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
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USDA-NIFA-BFRDP 2010-03143

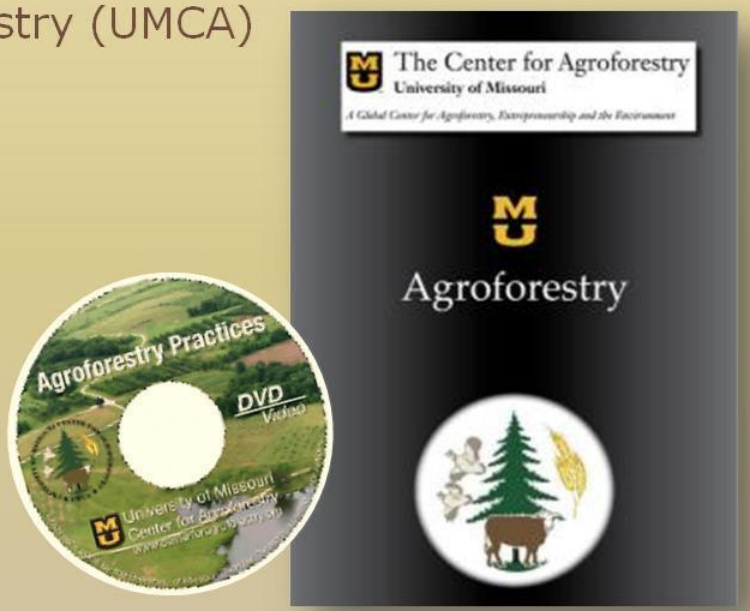
AGROFORESTRY

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

Some of the most common types of agroforestry are:

