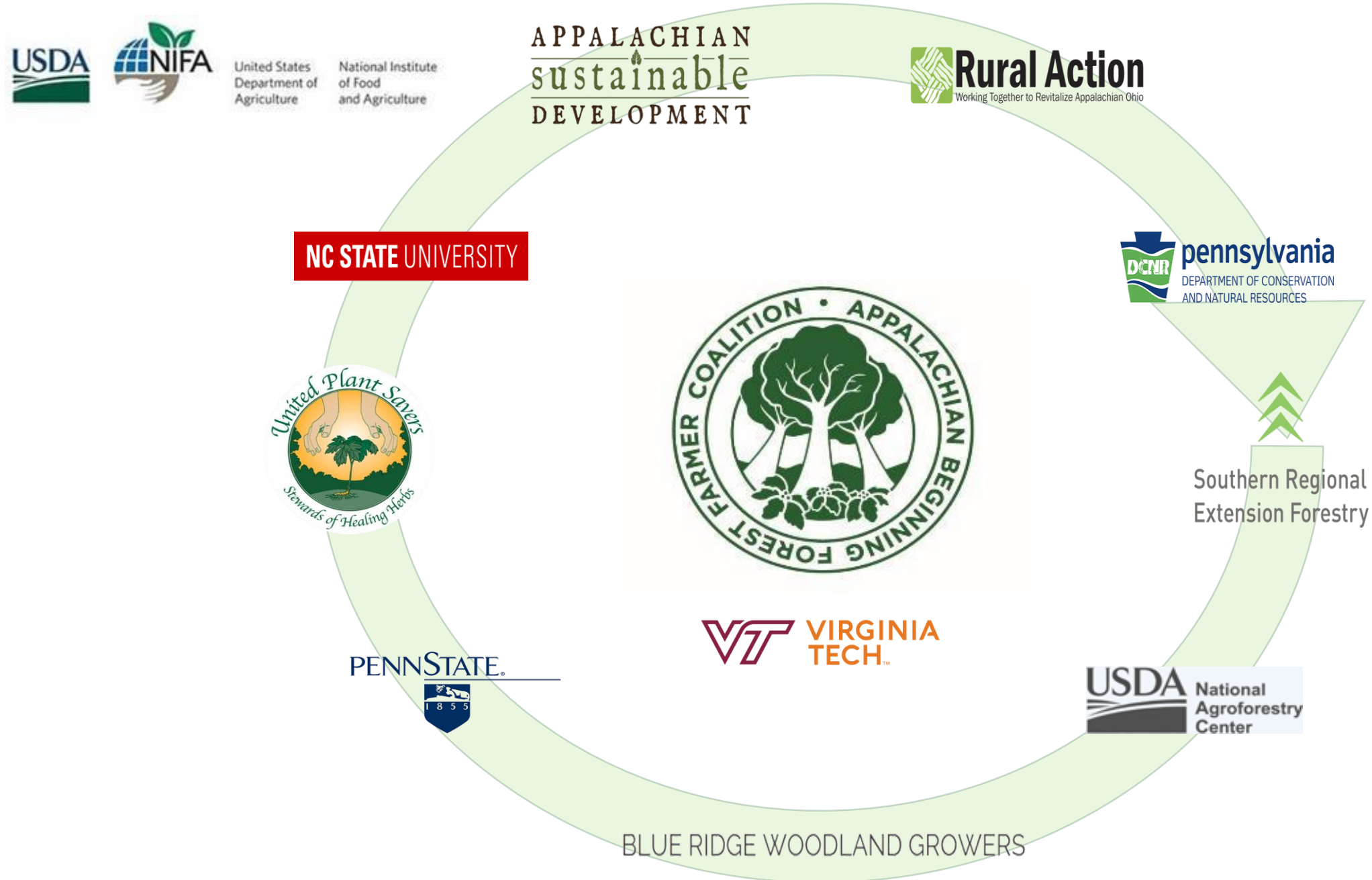
The Honorable Vicki Christiansen
Chief
United States Forest Service
201 14th Street, SW
Washington, DC 20024

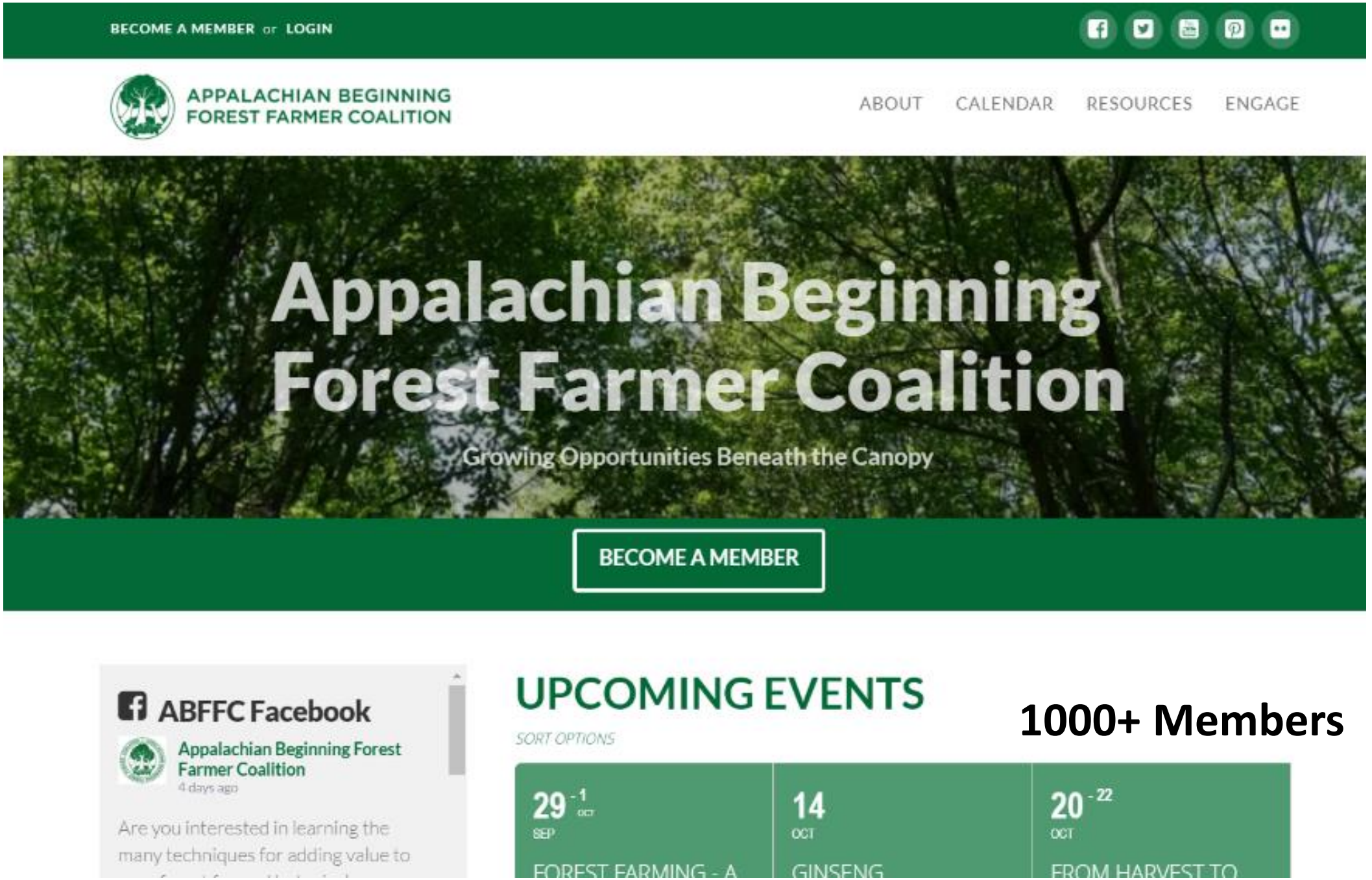
Dear Chief Christiansen:

I write today concerning the Forest Service's tracking and management of non-timber forest products (NTFPs). The United States has 766 million acres of forests that support local communities, states, and the economy. NTFPs are the plants, fungi, and other biological material that keep our forests healthy and productive. These products are harvested, processed, and sold throughout the nation – primarily in rural communities. Increased attention to these products by the Forest Service would lead to sounder management decisions for the nation's forests and support the people, communities, and industries that rely on NTFPs.

Dozens of herbal, edible, and decorative non-timber plants and fungi grow in our nation's forests, and hundreds of thousands of pounds of raw material are harvested each year and sold to supply a multi-billion dollar specialty crop market. Demand for these products is on the rise globally, and the implications for NTFP management and markets are substantial. Sales in the herbal products industry have increased 13 years in a row and over half of the woodland botanical species that supply herbal product manufacturers are native to the forests of the United States. However, many NTFP markets are underdeveloped because little standardized information is available on the volume, geographic distribution, and pricing for harvested non-timber products. In addition, the timing and quality of raw material are difficult to predict, leading to market-wide inefficiencies. This lack of data hamstrings business planning and makes long-term resource management impossible.

