

JOURNEY INTO AGROFORESTRY YOUTH ACTIVITY BOOK



Welcome to a Journey into Agroforestry!

Welcome to your *Journey into Agroforestry* project book. Do you think you will one day own land? If so, would you like to make the most effective land management decisions? This project in the 4-H Forestry Series takes you on an exploration of some land management decisions and forestry environments within your community and surrounding areas.

The activities in this book ask you to explore your community, ask questions, seek information, and create potential land management plans. Each activity and many of the challenges are designed to help you practice important life skills while learning how to think of alternative solutions to current land management challenges through *agroforestry*.

What I Want to Do and Learn in this Project:

my goals

The Experiential Learning Model

The experiential learning model is used in each activity as a means to help you gain the most from the experience.

The five steps in this learning model encourage you to try to do all, part or some of the activity before being told or shown how. The activity is the experience part of the cycle. The questions in the "Let's Talk" section of each activity to encourage you to think about what you have learned from the experience. The reflect and application questions ask you to:

- ◆ share what you did;
- ◆ process what was most important about the experience;
- ◆ generalize the life skill and earth stewardship skill practiced to your own life; and
- ◆ apply the life skill or science process skill to a new situation.

To fulfill the experiential learning process you must complete all the steps, including the review questions in "Let's Talk."

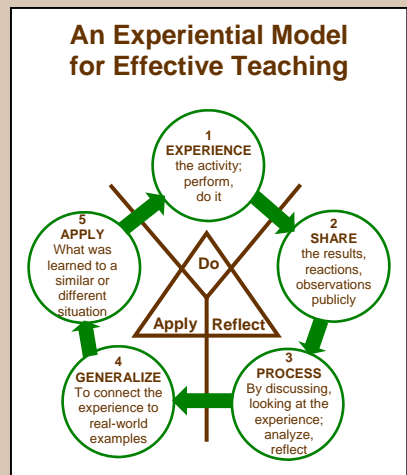


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Note to Project Helper

Thank you for volunteering your time to assist one or more young people with this project. Your involvement will make a real difference in the quality of their learning. You play an important role in helping them learn and understand the subject matter or life skills for application to real life issues.

Your Role as Project Helper

- ✓ Review the material in this book and the *Helper's Guide*.
- ✓ Give assistance in doing the activities.
- ✓ Try to get the young person to think through why something happened the way it did.
- ✓ Help the child to set goals, discover new ideas and learn new skills.
- ✓ Discuss the review questions after each chapter, listening and encouraging

Agroforestry Achievement Program

Agroforestry Achievement Program Guidelines

The project book may be used in its entirety as 9 activities. If not, it is recommended that you complete activities 1.1 and 1.2 and then pick and choose from the remaining activities.

- ✓ Do at least 7 activities this year and check them off.
- ✓ Have your agroforestry helper date and initial this log as you complete the activities.

Project Activities			PROJECT HIGHLIGHTS
Activity Name	Date Completed	Helper's Initials	Date and list the most fun things you did in this project.
Agriculture, animal pasture, and forest plantations			
What is Agroforestry			
Learning from example			
Identifying agroforestry on your own			
Market Research			
Why Budgeting?			
Environmental Interactions			
Plan a site			
Educate Public/Family			

Additional Activities

Throughout your 4-H project, you may elect to do additional activities such as... an exhibit at the fair, 4-H judging contest or Sill-A-Thon. Record those you have done.

Activity	Date	Helper's Initials



JOURNEY INTO AGROFORESTRY



I certify that _____
has successfully completed the requirements of the
Journey into Agroforestry Achievement Program.

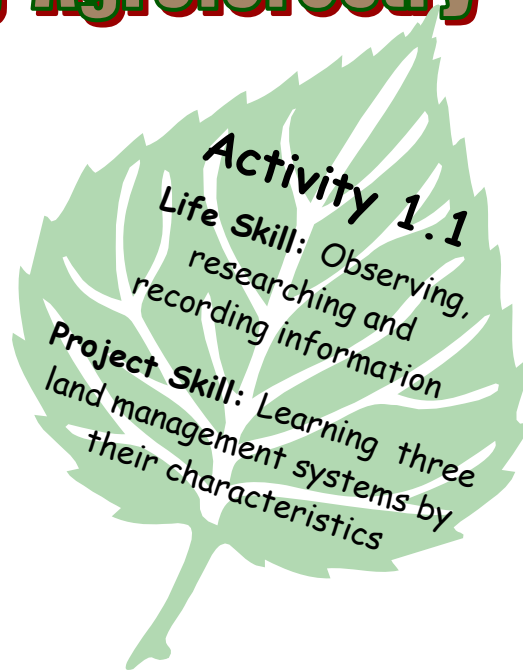
Agroforestry Helper _____ Date _____

Chapter 1: Introducing Agroforestry

The first four activities will help you get to know what agroforestry is and how it relates to you.

Land owners have many options for managing their land. Some make a living by growing crops; others may hold on to it for investment. Farmers have different approaches to managing their land, depending on what they need and what they can produce. Climate, soil conditions and tradition are just some of the factors that may influence how different farmers manage their animals, crops, or trees. It is their choice; there is no set “recipe.”

Here are three traditional management systems by which people manage their land to make money and provide products for us all.



In this project book a “forest” means land managed for multiple purposes dominated by trees

They include:

- 1) Crops managed in an agriculture field
- 2) Grazing animals managed in a pasture of grass
- 3) Trees managed in a plantation or forest

A Closer Look at Land Management Systems

Visit each of these agricultural systems, or find pictures on-line and complete this chart.

	Agriculture field	Pasture with livestock	Tree plantation or forest
1. What is produced?			
2. How many different products come from the same patch of land?			
3. How often is the product harvested?			
4. Does it require full sun?			
5. How many layers of plants are there? Are the crops all one height?			
6. What is the temperature on the ground and at crop height?			
7. What do you see on the ground?			
8. What are the benefits other than the products?			



Let's Talk!

Share with your helper

- ✓ Describe each system.
- ✓ Describe how you collected this information.

What's important?

What makes these systems similar?

What makes them different?

What characteristics describe each system?

What have you learned?

Describe other versions of a crop, pasture, or forest systems you have seen.

In which column would you put an orange grove?
A blueberry farm?

How many "products" might be possible in a forest? (example: deer hunting or firewood)

What are the advantages of producing one product on a farm?

Imagine what's next!

Now imagine trees with crops or trees with animals together on the same land in various patterns – rows, strips, patches, etc. This is agroforestry.

