

ACKNOWLEDGEMENTS

Partnership

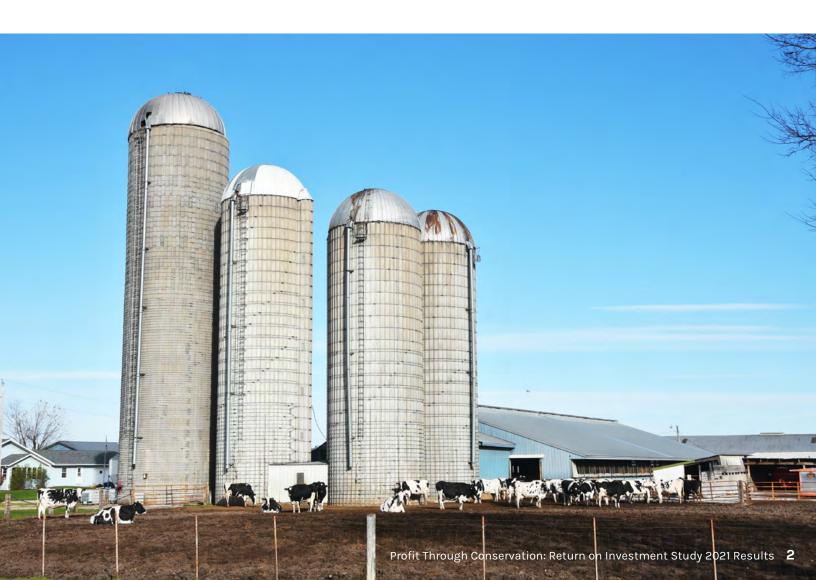
Headwaters Agriculture Sustainability Partnership (HASP)

Technical Team

Environmental Initiative, Stearns County Soil and Water Conservation District, AgCentric, and Houston Engineering, Inc.

Funding

AgCountry Farm Credit Services, Compeer Financial, Edge Dairy Farmer Cooperative, Midwest Dairy, Minnesota Department of Agriculture AGRI Grant, Minnesota Department of Agriculture Dairy Business Planning Grant, McKnight Foundation, Natural Resources Conservation Services, and The Nature Conservancy



PROJECT OVERVIEW

Purpose

The mission of the Headwaters Agriculture Sustainability Partnership (HASP) is to engage in projects that benefit the environment, the economic viability of farmers, and the vitality of rural communities. The purpose of this project is to build upon HASP's mission by exploring the return on investment from conservation practices implemented in dairy operations within the Sauk River Watershed.

Goals

- Connect environmental outcomes from conservation to farm profitability.
- Promote peer-to-peer sharing among farmers around effective conservation for the environment and farm profitability.
- Connect these stories to broader communities and audiences interested in conservation.

Report Layout

- Methodology.
- New participating farms are highlighted on a storyboard which includes:
 - · Farm background.
 - · Conservation practices and implementation.
 - · Conservation practices impact.
 - · Future plans.
- Aggregated results.
- Summary of results and trends.

Future

This report summarizes 2021 data for six participating farms. Our partnership plans to continue increasing the number of farms in this study. Our long-term hope is to develop a broad understanding of how conservation is providing improved environmental outcomes while maintaining or improving farm profitability in central Minnesota.

METHODOLOGY

When analyzing practice impacts, we assessed for the impact of several practices types including contour strip cropping, cover crops, filter strips, grassed waterways and sediment control basins. The farms in this study employed these and other practices to varying degrees. Therefore, the practice impact data provides a general sense of the effect of practice adoption but is not a complete representation of the farms' soil erosion or soil carbon score.

Financial

WHAT: A farm financial software

WHY: Investigate effects of conservation on farm budgets

HOW: Financial assessment and planning with a Farm Business Management instructor to assess inputs, outputs,

and profitability

TOOL: Farm Business Management provided by AgCentric

agcentric.org/farm-business-management

Water Quality

WHAT: A voluntary state program

WHY: Certification available to Minnesota farmers through the

Minnesota Department of Agriculture

HOW: Science-based best management practices that

contribute to water quality

TOOL: Minnesota Agriculture Water Quality Certification provided by Minnesota Department of Agriculture, Clean Water Land & Legacy and MN Water Quality Certified Farm

mda.state.mn.us/environment-sustainability/minnesotaagricultural-water-quality-certification-program

Sustainability

WHAT: A national sustainability assessment program

WHY: Sustainability tool that provides detailed assessment

HOW: Soil carbon, soil conservation, greenhouse gases,

water quality

TOOL: Fieldprint® Calculator provided by Field to Market

calculator.fieldtomarket.org

What

Demonstrate the profitability of on-farm conservation to understand the connection between farm finances and conservation.

