

Cover Crops



Crop Rotation



No Till or Low Till



# Heglar Creek Farms, ID

## SOIL HEALTH CASE STUDY

MAY 2024



*Triticale double crop coming out of winter*

Located in Cassia County, Idaho, Heglar Creek Farms grows a variety of crops, including feed and forage for their cattle and dairy cows. Kurt Heward has worked on the farm since 2015 and has been farm manager since 2017. This case study focuses on 1,700 acres where Kurt grows 3 years corn double-cropped with triticale (both for silage), rotated with 1 year cover crop mix or 4 years alfalfa, a change from the previous rotation of 2 years silage corn, 4 years alfalfa. Kurt employs conservation crop rotation (CCR), cover crops, no-till in corn and triticale, and reduced tillage in alfalfa.

Kurt first tried cover cropping in 2017, flying a grass mix onto corn midseason. He now seeds a cover crop after triticale every few years using a drill with lifted disks, though he is excited to use a no-till drill for better germination soon. He has tried various 6 to 12-way mixes, always including a legume, brassica, and grass. "I wish I knew what the best blend is, every year we change it a little bit," he says.

Kurt sees payoffs from investing in cover crops. In addition to grazing the mix in the winter and seeing corn yields increase, his soil microbe diversity has improved, something that has fascinated him since taking Dr. Elaine Ingham's Soil Food Web course. "One year turns 'em around. It's amazing," Kurt says of his soils after a year of cover crops.

Looking for ways to grow more feed while spending less time and money on tillage, Kurt began experimenting with no-till and double cropping. He planted some no-till corn in 2018 and said he "immediately fell in love." On recommendation from their livestock nutritionist, he planted several triticale fields that fall. After

harvesting triticale for silage in spring, the residue provides a great mat for no-till corn. As a bonus, minimizing soil disruption and having a living crop over winter reduces erosion. In addition to adding double cropped triticale, Kurt's CCR includes shifting 300 acres from alfalfa to corn silage, allowing him to plant more triticale.

Along with shifting to no-till in corn, Kurt has reduced the amount of tillage to establish alfalfa. Three out of four years, he also interseeds triticale into alfalfa after the 4th cutting to boost yield the next year

The farm previously tilled in the fall and spring before planting corn, which Kurt noted led to the loss of soil moisture. "I feel like my moisture profile is getting deeper and bigger every year since reducing tillage," says Kurt.

### Soil Health Economic & Environmental Estimated Outcomes

Partial budgeting analysis was used to estimate the marginal benefits and costs of CCR, cover crops, no-till, and reduced tillage on Heglar Creek Farms. The study was limited to only those income and cost variables affected by the adoption of these practices. The table on page 2 summarizes these economic effects, revealing that, due to the soil health practices, Kurt's net income increased by \$156/ac/yr on the 1,700-acre study area, achieving a 309% return on investment.

Kurt has seen several increases in income, most notably from triticale. Kurt is enthusiastic about triticale as a double crop with silage corn, which provides a \$154/ac/yr increase in net income. He finds that triticale silage is cheap to grow, has no negative impact on corn, introduces diversity and winter cover, and is nutritious for milk cows. Additionally, interseeding triticale into alfalfa after the last cutting three out of four years increases the next year's first hay cutting by one dry ton/ac, equating to equating to a \$154/ac/yr income boost.

Kurt attributes a 1.6% yield increase in corn silage to his soil health practices, an added \$22/ac/yr, noting the yield benefits are becoming more consistent with time. He also sees more



*Kurt standing in cover crop mix holding a turnip, post-freeze in November*

### Farm at a Glance

**COUNTY:** Cassia, ID

**WATERSHED:** Raft River

**CROPS:** Alfalfa hay, corn silage, & triticale silage

**FARM SIZE:** 4,040 acres (1,700-acre study area)

**SOILS:** Silty loam; mostly flat

**SOIL HEALTH PRACTICES:** Conservation crop rotation (CCR), cover crops, no-till corn & triticale, & reduced tillage alfalfa



*Healthy soil taken from a cover crop field with fungi & worm castings*



consistency between fields and in the feed's nutritional content. Grazing 100 acres of cover crop over the winter provides another \$150/ac/yr, paid by the livestock portion of the farm.

Several costs have decreased with the adoption of soil health practices. Most significantly, due to switching to no-till corn, machinery costs have decreased by eliminating disc, ripper, and dammer diker passes.<sup>1</sup> Kurt also bands half his nitrogen using the no-till drill instead of having a separate pass to broadcast it. Shifting to reduced tillage in alfalfa, Kurt eliminated a ripper pass. Altogether, Kurt saves \$62/ac/yr by reducing tillage. The only herbicide change has been in the timing of herbicide applications; now, the first application is earlier, before the corn emerges, to kill the regrowth of triticale.

