



This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations



United States Department of Agriculture
National Institute of Food and Agriculture

**This program is funded by the
Beginning Farmer and Rancher
Development Program (BFRDP)**

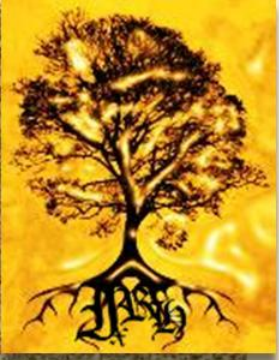
USDA-NIFA-BFRDP 2010-03143



AGROFORESTRY



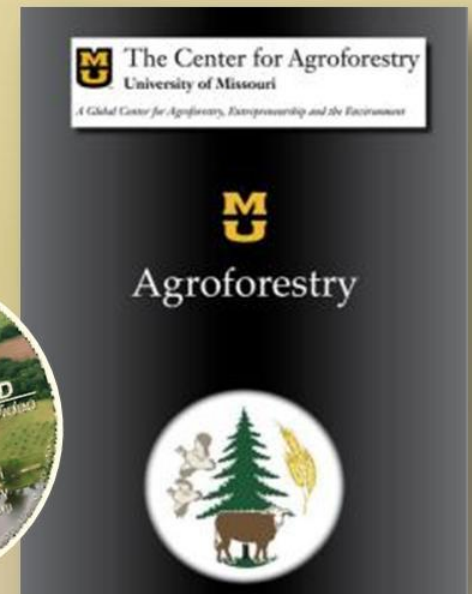
This project is partly sponsored by USDA-NIFA-
BFRDP 2010-03143.



We want to thank the Center for Agroforestry at the University of Missouri for their permission to use their materials to prepare this presentation

Training manual for Applied Agroforestry Practices

- University of Missouri
 - The Center for Agroforestry (UMCA)
 - 2006 Edition



What is Agroforestry?

Agroforestry is an intensively managed farming system that uses productive trees and or shrubs together with crops, livestock or both using an integrated approach



Benefits of Agroforestry

Diversifies and multiplies income opportunities

- By farming 3-dimensionally, you increase your usable acreage
- By growing more than one crop farm income is diversified and better able to withstand market fluctuations
 - Wood for energy generation, paper production, landscaping chips, fruits and nuts, wood shavings for animal bedding material, Christmas trees, saw logs for dimension lumber, high value timber such as furniture-quality wood and veneer logs
 - Specialty crops like decorative florals, mushrooms, herbs, medicinal plants and craft materials

A stylized illustration of a tree with a thick trunk and many branches, set against a bright yellow background. The roots are visible and spread out at the base of the tree.

Benefits of Agroforestry

Improves water use efficiency

- Reduces irrigation costs, reduces evaporation from the soil and plants
- Prevents flood damage

Improves water quality

- Trees and shrubs protect water quality by slowing run off and capturing excess nutrients, sediments and biological and chemical contaminants before they get into water ways
- Improves efficiency of fertilization and other treatments

Benefits of Agroforestry

- Prevents soil erosion caused by water or wind flow
 - Prevents the loss of nutrients and soil from the farm
 - Maintains and improves the productivity of the farm



Benefits of agroforestry

By growing trees carbon is sequestered and the trees are available to future generations

- For example, within 20 years a field windbreak can store over 215 million metric tons of CO₂



Benefits of agroforestry

- Windbreaks protect crops, livestock and soil and water resources
 - In cold weather, livestock protected by trees exhibit improved weight gains of as much as 10% and require up to 50% less feed
 - Windbreaks can greatly reduce or eliminate losses of newborn lambs and kids from blizzards
 - These trees also protect crops from damage caused by wind such as bruising, scarring and premature drop
 - Enhances pollination

Benefits of Agroforestry

Improves wildlife habitat

- Adding tree and or shrubs to existing farms provides food and shelter for wildlife and allows wild populations to flourish as they can use vegetation corridors to other potential habitats (forests, waterways or adjacent farms)



Benefits of Agroforestry

Increased biodiversity

- Attract and support wildlife
 - Hiking, hunting, bird watching, or other recreational uses
- Trees and shrubs provide homes for birds that can aid in controlling unwanted pests
- Provide habitat for beneficial insects as well

A stylized tree with a thick trunk and many branches, set against a yellow background. The roots are visible and spread out.