How

- 1. Use metrics from established financial and sustainability programs.
- 2. Analyze metrics by whole farm and individual crops.











"I think everything should be covered. Cover crop and minimal till are the most important things that we do conservation-wise. Everything we do is conservation minded." - Sadie Frericks

BLUE DIAMOND DAIRY

The Frericks are the first generation of their family to run a 20-acre dairy farm in Stearns County, Minnesota. Starting from scratch lets them be creative and try different practices.

They have about 200 animals on their farm, consisting mostly of cows and heifers. The family has received financial and technical support to pursue conservation practices from the NRCS Environmental Quality Incentives Program, livestock investment grants USDA livestock investment grants, and dairy business planning grants, to name a few.

The Frericks both grew up on dairy farms: Glen on a conservation-minded farm where they didn't till the soil every year. Rotational grazing for the cows was a common practice on Sadie's family farm. Today, the couple continues these conservation practices on their operation.

"I always say that we've combined the best of both of those farming systems into what we do here," Sadie said.

Conservation Practices



Cover crops

The Frericks began planting cover crops to increase forage for their herds. If the cover crop grows tall enough, they will harvest it and use it as feed for the cows. "It's done its job covering the soil, helping conserve moisture and prevent runoff," Sadie said.



Semi-rotational grazing

The Frericks allow their cows to graze in their pastures, which they try to manage like a native prairie with no till or plowing. They semi-rotationally graze instead of more intensive rotational grazing to help protect a population of bobolinks that nest in one area of the pasture.



Manure management

Manure from their lagoon is injected into their fields and excess manure is sold to nearby farms. The precision and mindfulness around how much manure is injected helps prevent manure runoff from getting into nearby waterways and ensure that the nutrients are cycled back into the soil.



Habitat preservation

The Frericks leave brush piles near their pond and allow some of their pasture to go un-grazed until after the bobolink nesting season is over. The population of bobolinks has declined by more than 50% over the past century due primarily to habitat loss, making places like the Frericks farm even more important.



Minimal till

The family has always done minimal tilling because they grow alfalfa in the spring and then follow that with no-till corn.



Runoff prevention

They installed earthen diversions and a manure lagoon to improve the water quality of the pond on their farm.

Moving into the Future

While practices such as semi-rotational grazing and cover crops are a staple of their operation, the Frericks continue to find ways to add new practices and adapt their current ones. Glen has a five-acre plot near the pasture that he experiments with; he once planted foraging soybeans into a corn rotation there.

"Don't be afraid to try something new. It's okay to be outside the cultural norm. Evaluate what practices are really moving the needle and let go of the ones that aren't. I think learning about other farms is super important." - Sadie Frericks

Main Takeaways

Cover crops provide additional feed for their livestock and increase organic matter in the soil. Sadie believes cover crops helped reduce soil runoff during the particularly wet spring of 2022.

Being the first generation in their family to farm this land, they've been able to creatively adopt new practices that improve their yields, soil health, and the local ecosystem.







"Our parents always used conservation practices. Conservation is one of the principles the farm was founded on." - Becky Kuechle

KUECHLE DAIRY

The Kuechle operate a third-generation dairy farm, where they raise steers to market and grow crops such as oats, barley, and alfalfa that are used as forage for the heifers.

The Kuechle siblings, Perry, Rhonda, Brenda, and Becky, decided to participate in the HASP Return on Investment study because they plan to add cover crops into their rotation and want to learn more about resources from partners and other farmers in the program. Their parents, who ran the farm until 2009, operated using a conservation mindsight, implementing practices like crop rotation and manure management with a focus on soil health. The siblings continue operating the farm with this mindset and hope that participating in this study and adding cover crops will help reduce erosion and improve soil health.





"I'm trying to be all about profitability and conservation, and luckily, the two work hand in hand if everything goes together."

- Ben Mergen

MERGEN FARM

Ben Mergen is a dairy farmer who milks 50 Holsteins and farms about 500 acres on his Stearns County, Minnesota farm, where he lives with his wife and three daughters.

Mergen started planting cover crops on some of his acres about five years ago using financial and technical support from the NRCS Conservation Stewardship Program. He decided to participate after hearing about how well cover crops have worked for other farmers. Mergen started small and has been expanding, with cover crops now planted on about two-thirds of his acres.