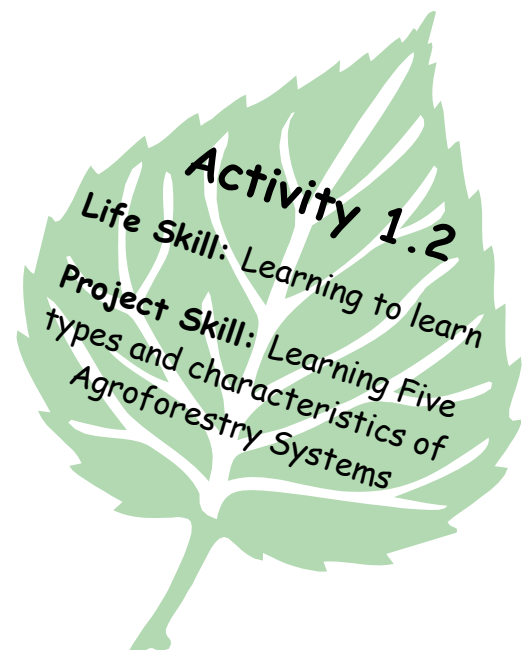
What might be advantages?

What might be disadvantages?

"Products" can be anything that generates money.

What is Agroforestry?

The tradition of agroforestry dates back thousands of years and has been practiced by people all over the world. It is still practiced today and people benefit in a variety of ways. Agroforestry is a land-management system that takes advantage of the ecological and economic benefits that come from combining trees shrubs with livestock crops. Agroforestry attempts to mimic the natural ecosystem by utilizing the beneficial connections between trees and other parts of the land. There are five different types of agroforestry practiced in the United States that involve these combinations. This section will introduce you to each practice and their benefits.



Agroforestry Systems of the USA

Read the definitions of five agroforestry practices and list the products you see in each picture. Examine the pictures and decide which agroforestry system it represents.

Silvopasture: A system which combines trees with pasture and livestock production.

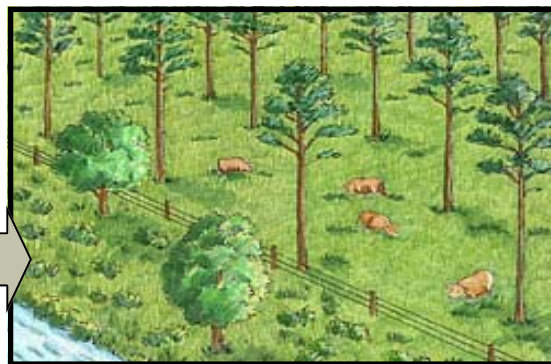
Land Owner Benefits:

- more than one source of income: trees and animals vs. only trees or only animals,
- lower fire hazard than thick vegetation that grows underneath tree plantation,
- healthier livestock by protecting them from hot summer sun,
- more wildlife viewing

Environmental Benefits:

- recycled nutrients from animal waste,
- erosion control,
- enhanced soil fertility

1



What products do you see?

Riparian Forest Buffer: A strip of trees, shrubs, and plants grown beside a river, stream or lake. This area can be managed to harvest products while also protecting water quality.

Land Owner Benefits:

- harvesting products from land that typically serves solely as environmental protection,
- wildlife viewing

Environmental benefits:

- protection of water quality,
- erosion control, wildlife habitat and
- travel corridors

2



What products do you see?



3

Alley Cropping: A system of widely spaced rows of trees and/or shrubs with crops growing between the rows.

Land Owner Benefits:

- harvest several products at different times during the year

Environmental benefits:

- reduces water runoff and erosion,
- reduces wind erosion,
- provides more diverse habitat than single crops, organic matter returned to soil,
- cycles nutrients from different soil depths

What products do you see?

Forest Farming: Growing crops under the closed canopy of a forest. Crops must be shade-tolerant!

Land Owner Benefits :

- additional sources of income;
- edible and ornamental plants for personal use.

Environmental benefits:

- providing forest benefits while keeping forest intact;
- maintains wildlife habitat

4



What products do you see?



5

Windbreak Growing trees/woody species in a line formation (often as a fence) to provide protection to crops, animals, and people from wind, snow, soil erosion, sun, etc.

Land Owner Benefits:

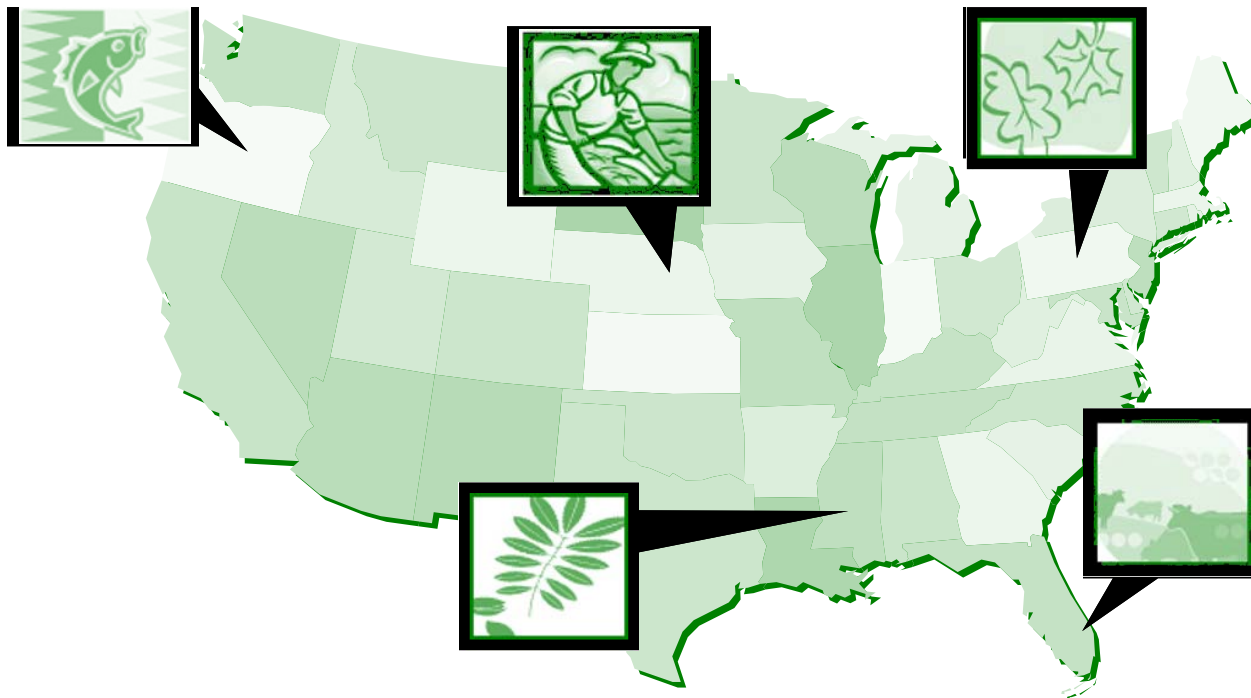
- saves money for farmers by reducing energy costs of heating and cooling buildings,
- improves crop yields,
- maintains health of livestock by protecting them from cold winter winds or hot summer sun,
- additional revenue from specialty or wood products,
- protects roads and highways from drifting snow

Environmental Benefits:

- prevention of soil erosion by wind,
- improves local air and water quality through trapping air pollutants like dust and chemicals used for fertilizers,
- wildlife habitat

What products do you see?