For decades, the Forest Service has generated an annual Timber Products Output (TPO) report as part of its Forest Inventory and Analysis (FIA) program. TPO reports publish standardized


USDA
NIFA
United States Department of Agriculture
National Institute of Food and Agriculture
APPALACHIAN sustainable DEVELOPMENT
Rural Action
Working Together to Revitalize Appalachian Ohio
NC STATE UNIVERSITY
pennsylvania
DCNR
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
United Plant Savers
Stewards of Healing Herbs
FARMER COALITION • APPALACHIAN BEGINNING FOREST
Southern Regional Extension Forestry
VIRGINIA TECH
PENNSTATE
1855
USDA National Agroforestry Center
BLUE RIDGE WOODLAND GROWERS


BECOME A MEMBER or LOGIN
APPALACHIAN BEGINNING FOREST FARMER COALITION
ABOUT
CALENDAR
RESOURCES
ENGAGE
Appalachian Beginning Forest Farmer Coalition
Growing Opportunities Beneath the Canopy
BECOME A MEMBER
ABFFC Facebook
Appalachian Beginning Forest Farmer Coalition
4 days ago
Are you interested in learning the many techniques for adding value to
UPCOMING EVENTS
SORT OPTIONS
29 - 1 OCT
SEP
14
OCT
20 - 22
OCT
FOREST FARMING - A
GINSENG
FROM HARVEST TO
1000+ Members

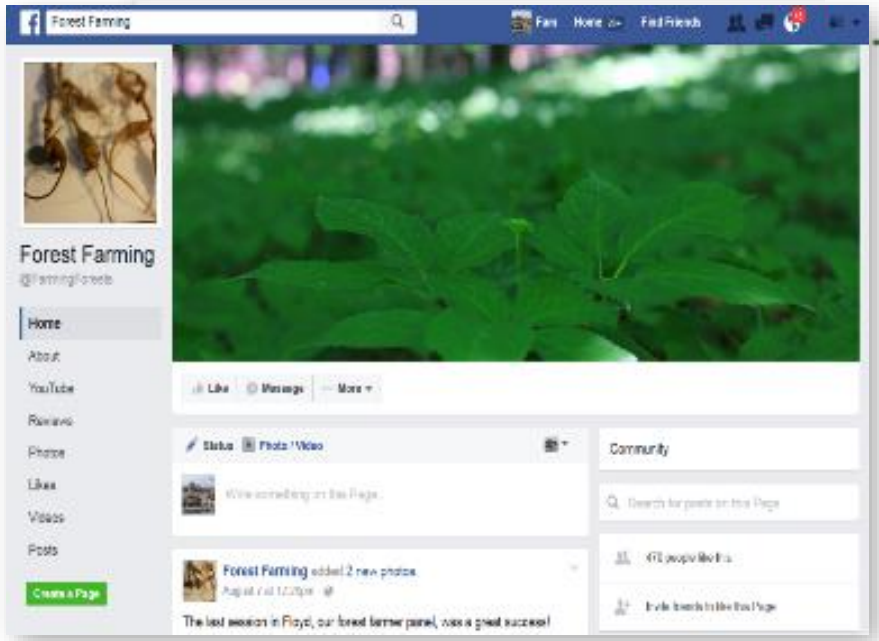


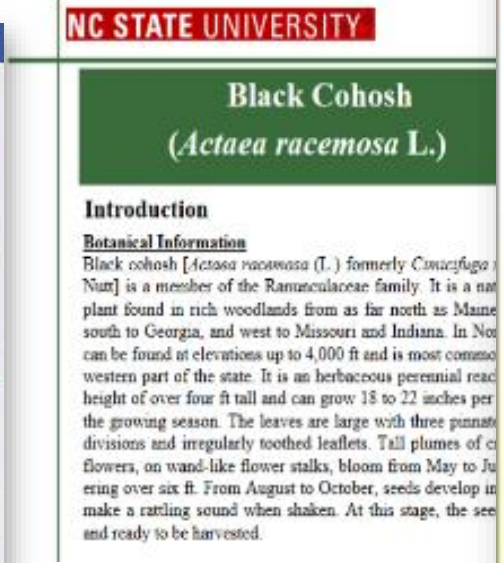
14 Forest Farming Training Programs

700+

Compendium






NC STATE UNIVERSITY

Black Cohosh
(*Actaea racemosa* L.)

Introduction

Botanical Information

Black cohosh [*Actaea racemosa* (L.) formerly *Cimicifuga* Nutt] is a member of the Ranunculaceae family. It is a native plant found in rich woodlands from as far north as Maine south to Georgia, and west to Missouri and Indiana. In North can be found at elevations up to 4,000 ft and is most common western part of the state. It is an herbaceous perennial reaching height of over four ft tall and can grow 18 to 22 inches per the growing season. The leaves are large with three pinnate divisions and irregularly toothed leaflets. Tall plumes of c flowers, on wand-like flower stalks, bloom from May to Ju ering over six ft. From August to October, seeds develop in make a rattling sound when shaken. At this stage, the see and ready to be harvested.


FOREST FARMING FOOTNOTES

Spring 2016

IN THIS ISSUE

Dear Community Members,

Big changes are underway in our forest farming community given the USDA's recent award of almost $6M/20C to a forest farming alliance of non-governmental organizations, universities, and government agencies. The support is part of the Beginning Farmer and Rancher Development Program, which was launched in 2008 to invest in next generation farmers and ranchers. The alliance includes many members of the forest farming community and will deliver an array of services to beginning forest farmers, connect key actors across the domestic medicinal forest plant supply chain, and bring the farming of plant populations to the forefront in Appalachia and beyond. This newsletter provides a brief overview of project activities and upcoming opportunities for this and other community member projects and initiatives. Also, Holly Chrisman has taken over Forest Farming Footnotes responsibilities from Catherine Bukowski, who is working diligently to complete her graduate program. We all owe Cathie a great deal of thanks for her excellent work in the past. Rudos! It is good to be back at it and communicating. Hope you enjoy this issue!

John Munsell Holly Chrisman Priya Jaishanker

TABLE OF CONTENTS

Who we are 2
Become a member! 3
Regional projects 4-6
Upcoming events 7
Project development 8
A look back at 2015 9

12,000+ YouTube Subscribers, 2 million+ views

Compendium

Forest Farming Site Evaluation Report

This report is provided by Virginia Tech's Center for Geospatial Information Technology for the PlantShoe project. The project is supported by the eXtension Foundation. The report serves as a siting tool that assesses habitat quality for plant species across a selected landscape broken out by 10 meter square grids. The ranking is expert-based and uses environmental criteria (e.g., percent forest cover, slope) identified in relevant literature. It is intended to help forest farmers and consultants when deciding where to establish forest farms. It is not a tool for "hunting" woodland plants, nor does it guarantee farming success. It is also not intended to replace on-the-ground feasibility assessments.



Figure 1: USGS Orthoimagery

Geographic Location: 39.6119, -78.1685 **Planar Area:** 19.38 acres

PlantShoe Botanical Detectives · VIRGINIA TECH · eXtension Issues + Innovation + Impact · CGIT

Black Cohosh

Weight scores (0-100) represent site suitability for each grid cell. Color codes can be used to reference site suitability across the associated maps.

Aspect

The aspect map shown in figure 2 is created from the USGS National Elevation Dataset. This data has a spatial resolution of 1/3 arc-second, ~ 10 meters. Click here for more information

Class	Weight	Percent of Site
North	100	24.89
Northeast	100	2.45
East	100	2.57
Southeast	50	3.5

Class	Weight	Percent of Site
South	30	5.37
Southwest	50	8.29
West	30	15.89
Northwest	50	37.03

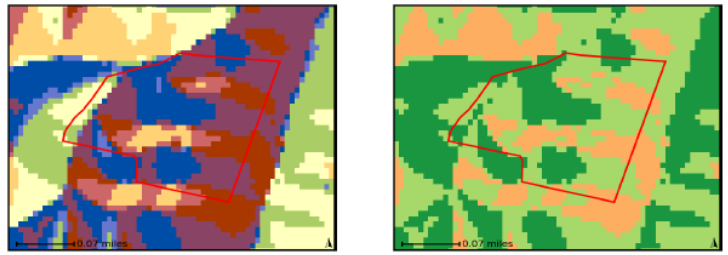


Figure 2: Aspect

Elevation

The contour map shown in figure 3 is created from the USGS National Elevation Dataset. This data has a spatial resolution of 1/3 arc-second, ~ 10 meters. The contours are generated dynamically at a 10 foot interval.

