ECONOMICS of Soil Health Systems

Portage River Watershed of Ohio



FARM SIZE 200 crop acres

CROPS GROWN Corn: 50 acres Soybean: 100 acres Winter Wheat: 50 acres



SOIL TEXTURE Clay



SOIL HEALTH MANAGEMENT SYSTEM

No-till production Cover crops Tests for selected measures of soil health



NET INCOME

Corn: \$19.72/acre Soybean: \$28.62/acre

INTRODUCTION

The Ron Snyder farm in the Portage River Watershed of Ohio increased profitability by decreasing costs of production for corn and soybean with a soil health management system (SHMS) of no-till production with cover crops. The farm has followed no-till practices for 20 years and has planted cover crops for 10 years.

Benefits of the SHMS reported by the farmer: \rightarrow IMPROVED WATER INFILTRATION

 \rightarrow REDUCED FERTILIZER APPLICATION



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 <u>HTTPS://SOILHEALTHINSTITUTE.ORG/ECONOMICS</u>.

FINDINGS

Initial Management System and Reduced Expenses

- \rightarrow The initial management system was conventional tillage production.
- \rightarrow Post-plant weed management was exclusively with herbicide in conventional tillage.
- → A disk operation and two field cultivator operations were eliminated for each crop.
- \rightarrow Phosphorous and potassium applications were eliminated for corn and soybean.
- \rightarrow Total reduced expenses were \$85.42/acre for corn and \$78.96/acre for soybean.

FARM #19







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ECONOMICS of Soil Health Systems: Portage River Watershed

Soil Health Management System and Additional Expenses

- \rightarrow The soil health management system adopted was no-till production with cover crops.
- Winter wheat production practices were not changed \rightarrow due to the SHMS.
- Cover crops included primarily oats and winter/cereal \rightarrow rye with up to 14 additional species.
- Cover crop seed cost was \$35.00/acre before corn and \rightarrow \$20.00/acre before soybean.
- \rightarrow Cover crops were drilled in the fall, after harvest of the preceding crop.
- \rightarrow Corn and soybean were planted as cover crops were roller-crimped in a single field trip.
- \rightarrow Total additional expenses were \$65.70/acre for corn \$50.34/acre for soybean.

Soil Health Management System Impact on Farm Income

- \rightarrow Reduced expenses were \$19.72/acre greater than additional expenses for corn.
- \rightarrow Reduced expenses were \$28.62/acre greater than additional expenses for soybean.
- The SHMS was implemented without reductions \rightarrow in yield.
- \rightarrow Net farm income increased \$19.72/acre for corn and \$28.62/acre for soybean.

Table 1. Partial Budget¹ Analysis, 20 Years with a Soil Health Management System on a 200-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	35.00	0.00	20.00
Fertilizer & Amendments	51.59	0.00	45.28	0.00
Pesticides	0.00	0.00	0.00	0.00
Fuel & Electricity	4.38	2.76	4.38	2.76
Labor & Services	10.47	10.49	10.32	10.13
Equipment Ownership	18.98	17.45	18.98	17.45
Total Expense Change	85.42	65.70	78.96	50.34
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	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	85.42	65.70	78.96	50.34

Change in Net Farm Income	19.72		28.62		

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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