Read each scenario, and decide which agroforestry system it represents.
(Use the matching number from the previous page.)



Scenario 1:

Francisco Mejia grows sunflowers and grazes cows in Nebraska. He wants to increase his yield of sunflowers and protect his cattle from the harsh winter conditions. He decides to plant nut producing trees in a _____ system.

Scenario 2:

Emily Polouski has a pecan orchard in Mississippi. She wants to harvest other crops in addition to the pecan nuts each year. She decides to try an _____ system by growing vegetables and herbs in between the rows of pecan trees. Her brother, who owns the other half of the pecan orchard decides to graze horses under the pecans. He established a _____ system.

Scenario 3:

Brian Goldman owns 50 acres of grass pasture and a herd of cattle in Florida. Along one side of the pasture grows a small patch of forest. The cattle often crowd under the forest when it is hot during the day. In order to add income from lumber and relieve heat stress from the cattle, Mr. Goldman decides to plant trees in his pasture to create a _____ system.

Scenario 4:

James McDonell, in Oregon, wants to start a fish farm in the lake on his property where he raises livestock. However, after testing the water quality, nitrates and particulate matter in the lake water are too high for fish to survive. In order to improve the water quality by filtering out fertilizers and animal wastes on his farm, he installs a _____ system.

Scenario 5:

Katherine Bloom has a natural oak forest in Pennsylvania and wants to create more income in addition to selling hunting permits. She decides to start a _____ system to grow mushrooms and medicinal plants in the forest.



Let's Talk!

Share with your helper

- ✓ Describe any agroforestry systems you have seen.
- ✓ Explain the main characteristics of each agroforestry practice.

What's important?

How would you define agroforestry?

What are two characteristics that all agroforestry systems share in common?

What are two benefits all agroforestry systems have in common?

What have you learned?

What characteristics of an agroforestry system are similar to a natural system?

For each agroforestry system to work the landowner must choose tree or shrubs that will grow well and will produce a marketable product. List the trees or shrubs that might be reasonable to explore for each system in your region.

Imagine what's next!

Imagine and describe three ways that these practices might be applied in your area.

How could agroforestry techniques be used in an urban or suburban area?

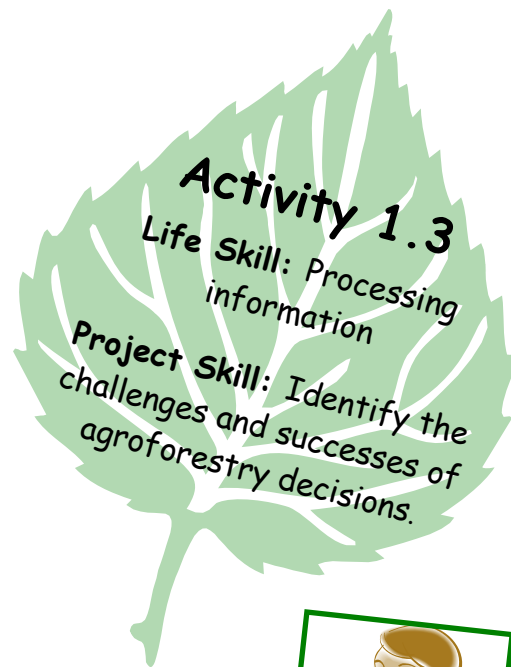
Why may it be challenging to land owners to try agroforestry?

How can learning new information help you or your community?

Did You Know?
A Geographic Information Systems Technology (GIS) professional creates 3-D visual maps of forests and tests scenarios before they occur in order to create the best land management plan for an area.

Learning from Example

As a newcomer to agroforestry, it is important you learn not only the benefits, but also the costs involved. In the field of agriculture or forestry, people often read “case studies” to better understand a practice. A case study is a written report of a real-life example that is used as a model for others to learn from. To gain practical experience before visiting a real agroforestry site, read this case study and decide what was done correctly and incorrectly.



Case Study

OVERVIEW

William Gordon manages the Star Ranch in Apopka, Florida. Over the past 13 years, he has established silvopasture systems on 100 acres of land, planting slash pine in various patterns. Previously, these 100 acres were pasture. The silvopasture is surrounded by 1200 acres of land. The land consists of 700 acres of citrus, 300 acres of natural and planted pine, and 200 acres of oak hammock. On the property a lake and wetland contribute to diversity, beauty, and the family’s enjoyment of this land.



Aside from orange juice, cattle, and timber, Mr. Gordon has made the most of the diversity on his land by selling hunting leases and conducting agrotourism (hosting events and field tours, such as church gatherings). Although this adds to his income, Mr. Gordon has found it difficult to make sure hunters follow the established rules and respect his property as well as his neighbor’s property. Safety and liability concerns also cause him to shy away from future hunting lease ventures.

OBJECTIVES

Mr. Gordon hopes that production of timber through the silvopasture and leasing the land for cattle grazing will earn more money than the previous management of leasing pasture land alone. Mr. Gordon’s land is near several Orlando developments. The pressure is greater every year to sell the farm land to developers. Although Mr. Gordon owns and manages the land and tree stands, the cattle that graze these silvopastoral systems are owned by an employee who leases the grazing rights. Because of this, Mr. Gordon has to make sure that the lessee understands all the management decisions that Mr. Gordon makes.



CHALLENGES / SUCCESSES

Pitch canker, a tree disease caused by a fungus, has been one of the biggest problems. The disease killed much of the first stand of pines he planted. Although pitch canker is common in slash pine, the problem was worsened by Mr. Gordon planting the trees too close together. These silvopasture stands were Mr. Gordon's first trials, and unfortunately, part of the learning experience. Mr. Gordon has reduced his risk in later plantings by increasing the spacing between trees and buying "improved" pitch canker resistant slash pine seedlings. Also, because the trees were planted a bit too closely in the first stand, there has already been canopy closure in some spots, and the pile-up of pine needles on the ground has made the grass unappealing or unavailable for cows to graze.



Mr. Gordon described an additional challenge of getting people to think in new ways. Initially, the cattle owner was not very happy to have land taken out of production for five years. (Three to five years is the amount of time the trees need to grow to be large enough to withstand cattle browsing). Now the cattle owner sees that it provides him with winter forage and reduces his feed costs. The protective tree cover provides benefits in the winter and summer. In the winter, the trees protect the grass from frost and extend the growing season of the pasture grasses. In the summer, the trees provide shade that helps reduce heat stress in the cattle.



In addition to leasing his land, Mr. Gordon sells a variety of forest products such as pine straw, as well as the hunting leases and tourism ventures. To find out what he could sell in the market, he did much of his research through observation and by making phone calls. Despite the up-front costs of establishing tree seedlings, Mr. Gordon believes that the long-term environmental, aesthetic, and monetary benefits will outweigh the costs.

FUTURE PLANS

Mr. Gordon plans to continue his work, slowly planting trees on old pastures a small section at a time. He is considering hiring a forestry consultant for assistance with marketing and future thinning of stands.

-Written by Nicole Strong

Let's Talk!

