ECONOMICS of Soil Health Systems

Lower Pee Dee Watershed of South Carolina

FARM SIZE
65 acres

CROPS GROWN
Corn
50% Crop rotation
Soybean
50% Crop rotation

SOIL TEXTURE
Sandy loam
Fine sand

SOIL HEALTH MANAGEMENT SYSTEM
No-till production
Cover crops
Monitoring of soil nutrient levels

NET INCOME INCREASE
Corn
$62.44/acre
Soybean
$43.06/acre

FARM #18

INTRODUCTION

The Rupert Burrows farm in the Lower Pee Dee Watershed of South Carolina increased profitability by decreasing costs of production for corn and soybean with a soil health management system (SHMS) of no-till production and cover crops. The farm initiated no-till production and planting cover crops in 2008.

Benefits of the SHMS reported by the farmer:

- → **IMPROVED WATER INFILTRATION**
- → **IMPROVED SOIL STRUCTURE**
- → **REDUCED COMPACTION**
- → **INCREASED BIODIVERSITY AND BENEFICIAL INSECTS**
- → **INCREASED SOIL ORGANIC MATTER**
- → **IMPROVED 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.
- → A field trip with a disc and a field cultivator were eliminated for corn and soybean.
- → Two insecticide spray trips were eliminated for corn and soybean.
- → Nitrogen was reduced by 65 lbs./acre of urea for corn.
- → Phosphorous and potassium were each reduced by 25% for corn, and potassium was reduced by 35% for soybean.
- → Total reduced expenses were $123.67/acre for corn and $85.88/acre for soybean.

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ECONOMICS of Soil Health Systems: Lower Pee Dee Watershed of South Carolina

Soil Health Management System and Additional Expenses

- The soil health management system was no-till production with cover crops.
- A cover crop mixture of pea, vetch, radish, winter/cereal rye, and various brassicas was planted after the preceding harvest of both crops.
- Cover crop seed costs were $25.00/acre before planting corn and $17.50/acre before planting soybean with fewer legumes and more grasses in the mix.
- Cover crops were planted with the no-till planter used to plant cash crops.
- Corn was planted into the living cover crop before termination with herbicide.
- Termination of cover crops with herbicide was not an additional expense before planting soybean.
- Total additional expenses were $61.23/acre for corn and $42.82/acre for soybean.

Soil Health Management System Impact on Farm Income

- Reduced expenses were $62.44/acre greater than additional expenses for corn.
- Reduced expenses were $43.06/acre greater than additional expenses for soybean.
- Reduced expenses were achieved without reduced crop yield for both crops.
- **Net farm income increased $62.44/acre for corn and $43.06/acre for soybean.**

Table 1. Partial Budget[1] Analysis, 13 Years with a Soil Health Management System on a 65-Acre Farm, $ per Acre per Year (2019 Dollars)

	Corn		Soybean	
	BENEFITS	COSTS	BENEFITS	COSTS
Expense Category	REDUCED EXPENSE	ADDITIONAL EXPENSE	REDUCED EXPENSE	ADDITIONAL EXPENSE
Seed	0.00	25.00	0.00	17.50
Fertilizer & Amendments	41.02	0.00	4.12	0.00
Pesticides	47.08	6.85	47.08	0.00
Fuel & Electricity	3.80	2.37	3.80	2.06
Labor & Services	10.71	9.61	9.82	8.56
Post-harvest Expenses	0.00	0.00	0.00	0.00
Equipment Ownership	21.06	17.40	21.06	14.70
Total Expense Change	**123.67**	**61.23**	**85.88**	**42.82**
	ADDITIONAL REVENUE	REDUCED REVENUE	ADDITIONAL REVENUE	REDUCED REVENUE
Yield, bu./acre	0.00	0.00	0.00	0.00
Price Received,[2] $/bu.	4.20	4.20	10.00	10.00
Revenue Change	**0.00**	**0.00**	**0.00**	**0.00**
	TOTAL BENEFITS	TOTAL COSTS	TOTAL BENEFITS	TOTAL COSTS
Total Change	**123.67**	**61.23**	**85.88**	**42.82**
Change in Net Farm Income	**62.44**		**43.06**	

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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