

Basic Economics of Agroforestry

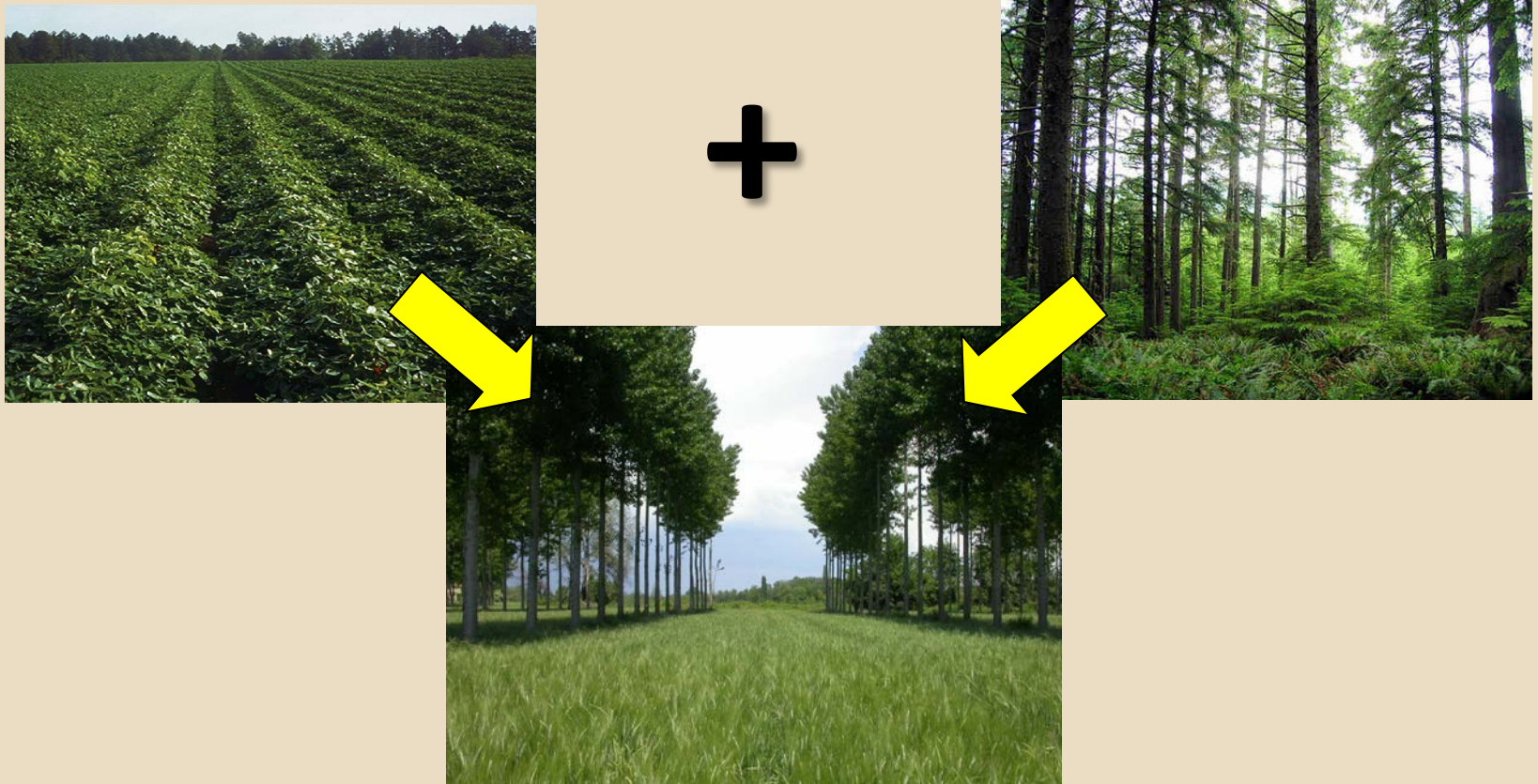
The economics of forest-crop production



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What is Agroforestry?

Combining trees with crops/livestock to create sustainable farming and ranching systems



Why Agroforestry?

Benefits to the Community:

- ***Productive soils***
- ***Clean water and air***
- ***Plentiful wildlife***
- ***Scenic views***
- ***Renewable energy***
- ***Secure and healthy food***
- ***Sustainable farms/ranches***



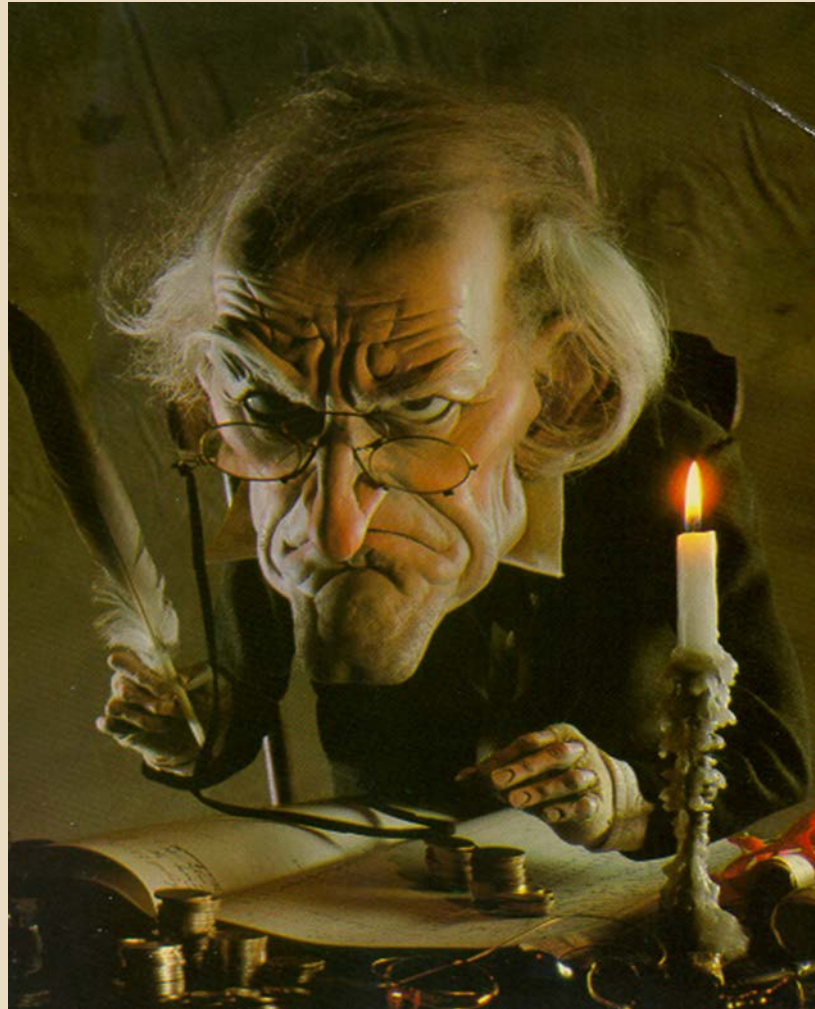
Why Agroforestry?