Share with your helper



- ✓ Describe the land before and after the agroforestry practice was installed.
- ✓ Which way do you like the land better and why?
- ✓ What type of agroforestry system is this?

What's important?

List the products harvested from the land managed in the agroforestry system.

What was added or removed (plants, animals, etc.) in the process of installing the agroforestry system?

Why did the land owner decide to manage land as an agroforestry system?

List two problems the land owner encountered from changing over to agroforestry.

List two benefits from the change.

What have you learned?

What would you have done the same? Differently?

Why is it helpful to learn from another person's experiences?

Imagine what's next!

How could you use this information and additional land owner's experiences to help others?

In what other situation would reading a case study aid in learning?

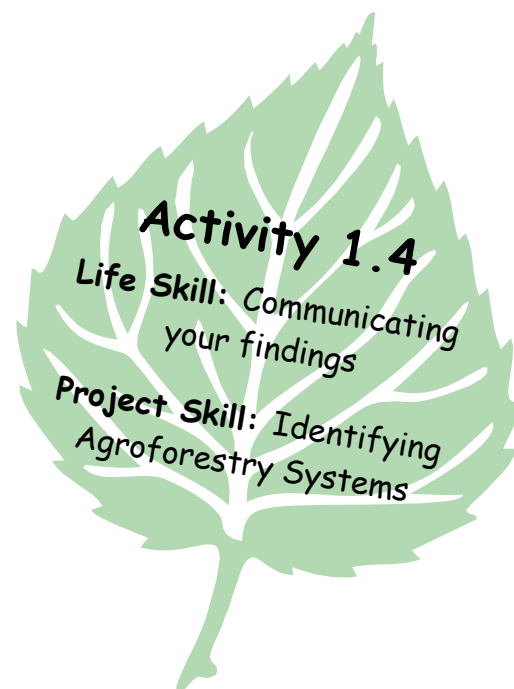
In what other professions would you use case studies as part of your job?

Did You Know?

A forester manages, uses and helps protect forests and other natural resources for a variety of purposes.

Identifying Agroforestry on Your Own

Now that you know about each agroforestry practice, your task is to identify and photograph your own examples of four of the five practices to share with others. Think about where you can find examples of each in your community or nearby communities. For example, riparian forest buffers can be found along rivers, ditches, canals, lakes, and streams. Can you find cattle grazing in the shade of trees? Often, land owners may manage their land unintentionally with an agroforestry design. However, these landowners may be able to make more money and better use of their land if they are familiar with these agroforestry strategies.



Your county extension agent may be the best person to contact to begin your search. They will know some of the land owners in your area and how they manage their land.

1. Compile a set of pictures of four of the five practices. Try first to take your own photographs of agroforestry in your community. Second, if you cannot find examples in your community, find pictures on-line to print.

2. Record and communicate your findings. You may need to ask the land owner to help you answer some of the questions if the answers are not apparent.

3. For each practice:

- ✓ Take photographs on location, or print out picture from the internet
- ✓ Identify and label the picture
- ✓ List the specific products from the site
- ✓ List two human or environmental benefits
- ✓ List two potential challenges



Practicing Agroforestry



Practice:

Location:

Human/Environmental
Benefits:

Potential Challenges:



Practice:

Location:

Human/Environmental
Benefits:

Potential Challenges:

in My Community



Practice:

Location:

Human/Environmental
Benefits:

Potential Challenges:



Practice:

Location:

Human/Environmental
Benefits:

Potential Challenges:



Let's Talk!

Share with your helper

- ✓ What was the most interesting thing you learned from talking to land owners? What surprised you?
- ✓ Discuss the benefits of agroforestry in your community.

What's important?

Which agroforestry system is most popular in your area? Why do you think that is?

Imagine what's next!

Do you think more land owners would use agroforestry if they knew about it? Why or why not?

Describe how an agroforestry system might change over time.

How can you use photography to communicate findings with others?

What have you learned?

What could agroforestry systems provide for your local community that traditional land management would not?

What could you do to communicate what you have learned about agroforestry with others?

What do they provide for the State of Florida?

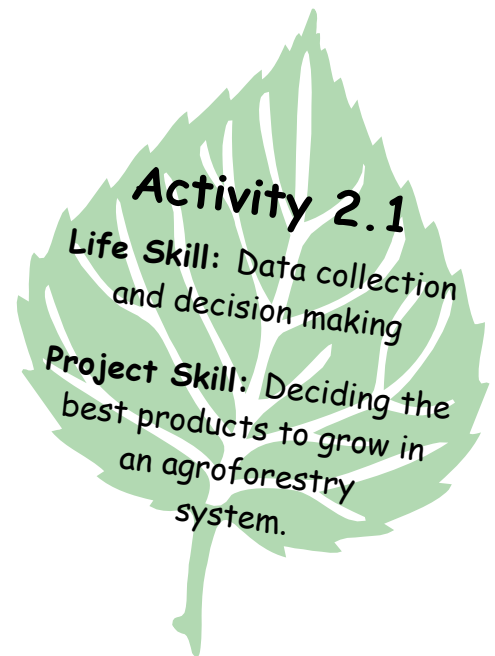
Did You Know?
An arborist or urban forester provides tree services to homeowners, commercial property owners and others in urban areas.

Chapter 2: Is Agroforestry Right for You?

The next three activities will help you become a good decision maker to determine if agroforestry is right for an area.

Market Research

The land owner faces many decisions when deciding on a new management plan. One of the largest decisions is **which** products to grow. The possibilities may seem endless – how do you choose? One of the most important things a land owner can do **before** starting to grow anything new is to investigate the *market*: the opportunity to sell specific products. One key element of the market is the buyer. Market research involves finding out what people need and want that is not currently being sold or not available in sufficient quantities. A survey can be conducted in order to identify the products that will bring the farmer the greatest success. The survey should be conducted in the same places the products will be sold. Some of these places may include: Farmers markets, Roadside stands, Grower cooperatives, Grocery stores, Restaurants/ health food stores.



A Trip to the Farmer's Market!

Pretend you own 100 acres suitable for agroforestry. You want to select products to grow in your agroforestry system that are in demand. In order to find out what products you should grow in your agroforestry system, you will conduct your own market research. The most common and accessible location for small farmers to sell their products is at the farmers market.

Find the closest farmers market online at:

<http://www.ams.usda.gov/farmersmarkets/map.htm>



With help from the guidelines below, design your own survey.

- 1.** The survey should be in an interview format.
- 2.** The questions will be divided into two surveys for the: a) farmers and b) buyers.
- 3.** Each section should be five to ten questions. Ten questions should be the maximum to keep the survey brief, yet beneficial.

Keep in mind that you want your survey to reveal the answer to your question. "What should I grow in my agroforestry system?"

