ECONOMICS of Soil Health Systems

Upper Warrior Creek Watershed of Georgia

FARM SIZE
220 cropland acres
10 acres pasture
Few stocker cattle
100 sows

CROPS GROWN
Corn
73 acres
Cotton
73 acres
Peanut
73 acres

SOIL TEXTURE
Clay loam

SOIL HEALTH MANAGEMENT SYSTEM
Strip tillage for corn and cotton
No-till for peanut
Cover crops
Monitoring of soil nutrient levels

NET INCOME INCREASE
Corn
-$41.79
Cotton
$125.71
Peanut
$42.70

FARM #3

INTRODUCTION

The Ricky Dollison farm in the Upper Warrior Creek Watershed of Georgia increased profitability for a crop rotation of corn, cotton, and peanut with a soil health management system (SHMS) of reduced tillage production and cover crops. Reduced tillage has been practiced for five years that included strip tillage for corn and cotton and no-till for peanut. Cover crops have been planted for three years.

Benefits of the SHMS reported by the farmer:

- **IMPROVED WATER INFILTRATION**
- **DECREASED EROSION**
- **REDUCED SOIL COMPACTION**
- **INCREASED BIODIVERSITY INCLUDING WILDLIFE**
- **ENHANCED RESILIENCE TO EXTREME WEATHER CONDITIONS**

ADDITIONAL INFORMATION ON THE FARM IS AVAILABLE IN A REPORT AND VIDEO PRESENTATION AT WWW.NACDNET.ORG/SOIL-HEALTH-ECONOMICS.

METHODS

The Soil Health Institute conducted an interview to obtain production information for evaluating economics of the soil health system based on partial budget analysis. In this approach, the benefits and costs of a soil health system are assessed by calculating changes in revenue and expenses before and after adoption of that system. The change in net farm income associated with adopting a SHMS is calculated as shown below and presented in Table 1.

Net change in farm income = Benefits – Costs, where:
Benefits = Reduced Expenses + Additional Revenue
Costs = Additional Expenses + Reduced Revenue

A DETAILED DESCRIPTION OF THE METHODOLOGY FOR PARTIAL BUDGET ANALYSIS CAN BE FOUND AT HTTPS://SOILHEALTHINSTITUTE.ORG/ECONOMICS.

FINDINGS

Initial Management System and Reduced Expenses

- The initial management system was conventional tillage production.
- Post-plant weed management was exclusively with herbicide in conventional tillage.
- Five field trips for tillage operations were eliminated for each crop.
- Total reduced expenses were $34.26/acre for all corn, cotton, and peanut.

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ECONOMICS of Soil Health Systems: Upper Warrior Creek Watershed of Georgia

Soil Health Management System and Additional Expenses

- The soil health management system adopted was strip till production for corn and cotton and no-till production for peanut.
- A cover crop mix of black oats, winter/cereal rye, and wheat with costs of $50.00/acre was broadcast in the fall before spring planting of each crop.
- The cover crop was terminated with herbicide before planting the cash crop.
- Post-harvest expense for increased cotton yield was assumed paid with cottonseed value.
- Total additional expenses were $76.05/acre for both corn and cotton and $83.56/acre for peanut.

Soil Health Management System Impact on Farm Income

- Additional expenses were $41.79/acre greater than reduced expenses for corn and cotton.
- Peanut additional expenses were $49.30/acre greater than reduced expenses for peanut.
- Cotton yield increased 250 lb./acre, and revenue increased $167.50/acre.
- Peanut yield increased 400 lb./acre, and revenue increased $92.00/acre.
- Corn yield was not affected by adoption of the soil health management system.
- **Net farm income increased $42.20/acre across the corn, cotton, and peanut rotation.**

Table 1. Partial Budget[1] Analysis, 5 Years with a Soil Health Management System on a 230-Acre Farm, $ per Acre per Year (2019 Dollars)

	Corn		Cotton		Peanut	
	BENEFITS	COSTS	BENEFITS	COSTS	BENEFITS	COSTS
Expense Category	REDUCED EXPENSE	ADDITIONAL EXPENSE	REDUCED EXPENSE	ADDITIONAL EXPENSE	REDUCED EXPENSE	ADDITIONAL EXPENSE
Seed	0.00	50.00	0.00	50.00	0.00	50.00
Fertilizer & Amendments	0.00	0.00	0.00	0.00	0.00	0.00
Pesticides	0.00	3.84	0.00	3.84	0.00	3.84
Fuel & Electricity	5.35	2.89	5.35	2.89	5.35	2.46
Labor & Services	9.70	5.94	9.70	5.94	9.70	7.78
Post-harvest Expenses	0.00	0.00	0.00	0.00	0.00	6.45
Equipment Ownership	19.21	13.38	19.21	13.38	19.21	13.03
Total Expense Change	**34.26**	**76.05**	**34.26**	**76.05**	**34.26**	**83.56**
	ADDITIONAL REVENUE	REDUCED REVENUE	ADDITIONAL REVENUE	REDUCED REVENUE	ADDITIONAL REVENUE	REDUCED REVENUE
Yield, Corn bu./acre; Cotton & Peanut lb./acre	0.00	0.00	250.00	0.00	400.00	0.00
Price Received,[2] $/unit	4.20	4.20	0.67	0.67	0.23	9.40
Revenue Change	**0.00**	**0.00**	**167.50**	**0.00**	**92.00**	**0.00**
	TOTAL BENEFITS	TOTAL COSTS	TOTAL BENEFITS	TOTAL COSTS	TOTAL BENEFITS	TOTAL COSTS
Total Change	**34.26**	**76.05**	**201.76**	**76.05**	**126.26**	**83.56**
Change in Net Farm Income	**-41.79**		**125.71**		**42.70**	

1 Expenses and expected yields based on farmer reported production practices. (https://soilhealthinstitute.org/economics/)
2 Commodity prices applied to yields based on long-term average prices. Irwin, S. "IFES 2018: The New, New Era of Grain Prices?" Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, January 11, 2019.

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