LOCAL FARMS
HEALTHY SOIL
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Holstein Cows for Milking

LAMB

Lamb Farms, Inc.

ACHIEVING ECONOMIC AND ENVIRONMENTAL GOALS THROUGH SOIL HEALTH

Introduction

Lamb Farms was founded in western New York in 1966 by Leslie and Gordan Lamb and Jim Veazey. Today the farm spans 8,499 owned acres, and 4,245 rented acres, supporting 10,000 dairy cows and replacements across four farmsteads. They practice a nine-year rotation of four-years corn silage/grain, one year wheat, and four-years alfalfa on 12,544 acres. The remaining 200 acres are rotated with three years of corn, one year of vegetables, another two years corn, one year wheat, then four years of hay. Remaining corn acreage after chopping for silage gets left for grain, typically around 1,000 acres per year.

Janette Veazey Post, the farm's crop manager since 2012, became interested in soil health practices to achieve farm goals. "...to produce the highest quality milk in an environmentally and cow friendly manner, while building a strong team and creating a positive image in our community," says Janette. She started with strip-till on 1,000 acres in 2013 to reduce costs and improve soil tilth, which maximized infiltration and enabled earlier planting. Janette found strip-till improved operational and cost efficiencies, allowing resource allocation to alternative activities that provide supplementary value like cover crop establishment, injecting manure, planting green, and splitting nitrogen applications. Currently, the farm strip-tills all their corn, now 4,500 acres, and practices vertical tillage on all 5,000 acres of alfalfa and occasionally wheat, when conditions are favorable.

In 2018 they adopted cover cropping on 3,500 acres and now plant a mix of triticale, clover and radish following

Janette Veazey Post

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corn silage and a single species of a grain variety after corn grain. The combination of strip-till and cover crops offers multiple soil health benefits. Since 2019, Janette 'plants green' on approximately 350 acres. "The fields are typically drier, and we can plant our highest quality corn on those acres because there is more nitrogen available" says Janette.

Working with a certified crop advisor, the farm began tightening their nutrient management in 2006, responding to CAFO regulations. In 2016 they started injecting manure on all tillable acres and applying a split nitrogen application on their corn. "Dairy farming is a natural way of recycling nutrients," says Janette. "The cows make manure, which we use to fertilize the crops that we grow to feed the cows."

Soil Health, Economic, Water Quality, and Climate Benefits

Analysts applied a marginal approach using Lamb Farms' Farm Credit East (FCE) economic database from 2009 to 2021 to answer the question, "Can soil health practices be adopted while maintaining or improving economic performance?" To measure economic performance, analysts defined profit as the value of crop production minus selected cropping program costs. The study compared only crop production income (price * yield * acres) and selected cost variables that differed between the conventional, "before" period (2009 to 2012) and the soil health management system "after" period (2013 to 2021). Janette chose 2013, the year the farm adopted strip tillage, as the start of their current system.

Variables taken from the farm's FCE database include the value of production by crop, expenses including fertilizers and lime, seeds and plants, sprays and other crop inputs, various machinery expenses and other inputs. Note, analysts do not attribute differences in values between the two periods to specific practices because the FCE data do not break down values by crop or specific farm operations.

Results presented in the table below show the Lamb Farm adopted soil health practices alongside other changes in farm practices, while improving economic performance. The farm's after period profit averaged $57/ac/year or $726,408 more annually compared to the before period for the 12,744-acre study area, achieving a 61% return on investment.

Vertical Tillage with a Landoll 7833 HSL

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Lamb Farm's Change in Profit, Before and After Adopting Soil Health Practices

(inflation adjusted $(2011 = 100))

Analysis Utilizes Data from the Farm Credit East ACA Dairy Benchmarks Program

Increases in Profit

Increases in Total Value of Production (TVP)

ITEM	PER ACRE	ACRES	TOTAL
Value of crop production (price X yield X acres)	$121	12,744	$1,542,024
Total TVP Increases			**$1,542,024**

Cost Decreases

ITEM	PER ACRE	ACRES	TOTAL
Fertilizers & lime expenses	$13	12,744	$165,672
Fuel, oil & grease	$17	12,744	$216,648
Total Cost Decreases			**$382,320**
Total Increases in Profit			**$1,924,344**
Total Acres in this Study Area			**12,744**
Annual Per Acre Increased Profit			**$151**

