ECONOMICS of Soil Health Systems

English River Watershed of Iowa

FARM SIZE
250 crop acres

CROPS GROWN
Corn and soybean

SOIL TEXTURE
Silty clay loam

SOIL HEALTH MANAGEMENT SYSTEM
Cover crops
Corn-soybean rotation
No-till production
Soils amended with liquid swine manure every 2 years
Monitoring of soil nutrient levels

NET INCOME INCREASE
Corn
$39.28/acre
Soybean
$11.33/acre

INTRODUCTION

The Levi Lyle farm in the English River Watershed of Iowa increased profitability with decreased costs of production from adding cover crops to a corn-soybean rotation in a soil health management system (SHMS) of no-till production. The farmer has followed no-till practices for 25 years and has planted cover crops for five years. All crop acreage was in no-till production, and one-third of the acreage was in production with no-till and cover crops.

Benefits of the SHMS reported by the farmer:

- **WEED SUPPRESSION**
- **REDUCED EROSION**
- **INCREASED RESILIENCE TO EXTREME WEATHER**
- **EARLIER ACCESS TO FIELDS IN WET YEARS**

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 no-till production without cover crops.
- Application of phosphorous and potassium were reduced 50% for both crops.
- Nitrogen in corn production was reduced 30 lbs./acre with UAN 32%.
- The roller-crimped cover crop mat reduced herbicide expense for soybean.
- Total reduced expenses were $39.28/acre for corn and $60.28/acre for soybean.

FARM #2

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ECONOMICS of Soil Health Systems: English River Watershed of Iowa

Soil Health Management System and Additional Expenses

- The soil health management system adopted was no-till production with cover crops.
- Winter/cereal rye was drilled after the preceding corn harvest.
- Cover crop seed costs were $19.50/acre for soybean.
- Cover crops for corn were volunteer winter/cereal rye from the preceding soybean crop.
- Cover crops were terminated before planting corn with herbicide that was not an additional expense.
- Soybean was planted and cover crops roller-crimped in a single field trip.
- Total additional expenses were $48.95/acre for soybean with no additional expenses for corn.

Soil Health Management System Impact on Farm Income

- Reduced expenses were $39.28/acre with no additional expenses for corn.
- Reduced expenses were $11.33/acre greater than additional expenses for soybean.
- Reduced expenses were achieved without reductions in crop yields.
- **Net farm income increased $39.28/acre for corn and $11.33/acre for soybean.**

Table 1. Partial Budget[1] Analysis, 25 Years with a Soil Health Management System on a 250-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	0.00	0.00	19.50
Fertilizer & Amendments	37.33	0.00	20.67	0.00
Pesticides	0.00	0.00	21.85	0.00
Fuel & Electricity	0.20	0.00	1.54	3.11
Labor & Services	1.25	0.00	6.15	9.39
Equipment Ownership	0.50	0.00	10.07	16.95
Total Expense Change	**39.28**	**0.00**	**60.28**	**48.95**
	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	**39.28**	**0.00**	**60.28**	**48.95**
Change in Net Farm Income	**39.28**		**11.33**	

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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