USDA United States Department of Agriculture

ECONOMIC CASE STUDY

Farmer Profile: Dave Magos

October 2016

Introduction

Dave Magos farms 2,200 acres of cropland in Jefferson County, New York. He grows corn silage and alfalfa for his dairy herd on about half of this with the remainder being used to grow corn grain and soybeans as cash crops. Dave farmed using conventional tillage until about eight years ago when his son's interest in deer hunting led Dave to establish a wildlife food plot, including some hand seeded tillage radishes. The following spring, he noticed that the ground was looser and easier to work, prompting Dave to begin planting cover crops in the fall of 2008.

Around the same time, Dave started farming more acres and decided to try no-till to save on machinery and labor. He planted 100 acres of no-till corn using a borrowed planter and was pleased with the results. This early success prompted Dave to purchase a used no-till planter in time for planting corn in the spring of 2009. Dave completed the transition to 100% no-till with cover crops in three years' time. His current rotation for the dairy side of the operation is 3 years corn silage and 3 years alfalfa including 800 acres of cover crops each year.

Although he has tried various types of cover over the years, Dave likes the benefits he gets from the tillage radish, annual ryegrass and oats. He chose tillage radish as cover following alfalfa because it breaks up the compacted layer and creates an excellent seed bed for planting corn in the spring. The fine roots developed by annual ryegrass help to loosen denser soil layers up to 24 inches down in the soil profile. The oats, seeded following his third year of corn, scavenge nutrients in the soil before they winter kill. Using oats as cover also helps with weed suppression meaning that most of the time, Dave does not need to spray prior to seeding back to alfalfa the following spring and the decomposed residue allows for easier no-tilling establishment.

Jefferson County, New York

670 Cow Dairy Farm

2,200 acres Cropland

No-till Farming and Cover Cropping helped his bottom line.

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Cover Crop Planting Schedule

Preceding Cash Crop	Cover Crop	Subsequent Cash Crop	Acres of Cover	Cover Crop Planting Date
Alfalfa	Tillage Radish	Corn Silage	200	Before Aug. 20
Corn Silage	Annual Ryegrass	Corn Silage	400	Targeted for Oct. 1
Corn Silage	Oats	Alfalfa	200	Targeted for Oct. 1

Soil Health Benefits

Dave has seen many benefits from combining cover cropping with no-till. He keeps his soil biology active by maintaining living cover at all times and then increases the retention of the resulting organic matter by minimizing soil disturbance and the living cover helps dry out and warm up the soil in the spring, enhancing his success with no-till. He has also reduced soil compaction since he only needs one trip to plant an acre of corn. Adopting soil health practices reduces erosion rates as well. Based on Dave's soils, weather, and crop rotation, the Revised Universal Soil Loss Equation, version 2 (RUSLE2) shows erosion rates decreasing from four tons per acre per year to less than one ton. Soil productivity modeling shows this reduction is worth about $5 per acre per year. Dave has also achieved better weed and insect control allowing him to eliminate the use of pesticides on his corn crop saving him $15 per acre. In addition, Dave has been able to transition away from GMO corn saving $26,000 in seed cost or $30 per acre. The switch to no-till and cover cropping has led to a five percent increase in his corn silage yields while at the same time, significantly reducing his labor and machinery cost. Dave has also been able to reduce the amount of nitrogen on his corn by 20 pounds per acre, saving about $9 per acre at current prices.

In addition to the 1,200 acres used for growing feed, Dave has been growing about 60 acres of wheat in rotation with corn silage. He sells the grain and uses the straw for bedding. While many farmers take advantage of an early wheat harvest to seed cover well before the fall, Dave seeds red clover in the spring while applying nitrogen top-dress on his wheat. Since the wheat has a significant head start, there is no decrease in wheat yields and once the wheat is harvested, the red clover is well established. This means that Dave is able to harvest two cuttings of the red clover – once in the summer after the wheat harvest and once the following May just before planting the corn. The four tons of dry matter that he harvests results in a three pound per cow daily increase in milk production during the 30 day period that the herd is fed the red clover haylage as part of their daily ration. The bump in production is worth about $60 per acre after accounting for the costs of red clover seed, harvesting the haylage, and terminating the red clover. The table presents a summary of the benefits and costs outlined above showing that Dave's net returns have increased by over $60 per acre, and $78,100 on the entire 1,260 acres used for feed production on the farm.

Partial Budget Analysis, Annual Net Returns

Increases in Net Income

Increase in Income

Item	Value	Acres[1]	Total
Yield Increase, Corn	$45	600	$27,000
Total Increased Income			$27,000

Decrease in Cost

Item	Value	Acres	Total
Nitrogen Reduction, Corn (Corn/Alfalfa Rotation)	$9	600	$5,400
Planting Cost Savings, Corn	$57	600	$34,200
Planting Cost Savings, Hay	$82	200	$16,400
Reduced Soil Loss (Corn & Hay)[2]	$5	800	$4,000
Insecticide Reduction, Corn	$15	600	$9,000
Herbicide Reduction, Hay	$19	200	$3,800
Seed Cost Reduction, Corn	$31	600	$18,600
Milk Production Increase	$158	30	$4,740
Nitrogen Reduction, Corn (Corn/Wheat Rotation)	$22	30	$660
Total Decreased Cost			$96,800
Total Increased Net Income			$123,800
Total Acres Farmed			1,260
Per Acre Increased Net Income			$98

Decreases in Net Income

Decrease in Income

Item	Value	Acres	Total
None identified			
Total Decreased Income			$0

Increase in Cost

Item	Value	Acres	Total
Cover before Corn	$51	600	$30,600
Cover before Hay	$60	200	$12,000
Cover with Wheat (Red Clover)	$102	30	$3,060
Total Increased Cost			$45,660
Total Decreased Net Income			$45,660
Total Acres Farmed			1,260
Per Acre Decreased Net Income			$36

Total Net Returns = $78,140

Per Acre Net Return = $62

[1] *1,200 acres of cropland is in corn silage for 3 years and hay for 3 years. Meaning, corn is planted on 600 acres every year and hay is planted on 200 acres each year. Another 60 acres of cropland is in a corn silage, wheat rotation, with 30 acres planted to red clover each spring.*

[2] *Value based on estimated per ton value of soil productivity in Northeast. Hansen and Ribaudo, Economic Measures of Soil Conservation Benefits, Regional Values for Policy Assessment, USDA, ERS, 2008.*

Closing Thoughts

Dave derives satisfaction from the knowledge that he is building better soil while saving money and described an occasion when planting his no-till corn a year or so ago. Just as he was getting started in a 50 acre field on one side of the road, he saw his neighbors coming down the road with two new 15 shank chisel plows each being towed by an articulated tractor heading for a larger field on the opposite side of the road. He started thinking about his investment in machinery compared with his neighbor and figured that he had less than $100,000 of equipment out in the field that day using less than seven tenths of a gallon of fuel to plant an acre of corn. He recalled, I was watching the smoke roll off those tractors and I said to myself, "I wonder what it costs them to get an acre of corn planted. I know how much it's costing me." Although it took Dave longer to finish a smaller piece of land than the neighbor was plowing that day, he knew when he drove off his field, he wouldn't be back three or four more times. His corn was planted and he could move on to the next field.