Benefits to the Land Owner:

- *Increase cash flow*
- *Increases real estate values*
- *Diversify income, reduce risk*
- *Marketable value-added products*
- *Improved crop yields & livestock production*
- *Financial assistance program payments*



Basic Economic Analysis





Benefit & Cost Analysis

Economic analysis requires four simple steps:

- 1. Estimate Costs**
- 2. Estimate Benefits**
- 3. Convert to “Like Terms”**
- 4. Compare Costs & Benefits**

1. Estimate Costs

<u>Cost Categories:</u>	<u>One Time</u>	<u>Annual</u>
Materials	X	
Equipment/Installation	X	
Labor	X	X
Mobilization	X	
Operation & Maintenance (Annual)		X
Acquisition of Technical Knowledge	X	
Forgone Income		X
Risk		X
Administration & Permit Costs	X	
Financing		
Non-Monetary Costs		



2. Estimate Benefits

Monetary and Non-Monetary Benefits

Crop/Forage/Timber Yield Increases

Livestock Health/Weight Gains

Wildlife Habitat Improvement

Recreation Opportunities

Specialty Forest Products

Healthy Environment (soil, water, air)

On and Off Site Watershed Benefits



3. Convert to “Like Terms”

- Same area units (acres)
- Monetary value where possible (dollars)
- Convert “one-time” to “annual” costs (amortization)

The Goal: \$/Acre/Year



Amortization Example

Should I Purchase Haying Equipment?

Mower, Swather & Bailer

Life of Equipment: 15 Years

Discount Rate: 8 Percent

Present Value: \$20,000

Payment (\$/Yr): ?

Amortize \$20,000, over 15 years, at 8% = \$2,340/Year

Amortization Example

Haying Equipment

Time Period	15 Years
Discount Rate	8 Percent
Present Value	\$20,000/Drill
Payment	\$2,340/Year
Acres Farmed	500 Ac
Cost per Acre/Year	$\$2,340/500 \text{ Ac} = \$4.68/\text{Acre}/\text{Year}$

Do we have enough Benefits to cover the \$4.68/Ac/Yr Costs?

4. Compare Costs & Benefits

- **Partial Budgeting**
 - Systematically displays Benefits and Costs
 - Only “things that change” are considered
 - Simplifies data collection
 - Use a “T-Chart” to display the effects
- **Make a decision**
 - Benefits > Costs
 - Meets land users goals & objectives
 - Consider non-monetary costs and benefits



“T” Chart

TREATMENT EFFECTS INFORMATION	
NAME _____ LOCATION _____ DATE _____ MANAGEMENT UNIT:	
TREATMENT:	RESOURCE PROBLEMS:
“+” POSITIVE EFFECTS (Benefits)	“-” NEGATIVE EFFECTS (Costs)
+ + + + +	- - - - -

“T” Chart Example

CONSERVATION TREATMENT EFFECTS

CONSERVATION MANAGEMENT UNIT – 72 acres conifer forestland. Before treatment timber is of poor quality with non-adapted conifer species, high risk of wildfire and is brush infested.

NEW CONSERVATION TREATMENT:	RESOURCE PROBLEMS:
Forest Site Preparation Tree and Shrub Establishment Tree and Shrub Pruning Forest Stand Improvement Upland Wildlife Management 4-Year EQIP Contract	Plant Productivity, Health and Vigor Plant, Wildfire Hazard Wildlife, Cover and Shelter
BENEFITS	COSTS
<p><u>Reduced Costs</u></p> <p>Wildfire hazard reduced</p> <p><u>Increased Revenue</u></p> <p>Timber yield increase (50 Yr rotation) Current production: 5,000 BdFt/Ac With forest improvement : 25,000 BdFt/Ac 20,000 BdFt/Ac * (\$.60/BdFt - \$.15/BdFt harvest cost) = \$9,000/Ac PV: (\$9,000, 50 Yr, 7%) = \$305 PMT: (\$305, 50 Yr, 7%) = \$22/Ac/Yr</p> <p>Improved forestland habitat for big game species</p> <p><u>Other</u></p> <p>Improve fish and wildlife habitat off-site Promote education & awareness of forest mgt. Assist meeting goals of Forest Practices Act</p> <p>Total Dollar Benefits = \$22/Ac/Yr</p>	<p><u>Increased Costs</u></p> <p>Forest Stand Improvement 72 Ac * \$300/Ac slash treatment 72 Ac * \$300/Ac mechanical release = \$43,200/Ac / 72 Ac (50 Yrs, 7%) = \$43/Ac/Yr (50% Gov Pmt)</p> <p>Tree and Shrub Establishment 16 Ac * 436 Trees/Ac * \$1.50/Tree 16 Ac * \$185/Ac moisture conservation = \$13,424/Ac / 72 Ac (50 Yr, 7%) = \$13/Ac/Yr (50% Gov Pmt)</p> <p>Tree and Shrub Pruning 72 Ac * \$225/Ac / 72 Ac (10 Yrs, 7%) = \$32/Ac/Yr (50% Gov Pmt)</p> <p>Forest Site Preparation 16 Ac * \$400/Ac mechanical site prep. = \$6,400/Ac / 72 Ac (50 Yrs, 7%) = \$6/Ac/Yr (50% Gov Pmt)</p> <p>Upland Wildlife Management \$1/Ac/Yr</p> <p>Total Dollar Costs = \$95/Ac/Yr</p>

NRCS Agroforestry Related Practices

Access Control 472

Access Road 560

Brush Management 314

Critical Area Planting 342

Firebreak 394

Forage Harvest Management 511

Forest Stand Improvement 666

Forest Trails and Landings 655

Fuel Break 383

Hedgerow Planting 422

Land Clearing 460

Precision Land Forming 462

Prescribed Burning 338

Prescribed Grazing 528

Recreation Area Improvement 562

Recreation Land Grading and Shaping 566

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Road/Trail/Landing Closure and Treatment 654

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Stream Habitat Improvement and Management 395

Streambank and Shoreline Protection 580

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Tree/Shrub Establishment 612

Tree/Shrub Pruning 660

Tree/Shrub Site Preparation 490

Upland Wildlife Habitat Management 645

Windbreak/Shelterbelt Establishment 380

Windbreak/Shelterbelt Renovation 650

Costs and Benefits of Agroforestry Practices



Costs of Agroforestry Practices

Costs are highly variable across the landscape and depend on the land users goals, objectives and site conditions.

Stocking existing forest land is relatively inexpensive.

Where native shrubs, forbs or other species are planted, the cost of establishing and managing forests increase.

The greatest forest expense may be forgone income from land taken out of crop production.



Agroforestry Implementation Costs

Tree and Shrub Site Preparation (\$/Ac)

	<u>Light</u>	<u>Medium</u>	<u>Heavy</u>
Chemical	\$95	\$155	\$185
Hand	\$125	\$215	\$370
Mechanical	\$95	\$175	\$370

Tree/Shrub Establishment (\$/Ac)

		<u>Light</u>	<u>Medium</u>	<u>Heavy</u>
<u>Materials</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>
Animal Damage Control, Barrier	Each	\$1.05	\$1.05	\$1.05
Animal Damage Control, Cage	Each	\$0.00	\$12.30	\$12.30
Animal Damage Control, Repellant	Acre	\$0.00	\$75.00	\$75.00
Moisture Conservation, Weed Control	Acre	\$50.00	\$125.00	\$125.00
Moisture Conservation, Tree Matts	Sqft	\$1.60	\$2.25	\$2.25
Tree/Shrubs Bare Root, Planted (300/Ac)	Acre	\$1.25	\$1.25	\$1.25
Tree/Shrubs Cuttings, Planted	Each	\$0.95	\$0.95	\$0.95
Tree/Shrubs Live Stakes, Planted	Each	\$0.95	\$0.95	\$0.95
Tree/Shrubs, Plugs, Planted	Each	\$1.55	\$1.55	\$1.55
Tree/Shrubs, Container, Planted	Each	\$3.70	\$3.70	\$3.70
Typical Cost (\$/Ac):		\$420	\$490	\$800

*Depends on site and economic conditions.