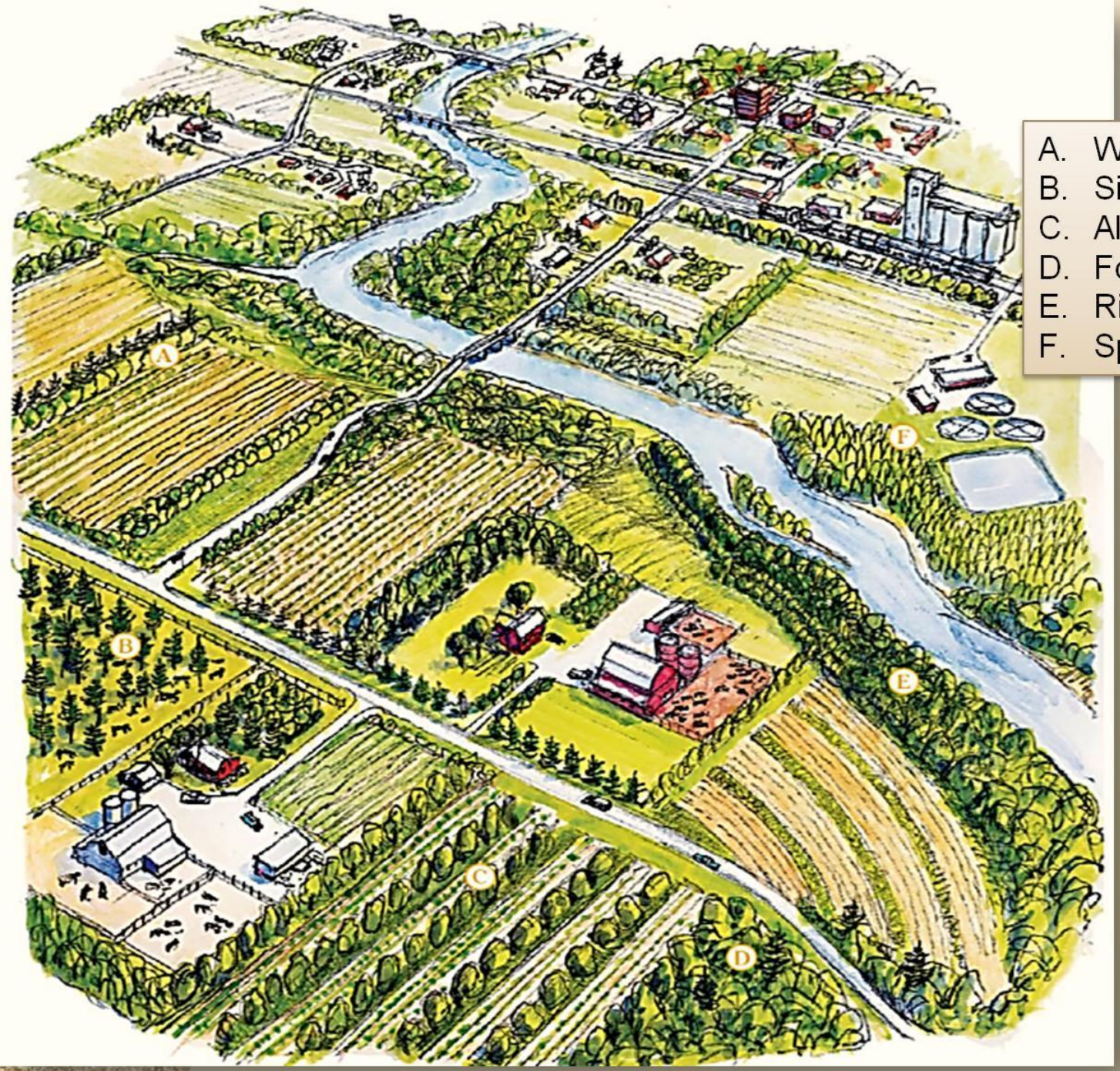
Alley cropping

Riparian buffers

Silvopasture

Forest farming

Windbreaks and shelterbelts



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

Riparian buffers

Before and after adequate agroforestry management

Riparian Buffers

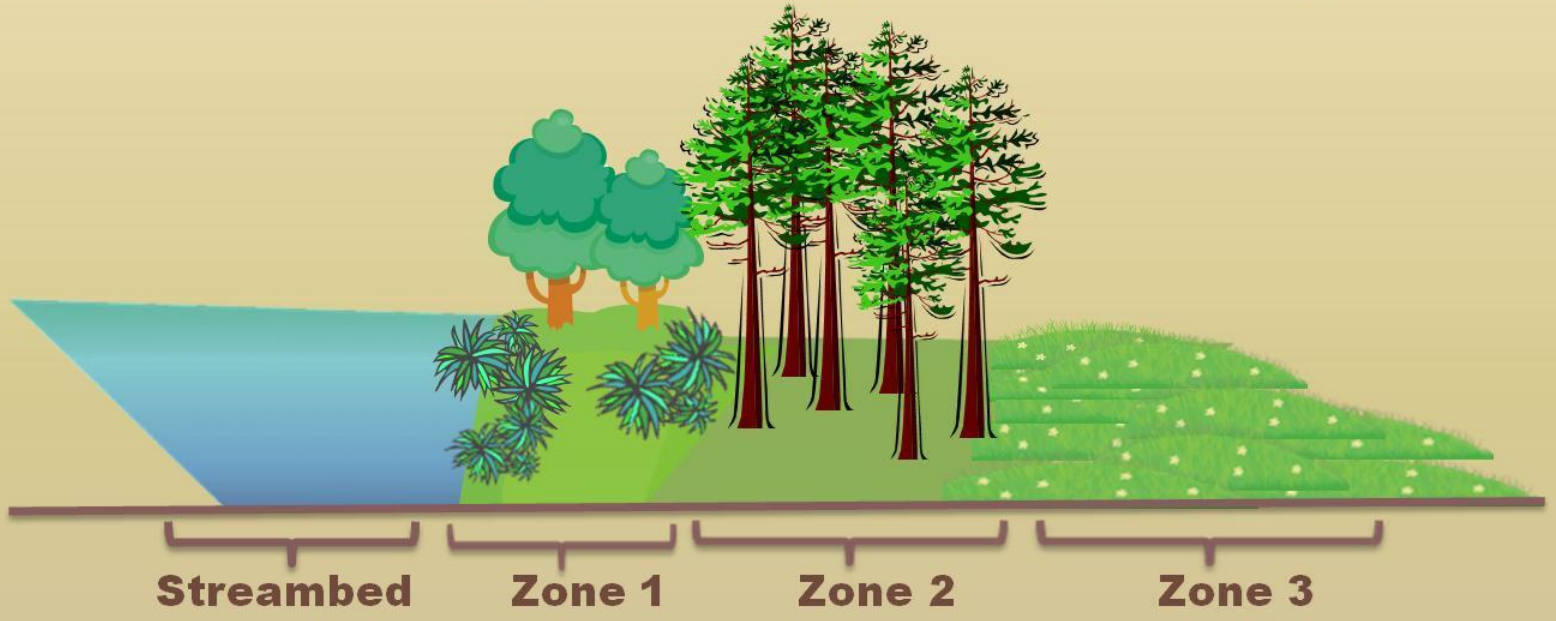
Planned combinations of trees, shrubs, grasses, forbs and bioengineered structures close or within, a stream designed to mitigate the impact of land use on the stream