Having increased his soil's water holding capacity, Kurt saves \$7/ac/yr by irrigating

corn one week less than he used to. Now that his soils stay in place thanks to no-till and triticale planted over the winter, he saves \$2/ac/yr as he no longer must fix gullies.

Shifting 300 acres of alfalfa into corn silage production costs \$88/ac/yr due to the higher cost of growing corn, though it allows Kurt to grow more triticale, which is very profitable.

There have been a few increases in cost associated with these soil health practices. Interseeding triticale into alfalfa three out of four years involves added seed and planting costs, as does planting the cover crop mix. Kurt also applies some nitrogen to his cover crop mix to ensure good growth. Altogether, this costs \$106/ac/yr.

To learn more about soil health, Kurt and other farm employees spend a combined 100 hrs/yr on learning activities and

\$3,000 in conference fees. Kurt notes, "It's easy to justify when I'm able to make my ground more efficient."

### Closing Thoughts

Kurt is committed to creating healthy soil that can do some of the hard work for him. His soil organic matter increased from 2% to 2.5–3% in just five years; he believes "soil health revolves around building organic matter." In addition to talking to neighbors about the benefits of soil health practices, he sits on the board of his conservation district. He constantly explores new ways to reduce costs and improve soil biology, such as growing his own biologicals to apply to the soil. "The last chapter of my book is going to be doing all this without synthetic fertilizers."

—Jen Tillman

## ECONOMIC EFFECTS OF SOIL HEALTH PRACTICES ON HEGLAR CREEK FARMS, ID (2023 PRICES)<sup>2</sup>

Increases in Net Income			
Increase in Income			
ITEM	PER ACRE	ACRES	TOTAL
Increase in net income from adding double crop triticale (2.5 dry ton/ac)	\$154	1,080	\$166,656
Yield increase in hay due to interseeding triticale into alfalfa (+1 dry ton/ac)	\$154	338	\$51,960
Yield increase in corn silage (+1.6%)	\$22	950	\$21,208
Grazing 100 acres multi-species cover crop	\$150	100	\$15,000
<b>Total Increased Income</b>			<b>\$254,824</b>
Decrease in Cost			
ITEM	PER ACRE	ACRES	TOTAL
Machinery cost savings due to reduced tillage alfalfa & no-till corn silage	\$62	1,400	\$86,883
One less week of irrigation on corn silage	\$7	950	\$6,384
Eliminate gully-fixing caused by erosion	\$2	1,700	\$3,738
<b>Total Decreased Cost</b>			<b>\$96,351</b>
<b>Annual Total Increased Net Income</b>			<b>\$351,175</b>
<b>Total Acres in this Study Area</b>			<b>1,700</b>
<b>Annual Per Acre Increased Net Income</b>			<b>\$207</b>

Decreases in Net Income			
Decrease in Income			
ITEM	PER ACRE	ACRES	TOTAL
Decrease in net income from shifting 300 acres alfalfa to corn silage	\$88	300	\$26,297
<b>Total Decreased Income</b>			<b>\$26,297</b>
Increase in Cost			
ITEM	PER ACRE	ACRES	TOTAL
Cover crop and interseeding triticale costs (seed, planting machinery, fertility)	\$106	508	\$53,692
Soil health practices learning activities (100 hrs/yr + \$3000 conference fees)			\$5,923
<b>Total Increased Cost</b>			<b>\$59,615</b>
<b>Annual Total Decreased Net Income</b>			<b>\$85,911</b>
<b>Total Acres in this Study Area</b>			<b>1,700</b>
<b>Annual Per Acre Decreased Net Income</b>			<b>\$51</b>

**Annual Change in Total Net Income = \$265,264**

**Annual Change in Per Acre Net Income = \$156**

**Return on Investment = 309%**

<sup>1</sup>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: Field & Forage Operations*). <sup>2</sup>This table represents estimated average costs and benefits attributed to adopting soil health practices on the 1,700-acre study area, as reported by the farmer • Rounding of per acre values may result in minor discrepancies in totals. • Prices used: Ensilage: \$51.32/ton (USDA NASS, 2022-2024, *Crop Values Summary, 2019–2023 averages*); Corn Silage: \$55/ton, Hay alfalfa: \$195/ton

(farmer provided); Nitrogen: \$0.63/lb (ISU, 2022–2024, *Ag Decision Maker: Estimated Costs of Crop Production in Iowa, 2019–2023 averages*); 2023 labor rate: \$29.23/hr (U.S. Bureau of Labor Statistics, 2023, *Occupational Employment & Wage Statistics, First-Line Supervisors of Farming*). • 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/soilhealthcasestudies](http://farmland.org/soilhealthcasestudies). • This material is based on AFT's work supported by a USDA NRCS Cooperative Agreement #NR223A750010C003.

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