Elevation Classifications

Class	Weight	Percent of Site
< 200	0	25.18
200 - 1200	100	74.82
> 1200	0	0.0

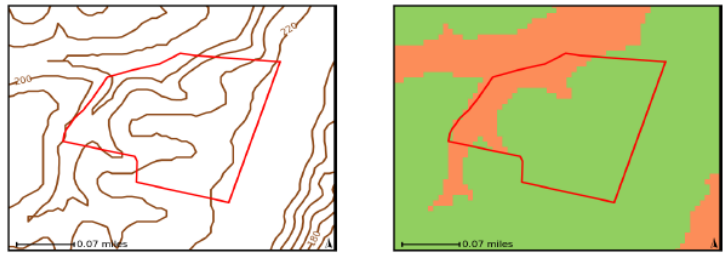


Figure 3: Elevation

Species Summary

The sub-scores for the variables are accumulated to calculate a total score for each species. The total score for each species can be averaged to calculate an overall score that describes the overall suitablity of the site. Possible scores range from 0-700.

Species	Aspect	Elevation	Slope	Soil Fertility	Soil Moisture	Soil Drainage	Forest Canopy	Total Score
Black Cohosh	42.238	74.82	87.46	6.27	46.69	39.94	56.5	353.918
Bloodroot	42.238	74.82	87.46	6.27	0.0	39.94	28.24	278.968
Goldenseal	42.238	74.82	87.46	6.27	0.0	39.94	28.24	278.968
Ramps	56.36	0.0	89.26	6.27	0.0	39.94	72.46	264.29
							Average Score	294.036

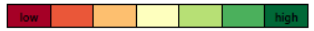


Figure 34: Overall site suitability scores.

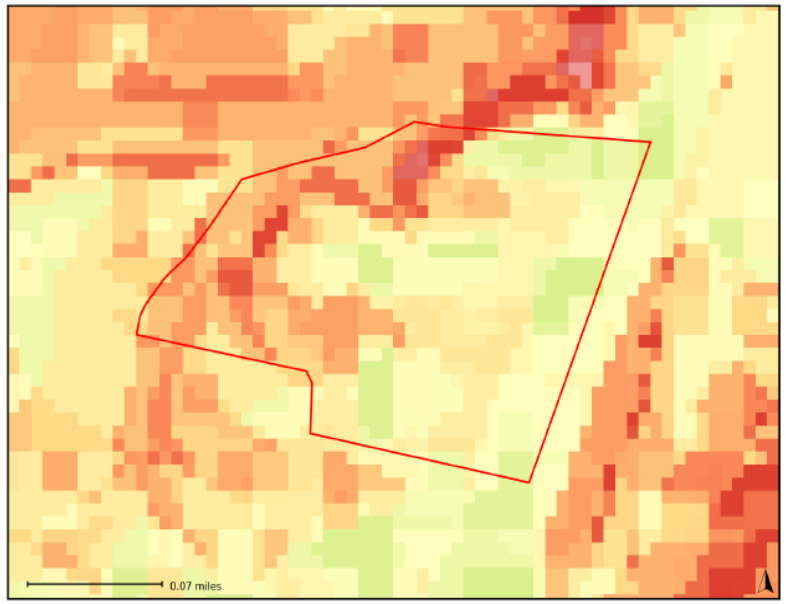


Figure 35: Overall site suitability.

USDA NIFA United States Department of Agriculture National Institute of Food and Agriculture