Riparian Buffers

- Protect water quality
- Stabilize stream banks and prevent erosion
- Increase wildlife habitat
- Improve aquatic habitat
- Increase the income potential and diversity of the farm

Riparian buffers are usually designed to contain three zones:

- **Zone 1** – Undisturbed forest: trees and vegetation to stabilize the stream bank; trees shade the stream and keep water cool
- **Zone 2** –Managed forest: trees can be harvested. Organic soils will remove nitrogen. Traps soil particles and other nutrients
- **Zone 3** – Grass: increases water storage and filtration. Grass next to the crop zone and composed of deep rooted grasses



Riparian Buffers

- Zone 1
  - Those plants used in zone 1 need to be able to withstand flooding
  - Plants that are fast growing and spread readily are beneficial

http://www.ent.iastate.edu/imagegal/practices/buffer/buffer.html

Riparian Buffers

- Zone 2
  - Plants here need to be able to handle occasional flooding
  - Trees and shrubs gown here can be used to produce income
    - Fruit trees
    - Berry bushes
    - Nut trees

Mixing trees shrubs and forbs will increase wildlife habitat

http://www.srs.fs.usda.gov/pubs/su/016/watershed.htm

Riparian Buffers

- Zone 3
  - The main function is to slow ground runoff allowing it to enter the root zone were nutrients can be absorbed
  - Grasses with stiff steam will help to slow water
  - The width of this zone can be adjusted to accommodate the amount of runoff
    - Wide for large amounts
    - Narrow in small

http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1187631191985&lang=eng

Riparian Buffers

- Leasing out the right to hunt can be a good source of income
  - Need to plant and manage the buffer for increased wildlife
- Other sources of income include
  - Nuts
  - Berries
  - Timber
  - Biomass

Wood ducks, Texas

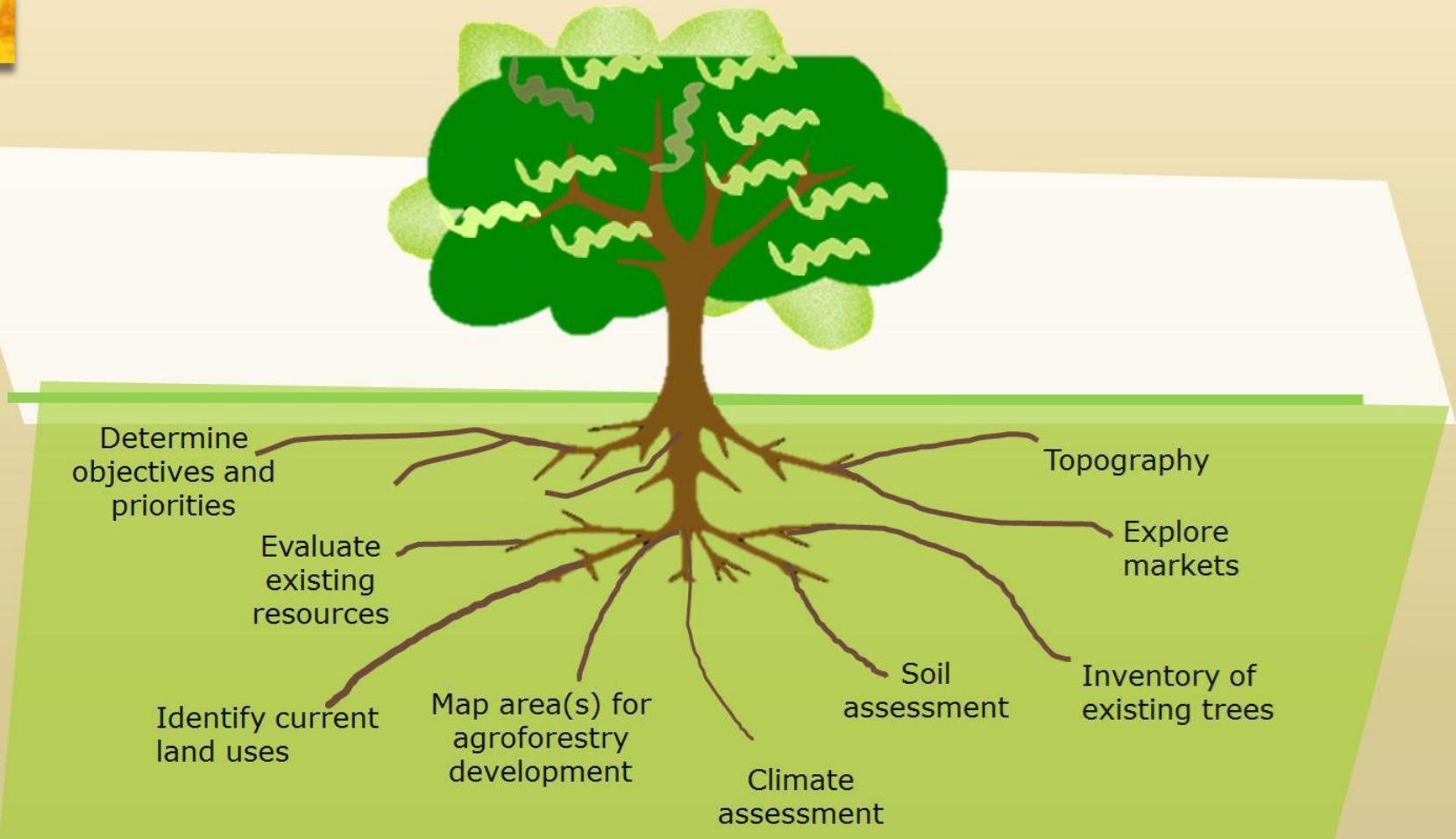
http://www.bigcountryaudubon.org/2006/10/23/ospreys-over-abilene-mid-oct/