Example questions to ask farmers:

- What can you sell here? What can you not sell here?
- What do you add value to (such as make fruit into jelly) and why do you add value?
- How do you attract people to your product?
- Do you do anything to make your product different?
- What products do you usually sell out of?
- What products do you never sell out of?
- Is there a product that people buy that is not produced locally, but can be?
- Is there something that people would like to buy, but is not available?
- Do purchasers express any concerns about buying food products here?
- Your own questions _____

Example questions to ask buyers:

- What do you buy at the farmers market?
- What would you like to buy here that is not sold here?
- What product(s) sell out that can be hard to buy?
- Do you have a concern about food products?
- What is your favorite reason for coming to the farmers market?
- Your own questions _____

Once you have designed your farmer's market survey, test the questions on a family member or friend. This is a good practice to make sure the questions are understood clearly by the people taking the survey.



Be sure to:

- Keep the farmer and buyer surveys on separate pieces of paper
- Make 10 copies of each (front and back to conserve paper!)

Now at the farmers market, you will be nothing less than a professional! You are ready to conduct your survey. Grab your clip board and pen and head out to the farmers market. Survey five to ten farmers and five to ten buyers.

Let's Talk!



Share with your helper

- ✓ Explain what a survey is and how can benefit from conducting one.
- ✓ Discuss how you felt while conducting your survey.
- ✓ Decide what products you might want to grow to meet market demands that are not being met.

What's important?

What products sell well? Why?

In addition to the farmer's market, in what other sites could you survey owners/producers and buyers?

What products do not sell well? Why?

In what careers could you use the skills you've practiced with this project activity?

What have you learned?

How did farmers "add value" to their products? Why?

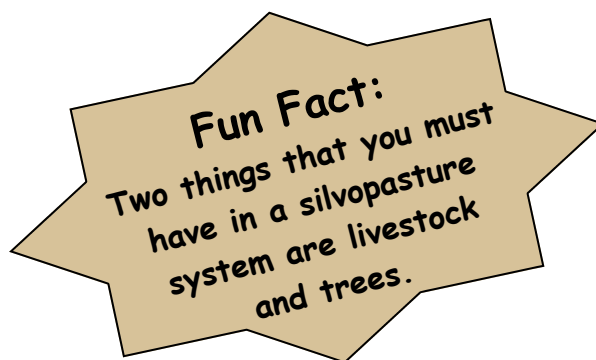
More challenges

In order to make your product stand out from the rest, create a poster to put at your stand at the farmer's market to advertise your product. Or offer to make a poster for a farmer at the market.

What do buyers care about? Why?

Imagine what's next!

Describe one way you could attract people to your agroforestry product at the farmers market.



Budgeting: Profit or Loss?

During the planning phase of any business, the manager creates a budget of what she or he expects to spend and earn. This will help the owners decide if the planned business will actually make money and how many years it will take to start making a profit. In addition to businesses, an individual or a family may work on a budget to determine if there will be any money after they pay the bills to buy something special.

Activity 2.2
Life Skill: Managing Resources and Decision Making
Project Skill: Calculate and compare different management systems for costs and profits.



The Activity



On the next page is the expected budget of three different types of agriculture and forestry management practices: silvopasture, cattle pasture, and pine plantation. Because some activities occur every year and others occur sporadically, but predictably, the costs and revenues change from year to year. Actual costs and revenues for any of the activities could be substantially different than these examples, pointing out the necessity of doing a budget before selecting a particular management practice. Use this information to create an annual budget for each system. Then combine your results into the summary chart.

Calculate an annual budget for each agroforestry system using the expected costs and revenue presented.



Silvopasture System

Year	Costs	Revenue	Net profit
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Silvopasture System Sample Budget

Year	Activity	Cost \$/acre	Income \$/acre
0	Establishment of trees and forage	250	
1-20 (annual)	Forage maintenance	30	
4-15 (annual)	Cattle purchase/care & sales	350	510
15	Thinning trees		200
4,8,12,16, 20	Prescribed burn	15	
20	Final harvest		1000
0-20 (annual)	Property tax	10	

Cattle Pasture System

Year	Costs	Revenue	Net profit
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Cattle Pasture System Sample Budget

Year	Activity	Cost \$/acre	Income \$/acre
0	Establishment of forage	115	
1-20 (annual)	Forage maintenance	30	
2-20 (annual)	Cattle purchase/care & sales	350	525
2,4,6,8,10,12,14,16,18,20	Prescribed burn	5	
0-20 (annual)	Property tax	10	

Pine Plantation System

Year	Costs	Revenue	Net profit
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Pine Plantation System Sample Budget

Year	Activity	Cost \$/ac	Revenue \$/ac
0	Establishment of trees	200	
10-20 (annual)	Hunting lease		10
8,9,10,11,12	Pine straw		70
15	Thinning trees		500
4,8,12,16, 20	Prescribed burn	15	
10,15	Fertilization	80	
20	Final harvest		2000
0-20 (annual)	Property tax	10	

Summary

Years	Silvopasture Net profit \$/acre	Cattle Pasture Net profit \$/acre	Pine Plantation Net profit \$/acre
0-5			
6-10			
7-15			
16-20			
0-20			

How would the budget change if:

1. In year eight and on, the state passed a regulation that allows farmers to sell environmentally friendly meat for extra money. All farms with silvopasture will increase the cattle sales by \$75 per acre.

2. In year five and on, the state passed a regulation that gives a tax break on farms that practice environmentally friendly management. All farms with silvopasture reduce property tax from \$10 to \$5 an acre.

Let's Talk!



Share with your helper

- ✓ Which system made the most money at 5 years? 20 years?
- ✓ Which system required the most investment?

What's important?

What information did you find out from calculating the budgets? How is this information useful?

Imagine what's next!

Why is it important to plan a budget in advance?

Name some additional costs not included in the example budget for each type of system.

What can you make a budget for at your school or at your home?

What have you learned?

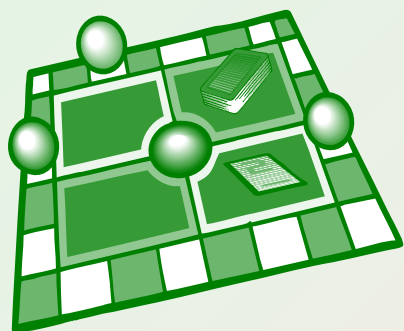
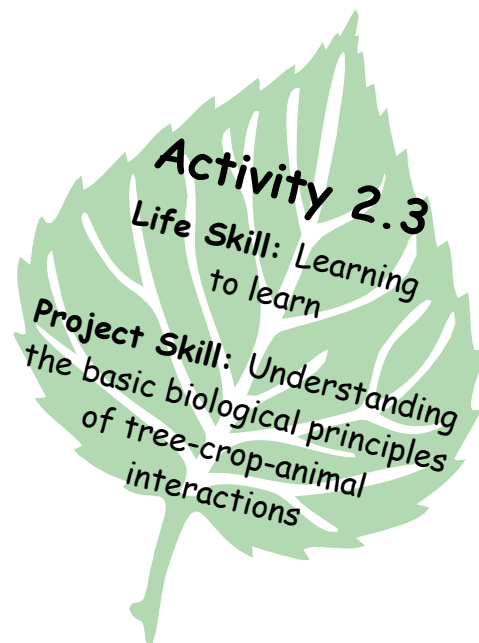
Which system protects water quality the best?
Which system may cause the most water quality problems and what can you add to that system to protect water quality?

