ECONOMICS of Soil Health Systems

Middle Kickapoo River Watershed of Wisconsin

FARM SIZE
1,400 acres
620 cows,
540 of which are lactating

CROPS GROWN
Corn
950 acres
Alfalfa
300 acres
Oats/Alfalfa
150 acres

SOIL TEXTURE
Clay loam

SOIL HEALTH MANAGEMENT SYSTEM
No-till production
Cover crops
Corn-alfalfa-oats rotation
Soils amended with dairy manure
Monitoring of soil nutrient levels

NET INCOME INCREASE
Grain Corn
$39.26/acre
Silage Corn
$15.41/acre

FARM #13

INTRODUCTION

The Jack Herricks farm in the Middle Kickapoo River Watershed of Wisconsin increased profitability by increasing corn yields with a soil health management system (SHMS) of no-till production and cover crops. No-till production has been practiced for 35 years and cover crops planted after corn that is cut as silage for 10 years.

Benefits of the SHMS reported by the farmer:

- → **IMPROVED DRAINAGE AND WATER INFILTRATION**
- → **DECREASED SOIL COMPACTION**
- → **INCREASED SOIL ORGANIC MATTER**

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 corn for grain production.
- → Post-plant weed management was exclusively with herbicide in conventional tillage.
- → A field trip with a field cultivator and with a vertical tillage implement were eliminated.
- → Total reduced expenses were $27.51/acre.

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ECONOMICS of Soil Health Systems: Middle Kickapoo River Watershed of Wisconsin

Soil Health Management System and Additional Expenses

- The soil health management system adopted was no-till corn for grain production with cover crops.
- Cover crop seed costs were $10.00/acre before planting corn for grain.
- A cover crop of winter/cereal rye was drilled by custom application for $15.00/acre after the preceding corn crop was harvested for silage.
- Corn for grain was planted after terminating the cover crop with herbicide.
- Post-harvest expenses due to increased yield were hauling, drying, and check-off fee for corn fed as grain.
- Total additional expenses were $51.25/acre for corn fed as grain and $12.10/acre for corn fed as silage.

Soil Health Management System Impact on Farm Income

- Additional expenses were $23.74/acre greater than reduced expenses for grain corn.
- Additional expenses were $15.41/acre less than reduced expenses for silage corn.
- Grain corn yield increased 15 bu./acre, with additional revenue of $63.00/acre.
- **Net farm income increased $39.26/acre for corn fed as grain and $15.41/acre for corn fed as silage.**

Table 1. Partial Budget[1] Analysis, 35 Years with a Soil Health Management System on an 800-Acre Farm, $ per Acre per Year (2019 Dollars).

	Grain Corn		Silage Corn	
	BENEFITS	COSTS	BENEFITS	COSTS
Expense Category	REDUCED EXPENSE	ADDITIONAL EXPENSE	REDUCED EXPENSE	ADDITIONAL EXPENSE
Seed	0.00	10.00	0.00	0.00
Fertilizer & Amendments	0.00	0.00	0.00	0.00
Pesticides	0.00	3.14	0.00	0.00
Fuel & Electricity	3.26	1.34	3.26	1.03
Labor & Services	7.81	20.45	7.81	4.07
Post-harvest Expenses	0.00	6.75	0.00	0.00
Equipment Ownership	16.44	9.57	16.44	7.00
Total Expense Change	**27.51**	**51.25**	**27.51**	**12.10**
	ADDITIONAL REVENUE	REDUCED REVENUE	ADDITIONAL REVENUE	REDUCED REVENUE
Yield, bu./acre	15.00	0.00	0.00	0.00
Price Received,[2] $/bu.	4.20	4.20	4.20	4.20
Revenue Change	**63.00**	**0.00**	**0.00**	**0.00**
	TOTAL BENEFITS	TOTAL COSTS	TOTAL BENEFITS	TOTAL COSTS
Total Change	**90.51**	**51.25**	**27.51**	**12.10**
Change in Net Farm Income	**39.26**		**15.41**	

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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