There are multiple programs that provide incentives for agroforestry

Federal

- Conservation Reserve Program, Conservation Reserve Enhancement Program, Wetland reserve Program, Forest Land Enhancement Program, Sustainable Agriculture Research and Education Program

State

- Department of Natural Resources

Private

- Pheasants Forever, Ducks Unlimited, Quail Unlimited, National Wild Turkey Federation

Tax incentives

- Reforestation, conservation, business investment and capital gains

Benefits of Agroforestry

Cost-share programs

- In some cases landowners are reimbursed 40-90% of the implementation costs

IRC incentives

Section 194

Deduction allows landowner to deduct the first \$10,000 of reforestation expenses

Section 175

Allows deduction up to 25% of the gross income earned from the farming business

Section 126

Exclude cost-share payments received from approved federal or state conservation programs

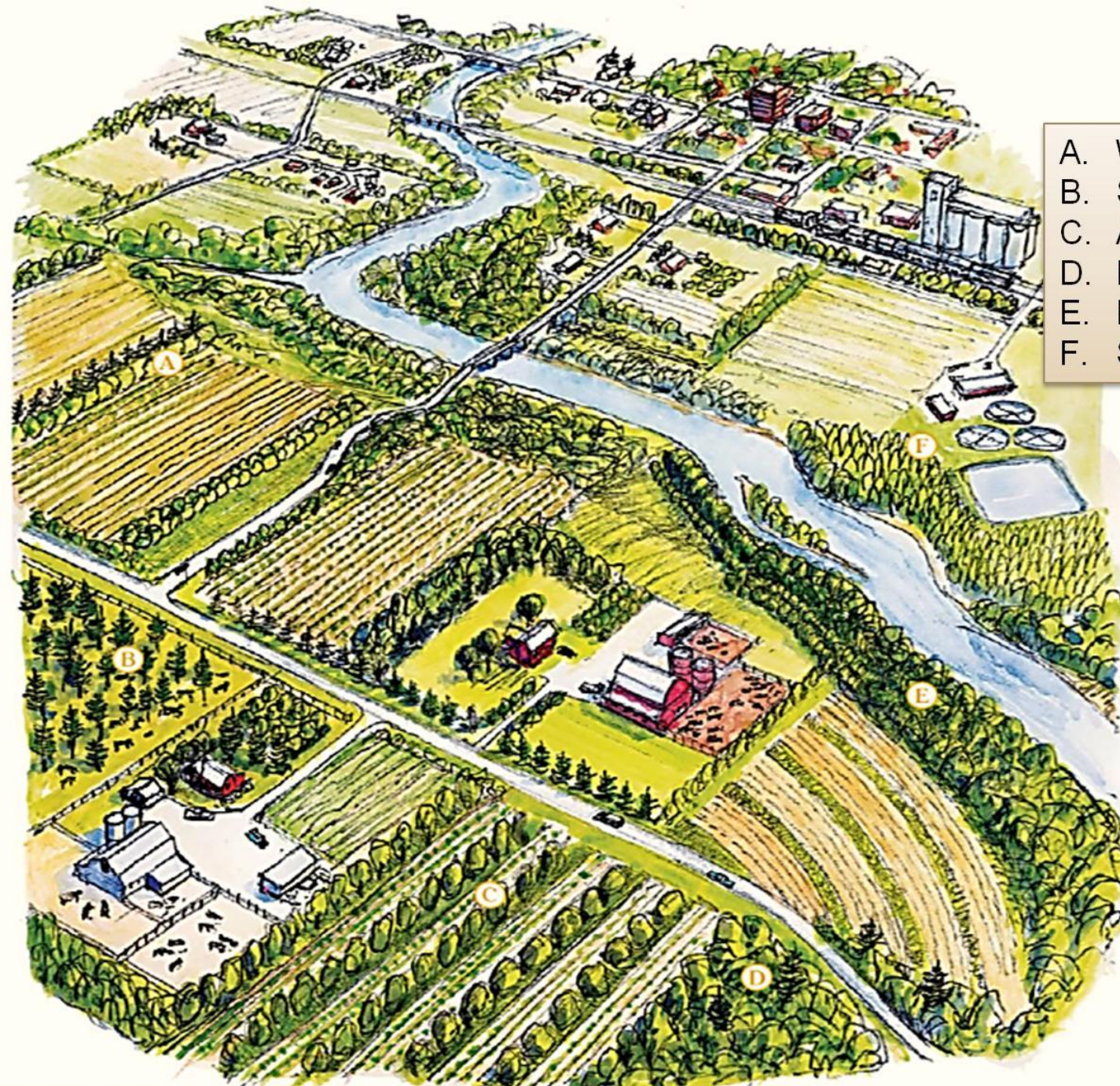


Benefits of Agroforestry

- Agroforestry improves quality of life of farmers and their communities
- Trees reduce noise, dust, odors
- Green spaces are among one of the top 5 things people seek when choosing a place to live
- Promotes outdoor activities