What could be changed to make the least profitable operation more profitable?

Fun Fact:
Strategic placement
of plants can help keep
insect pests and disease
out of gardens.

Environmental Interactions

The ecological interactions between trees, crops, and livestock are important reasons for using agroforestry systems. Some agroforestry systems are simple and form only a few connections. Others are so complex they may look more like a natural system than a managed area. If properly planned, these interactions are what create many of agroforestry's benefits. These interactions can also cause problems such as competition for sunlight, water, and nutrients between trees and crops. This game will introduce you to some of the basic biological factors in agroforestry. These interactions are what farmers want to keep in mind while planning their agroforestry system.



Environmental Interactions Game

Find a family member or friend to play the game with. Two to four people can play. By playing this game you will learn more about the ecological interactions between agroforestry components. The object of this game is to earn agroforestry knowledge valued in credits. The player with the most points at the end of the game wins.

Directions:

1. Each player needs a game piece to move through the agroforestry board. You can use different coins, such as a penny, nickel, or quarter.
2. Shuffle the Environmental Interaction cards well and place the phrases pointing down on the board.
3. Use a piece of notebook paper to keep a tally of your agroforestry credits.
4. All players put game pieces on start square.
5. Draw a card and move to the next square that corresponds with the AF system on your card. Read the card aloud and record your credits earned or lost on the tally sheet.
6. Take turns until the first person reaches "Finish" – any AF card can get you into the finish square. First person that reaches "Finish" earns 20 bonus credits.
7. Once all the players are done, count up the credits for each player. The person with the most credits earns the title, "Master Agroforester"
 - 2nd place, "Advanced Agroforester"
 - 3rd place, "Intermediate Agroforester"
 - 4th place, "Beginner Agroforester"



Let's Talk!

Share with your helper

- ✓ Tell about the most surprising tree-crop-animal interaction
- ✓ What did you learn about interactions?

What's important?

Name three risks a land owner needs to keep in mind while designing their agroforestry plot.

Imagine what's next!

Other than in an agroforestry system, when may someone be concerned about biological interaction between plants and/or plants and animals?

What might be the most important interactions in your area and for the farmers you surveyed?

In a town or city, how may trees affect their surroundings?

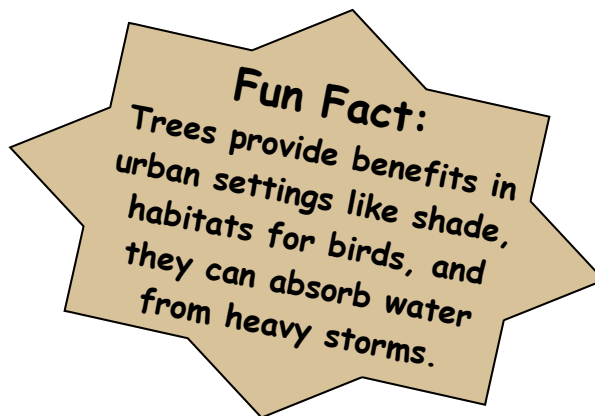
What have you learned?

How might these interactions be important for the farmers you surveyed?

More Challenges:

Using the internet, find out how people use agroforestry in a different country. Possibly communicate with other 4-H groups abroad and ask how agroforestry is helping in their country. Write a newspaper article about your findings.

How could you change agroforestry designs to reduce the effects of the different "con" cards?




Fun Fact:

Trees provide benefits in urban settings like shade, habitats for birds, and they can absorb water from heavy storms.

ENVIRONMENTAL

FF WB SP AC RFB FF

RFB AC SP WB



Alley Cropping

WB SP AC

Playing
He

FF RFB AC SP Move ahead 5 spaces WB FF

RFB Move back 5 spaces

RFB Move ahead 5 spaces

FF Move back 5 spaces

WB

SP



Riparian Forest


RFB FF WB SP AC RFB Move back 5 spaces

AC

SP

WB Move ahead 5 spaces

FF



Silvopasture

AC RFB FF W Move ahead 5 spaces

RFB AC SP WB FF RFB AC Move ahead 5 spaces SP Start

INTERACTIONS

Cards
are



SP AC RFB FF WB SP

WB

FF
Move ahead
5 spaces

RFB

AC

SP

WB

FF

WB
Move back
5 spaces

SP AC RFB



AC

RFB

FF

WB

WB
Move ahead
5 spaces

FF

RFB

AC

SP

SP

AC

RFB

FF

WB

SP
Move back
5 spaces

AC



RFB

FF

WB

SP

AC

Finish

FF
Move back
5 spaces

RFB

AC

SP

WB
Move ahead
5 spaces

FF

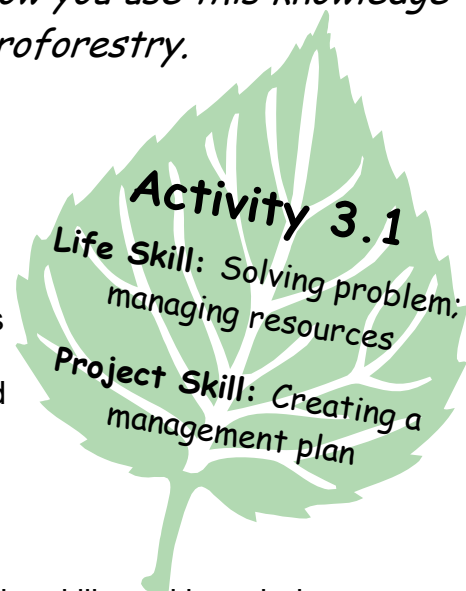
RFB

Chapter 3: Agroforestry Action

In the previous chapters, you have been introduced to the various way agroforestry can be applied to the land. Now that you understand the benefits and challenges of these practices, this chapter will allow you use this knowledge in addition to teaching others about agroforestry.

Plan a Site

A management plan is a document created by land owners to guide and direct the use and management of land. In addition to private land owners, public and commercial lands all have a prescribed management plan. The goals of plans match the owner's objectives and can vary from recreation in a State Park to growing trees for lumber on a large tree plantation. When making plans, land owners, consultants, and other people often make a drawing or map that demonstrates how the plan will be laid out on the ground. This aids in allowing all people involved to discuss the plan together and make changes and additions they can agree on.



The beginning stages of the management planning process require the skills and knowledge you have gained in completion of this project book. Think about what you have learned in the project book and use this knowledge to make an agroforestry plan. You know:

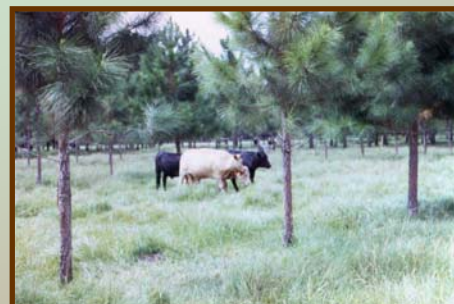
- 1) What each agroforestry practice is used for.
- 2) What products come from each agroforestry practice.
- 3) What you learned from your market research.
- 4) What you learned from the interactions between trees-crops-animals.