Decreases in Net Profit

Decreases in Total Value of Production (TVP)

ITEM	PER ACRE	ACRES	TOTAL
None identified			$0
Total Decreased Income			**$0**

Cost Increases

ITEM	PER ACRE	ACRES	TOTAL
Seed	$15	12,744	$191,160
Spray & other crop input expenses	$19	12,744	$242,136
Machinery repair & farm vehicle expenses	$14	12,744	$178,416
Machine hire, rent & lease expenses	$46	12,744	$586,224
Total Cost Increases			**$1,197,936**
Total Decreases in Profit			**$1,197,936**
Total Acres in this Study Area			**12,744**
Annual Per Acre Decreased Profit			**$94**

Annual Change in Profit = $726,408

Annual Change in Per Acre Profit = $57

Return on Investment = 61%

Crop production value (price * yield) averaged $121/ac more and is notably more consistent from year to year.

Some costs were less when compared to the before period. After initiating soil health practices, including optimally managing nutrients, the "fertilizers and lime" expense category averaged $13/ac less compared to the before period. Additionally, "fuel, oil and grease" expense averaged $17/ac less for the after period. When comparing tillage tasks, fewer tractor passes characterize the after period. Moreover, strip tillage provides a smooth and level seedbed in one pass, which has reduced fuel and labor costs relative to before period tillage.

Due to whole-farm management decisions and the added cost of cover cropping, Lamb Farms averaged greater "seed," "spray and other crop input" expenses for the after period. Expenses also increased for "machinery repair & farm vehicle," and "machine hire, rent & lease." Janette believes that, despite reducing fuel costs associated with tillage operations with fewer tillage passes, the greater average costs result in part due to data reporting procedures. Equipment repair expense reflects some non-cropping program tasks. Consequently, some machinery repairs are related to barn, feed, or manure storage costs.

To estimate the water quality and climate benefits experienced on one of Janette's 44-acre fields, USDA's Nutrient Tracking Tool was used and found that her use of strip-till, cover crops, and nutrient management reduced N, P, and sediment losses by 31, 59, and 34% respectively. On the same field, USDA's COMET-Farm Tool estimates that Janette's soil health practices resulted in a 102% reduction in total greenhouse gas emissions, which corresponds to taking eleven cars off the road each year.

Closing Thoughts

The Lamb Farms team has successfully implemented soil health systems, alongside other changes in their cropping program, while improving economic performance. After adding cover crops, reducing tillage and optimally managing nutrients, the farm has realized higher yields, reduced fuel and erosion expenses and increased labor efficiency. Reducing tillage, for example, allows resources to be allocated to alternative activities. In recognition of their efforts, the New York Beef Council awarded Lamb Farms the Environmental Stewardship Award in 2021. "Farmers are caretakers of their animals and the land," says Janette. "We care about implementing sound environmental practices that will allow future generations the same opportunities that we have had."

The before period includes the years 2009 through 2012 while the after period covers the period 2013 through 2021 • Please note that analysts calculated averages by item for the after period excluding the years 2015–2017 as FCE data were unavailable those years. Therefore, analysts calculated after period averages using data for the years 2013, 2014, and 2018–2021 • Changes by item equal the average for the after period minus the average for the before period • For this analysis, the measure of profit (value of harvested crops above selected cropping program costs) is equal to the value of harvested crops minus selected cropping program costs • Value of crop calculations use NYS Ag Statistics Service prices received information • All $ values are reported in real, inflation adjusted terms using USDA price indices, 2011 = 100 (USDA/NASS, ERS et al. Various years) • Return on investment is the ratio of Annual Change in Profit divided by the Annual Decreases in Profit • Analysts thank Janette Veazey Post, Lamb Farms, Inc., for permission to access a subset of the farm's Farm Credit East, ACA (FCE,ACA) Dairy Benchmark historical records; Randy Risjan, FCE, ACA for accessing records and supplying needed date; Nicole Tommell, Farm Business Management Specialist, CCE/CNY Regional Ag Program, for reviewing this work. • For information about: (1) study methodology, https://farmland.org/project/genesee-river-demonstration-farms-network/; (2) Nutrient Tracking Tool, see ntt.tiaer.tarlenton.edu; (3) USDA's COMET-Farm Tool, see cometfarm.nrel.colostate.edu. This analysis is supported by a 2020 NYFVI grant (FVI 20 050).

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