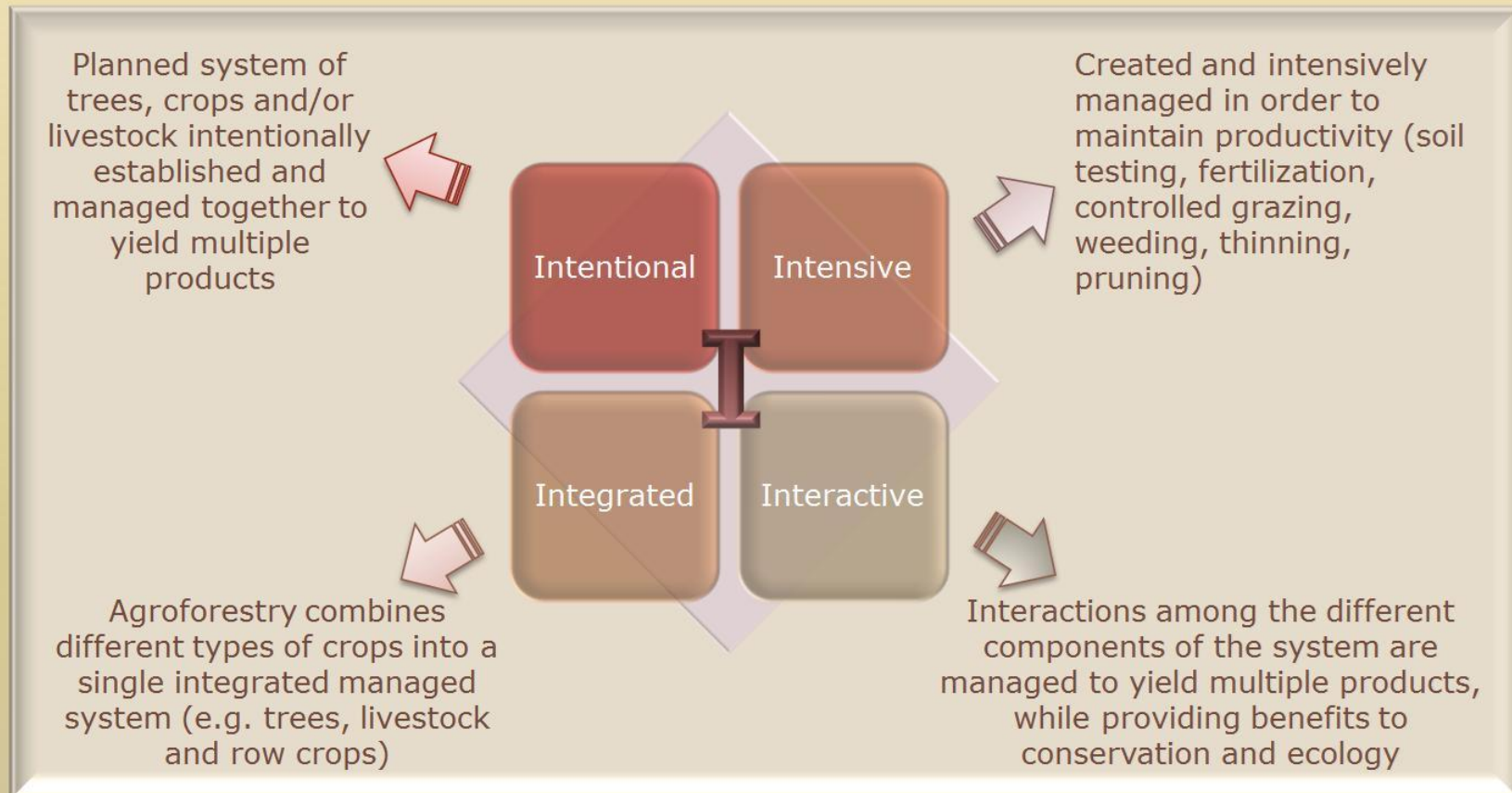


- A. Windbreaks
- B. Silvopasture
- C. Alley cropping
- D. Forest farming
- E. Riparian forest buffers
- F. Special applications



What is Agroforestry

There are four “I’s” that characterize Agroforestry





Some of the most common types of agroforestry are:

Alley cropping



Silvopasture



Riparian buffers



Forest farming



**Windbreaks and
shelterbelts**



Silvopasture



<http://forest.mtu.edu/pcforestry/resources/studentprojects/silvopasture.html>

Silvopasture

- Silvopasture is the integration of trees, forage and grazing livestock in a managed system
 - Livestock are used to graze the forage that is grown under the trees
 - It is not just allowing livestock to graze unmanaged wood lots





- Examples of opportunities for income from the silvopasture practice:

- Meat and dairy goats
- Sheep
- Poultry
- Pigs
- Forage and hay
- Wood products
- Nut, fruit and berry crops
- Improved wildlife habitat/lease hunting