The Activity:

Select one of the three land options on the next page. They include:

- 1) Hypothetical land situation in an urban area.
- 2) Hypothetical land situation in a rural area.
- 3) Pick a piece of land you are familiar with that would be suitable and benefit from agroforestry management.

Your task is to improve the land management practices using the agroforestry methods you learned. First, identify at least three management issues that need to be fixed, such as poor water quality, soil erosion, and income dependency on one crop. Then pick three different agroforestry systems you could use to fix the problems on the land. Make a diagram to explain how you designed the property. Label the types of trees, crops and animals you would use and why. You may need to do some research on the internet or make phone calls to extension agents find out what types of trees, crops and animals to use. Include a key or notes at the bottom to explain your strategies.



Activity Options

Option #1 Urban area:

You live in the city and are assigned a project to demonstrate the benefits of agroforestry and how they can address land management problems of a city park that borders a retirement community. There are three issues:

- 1) The residents live near a playground area. The residents complain about the kids tromping on their property and wish there was something you could do to keep them in the limits of the playground. However, they want to keep their backyard natural and would prefer not to put a fence in. In addition, they would like to attract more birds to their property.
- 2) The city park is of average size, with a pond in the middle of the land. There are only three trees, none of them near the pond on the property. Other than the trees, there is not much vegetation in the area except for grass. The city park management would like to put fish in the pond. However, the pond water is not clean enough for fish to live in. It has too many nutrients from grass fertilizers and duck droppings.
- 3) Some people in the retirement community would like to grow something they can eat or use in their backyard. However, the back yard doesn't get much light from the shade of the trees that fill in the area.

Option #2 Rural area:

You live 30 miles from a town. After learning about agroforestry systems, you decide you would like to make some changes in your land management plans.

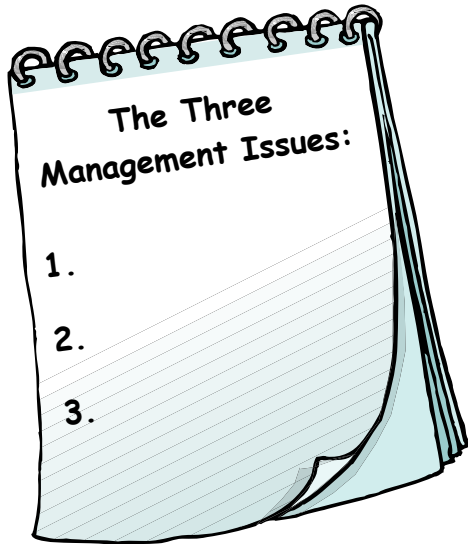
- 1) You have 150 cattle that graze on pasture. The summer heat is extreme and you would like to provide shade for your cattle. You would like to grow more trees on your property, but do not want to give up pasture area.
- 2) The water in the lake on your property has become overtaken by algae since you increased your herd from 50 to 150 cattle. You would like to improve the water quality of the lake that is set in the middle of the pasture.
- 3) You have acres of pine trees that are in their fifth year of growing. You would like to do something more with that land while the trees are still growing to make more income until you harvest the trees.

Option #3:

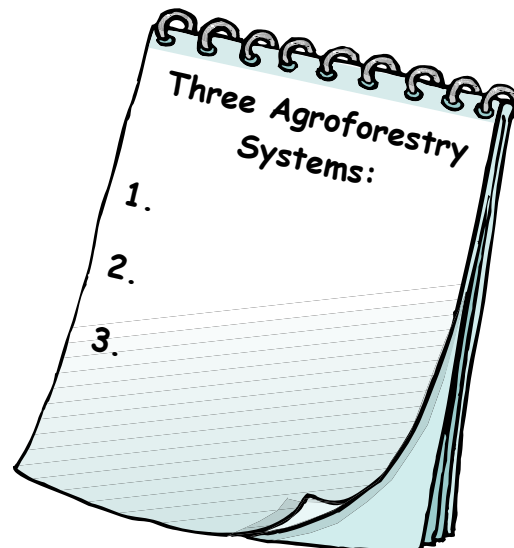
You pick out your own piece of land in order to design a basic agroforestry plan.

Agroforestry Action:


Make your diagrams to explain how you designed the property. Label the types of trees, crops and animals you would use and why. Include a key or notes at the bottom to explain.





A Site Plan



Use a key like this:

 = Pine Tree

 = Creek

 = Animal



Let's Talk!

Share with your helper

- ✓ Explain how you decided on the three agroforestry practices you picked
- ✓ Discuss the advantage of using a diagram to explain a plan

What's important?

What is the importance of making a plan before actually doing it?

What are three important components of a new agroforestry practice the land owner needs to research before using it on their land?

What are important features of a diagram or map?

Imagine what's next!

Do you think management plans are flexible and can be changed as needs and trees grow taller or are harvested? Why?

What have you learned?

Why did you choose the land option you selected?

In what other work can you use a diagram to explain a plan besides in land management?

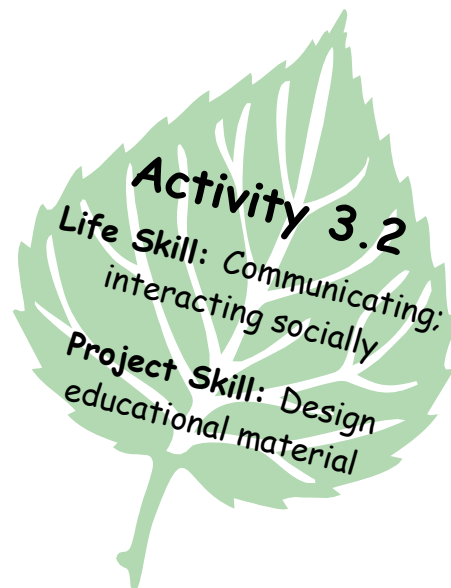
What other agroforestry practices could you have used and what would you have done differently?

Did you Know?
Landscape architects design the outdoor areas of buildings so that they are functional, beautiful, and compatible with the natural environment.

Educate Public/Family

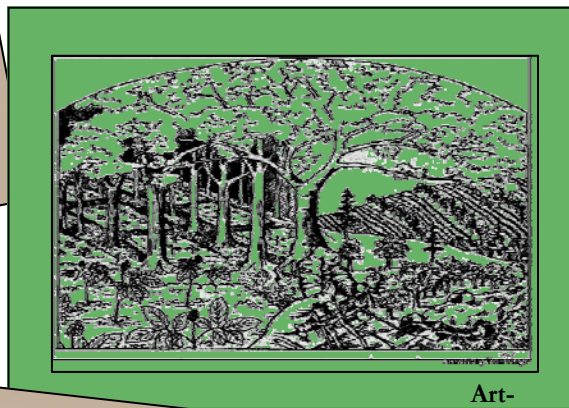
When a new technology or way of doing something is presented, sometimes it is slow to gain acceptance. Even though the benefits can be many, traditions and community norms are usually favored rather than trying something new. Think of something you and your family once used that is now considered old. Why did you stop using it? What convinced you to use the new technology?

