ECONOMICS of Soil Health Systems

Choctawhatchee, Pea, and Yellow Rivers Watersheds of Alabama

FARM SIZE
2,000 acres
Cropland
1,400 acres
Pasture
400 acres
Hay
200 acres
Cow/Calf
300 brood cows

CROPS GROWN
Double crop cotton/peanut
Cotton
600 acres
Peanut
600 acres

SOIL TEXTURE
Ranging from clay to sandy textures

SOIL HEALTH MANAGEMENT SYSTEM
Strip till production
Cover crops
Variable rate lime application
Monitoring of soil nutrient levels

NET INCOME INCREASE
Cotton
$294.15/acre
Peanut
$104.11/acre

FARM #28

INTRODUCTION

The Myron Johnson farm in the Choctawhatchee, Pea, and Yellow Rivers Watersheds of Alabama increased profitability for cotton and peanut by increasing crop yields with a soil health management system (SHMS) of strip till production and cover crops. The farm has practiced strip till production with cover crops for nine years.

Benefits of the SHMS reported by the farmer:

- → **IMPROVED WATER INFILTRATION**
- → **REDUCED EROSION**
- → **IMPROVED SOIL STRUCTURE**
- → **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.
- → Pre-plant tillage with a subsoiler and two disc field trips were eliminated for both crops, and one post-plant field trip with a row crop cultivator was eliminated for peanut.
- → Total reduced expenses were $45.95/acre for cotton and $51.28/acre for peanut.

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Soil Health Management System and Additional Expenses

- The soil health management system adopted was strip till production with cover crops.
- Cover crops consisting of wheat, oat, triticale, and winter/cereal rye were broadcast in the fall with a 22-11-11 fertilizer blend.
- Cover crops were terminated with herbicide, and approximately two weeks afterwards, a strip till implement with a roller was applied in preparation for planting cotton and peanut.
- Cover crop seed cost was $23.00/acre and $6.00/acre for fertilizer as the mix was broadcast.
- Herbicide expenses increased $28.53/acre for cotton and $38.37/acre for peanut.
- Post-harvest expenses due to increased peanut yield were hauling, drying, cleaning, and check-off fees.
- Post-harvest expense for increased cotton yield was assumed paid with cottonseed value.
- Total additional expenses were $86.80/acre for cotton and $108.17/acre for peanut.

Soil Health Management System Impact on Farm Income

- Reduced expenses were $40.85/acre less than additional expenses for cotton.
- Reduced expenses were $56.89/acre less than additional expenses for peanut.
- Yield increased 500 lb./acre, and additional revenue was $335.00/acre for cotton.
- Yield increased 700 lb./acre, and additional revenue was $161.00/acre for peanut.
- **Net farm income increased $294.15/acre for cotton and $104.11/acre for peanut.**

Table 1. Partial Budget[1] Analysis, 9 Years with a Soil Health Management System on a 1,400-Acre Farm, $ per Acre per Year (2019 Dollars).

	Cotton		Peanut	
	BENEFITS	COSTS	BENEFITS	COSTS
Expense Category	REDUCED EXPENSE	ADDITIONAL EXPENSE	REDUCED EXPENSE	ADDITIONAL EXPENSE
Seed	0.00	23.00	0.00	23.00
Fertilizer & Amendments	0.00	6.00	0.00	6.00
Pesticides	0.00	28.53	0.00	38.37
Fuel & Electricity	8.55	3.60	9.49	3.60
Labor & Services	10.49	7.72	11.78	7.96
Post-harvest Expenses	0.00	0.00	0.00	11.29
Equipment Ownership	26.91	17.95	30.01	17.95
Total Expense Change	**45.95**	**86.80**	**51.28**	**108.17**
	ADDITIONAL REVENUE	REDUCED REVENUE	ADDITIONAL REVENUE	REDUCED REVENUE
Yield, lb.	500.00	0.00	700.00	0.00
Price Received,[2] $/bu.	0.67	0.67	0.23	0.23
Revenue Change	**335.00**	**0.00**	**161.00**	**0.00**
	TOTAL BENEFITS	TOTAL COSTS	TOTAL BENEFITS	TOTAL COSTS
Total Change	**380.95**	**86.80**	**212.28**	**108.17**
Change in Net Farm Income	**294.15**		**104.11**	

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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