Silvopasture Establishment (\$/Ac)

	<u>\$/Acre</u>		
Moisture Conservation, Weed Control	\$100.00		
Tree Bare Root, Planted (100/Ac)	\$150.00		
Perennial Grass Seed Mix:	\$93.00		
Pounds per Acre (18/Ac):			
Cost per Pound (\$3.50/Lb):			
Fertilizer (placed with seed)	\$60.00		
<u>Equipment/Installation (\$/Pass/Acre)</u>	<u>Passes</u>	<u>Machinery</u>	<u>Labor</u>
2 Wheel Drive 70 HP	8	\$4.27	
Mold-Board Plow 4-Bottom	1	\$9.96	\$6.57
Tandem Disk 11ft	2	\$2.32	\$3.58
Dixon Harrow	2	\$3.75	\$2.19
Cultipacker	1	\$6.07	\$1.86
Spreader (Fertilizer)	1	\$5.99	\$0.91
Grass Seed Drill	1	\$6.47	\$3.42
Equipment Total:			\$57.34
Mobilization			\$12.71
Operation & Maintenance			\$12.71
Typical Cost (\$/Ac):			\$486

*Depends on site and economic conditions.

Riparian Forest Buffer (\$/Ac)				
		Low	Moderate	High
<u>Materials</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>
Animal Damage Control, Barrier	Each	\$1.23	\$1.23	\$1.23
Animal Damage Control, Cage	Each	\$12.30	\$12.30	\$12.30
Animal Damage Control, Repellant	Acre	\$73.79	\$73.79	\$73.79
Moisture Conservation, Weed Control	Acre	\$122.99	\$122.99	\$122.99
Moisture Conservation, Tree Mats	Sqft	\$1.60	\$1.60	\$2.21
Tree/Shrubs Bare Root, Planted (220/Ac)	Acre	\$324.69	\$1.84	\$1.60
Tree/Shrubs Cuttings, Planted	Each	\$0.92	\$0.92	\$0.92
Tree/Shrubs Live Stakes, Planted	Each	\$0.92	\$0.92	\$0.92
Tree/Shrubs, Plugs, Planted	Each	\$1.54	\$1.54	\$1.54
Tree/Shrubs, Container, Planted	Each	\$3.69	\$3.69	\$3.69
Mobilization		\$8.95	\$7.58	\$22.19
	Typical Cost (\$/Ac):	\$450	\$760	\$1,100

*Depends on site and economic conditions.

Benefits of Agroforestry Improvements

Forests perform biologic, hydrologic, or geologic functions and produce ecological services and goods.

While forest land benefits a landowner, the real benefits are the cumulative effects of numerous buffers across an entire watershed.

The “dollar” benefits of agroforests can be difficult to quantify, but there is significant value of these ecological services.

Not all forests provide the same functions and services, but depend on site specific conditions.

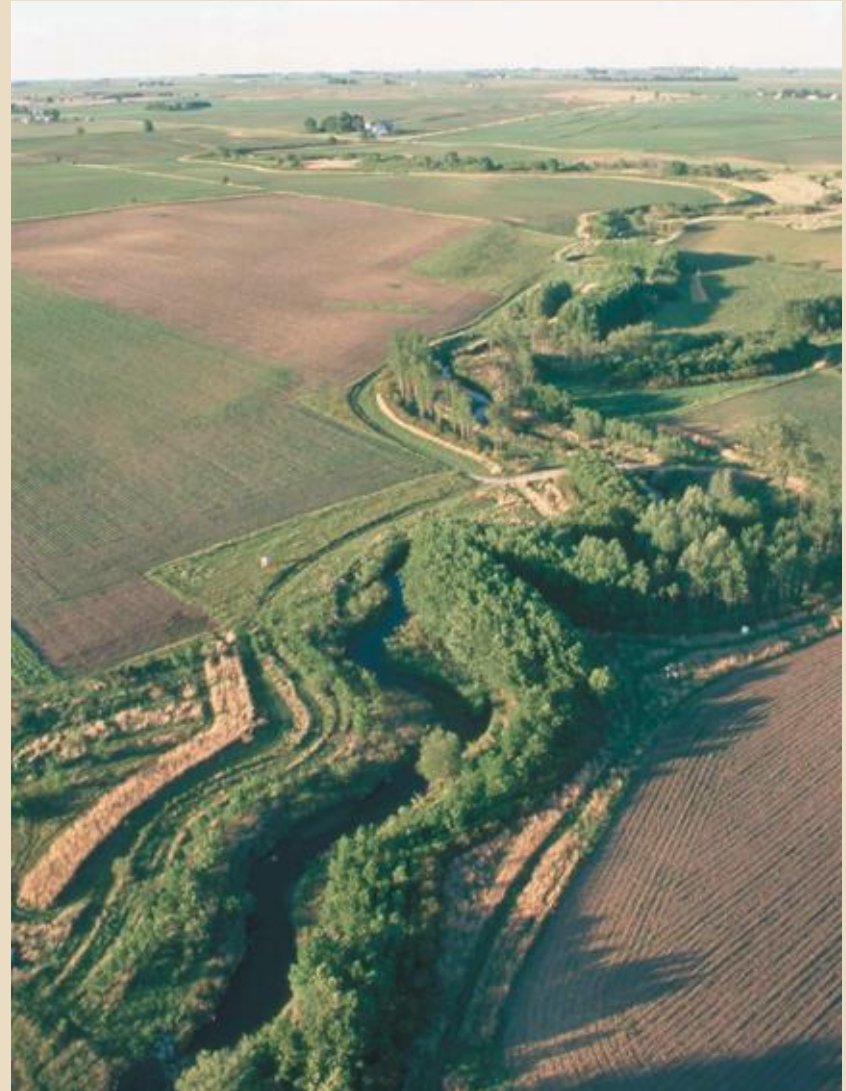


Biodiversity

Riparian and upland forests can provide critical habitat for wildlife and plant species in areas with limited native habitat.

Forests provide food and cover and serve as corridors for species movement, connecting patches of fragmented habitat.

Maintaining viable populations of native species benefits society by providing fishing, hunting, and nature study opportunities.