APPALACHIAN sustainable DEVELOPMENT

Rural Action
Working Together to Revitalize Appalachian Ohio

NC STATE UNIVERSITY

pennsylvania DCNR DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

United Plant Savers
Stewards of Healing Herbs

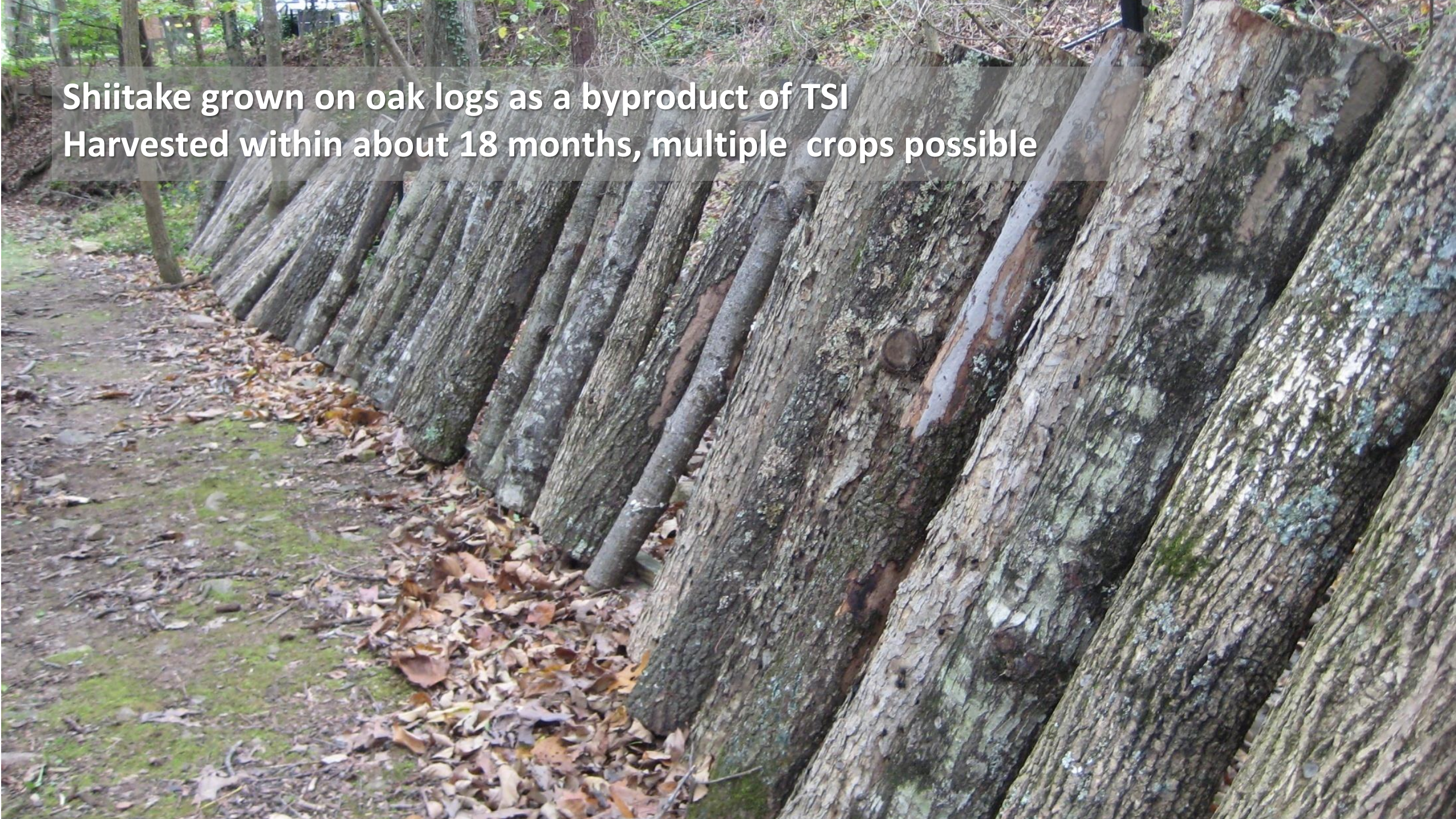


Organic Growers School

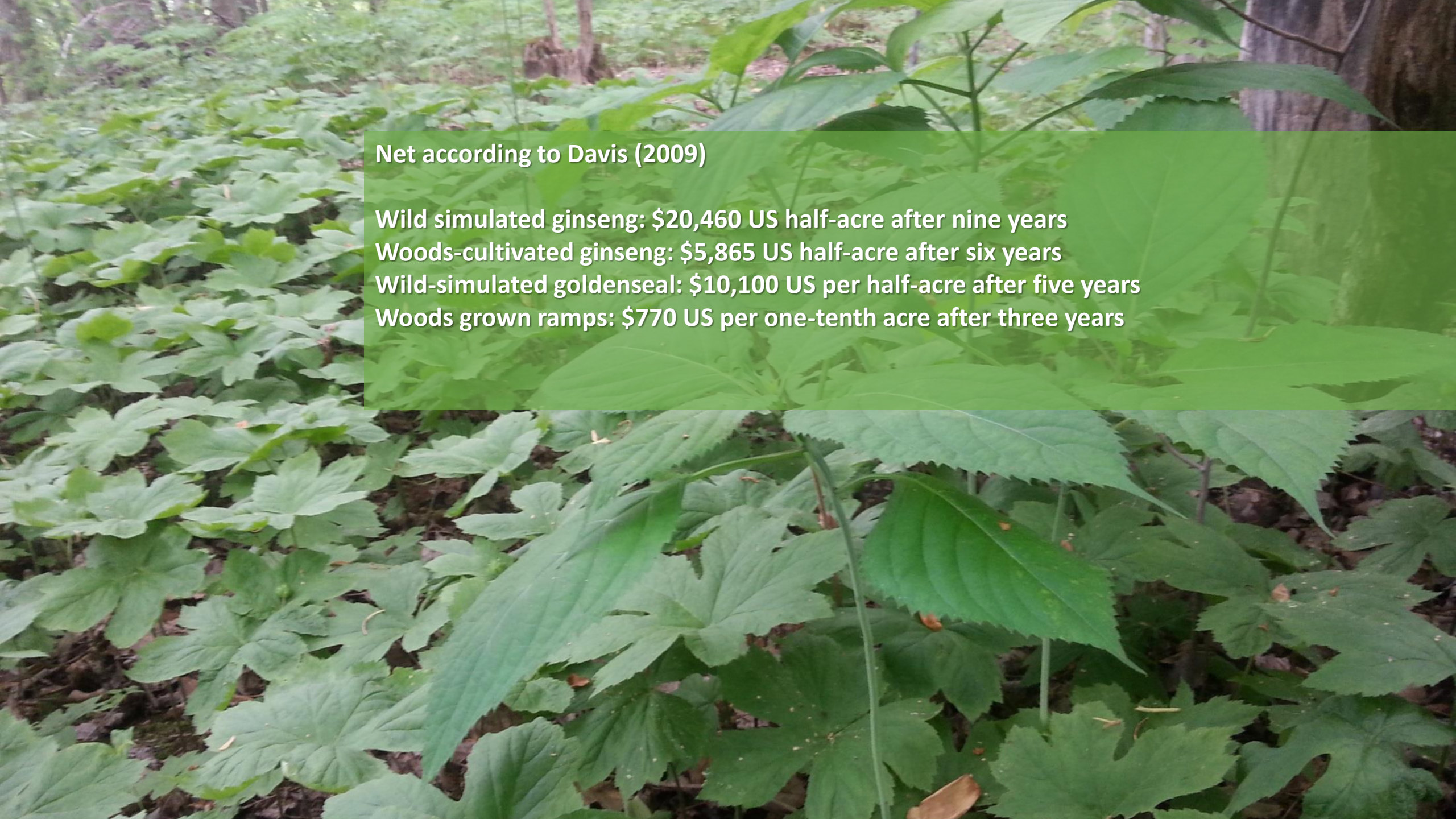
PENNSTATE 1855

USDA National Agroforestry Center

YEW MOUNTAIN CENTER


Shiitake grown on oak logs as a byproduct of TSI
Harvested within about 18 months, multiple crops possible





Net according to Davis (2009)

Wild simulated ginseng: $20,460 US half-acre after nine years
Woods-cultivated ginseng: $5,865 US half-acre after six years
Wild-simulated goldenseal: $10,100 US per half-acre after five years
Woods grown ramps: $770 US per one-tenth acre after three years


Windbreaks

What is gained?

Crop tolerance to wind damage

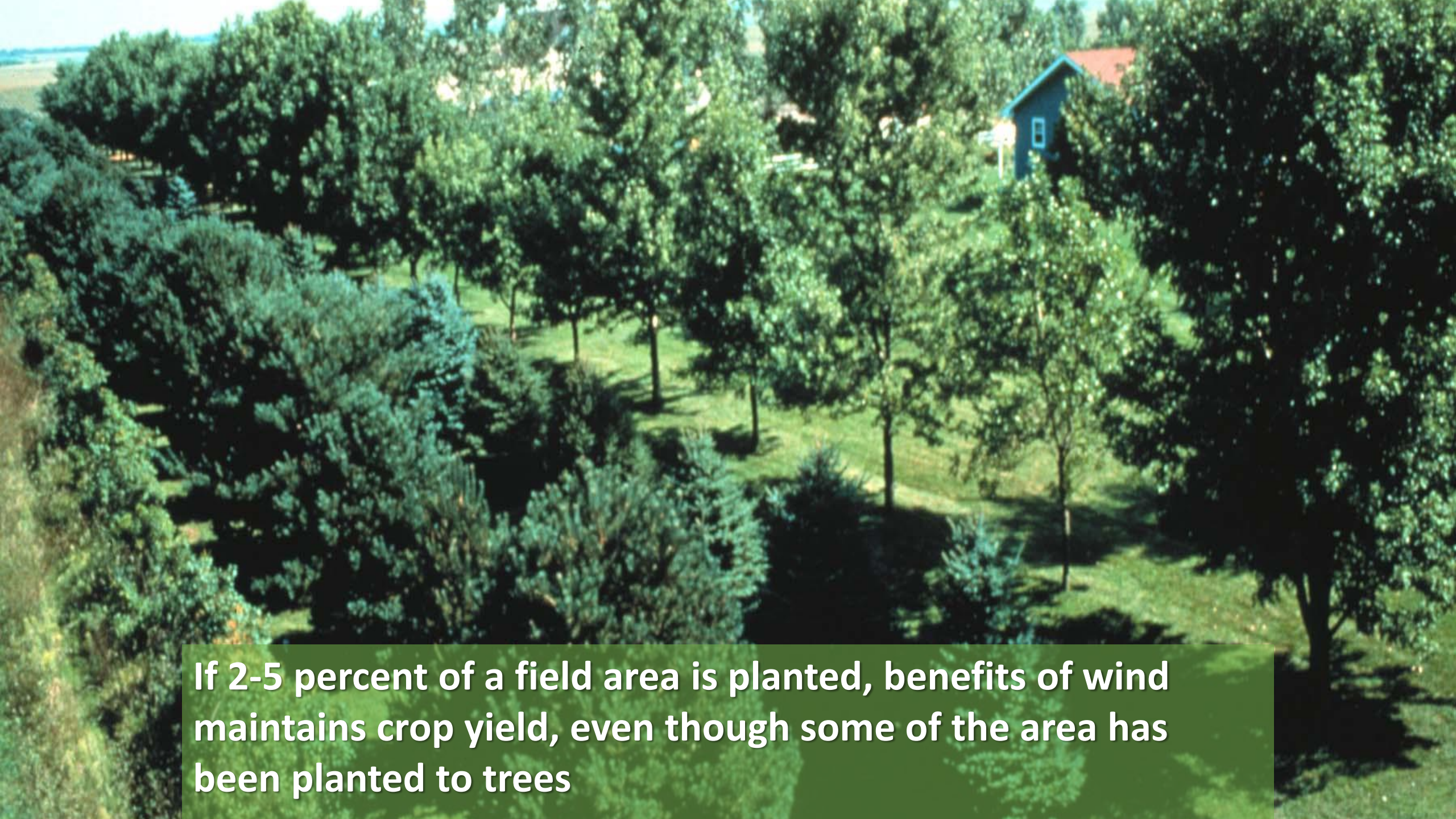
<u>High</u>: Wheat, Oat, Barley, Flax

<u>Moderate</u>: Corn Sorghum, Sunflower

<u>Low</u>: Alfalfa seedlings, Beans, Cotton, Flowers, Leafy Vegetables, Peas, Peppers, Soybean, Tobacco, Young Orchards

