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Schmitt Family Farm

FINDING THE VALUE OF SOIL HEALTH MANAGEMENT

"In just one year I saw a positive change. I had better infiltration and decreased run-off and erosion in my sweet corn fields following heavy rains."

–PHIL SCHMITT

For over 150 years, the Schmitt family has made farming a way of life on Long Island. While their family farm has moved eastward over the past four generations to its present location in Riverhead, New York, the Schmitts have always grown vegetables. They currently grow around 30 different crops in any given year on their 250-acre farm and sell their fresh vegetables at local farm stands, supermarkets and throughout the New York City area.

Reduced tillage keeps ground covered with crop residue.

Growing 30 different crops every year is not easy—not for farmer Phil Schmitt or for his farm's sandy soils. Growing so many crops means that some fields are double- or even triple-cropped every year. Such intense production can degrade soils when they are not given significant periods of rest.

On Long Island, farmland is scarce and expensive; simply buying more land to let fields lay fallow isn't a viable option for most. The Schmitt Farm dealt with degraded soil in the past—but change came when Phil decided to get serious about managing for soil health.

Getting to the Root of the Problem

Until about 12 years ago, it was standard practice for Phil to moldboard plow his fields after the harvest of one crop, and before planting his next crop. While clean, bare soil may look appealing and have some functional advantages, over time traditional plowing removes organic matter that feeds the soil's microorganisms, compacts the soil with heavy machinery, and breaks apart the soil structure that stores water and nutrients.

Every year Phil observed issues due to soil compaction, including poor drainage, increased runoff and erosion, and poor crop health, which lead him to make innovative changes on his farm. The practices used for generations before him were no longer working. He also knew generally that excessive erosion and nutrient run-off can contribute to surface and ground water quality issues on Long Island.

In 2006, Phil began experimenting with different soil conservation and nutrient management practices. He now incorporates cover crops, compost, reduced tillage, controlled release nitrogen fertilizer (or CRNF), and integrated pest management strategies into his operation. As a result, his organic matter levels have risen from 0.5 percent to three percent since adopting a diversity of soil health practices.

Table 1. Economic Impact of Reduced Tillage and Controlled Release Nitrogen Fertilizer on Sweet Corn Ground

Increases in Net Income Per Year			
Increase in Income			
ITEM	**PER ACRE**	**ACRES**	**TOTAL**
None Identified			$0
Decrease in Cost			
ITEM	**PER ACRE**	**ACRES**	**TOTAL**
Change in Establishment Cost due to Change in Tillage	$37.72	75	$2,829
Changes in Field Operations due to Adopting Nutrient Management Plan	$9.65	75	$724
Value of Decreased Erosion due to No-Till	$8.00	75	$600
Total Decreased Cost			$4,153
Total Increased Net Income			$4,153
Total Acres Farmed			75
Per Acre Increased Net Income			$55

Decreases in Net Income Per Year			
Decrease in Income			
ITEM	**PER ACRE**	**ACRES**	**TOTAL**
None Identified			$0
Increase in Cost			
ITEM	**PER ACRE**	**ACRES**	**TOTAL**
Change in Usage of Agrochemicals due to Tillage Change	$7.00	75	$525
Change in Usage of Primary Nutrients due to Nutrient Management	$15.00	75	$1,125
Total Increased Cost			$1,650
Total Decreased Net Income			$1,650
Total Acres Farmed			75
Per Acre Decreased Net Income			$22

Total Change in Net Returns Per Year = $2,503

Per Acre Change in Net Returns Per Year = $33.37

Savings in the Sweet Corn

Today, Phil's standard management practice for his 75-acres of sweet corn is to use a zone builder with CRNF. A zone builder is a reduced tillage implement that has a shank or subsoiler to disturb only the soil in the planting row, minimizing soil surface disruption and maintaining surface residues between rows. Switching from the traditional plow to zone building has allowed Phil to reduce the number of passes he makes each season for field preparation and planting from four to one, respectively.

Phil now saves roughly $8.00 per acre in fuel costs and more in tractor maintenance expenses and labor. Although his upfront purchasing costs for CRNF are higher, $175 compared to $160 for conventional nitrogen per acre, he no longer needs to make a second application of nitrogen to his sweet corn, eliminating another pass over the field and reducing fuel costs. Making fewer trips over the field helps Phil save time, labor, and money (Table 1), while minimizing losses to the environment.

Phil also has fewer issues with soil compaction after switching to reduced tillage. In just one year, he observed better infiltration and decreased runoff and erosion in his sweet corn fields following heavy rains. Quantifying all the monetary savings Phil receives from reduced soil erosion is difficult. However, by simulating the changes in management using USDA erosion models—which account for soil type, crop and weather—runoff and wind erosion rates on his farm decreased from 8.4 to 1.8 tons per acre per year. At the same time, Phil has observed no change in his sweet corn yield since switching to reduced tillage and CRNF.

Closing Thoughts

"There's definitely a learning curve," Phil says. The switch to using a zone builder and CRNF has meant adjusting other practices on his farm, including the type and timing of his herbicide and fungicide program. Although he added an herbicide application that was not needed with plowing ($7 per acre), he has saved money through reducing tillage and using the CRNF. Comparing all of Phil's expenses for plowing and nitrogen fertilizer to reduced tillage plus CRNF shows a total net return on the Schmitt Farm of $2,503, which equates to $33.37 per acre (Table 1).

Like all farmers, Phil faces a suite of challenges from weather variability to economic pressures and he must make decisions that are both financially sound and sustain his soils. Through moderate changes over time, Phil has found the sweet spot for healthier soil by minimizing soil disturbance, increasing organic matter, and improving his nutrient management, all without sacrificing crop yields.

Learn more at **www.farmland.org/cleanwaterny**.

American Farmland Trust

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