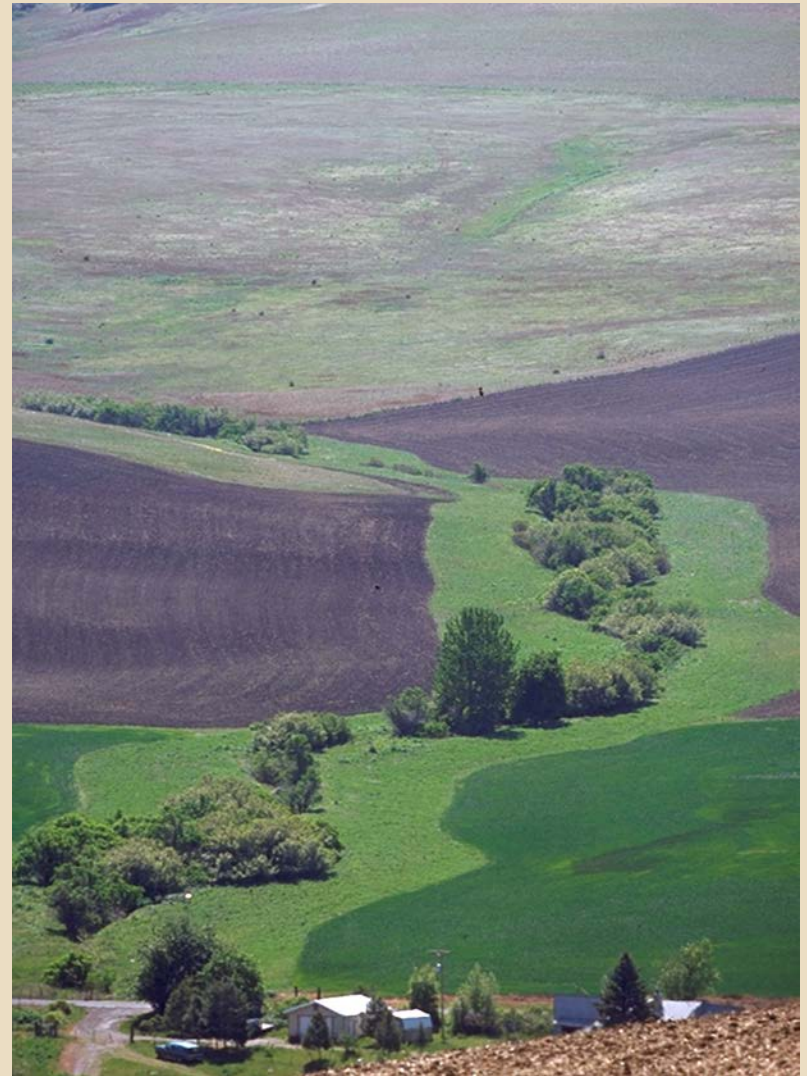
Visual Amenity

Aesthetically pleasing landscapes are more valuable than one with limited visual quality.

Forests often frame views and provide greater landscape diversity through color, form, and textures.

Unique corridors are often targeted for improvement by state and local open space organizations.

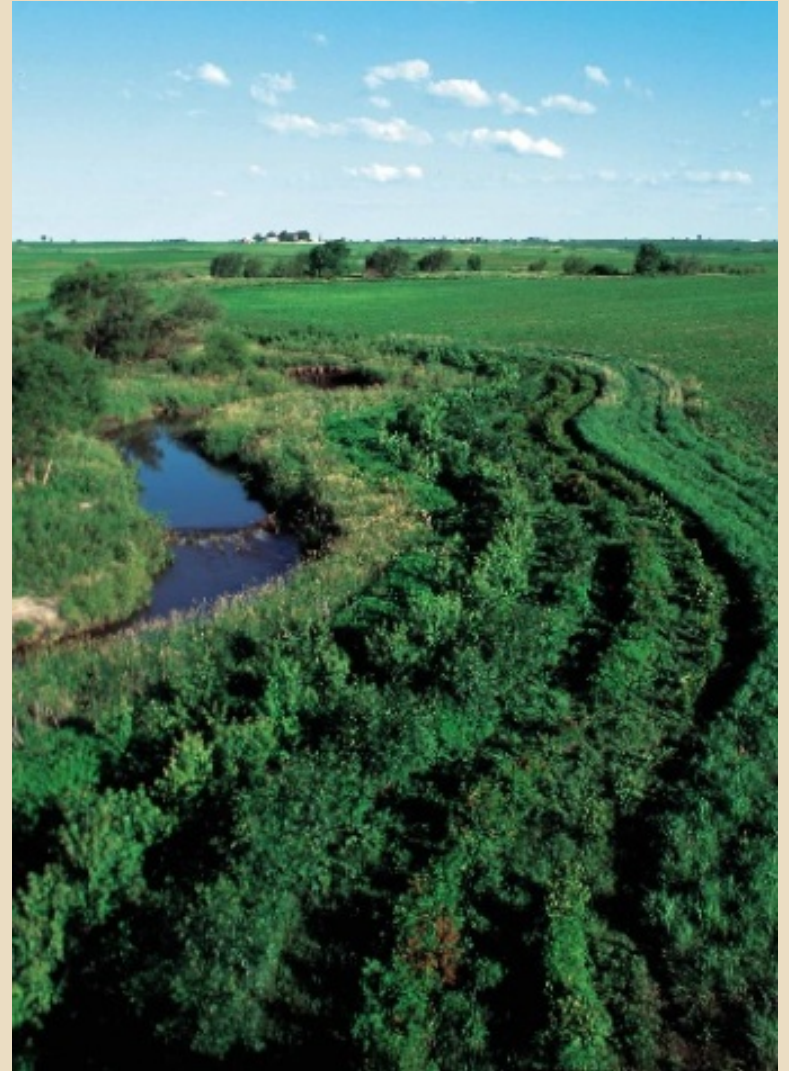
In addition, property values are higher near these types of forests.



Water Quality

Forest ecosystems can effectively filter and process sediment, nutrients, and pesticides from surface and subsurface flows.

When water quality is maintained by natural processes in forests and wetlands, expensive water treatment methods can be avoided.



Water Quantity

Riparian and wetland forests can have dramatic effects of peak flows of flood waters and also on base flows during dry periods.

By slowing flow velocity and by acting as a natural reservoir, forested riparian areas can reduce the impacts of downstream flooding.

By slowly releasing flows over extended periods, riparian forests can augment base flows, maintaining aquatic life in streams and rivers.



Recreation

Forests can provide landowners and communities with numerous recreational benefits.

When forests are combined with recreational greenways there are significant economic benefits for adjacent communities.

Property values are typically higher along greenways.

Forests offer benefits for nature study, hunting, and fishing depending on the location.



Farm Management

Agroforestry can provide opportunities to improve farm efficiency and management.

Less profitable areas of the field may be taken out of crop production (such as wet areas, odd corners, fence or ditch rows, etc.) and put into trees.



Farm Production

Land use changes from crop production to trees can provide opportunities for additional income.

Agroforestry land may still be used for hay or forage production.

Riparian forest buffers may be used for timber production, specialty products or other wood products.

Typical Net Returns (\$/Acre/Year):

Timber	\$5 - \$30
Pasture	\$10 - \$50
Hay	\$50 - \$300
Crop	\$100 - \$500
Agroforestry	\$5 - \$500





Specialty Forest Products

Opportunities exist to grow unique plants with limited markets but high income potential. Marketing and networking is required to receive sell these forest products.