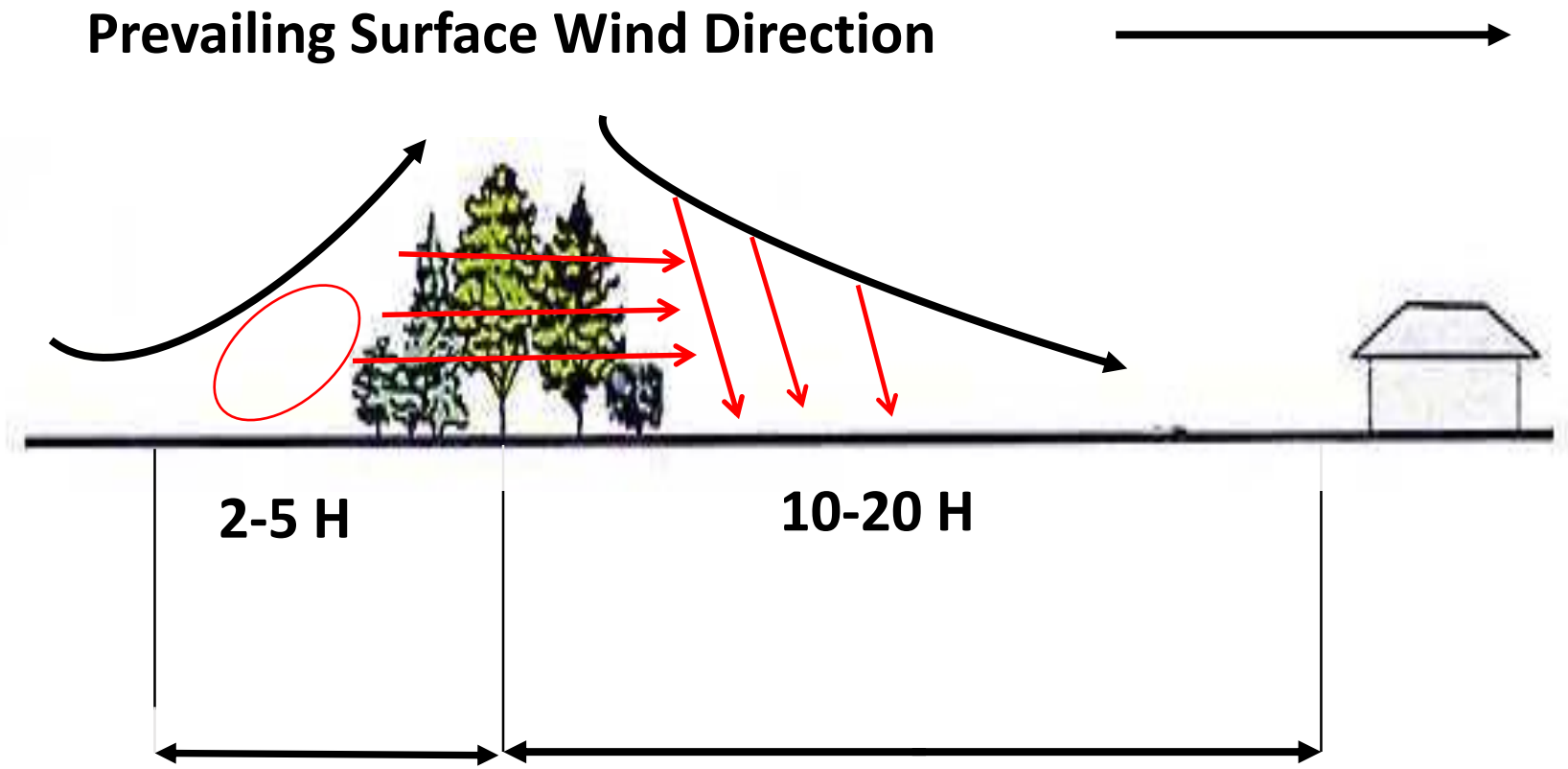
Ogbuechi and Brandle (1982) soybean flowering 4-10 days earlier
Peppers and cabbage reached harvest maturity 3-10 days earlier
Increases in corn, cotton, and vegetable productivity are common

Yield increases from 6 to 44%

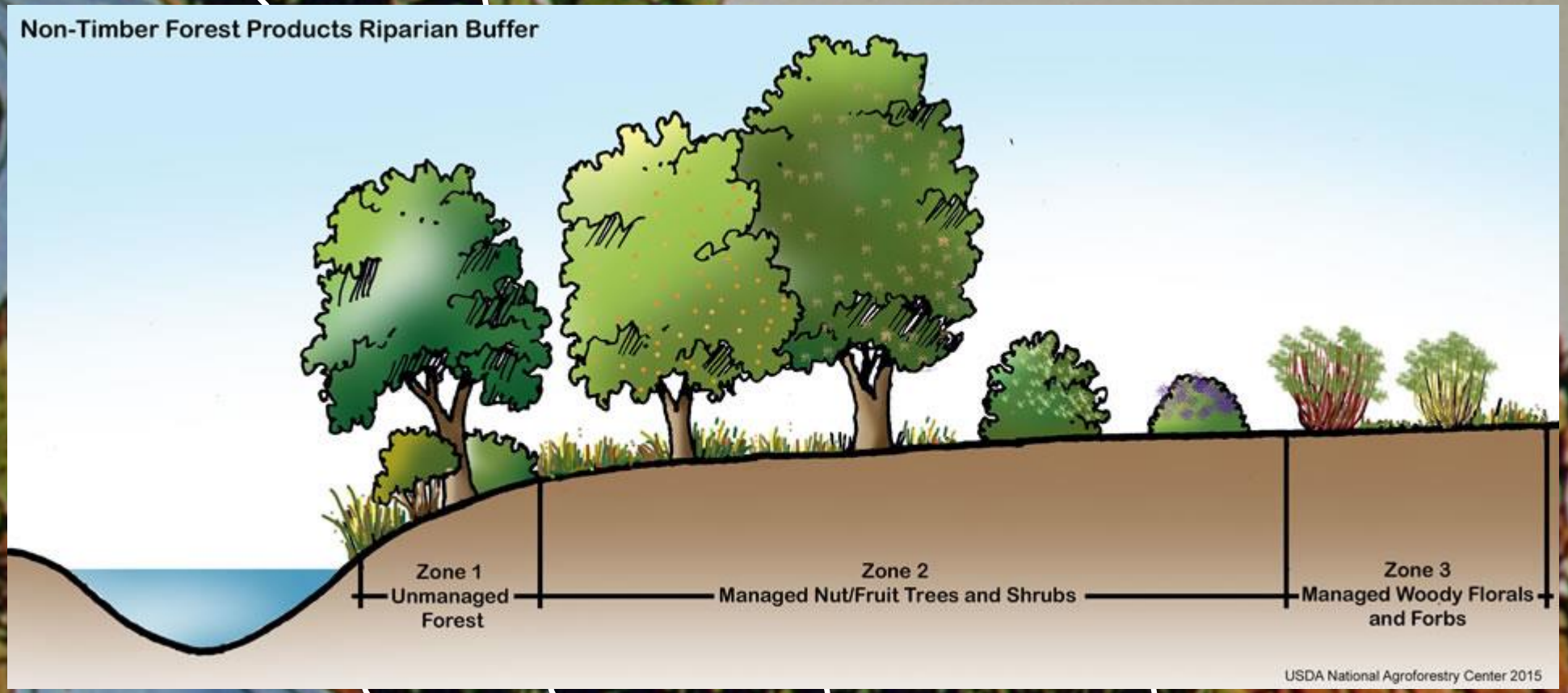


If 2-5 percent of a field area is planted, benefits of wind maintains crop yield, even though some of the area has been planted to trees

Windbreaks




Riparian Buffers


Non-Timber Forest Products Riparian Buffer
Zone 1
Unmanaged
Forest
Zone 2
Managed Nut/Fruit Trees and Shrubs
Zone 3
Managed Woody Florals
and Forbs
USDA National Agroforestry Center 2015











USDA National Agroforestry Center

AgBufferBuilder



AgBufferBuilder is a GIS-based computer program for precision design of vegetative filter strips around agricultural fields. The tool analyses the terrain for spatial patterns of overland runoff and designs a variable-width configuration that matches those patterns to provide a constant, user-selected, level of performance along the field margin. The tool also can assess the performance level of existing or hypothetical configurations.

Why Use *AgBufferBuilder*?

- To improve filter strip performance by enlarging the strip where overland flow concentrates.
- To reduce costs by downsizing filter strip where little runoff flow occurs.
- To assess and compare the performance of alternative designs.
- AgBufferBuilder designed configurations are, on average, **twice as effective** as fixed width configurations covering the same number of acres (see *AgBufferBuilder: A geographic information system (GIS) tool for precision design and performance assessment of filter strips*).





