PROFITABILITY of Soil Health Systems



Sledge Taylor

Como, Mississippi

FARM SIZE
6,200 acres

CROPS GROWN
Cotton
Corn
Peanut
Hay

SOIL TEXTURE
Sandy loam and silt loam

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

INTRODUCTION

Over time, the Sledge Taylor farm in northern Mississippi increased profitability for cotton and corn by decreasing production costs with a soil health management system of no-till production and planting cover crops. Benefits were improved water infiltration, reduced erosion, improved soil structure, enhanced crop resilience, and increased organic matter. The farm has been following no-till practices on cotton and corn production for 35 years and is transitioning to no-till peanut production. Cover crops have been planted on 55% of cotton and corn acreage for 10 years.

The farm has flat to rolling terrain with 35% of crop acreage furrow irrigated. Total crop acreage of 4,500 acres was allocated as 3,500 cotton acres, 550 corn acres, and 450 peanut acres, with 1,700 acres of pasture including 250 acres in hay production for 300 brood cows in a cow/calf operation. The farm conducted soil testing with grid sampling in three year rotations for variable rate applications of nitrogen and lime.

FINDINGS

Initial Management System and Reduced Expenses

- The initial practice was conventional tillage for cotton, corn, and peanut.
- Four tillage operations were eliminated for cotton.
- Three tillage operations and mowing of stalks were eliminated for corn.
- Lime applications were reduced from one ton every five years to one ton every 10 years.
- Potassium was reduced 20 lb./acre for cotton and phosphorous was reduced 20 lb./acre for corn.
- Furrow irrigation was reduced one application for cotton and corn due to improved water infiltration and soil water holding capacity.
- Field maintenance and land forming were reduced by 100 annual hours due to reduced erosion and improved soil structure.
- Total reduced expenses were $79.13/acre for cotton and $89.74/acre for corn.

Other benefits reported:

- INCREASED SOIL ORGANIC MATTER
- IMPROVED WATER INFILTRATION
- IMPROVED SOIL STRUCTURE
- REDUCED EROSION
- ENHANCED CROP RESILIENCE

PROFITABILITY of Soil Health Systems: Sledge Taylor Farm, Como, Mississippi

Additional Expenses from Soil Health Management

- The alternative practice adopted was no-till production for cotton and corn with occasional reshaping of beds to facilitate furrow irrigation.
- A winter/cereal rye, radish, winter pea cover crop mix costing $30/acre was broadcast by aerial application.
- Post-harvest expenses associated with increased yield for corn included drying, hauling, and check-off fees.
- Increased cotton yield required additional round module covers, but post-harvest expenses from increased yield were assumed paid by increased seed value.
- Total additional expenses were $54.30/acre for cotton and $61.58/acre for corn.

Impact on Farm Income from Soil Health Management

- Cotton reduced expenses were $24.83/acre greater than additional expenses.
- Corn reduced expenses were $28.16/acre greater than additional expenses.
- Cotton yield increased 100 lb./acre and corn yield increased 20 bu./acre due to impacts of the SHMS.
- With long-term average crop prices, cotton revenue increased $70/acre and corn revenue increased $90/acre.
- Net farm income increased $94.83/acre for cotton and $118.16/acre for corn.

Partial Budget[1] Analysis, 10 Years with a Soil Health Management System on a 6,200-Acre Farm, $ per Acre per Year (2024 Dollars).

	Cotton		Corn	
Expense Category	**REDUCED EXPENSE**	**ADDITIONAL EXPENSE**	**REDUCED EXPENSE**	**ADDITIONAL EXPENSE**
Seed	0.00	30.00	0.00	30.00
Fertilizer & Amendments	14.08	0.00	18.50	0.00
Pesticides	0.00	0.00	0.00	0.00
Fuel & Electricity	9.64	0.31	3.71	0.31
Labor & Services	16.85	1.16	10.35	1.16
Post-harvest Expenses	0.00	0.00	0.00	9.00
Equipment Ownership	37.78	8.32	40.63	8.32
Total Expense Change	**79.13**	**54.30**	**89.74**	**61.58**
	ADDITIONAL REVENUE	**REDUCED REVENUE**	**ADDITIONAL REVENUE**	**REDUCED REVENUE**
Yield, bu./acre	100.00	0.00	20.00	0.00
Price Received,[2] $/bu.	0.70	0.70	4.50	4.50
Revenue Change	**70.00**	**0.00**	**90.00**	**0.00**
	TOTAL BENEFITS	**TOTAL COSTS**	**TOTAL BENEFITS**	**TOTAL COSTS**
Total Change	**149.13**	**54.30**	**179.74**	**61.58**
Change in Net Farm Income	**94.83**		**118.16**	

[1] Expenses and expected yields based on farmer reported production practices. [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, 2019. View our full methodology at www.soilhealthinstitute/economics.

METHODS: Our partial-budget farmer interviews calculate impacts on revenue and expenses due to changes in management.



Net change in farm income = Benefits – Costs
Benefits = Reduced Expenses + Additional Revenue
Costs = Additional Expenses + Reduced Revenue

For related studies in additional regions, search "Profitability" on soilhealthinstitute.org/resources.

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