Foods

Nuts

Mushrooms

Huckleberries

Blueberries

Blackberries

Persimmon

Medicinals

Oregon grape

Ginseng

Goldenseal

Cascara bark

May apple

Witch-hazel

Pacific yew

Decoratives

Ferns

Tree boughs

Cones

Moss

Corkscrew willow

Pine Straw



Energy Crops

Biomass crops reduce on farm energy costs, reduce reliance on fossil fuels, created a new income source and improve soil health.



Other Agroforestry Benefits

Clean air/water

Protect aquatic habitat

Enhance wildlife habitat

Protect stream banks

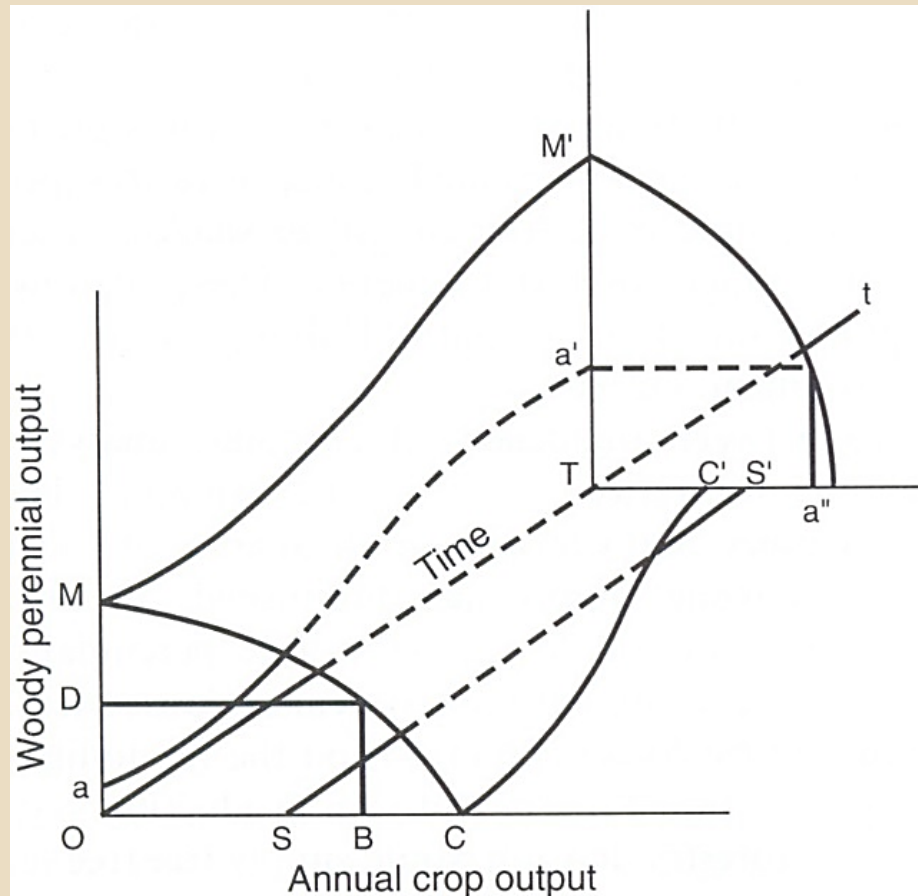
Flood protection

Scenic vistas



Agroforestry Practices

Economic Examples



Windbreaks

Plantings of single or multiple rows of trees or shrubs that redirect or modify the wind and are established for one or more environmental purposes.



Windbreaks

Benefits

\$5+/Ac/Year crop yields

- Reduce energy costs
- Screen unsightly areas
- Reduce erosion
- Reduce pesticide drift
- Protect plants
- Manage snow
- Improve irrigation use
- Increase crop yields
- Shelter livestock
- Mitigate odors and dust
- Provide wildlife habitat
- Enhance aesthetics

Costs

\$1.69 Linear Foot (installed)

\$.12/Foot/Year (20yr, 4%)

\$1.50/Acre/Year (40 Ac, 500 Ft)

Windbreak Area

Length (ft): 500

Width (ft): 10

Acres: .11

<u>Component (installed)</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Spacing (feet)</u>	<u>\$/Ft</u>
Animal Damage Control, Barrier	Each	\$1.48	8.0	\$0.18
Moisture Conservation, 4x4 Tree Matts	Each	\$2.21	8.0	\$0.28
Tree/Shrubs Bare Root, Planted	Each	\$3.69	8.0	\$0.46
Tree/Shrubs, Container, Planted	Each	\$6.15	8.0	\$0.77
			<u>Acres</u>	
Animal Damage Control, Repellant	Acre	\$30.75	0.11	\$0.01
Moisture Conservation, Weed Control	Acre	\$36.90	0.11	<u>\$0.01</u>
Total Material Costs/Foot:				\$1.69

Alley Cropping

Growing an annual or perennial crop simultaneously in the alley ways between rows of a long term tree crop. The agricultural crop generates annual income while the longer-term tree crop matures.



Alley Cropping

Benefits

\$58+/Acre/Year (50% timber/crop)

- \$8/Acre/Year Timber
- \$50/Ac/Year Crop

- **Diversify farm enterprise**
- **Reduce erosion**
- **Improve water quality**
- **Protect crops**
- **Improve nutrient utilization**
- **Enhance wildlife habitat**
- **Improve aesthetics**

Costs

\$465/Acre (installed)

\$29.77/Acre/Year (25yr, 4%)

Alley Cropping (\$/Ac)

	<u>\$/Acre</u>
Moisture Conservation, Weed Control	\$100.00
Tree Bare Root, Planted (100/Ac)	\$150.00

Perennial Grass Seed Mix:	\$93.00
Pounds per Acre (18/Ac):	
Cost per Pound (\$3.50/Lb):	

Fertilizer (placed with seed)	\$60.00
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<u>Equipment/Installation (\$/Pass/Acre)</u>	<u>Passes</u>	<u>Machinery</u>	<u>Labor</u>
MFWD Tractor 200 HP	6	\$9.34	
Chisel Plow 15ft	2	\$2.46	\$2.10
Roller Packer	1	\$1.59	\$1.75
Offset Disk	2	\$3.15	\$2.92
Grain Drill	1	\$5.57	\$2.94
Equipment Total:			\$31.83

Mobilization	\$15.00
Operation & Maintenance	<u>\$15.00</u>

Typical Cost (\$/Ac): \$465

Silvopasture

Combines timber, livestock and forage production on the same acreage. Trees provide longer-term returns, while livestock generate an annual income.