Alley Cropping


Maize
Powder Puff
06/03/2010


Herb Pharm, Williams, OR


HESSTON
Time
18% of field in alley cropping

Juvenile






Seasonality



Urban and Community Systems

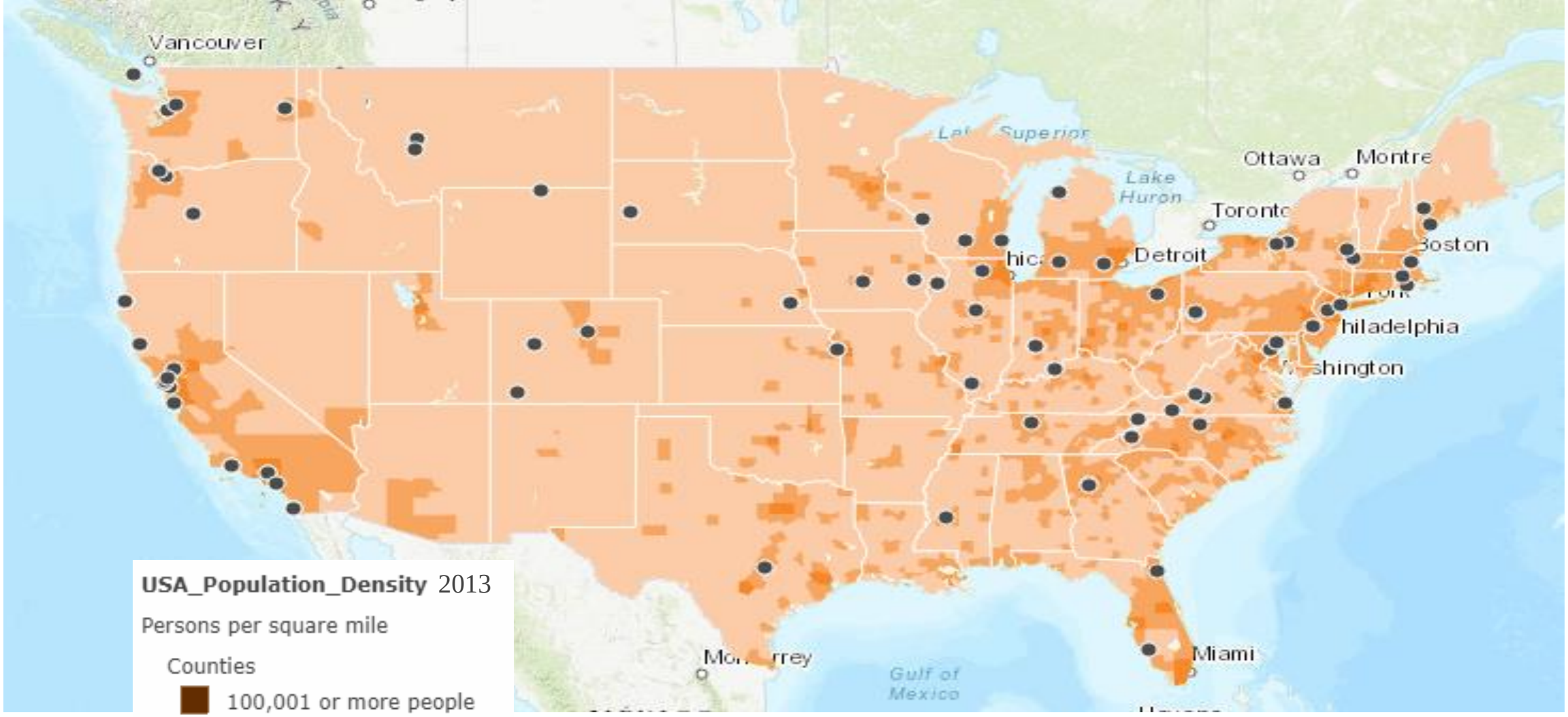


Catherine J. Bukowski

Food Forest (multistory agroforestry)

A production system designed to resemble a diverse forest, and to optimize resource use and maximize production in small or large places, typically where people concentrate





As of 2018, over 75 urban food forestry projects have been found through online searches or word of mouth


3199 N Williams Ave
Portland, Oregon
Street View - May 2009
Fargo Community Food Forest
Portland, Oregon (May 2009)
Google
Image capture: May 2009 © 2016 Google Terms Report a problem


3199 N Williams Ave
Portland, Oregon
Street View - Jul 2011
Fargo Community Food Forest
Portland, Oregon (May 2011)
Google
Image capture: Jul 2011 © 2016 Google Terms Report a problem

Fargo Community Food Forest
Portland, Oregon (October 2015)



