



McDonald Farms, WA

SOIL HEALTH CASE STUDY

JULY 2025



Drilling no-till wheat into wheat stubble

Travis McDonald is a fourth-generation farmer in Douglas County, Washington where he primarily farms a wheat-fallow rotation with his twin brother, Taylor, and father, Howard, at McDonald Farms. This is a common rotation for this region, which averages only 9–12 inches of rain annually, not enough to support a crop every year. This case study focuses on 7,000 acres where McDonald Farms has implemented conservation crop rotation (CCR), no-till, and nutrient management (NM).

Previously using five or six tillage passes per year, Travis worked endless hours while still always feeling behind. After his grandfather passed away, the McDonalds discussed how they could move forward: should they invest in another tractor and more tillage equipment, or try something different, like no-till (direct seeding)? With support from their local NRCS representative and financial assistance from the Environmental Quality Incentives Program (EQIP), the family purchased a no-till drill in 2015 and began to shift toward conservation practices.¹

After switching to no-till, Travis noticed improvements in soil health sooner than expected. The hard pan layer disappeared, the soil became softer, and moisture started infiltrating into the soil rather than running off, a welcome shift in a semi-arid climate. “Now, it feels like you’re walking on a little bit of a pillow,” he shared, “as opposed to the hard conventional ground.”

Not long after adopting no-till, the McDonalds introduced nutrient management to be more intentional about using pricey fertilizer. They now use yield and soil sample results to inform variable rate urea application instead of applying anhydrous ammonia at set rates.

Then in 2017, they introduced a new cash crop: canola. Before that, the 7,000-acre study area followed a simple pattern: half fallow, half winter wheat. Today, half remains fallow, while the cropped 3,500 acres includes 125 acres of canola. Both winter wheat and canola are planted in August and harvested the following July.

Inspired by other farmers in the area, the McDonalds were curious if canola could help control grassy weeds in wheat fields. “Chemicals that control grass in canola are much cheaper than controlling grasses in a wheat crop,” Travis noted. Establishing a stand in the fall can be tricky due to the tiny seeds, but Travis noticed that canola is hardy, so if it germinates it will survive. He likes the diversity canola introduces to his system and appreciates the challenge of growing a new crop. Travis dreams of ramping up canola to 1,000 acres now that he has several years of experience with it.

Soil Health Economic & Environmental Estimated Outcomes

Partial budgeting analysis was used to estimate the marginal benefits and costs of adopting CCR, no-till, and nutrient management on McDonald Farms. The study was limited to only those income and cost variables affected by the adoption of these practices. The table on page 2 presents a summary of these economic effects revealing that, due to the three soil health practices, Travis’ net income increased by \$70/ac/yr on the 7,000-acre study area, achieving an impressive 311% return on investment.

Travis attributes an 11.5% increase in wheat yields to the adoption of no-till and nutrient management, which led to an increase in income of \$30/ac/yr. From the eight years before 2015 to the eight years after, county average yields increased by 5.4%,² while Travis’ yields rose by 16.9%. Another significant income increase was due to adding canola to the wheat-fallow rotation as a conservation crop rotation (CCR). Converting 125 acres of high tillage wheat to no-till canola increased the McDonalds’ net income by \$77/ac/yr, mainly by generating significantly higher revenue.



Taylor (brother), Howard (father), and Travis McDonald.

Farm at a Glance

COUNTY: Douglas, WA

WATERSHED: Foster Creek

CROPS: Canola & winter wheat

FARM STUDY AREA: 7,000 acres

SOILS: Sandy loam on rolling hills

SOIL HEALTH PRACTICES: Conservation crop rotation (CCR), no-till, & nutrient management (NM)



Canola field in bloom, early June



The largest decrease in cost was the \$57/ac/yr machinery savings due to the adoption of no-till and nutrient management.³ This is primarily driven by the elimination of 5–6 tillage passes per year, along with one fertilizer pass, thanks to their no-till drill that applies dry fertilizer in-furrow and mid-row. Some individual machinery costs have increased, such as the annual cost of planting due to the higher up-front cost of the no-till drill and the additional power needed to drill into untilled soil. They also use two additional herbicide passes to control weeds instead of using tillage. However overall, the savings vastly outweigh the costs when it comes to machinery.

Travis has saved \$5/ac/yr on wheat inputs due to his nutrient management plan. The 18% reduction in nitrogen (N) applied to wheat outweighs the slight increase in phosphorus and sulfur applied. Travis notes his nutrient management plan “is not saving much money on fertilizer, but it’s

using fertilizer in a smarter way, putting it where the yields are.”

Before adopting no-till, the McDonalds picked rocks three times per year on fallow land. Now, since rocks aren’t pulled to the surface after cultivation passes, they only pick rocks once a year, saving \$0.7/ac/yr.