Typically, people change their way of doing something when it benefits them and their family. Many companies try to persuade others to use their products by explaining how it will benefit the buyer. Think of agroforestry as a product. You understand the benefits of agroforestry and want to share this with others.



The Activity:

You now will fill the role of an extension agent whose job is to educate people about agroforestry. Remember the record book you created? Use your record book as a resource and expand on the information to make a brochure, poster, or other education display for your family, school or community. Your agroforestry educational material will reach out to others and share your new knowledge to inform others about the benefits of agroforestry.



Make sure to include:

- Five main types of agroforestry
- Benefits of each practice
- Facts you have learned to make your point memorable
- Contact information for people interested in learning more about agroforestry, such as a website or county extension office phone number
- Title that will catch someone's eye and make them curious to look at the poster
- Pictures, graphics, colors, and other attention keepers



Let's Talk!

Share with your helper

- ✓ Discuss what type of educational material you chose and why you chose it.
- ✓ Describe how you made your point convincing.

What's important?

Who and where will you display or distribute your educational material? Why?

How do extension agents play a crucial role in communication between land owners?

How did you make your educational material fun to look at?

Imagine what's next!

Name different topics for an educational campaign you can create to share information you believe is important with others.

What have you learned?

What are the advantages of using a poster, brochure, or other similar methods of spreading information?

Did you Know?
Wildland fire managers prevent, suppress, contain and control damage as a result of fires.

Environmental Interactions Game Card Instructions

Prepare cards for each of these items or copy the card set from pages 28-31 of the Leader's Guide.

Alley Cropping cards

- Trees in your alley cropping system protect against loss of topsoil and fertilizers, earn 10 credits.
- Leaves on the trees in your alley cropping system make a barrier against hard rain and prevent soil erosion, earn 5 credits.
- Deep roots of trees absorb fertilizers the crops missed and protect water quality, earn 10 credits.
- Planting more trees on your property increases bird habitat, earn 5 credits.
- Less manufactured fertilizers and insecticides are needed due to nutrient cycling in your agroforestry system, earn 10 credits.
- Birds you attract with extra trees eat insect pests, earn 5 credits.
- You use three types of agroforestry on your property which increases species diversity on your land, earn 5 credits.
- Your new agroforestry system efficiently uses less land but yields the same amount of products as before, earn 5 credits.
- Trees too close to crops and compete for nutrients, lose 5 credits.
- You did not choose plants that tolerate shade and your crop dies in the shady parts of your alley cropping system, lose 5 credits.
- You are not careful when spraying alley crops with pesticide and get it on the orange trees which damage your orange crop, lose 5 credits.
- You forgot to cut back limbs on your trees and there's too much shade on your crops, lose 5 credit.
- Water competition between your crops and trees yields a small crop, lose 10 credits.

Silvopasture cards

- Cows get relief from the hot sun in the shade of the trees of your silvopasture system, earn 10 credits.
- Your cows are happy because pasture is protected by the trees in your silvopasture system from frost which gives grass a longer growing season, earn 10 credits.
- Wildlife habitat improves by planting trees to make a silvopasture system on your property, earn 5 credits.
- You decide to use three types of agroforestry on your property which increases species diversity on your land, earn 5 credits.
- Your new agroforestry system efficiently uses less land but yields the same amount of products as before, earn 5 credits.
- Pine needles pile up on your pasture and cows have trouble grazing, lose 5 credits.
- Optimal soil conditions are not the same for trees and pasture, so your trees do not grow as fast in the silvopasture system as in a forest, lose 5 credits.
- You let your cattle graze in a pasture where you planted trees for silvopasture only one year ago and cattle trample tree seedlings, lose 10 credits.

Forest Farming cards

- You take advantage of the environmental conditions in your forest and grow ferns in the shade, earn 10 credits.
- You take advantage of the environmental conditions of your forest and grow mushrooms in the shade, earn 10 credits.
- Instead of building a structure to shade ornamental potted plants you grow to sell, you grow them in the shade of your forest, earn 5 credits.
- You decide to use three types of agroforestry on your property which increases species diversity on your land, earn 5 credits.

Alley Cropping (AC)

Trees in your alley cropping system protect against loss of topsoil and fertilizers.

Earn 10 Credits

Sample Card from Leader's Guide

- Animals eat part of your shiitake mushroom crop grown under the forest on your property, lose 5 credits.
- Birds eat blueberry fruits, lose 5 credits.
- You forget that crops must be shade tolerant to grow in the understory of the forest. You plant crops that need sun and they never grow, lose 10 credits.

Riparian Forest Buffer cards

- Look at that strong stream bank! Trees and other vegetation hold soil intact and prevent erosion and loss of land into the stream, earn 5 credits.
- Neighbor's agriculture fields flood from a recent storm, but you have riparian forest buffers along the stream of your property that absorbs the extra water and keep your crops safe, earn 10 credits.
- The water quality of the stream on your property improves greatly as roots in the riparian forest buffer filter and trap fertilizers and animal waste, earn 10 credits.
- The fish are happy in the stream on your property because the aquatic habitat improved after you planted a riparian forest buffer, earn 5 credits.
- You plant mostly nut and berry producing trees and shrubs in your RFB which gives you money and environmental benefits, earn 5 credits.
- Birds eat fruits, lose 5 credits.
- You forget that crops must be shade tolerant to grow in the understory of the trees in your riparian forest buffer. You plant crops that need sun and they never grow, lose 10 credits.

Windbreak cards

- Breath deeply, less dust flies through the air after you plant windbreaks along the borders of your property, earn 10 credits.
- The windbreak you planted helped prevent frost damage and protects your crops, earn 5 credits.
- Animals get relief from hot sun in the shade of a windbreak, earn 5 credits.
- Planting more trees on your property increases bird habitat, earn 5 credits.
- The birds you attract with extra trees eat insect pests, earn 5 credits.
- You decide to use three types of agroforestry on your property which increases species diversity on your land, earn 5 credits.
- You forget to prune the trees in your windbreak and they grow tall. Shade intolerant crops die in the shade, lose 5 credits.
- You forget to keep animals away from tree seedlings you planted for a windbreak. Tree seedlings die from being trampled, lose 10 credits.
- You let your cattle graze in a pasture where you planted trees for silvopasture only one year ago. Cattle trample tree seedlings, lose 5 credits.

Name: _____

Club: _____

County: _____



4-H Pledge

I Pledge:

My head to clearer thinking
My heart to greater loyalty
My hands to larger service, and
My health to better living
For my club, my country, and my world.

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