Catherine J. Bukowski



Megaregions

Catherine J. Bukowski



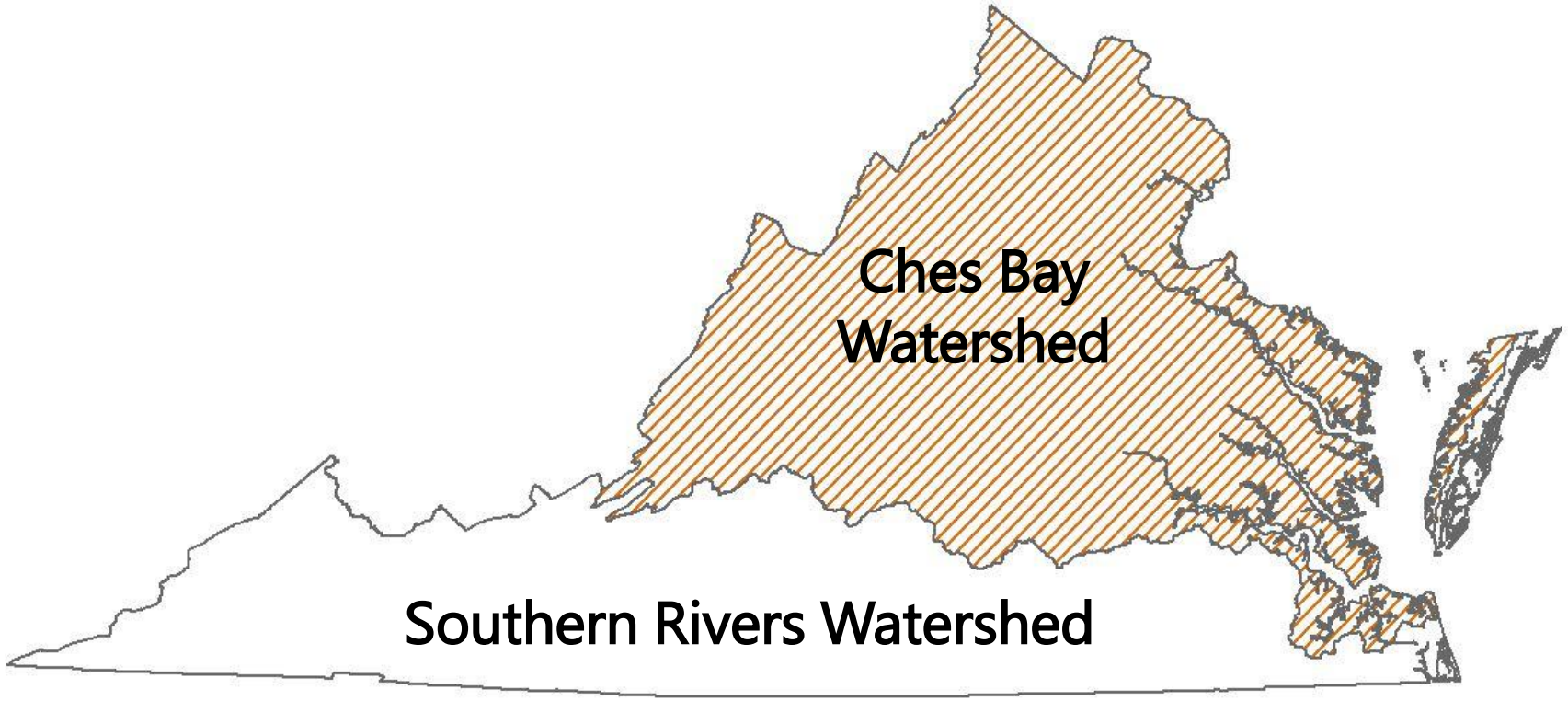
Small Cities and Towns

Catherine J. Bukowski



Project Examples

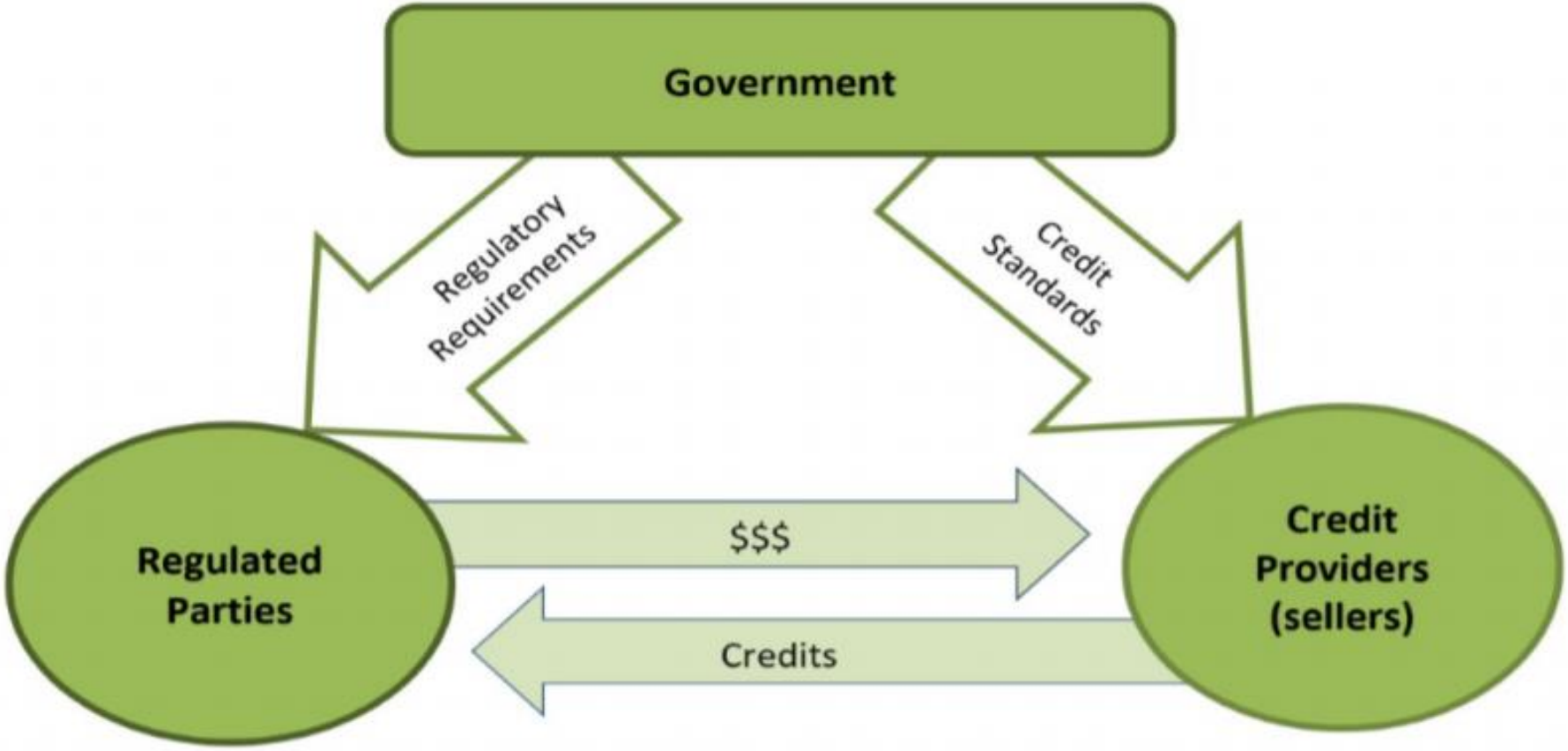
Virginia Nutrient Credit Trading Program



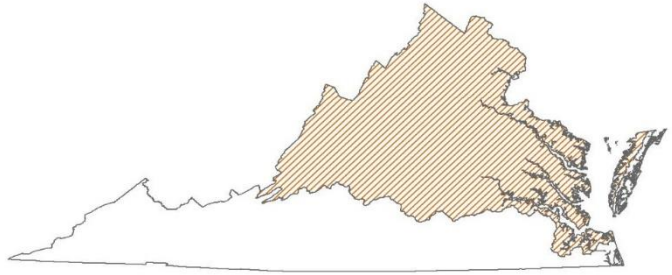
Focused on agroforestry as an accepted best practice in Virginia…

Private Market

Financial exchange between two actors that helps regulated parties come into compliance



VA Nutrient Credit Trading Program



Opened in 2009 – substantial prices for non-point credits

80+ non-point facilities (~80% CBW, ~20% SR, ~10-750 lb. P)
5,200+ pounds of P released from non-point

50%+ have been purchased, prices fluctuate

$10k to $67k (average ~$20k; $100+million, but declining?)

VDOT (~35%), private development (~55%), municipalities


Baseline
Tradable
Additionality


Deed restricted easement
(400 tpa, management allowed)
Open land / agricultural retirement


Baseline

Disproportionality; Essentially all upfront



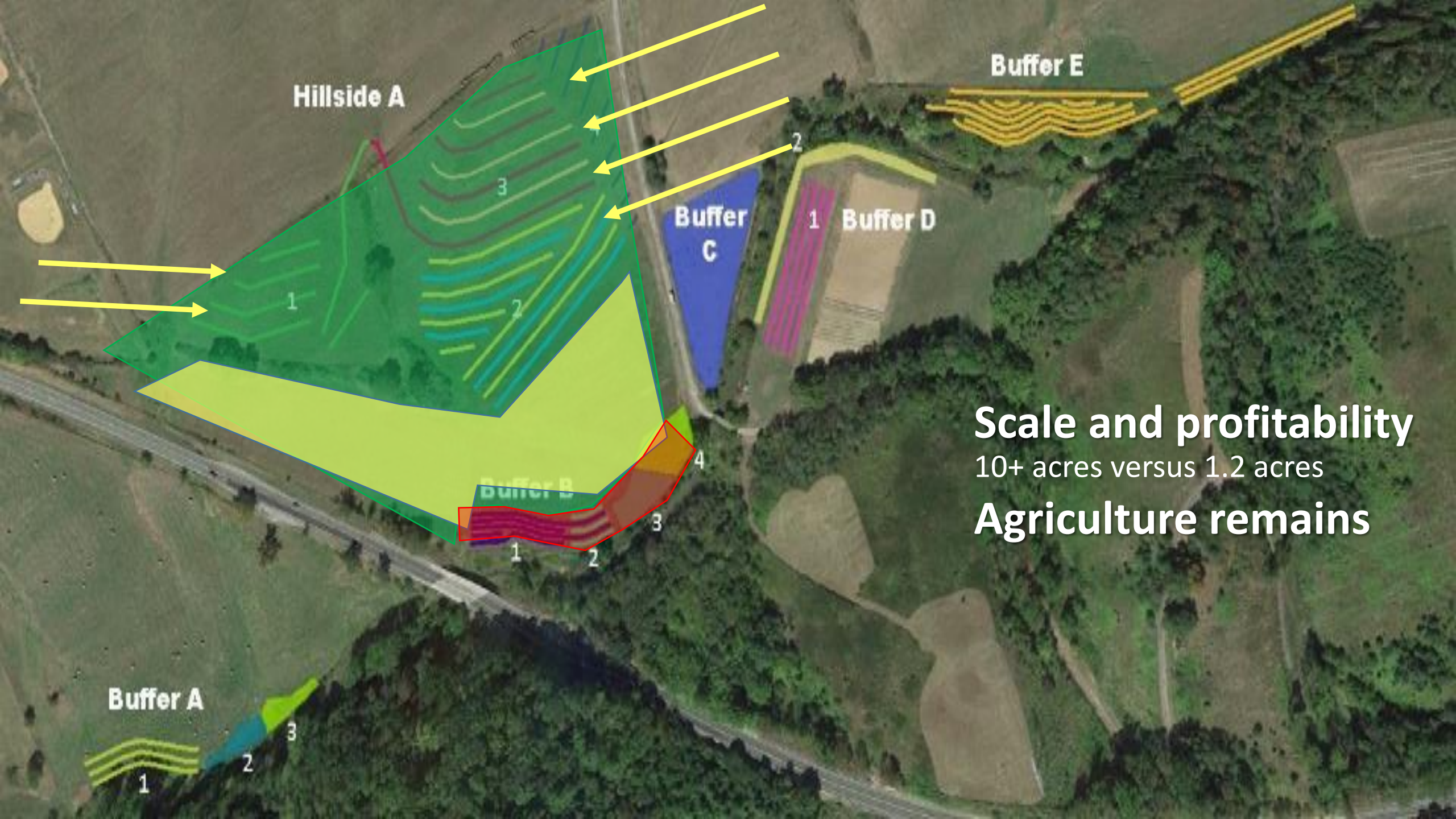
Shenandoah-Potomac Basin Land Conversion

Land Conversion Type	West of I-95		East of I-95	
	TN	TP	TN	TP
Cropland to Forest	10.91	0.81	11.58	0.74
Cropland to Hay	5.77	0.58	6.40	0.26
Cropland to Mixed Open (fallow)	8.32	0.33	8.55	0.08
Hay to Forest	4.53	0.61	4.64	0.68
Hay to Mixed Open (fallow)	1.94	0.13	1.61	0.02
Pasture to Forest	0.91	0.32	2.85	0.85