While adopting no-till reduced tillage machinery costs, Travis uses two additional herbicide passes on fallow fields and uses more glyphosate per pass. This increased his herbicide chemical costs by \$22/ac/yr. In addition to the economic cost, Travis explains, “There’s a lot more to think about. When you’re tilling, you can just go, weather doesn’t really matter. But you can’t spray if the wind’s blowing, if it’s going to rain, or if it’s too hot or humid.”

Part of the McDonalds’ nutrient management plan included starting to take soil samples. They sample 3 zones per 500 acres on the fallow acres each year, which is a \$0.4/ac/yr cost increase.

Travis estimates his family spends a total of 90 hours per year learning about soil health practices, a cost of \$2,631/yr.

Closing Thoughts

For the McDonalds, adopting soil health practices has been key to staying profitable in an industry with increasingly tight margins. Travis acknowledges that current costs no longer allow for his grandfather’s practices to be profitable. “When things were good, you could do whatever you wanted,” he said, “and it was going to work out. This day and age, it’s going to be tough.”

While trying new practices can be intimidating, Travis is grateful he had the full support of his father and brother and financial support from NRCS. In addition to improved soil health and net income, adopting soil health practices has allowed Travis to spend quality time with his wife and young kids, something he values above all else.

—Jen Tillman, American Farmland Trust

ECONOMIC EFFECTS OF SOIL HEALTH PRACTICES ON MCDONALD FARMS, WA (2023 PRICES)⁴

Increases in Net Income			
Increase in Income			
ITEM	PER ACRE	ACRES	TOTAL
11.5% wheat yield increase due to no-till & NM	\$30	3,375	\$100,475
Increase in net income due to addition of 125 acres of canola (CCR)	\$77	125	\$9,629
Total Increased Income			\$110,104
Decrease in Cost			
ITEM	PER ACRE	ACRES	TOTAL
Machinery cost savings due to no-till (5–6 fewer tillage passes/yr) & NM (1 fewer pass/yr)	\$57	3,375	\$193,050
Fertilizer cost savings due to NM (18% less N)	\$5	3,375	\$16,408
Fewer rock picking passes due to no-till	\$0.7	3,500	\$2,560
Total Decreased Cost			\$212,018
Annual Total Increased Net Income			\$322,122
Total Acres in this Study Area			3,500
Annual Per Acre Increased Net Income			\$92

Decreases in Net Income			
Decrease in Income			
ITEM	PER ACRE	ACRES	TOTAL
None Identified			\$0
Total Decreased Income			\$0
Increase in Cost			
ITEM	PER ACRE	ACRES	TOTAL
Herbicide cost increase due to no-till (chemical for 2 more passes & higher rate)	\$22	3,375	\$74,250
Soil sampling cost due to NM	\$0.4	3,375	\$1,418
Soil health practices learning activities (90 hrs/yr)			\$2,631
Total Increased Cost			\$78,298
Annual Total Decreased Net Income			\$78,298
Total Acres in this Study Area			3,500
Annual Per Acre Decreased Net Income			\$22

Annual Change in Total Net Income = \$243,824

Annual Change in Per Acre Net Income = \$70

Return on Investment = 311%

¹ The McDonalds received \$42/ac/yr through NRCS EQIP for 3 years (2015–2017) for no-till. This is not included in the analysis because cost-share is temporary and not received by all.

² The average Douglas County wheat yields were derived using data collected by the National Agricultural Statistics Service (NASS), United States Department of Agriculture. ³ Machinery costs include the cost of equipment, custom hire, labor, depreciation, interest, insurance, housing, repairs, and fuel (Univ. of IL at Urbana-Champaign, Sept. 2023, *Farm Business Management Machinery Cost Estimates*; Univ. of Arkansas System, 2021, *Estimating Farm Machinery Costs*). ⁴ This table represents estimated average costs and benefits attributed to adopting soil health practices over the study area, as reported by the farmer. • Rounding of

per acre values may result in minor discrepancies in totals. • Prices used: Canola: \$13.32/bu, Winter Wheat: \$7.06/bu (USDA NASS, 2022–2024, *Crop Values Summary, 2019–2023 averages*); Nitrogen: \$63/lb, Phosphate: \$61/lb (Iowa State University, 2022–2024, *Ag Decision Maker: Estimated Costs of Crop Production in Iowa, 2019–2023 averages*); 2023 hourly labor rate: \$29.23/hr (U.S. Bureau of Labor Statistics, 2023, *Occupational Employment & Wage Statistics*). • Return on investment is the ratio of Annual Total Change in Net Income to Annual Total Decreased Net Income, as a percent. • For information about study methodology, see farmland.org/soil-health-economic-case-study-methods • This material is based on AFT’s work supported by a USDA NRCS Cooperative Agreement #NR223A750010C003.

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