Silvopasture

Benefits

\$33+/Acre/Year (50% timber/pasture)

- \$8/Acre/Year Timber
- \$25/Ac/Year Forage
- Improved plant vigor
- Lower animal stress
- Reduced wildfire risk
- Improved wildlife habitat
- Annual income
 - Grazing, hay, hunting
- Long-term income (timber)

Costs

\$486/Acre (installed)

\$31.11/Acre/Year (25yr, 4%)

Silvopasture Establishment (\$/Ac)

	<u>\$/Acre</u>
Moisture Conservation, Weed Control	\$100.00
Tree Bare Root, Planted (100/Ac)	\$150.00

Perennial Grass Seed Mix:	\$93.00
Pounds per Acre (18/Ac):	
Cost per Pound (\$3.50/Lb):	

Fertilizer (placed with seed)	\$60.00
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<u>Equipment/Installation (\$/Pass/Acre)</u>	<u>Passes</u>	<u>Machinery</u>	<u>Labor</u>
2 Wheel Drive 70 HP	8	\$4.27	
Mold-Board Plow 4-Bottom	1	\$9.96	\$6.57
Tandem Disk 11ft	2	\$2.32	\$3.58
Dixon Harrow	2	\$3.75	\$2.19
Cultipacker	1	\$6.07	\$1.86
Spreader (Fertilizer)	1	\$5.99	\$0.91
Grass Seed Drill	1	\$6.47	\$3.42

Equipment Total: \$57.34

Mobilization \$12.71

Operation & Maintenance \$12.71

Typical Cost (\$/Ac): \$486

Riparian Forest Buffers

Riparian forest buffers are natural or planted woodlands adjacent to water bodies. They are designed with trees, shrubs, and grasses to protect water resources from non-point source pollution.



Riparian Forest Buffers

Benefits

\$8+/Acre/Year (timber production)

- Clean water
- Protect aquatic habitat
- Enhance wildlife habitat
- Protect stream banks
- Flood protection
- Long-term income (timber)

Costs

\$450/Acre (installed)

\$28.81/Acre/Year (30yr, 4%)

Riparian Forest Buffer (\$/Ac)

		Low	Moderate	High
<u>Materials</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>	<u>\$/Unit</u>
Animal Damage Control, Barrier	Each	\$1.23	\$1.23	\$1.23
Animal Damage Control, Cage	Each	\$12.30	\$12.30	\$12.30
Animal Damage Control, Repellant	Acre	\$73.79	\$73.79	\$73.79
Moisture Conservation, Weed Control	Acre	\$122.99	\$122.99	\$122.99
Moisture Conservation, Tree Mats	Sqft	\$1.60	\$1.60	\$2.21
Tree/Shrubs Bare Root, Planted (220/Ac)	Acre	\$324.69	\$1.84	\$1.60
Tree/Shrubs Cuttings, Planted	Each	\$0.92	\$0.92	\$0.92
Tree/Shrubs Live Stakes, Planted	Each	\$0.92	\$0.92	\$0.92
Tree/Shrubs, Plugs, Planted	Each	\$1.54	\$1.54	\$1.54
Tree/Shrubs, Container, Planted	Each	\$3.69	\$3.69	\$3.69
Mobilization		\$8.95	\$7.58	\$22.19
Typical Cost (\$/Ac):		\$450	\$760	\$1,100



Forest Farming

The **intentional** manipulation, **integration**, and **intensive** management of woodlands under a managed forest canopy to produce non-timber products.



Forest Farming

Benefits

\$0 to \$100+/Acre/Year

- **Annual income:**
 - Wild/Native Foods
 - Medicinals
 - Decoratives
 - Hunting
 - Recreation
- **Improved wildlife habitat**
- **Long-term income (timber)**

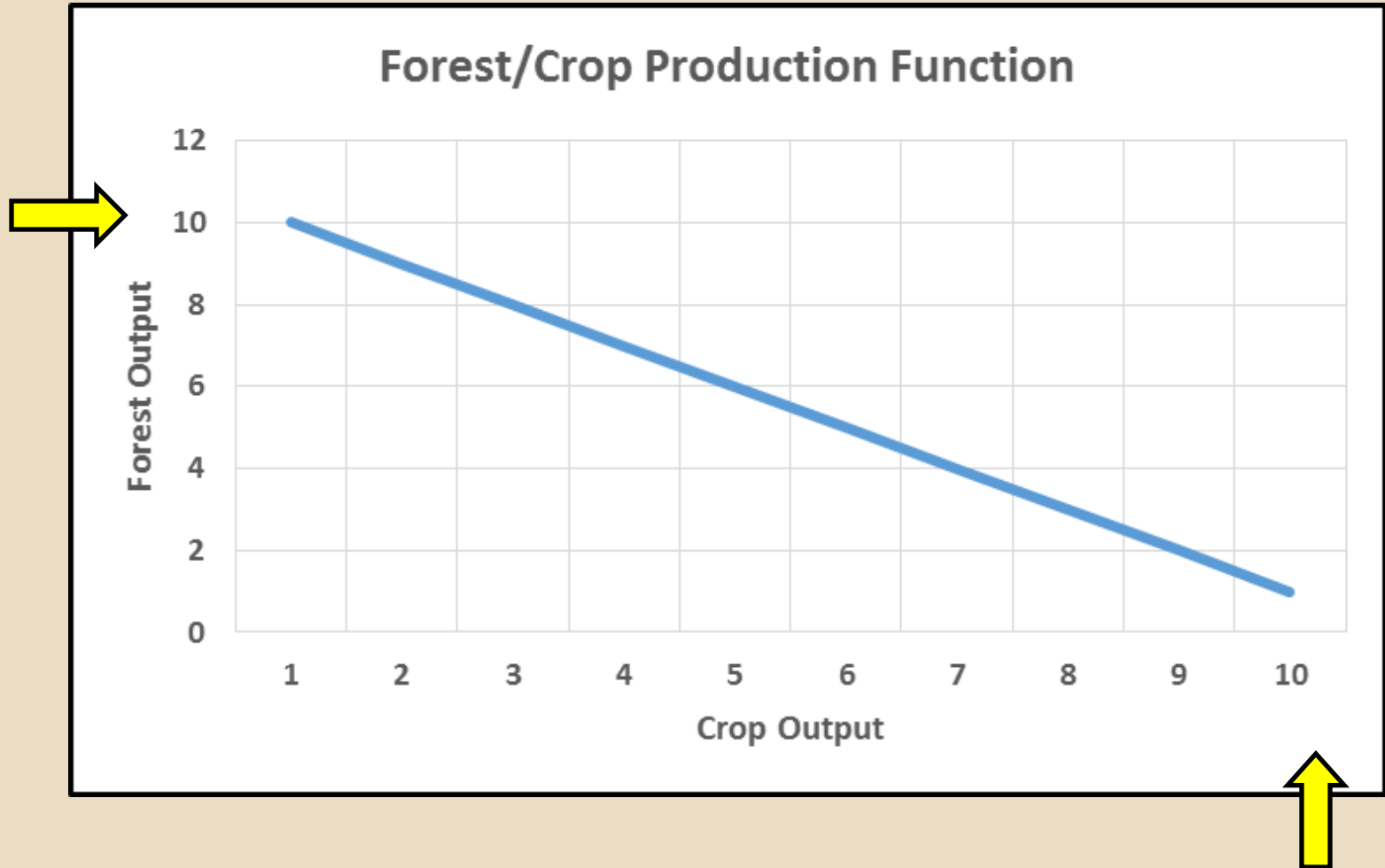
Costs

\$0 to \$500/Acre (installed)

Up to \$30/Acre/Year (30yr, 4%)