Conservation Credit for Agroforestry Production



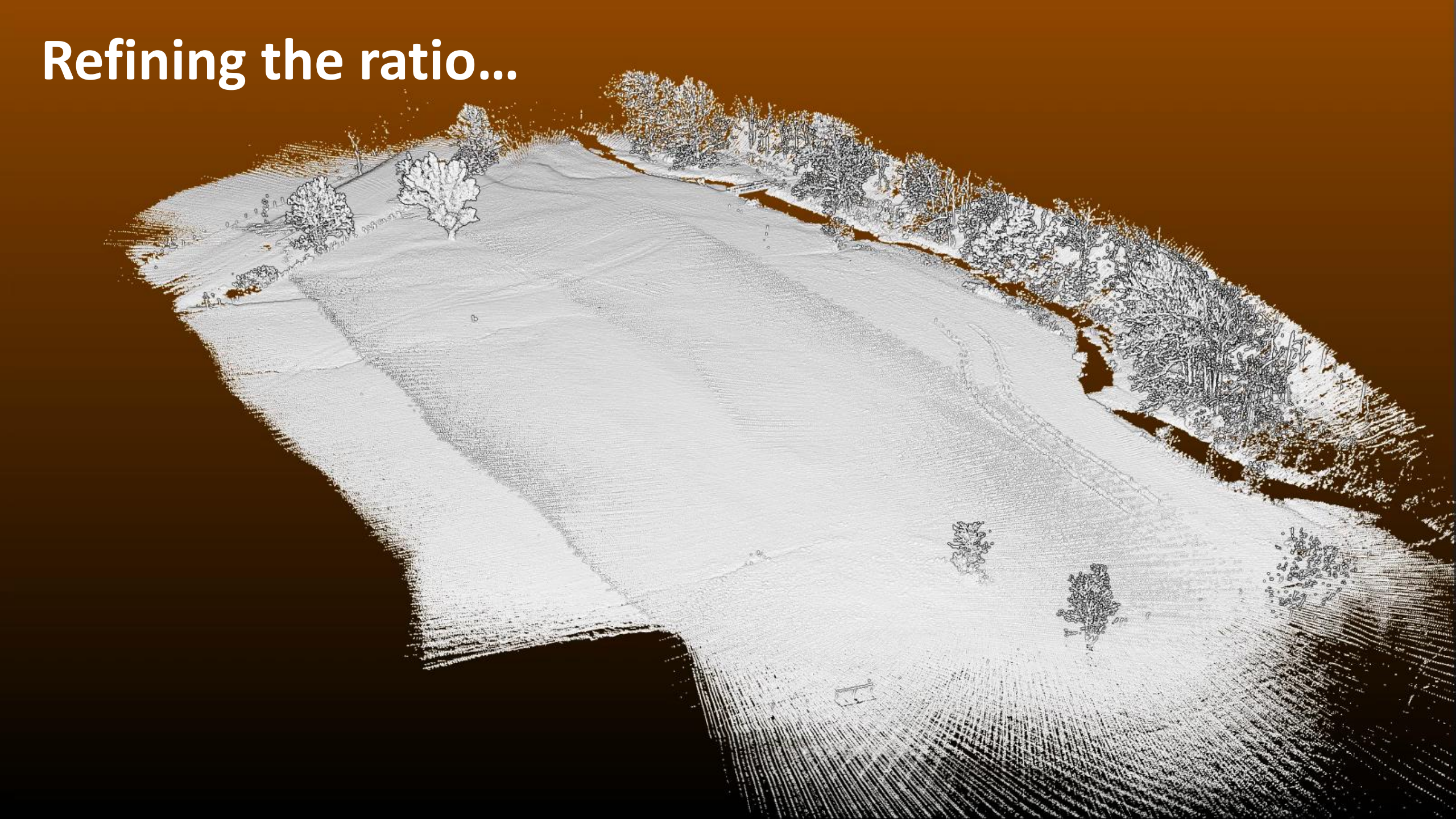


Scale and profitability

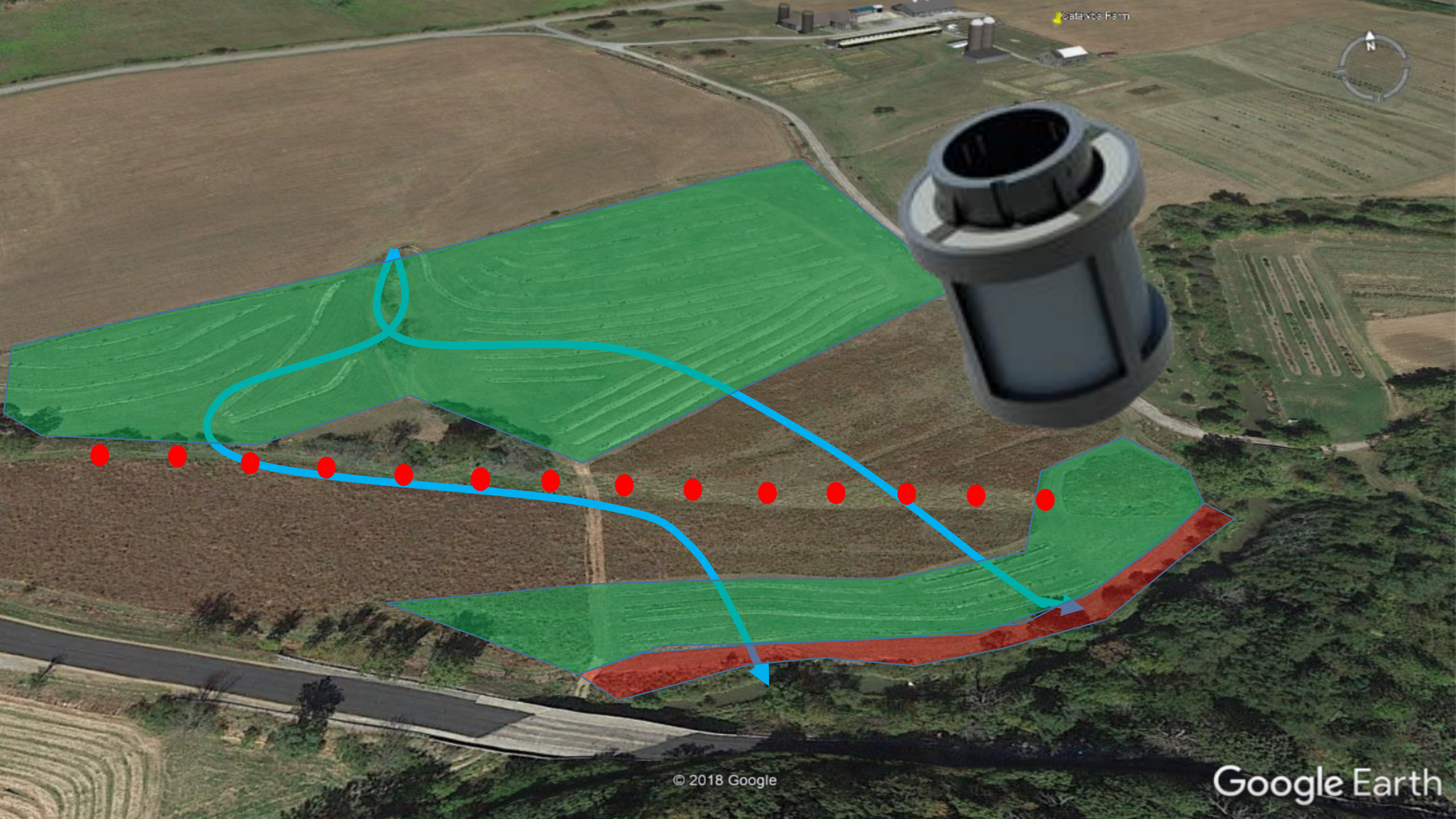
10+ acres versus 1.2 acres

Agriculture remains

Refining the ratio…




Catawba Farm
N
© 2018 Google
Google Earth


Catawba Farm
N
© 2018 Google
Google Earth

Agroforestry tour




I GET MY BOOTLEG FROM FLOYD'S
CNRE
Jon and Dana Beegle
Owners of StoneRoot Farm







Bob Taylor, Zora Township Ontario, Canada

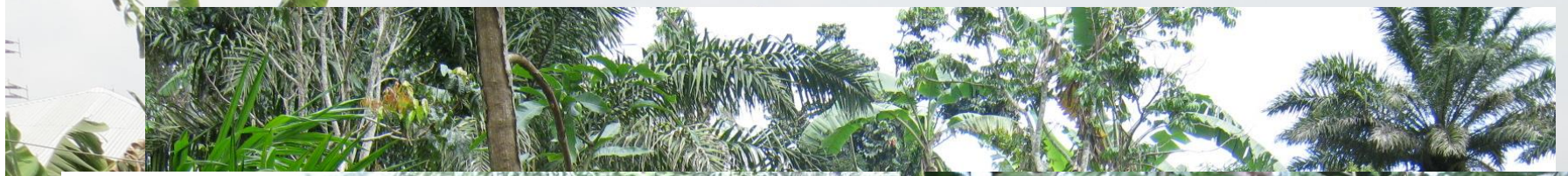




Photo credit: OMAFRA

Ekan United Sisters CIG, Batibo, NW Cameroon









Jesuraj and other Pudukottai Farmers in Tamil Nadu





Agroforestry model:
Gmelina+ Peper+Banana

Agroforestry model:
Gmelina+ Cumbu



Photo credit: R.Samuel

Yan Yan Gurt West Farm Deans Marsh, Victoria Australia











Questions

http://www.youtube.com/watch?v=ME5Lt-gnE64

http://www.youtube.com/watch?v=hJxrluAjS3g