ECONOMICS of Soil Health Systems

Lower South Platte Watershed of Colorado

FARM SIZE
2,000 acres

CROPS GROWN
Wheat
Rye
Yellow Pea
Millet
Chickpea

SOIL TEXTURE
Silt loam

SOIL HEALTH MANAGEMENT SYSTEM
No-till production
Cover crops
Composite soil sampling to monitor nutrient levels to determine efficient nitrogen aplication levels

NET INCOME INCREASE
$102.13/acre overall

FARM #9

INTRODUCTION

The John Heermann farm in the Lower South Platte Watershed of Colorado increased profitability by reducing input costs for production of wheat, rye, yellow pea, millet, and chickpea with a soil health management system (SHMS) of no-till production and cover crops. No-till production has been practiced for 10 years and cover crops have been planted for five years.

Benefits of the SHMS reported by the farmer:

- **REDUCED WIND AND WATER EROSION**
- **IMPROVED WATER INFILTRATION**
- **INCREASED RESILIENCE TO DROUGHT STRESS**
- **WEED SUPPRESSION**
- **IMPROVED SOIL STRUCTURE**

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 for all cash crops.
- A field trip with a chisel plow and a sweep plow were eliminated.
- Three spray trips with herbicide expenses of $36.00/acre were eliminated before planting.
- One spray trip with herbicide expenses of $20.00/acre was eliminated after planting.
- Phosphorous was reduced 20 lbs./acre.
- The value of reduced nitrogen was $26.00/acre.
- Improved soil structure reduced diesel fuel required for a tractor field trip 0.1 gal/acre.
- Total reduced expenses were $127.83/acre for all cash crops.

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Soil Health Management System and Additional Expenses

- The soil health management system adopted was notill production with cover crops.
- Cover crop seed costs averaged $15.00/acre before planting all cash crops.
- Cover crops included oat, rye, cowpea, radish, and various legumes that were drilled in the early spring, late spring, and the fall.
- Termination of cover crops with herbicide before planting each seasonal cash crop was not an additional expense.
- Total additional expenses were $25.70/acre for all cash crops.

Soil Health Management System Impact on Farm Income

- Reduced expenses were $102.13/acre greater than additional expenses.
- Reduced expenses were achieved with no reduced cash crop yields.
- **Net farm income increased $102.13/acre.**

Table 1. Partial Budget[1] Analysis, 10 Years with a Soil Health Management System on a 2,000-Acre Farm, $ per Acre per Year (2019 Dollars).

Aggregated Crops

	BENEFITS	COST
Expense Category	REDUCED EXPENSE	ADDITIONAL EXPENSE
Seed	0.00	15.00
Fertilizer & Amendments	36.20	0.00
Pesticides	56.00	0.00
Fuel & Electricity	4.20	1.38
Labor & Services	9.97	3.40
Equipment Ownership	21.46	5.92
Total Expense Change	**127.83**	**25.70**
	ADDITIONAL REVENUE	REDUCED REVENUE
Yield, NA	0.00	0.00
Price Received, NA	0.00	0.00
Revenue Change	**54.60**	**0.00**
	TOTAL BENEFITS	TOTAL COSTS
Total Change	**127.83**	**25.70**
Change in Net Farm Income	**102.13**	

1 Expenses and expected yields based on farmer reported production practices. (https://soilhealthinstitute.org/economics/)

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