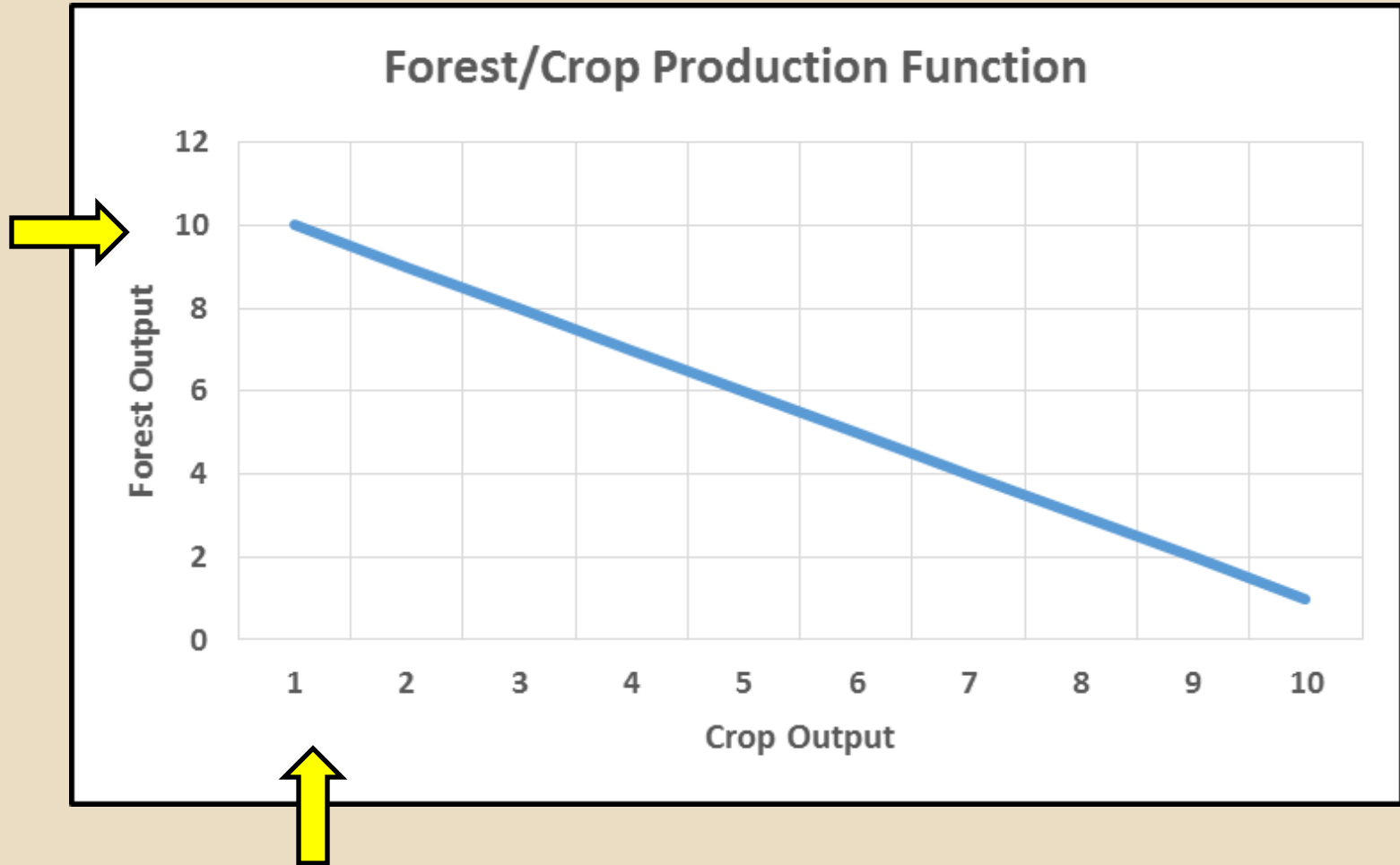
Agroforestry Production Functions

What Output is Maximum Profit?



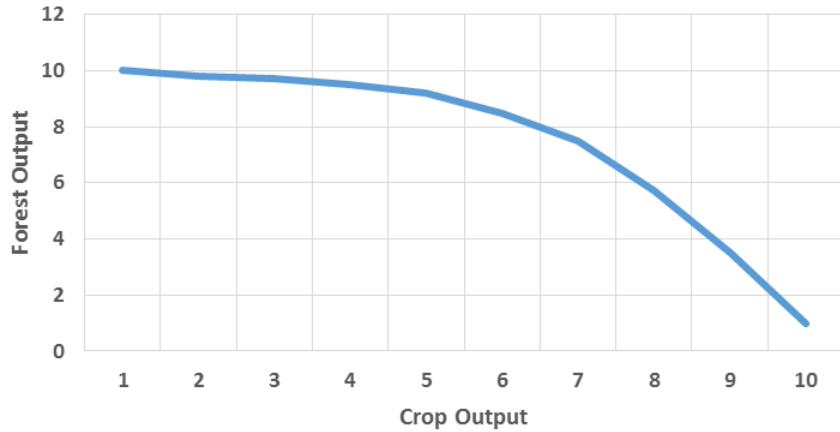
Agroforestry Production Functions

What Output is Maximum Profit?