<http://www.fao.org/forestry/64104/en/>



- Components of a silvopasture practice
 1. Livestock
 2. Trees
 3. Pasture



http://www.waldeneffect.org/blog/Appalachian_silvopasture/



1. Livestock

- Animal performance can be enhanced by the use of silvopastoral practices
 - Trees provide the animals with food, shade and protection from the elements such as cold or wind
 - Careful management is needed to ensure livestock do not damage the trees (browsing, trampling, rubbing, etc.)
 - Effective fencing management is very important as potential for fence malfunction or damage increases with the risk of falling branches

2. Trees



Desirable characteristics of an agroforestry tree species

- Marketable: this includes both the wood itself and other products such as nuts or fruits
- Compatible with the companion crops or forage that you choose. Some trees produce growth-inhibiting chemicals which may affect what you can grow
- High quality and high value or highly valued products
- Fast growing or of such a high value that a species of medium growth rate is acceptable
- Deep-rooted so the trees do not compete with the crops or forage for moisture
- Have rapidly decomposing foliage
- Be properly matched to the site. Site tolerant, suited to either a wet or dry site
- The leaves should produce a light, rather than a heavy shade. This will be especially important as the trees mature and the canopy closes. The lighter the shade that is produced, the longer you can grow crops or forages
- Make sure that the trees are capable of producing the products you desire.



3. Pasture

- As feed for livestock, forage is a vital component of silvopastoral systems
- Choose a forage that will do well in the level of shade produced by the tree cover and meet the nutritional needs of the chosen livestock
- Tree size, density and pattern all influence understory forage production
- Consider that shade will change as the trees mature



http://www.waldeneffect.org/blog/Appalachian_silvopasture/

Silvopasture

Silvopastures can be established by:

- Planting selected trees into an established pasture
- By planting selected forages among trees that have been selectively thinned so that forages will be able to grow under them



<http://forest.mtu.edu/pcforestry/resources/studentprojects/silvopasture.html>



<http://www.flickr.com/photos/baallands/2216308884/>



Some notes on silvopastoral systems

1. When planting trees they should be protected from the livestock
 - Fences can be used
 - Forage can be harvested as hay
 - Goats can damage older trees as well
2. As trees age and create more shade use plants that are tolerant to shade
 - Trees will have to be pruned or thinned
3. This system works best when combined with rotational grazing management

This presentation was prepared by



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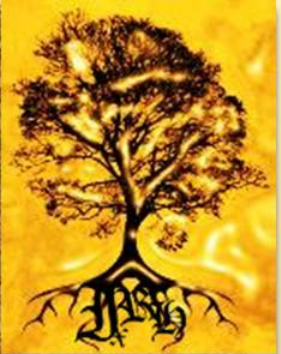
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This project is the result of the collaboration of these institutions:



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Want more information?

- Visit the Center for Agroforestry
 - University of Missouri

<http://www.centerforagroforestry.org/>



THE CENTER FOR AGROFORESTRY
UNIVERSITY OF MISSOURI
A Global Center for Agroforestry, Entrepreneurship and the Environment
School of Natural Resources
College of Agriculture, Food and Natural Resources

**Agroforestry
Silvopasture**

NEW & NOW

New UMCA Media Release:
The Online Master's Program
in Agroforestry

**3rd Annual Agroforestry
Symposium is**
January 11, 2012

**CSA News: Agroforestry, A
Growing Science seeks to
boost its practice**

**New Agroforestry in Action
guide: Black Truffle
Cultivation**

News! Information about
online graduate program

**In the News: UMCA director
discusses agroforestry**

The Center for Agroforestry at the University of Missouri, established in 1998, is one of the world's leading centers contributing to the science underlying agroforestry, the science and practice of intensive land-use management combining trees and/or shrubs with crops and/or livestock.

Agroforestry practices help landowners to diversify products, markets and farm income; improve soil and water quality; sequester carbon, and reduce erosion, non-point source pollution and damage due to flooding; and mitigate climate change.

The five integrated practices of agroforestry - forest farming, alley cropping, silvopasture, forest farming and windbreaks - enhance land and aquatic habitats for fish and wildlife and improve biodiversity while sustaining land resources for generations to come.

Message from the Director

Greetings from The Center for Agroforestry at the University of Missouri! As many of you know, the Center has...

[Read full message >>](#)

Want more information?

USDA-National Agroforestry Center	http://www.unl.edu/nac
USDA-Natural Resources Conservation Service	http://www.nrcs.usda.gov/
US-Forest Service	http://www.fs.fed.us/
ATTRA	https://attra.ncat.org/attra-pub/summaries/summary.php?pub=62
Agricultural Marketing Resource Center (Ag MRC)	http://www.agmrc.org/commodities_products/forestry/