Riparian Buffers Summary

- When effective implemented riparian buffers control erosion and help prevent farm inputs from entering waterways
- They increase wildlife habitat
- Provide alternate sources of income

Goats are the ideal alternative for clearing along your river, creek, pond, etc. No herbicides or machinery required. Plus your goats will have plenty of food and water

Selecting an agroforestry strategy



Planning

- Before starting an agroforestry project it is important to have a plan
- When starting don't try and do more than you can
  - Start small don't try and do everything at once

Planning

- **Trees are a long term project so plan accordingly**
  - What are your long term goals?
    - Some crops will be ready within a year, 5 years or 20 years
  - What are your resources?
  - What type of agroforestry will work best for you?
  - Will you be able to market your products?

Planning

- Are there areas on your farm that would benefit more from trees than others?
- Is short or long term income more important?
- How much management are you willing to put into it?
- Are there tax benefits?
- Is there help in startup costs?

http://www.djcase.com/projects/indiana-residents-perceptions-woodland-management

Planning

- Know your resources
- Use a map, soil assessments and climate assessment to determine the type of plants will grow on your farm
- Then use plant guides to determine which plants to grow based on your goals

http://www.teagasc.ie/forestry/events/forest_management_walks_May_2010.asp

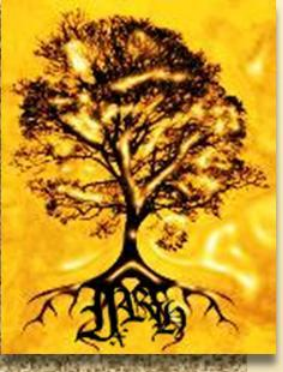
Designing the Layout

- In designing the layout of the farm several issues need to be considered:
  - Number of trees species
  - Plant trees in single or multiple rows
  - Alley width
  - Distance between trees in a row

http://foodforest.com.au/planningYourProperty.htm

- Planting more than one species of trees allows for:
  - Greater diversity of income
    - For example, planting fruiting trees with fruit producing shrubs lengthens the time that you have fruit for market
  - Greater biodiversity
  - Better habitat for wildlife

- However you must consider that planting more species:
  - Requires more management
  - Competition for light and nutrients between trees (root competition)
  - Also some trees produce compounds that inhibit the growth of others (allelopathy)



http://www.sciencedirect.com/science/article/pii/S001670
6104000266

http://www1.montpellier.inra.fr/safe/english/PAC/introduction.php

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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/

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/