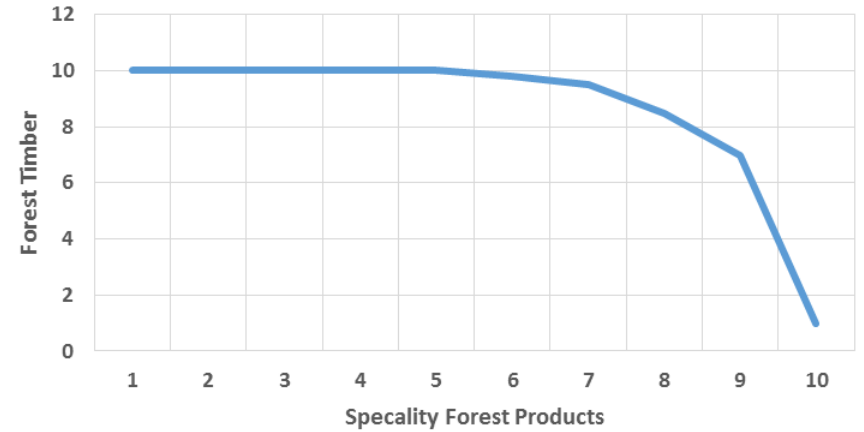


Agroforestry Production Functions

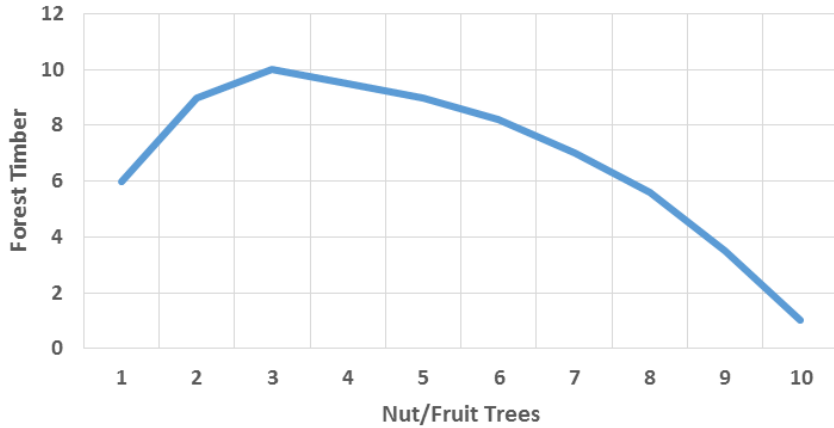
Competitive Production Function



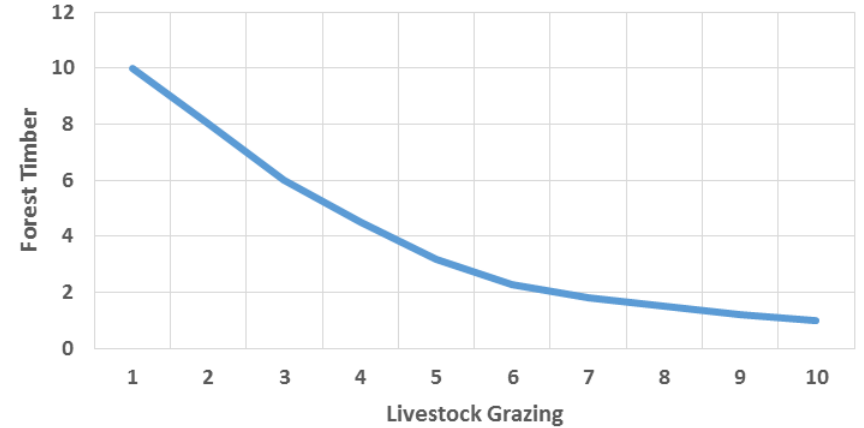
Supplementary Production Function



Complementary Production Function



Antagonistic Production Function



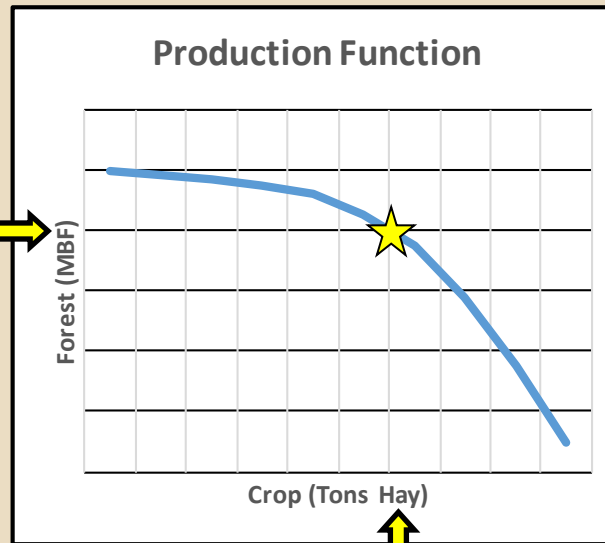
Maximize Profit

Timber Production

Units: **MBF**
 Timber Harvest Rotation (Yrs): **30**
 Units Harvested (#/Acre): **2,500**
 Net Income (\$/Unit): **\$250**
 Discount Rate: **3%**
 Annual Net Income (\$/Unit/Year): **\$12.75**

Hay Production

Units: **Tons**
 Net Income/Unit (\$/Unit): **\$125**



Timber Percent	Hay Percent	Timber Composite Acre	Hay Composite Acre	Timber #/Acre/Year	Hay #/Acre/Year	Timber Net Income \$/Acre/Year	Hay Net Income \$/Acre/Year	Total Net Income \$/Acre/Year
10%	90%			8.33	5.00	\$106	\$625	\$731
20%	80%			16.67	4.90	\$213	\$613	\$825
30%	70%			25.00	4.85	\$319	\$606	\$925
40%	60%			33.33	4.75	\$425	\$594	\$1,019
50%	50%			41.67	4.60	\$531	\$575	\$1,106
60%	40%			50.00	4.25	\$638	\$531	\$1,169
70%	30%			58.33	3.75	\$744	\$469	\$1,213
80%	20%			66.67	2.88	\$850	\$359	\$1,210
90%	10%			75.00	1.75	\$957	\$219	\$1,175
100%	0%			83.33	0.50	\$1,063	\$63	\$1,125

Max Profit (\$/Ac/Yr): \$1,213
% Timber (Acre): 70%



Financial and Technical Assistance

Federal Farm Bill Programs (CRP, EQIP, WHIP, Etc.)

Conservation Easements

State Programs

Agricultural Commodity Organizations

Wildlife and Nature Organizations

NRCS Program Payment Percentages

Maximum Payment Rates by Program and Cost Category		
Authorized Program:	EQIP, WHIP, AMA	
Cost Category	Regular Rate	Historically Underserved
Materials	75%	90%
Equipment and Installation	75%	90%
Labor	75%	90%
Mobilization	75%	90%
Operation and Maintenance	N/A	N/A
Acquisition of Technical Knowledge	75%	90%
Foregone Income	100%	100%
Risk	N/A	N/A
Administration and Permit Costs	N/A	N/A

* NRCS General Manual 440-512-Subpart D - Program Payment Schedules - 512.33 Payment Rates

* States may make payments less than the Maximum Payment Rate

Program payments are nationally developed and can be seen in the Field Office Technical Guide (Section I) or by visiting the county USDA Service Center.

EQIP Program Payment Examples

*Nine Agroforestry Practices

Conservation Practice

Windbreak/Shelterbelt Est.

Forest Management Plan

Hedgerow Planting

Tree & Shrub Establishment

Riparian Forest Buffer

Tree & Shrub Site Preparation

Forage Harvest Management

Forage and Biomass Planting

Forest Stand Improvement

Payment

\$.20 - \$3.00/Foot

\$1,000 - \$5,000/Each

\$1.22 - \$3.36/Foot

\$100 - \$2,700/Acre

\$100 - \$3,000/Acre

\$30 - \$700/Acre

\$4 - \$168/Acre

\$53 - \$180/Acre

\$60 - \$900/Acre

EQIP Program Payment Examples

*Seven Riparian Forest Buffer scenarios

Riparian Forest Buffer (\$/Acre)

Cuttings, Small to Medium	\$897
Cuttings, Medium to Large	\$2,248
Bare-root, hand planted	\$780
Bare-root, machine planted	\$701
Small container, hand planted	\$1,316
Small container, machine planted	\$1,125
Large container, hand planted	\$3,016

Tools for Economic Analysis

NRCS Economic Tools Website - Tools by Land Use

University/Extension Service – Crop Budgets

Conservation Partners – SWCD, WS Councils

Other

Is Agroforestry Right for You?

- **Consider the interactions between:**
 - Ecological (physical, biological)
 - Social (quality of life)
 - Economic (livelihood)
- **Identify the implementation and annual costs**
- **Identify the long-term benefits to you & society**

Agroforestry requires an integrated, multi-disciplinary approach to agriculture



For Additional Information

- ***Hal Gordon, NRCS Agricultural Economist***
hal.gordon@por.usda.gov
- ***Field Office Technical Guide (practices and programs)***
<http://efotg.sc.egov.usda.gov/>
- ***NRCS Economic Tools***
[Search: NRCS Economic Tools](#)
- ***USDA National Agroforestry Center***
<http://www.unl.edu/nac/>

"Riparian Buffer," a paper sculpture by Dan Machione



**CONSERVATION BUFFERS WORK...
ECONOMICALLY AND
ENVIRONMENTALLY**



Program Aid 1615 Revised September 2000

Questions?



**"The USDA NRCS is an equal opportunity
provider and employer "**