This spring he used a strip-till system, allowing him to target the planting zone while not disturbing the rest of the topsoil.

Mergen has found that adopting conservation practices can be profitable and has utilized numerous programs that provide technical and financial support, including a pilot program to measure how much carbon is captured in the soil after implementing soil health practices like cover crops.

Conservation Practices



Cover crops

Mergen plants his corn and soybeans into cereal rye cover crops. The crop helps keep the soil and nutrients in place, reducing runoff and erosion.



Strip-till system

Mergen recently purchased a strip-till system using a cost-share program through The Nature Conservancy. This allows him to till a strip of soil ahead of planting, creating an environment for rapid seed growth while preserving the rest of the topsoil.

"Start small and find someone to talk to. If it's not the NRCS or the Soil and Water Conservation District, there's someone in your area that's probably doing it. Start small for a couple years and work into it." - Ben Mergen

Moving into the Future

Mergen mostly plants a cereal rye cover crop, but he hopes to experiment and try new cover crops in the future. With the new strip-till system, Mergen can till the strips in one pass, reducing how much labor is required to prepare the soil for planting.

Main Takeaways

Mergen successfully plants corn and soybean into the cover crop rotation and then terminates the cover crop with a chemical application.

Mergen is an early adopter of strip tilling in the region. With heavy rains this spring, the strips in one of Mergen's fields washed out. But he found success in strip-tilling his other fields and is hopeful the practice will reduce erosion and improve soil health over time.

2021 ALFALFA RESULTS

Summary Stats include: 461 ACRES 26 FIELDS

Gross Return (\$/acre)	\$571.47 Benchmark Farms	\$914.78 Participating Farms	♦ \$343.31 per acre
Net Return (\$/acre)	\$91.82 Benchmark Farms	\$508.19 Participating Farms	♣ \$416.37 per acre
Yield (ton/acre)	3.46 tons Benchmark Farms	5.53 tons Participating Farms	♠ 2.07 tons per acre
Soil Carbon Soil Carbon Capacity	0.36 Benchmark Farms	0.41 Participating Farms	♠ 0.05
Soil Erosion (ton/acre/year)	1.9 tons Benchmark Farms	1.7 tons Participating Farms	▼ 0.2 tons per acre
Cost of Production (\$/ton)	\$151.64 Benchmark Farms	\$67.18 Participating Farms	▼ \$84.46 per ton
Greenhouse Gases (lbs CO ₂ e)	263 Benchmark Farms	313 Participating Farms Number influenced by one farm with high energy consumption for manure application.	♣ 50 Ibs CO₂e
Water Quality		Eligibility Minimum	MINNESOTA WATER QUALITY CERTIFIED FARM

2021 CORN GRAIN RESULTS

Summary Stats include: 187 ACRES 7 FIELDS

Gross Return (\$/acre)	\$828.14 Benchmark Farms	\$1,057.45 Participating Farms	♣ \$229.31 per acre
Net Return (\$/acre)	\$204.90 Benchmark Farms	\$374.54 Participating Farms	★ \$169.64 per acre
Yield (bu/acre)	137.74 bu Benchmark Farms	178.57 bu Participating Farms	◆ 40.83 bu per acre
Soil Carbon Soil Carbon Capacity	0.63 Benchmark Farms	0.63 Participating Farms	0
Soil Erosion (ton/acre/year)	1.3 tons Benchmark Farms	0.5 tons Participating Farms	● 0.8 tons per acre
Cost of Production (\$/bu)	\$3.81 Benchmark Farms	\$2.81 Participating Farms	▼ \$1.00 per bu
Greenhouse Gases (lbs CO ₂ e/bu)	10 Benchmark Farms	9 Participating Farms	▼ 1 Ibs CO₂e/bu
Water Quality		Eligibility Minimum	MINNESOTA WATER QUALITY CERTIFIED FARM

2021 CORN SILAGE RESULTS

Summary Stats include: 751 ACRES 33 FIELDS

Gross Return (\$/acre)	\$565.07 Benchmark Farms	\$892.00 Participating Farms	★ \$326.93 per acre
Net Return (\$/acre)	\$93.72 Benchmark Farms	\$294.50 Participating Farms	★ \$200.78 per acre
Yield (ton/acre)	14.28 tons Benchmark Farms	16.59 tons Participating Farms	♣ 2.31 tons per acre
Soil Carbon Soil Carbon Capacity	0.37 Benchmark Farms	0.39 Participating Farms	♠ 0.02
Soil Erosion (ton/acre/year)	2 tons Benchmark Farms	2 tons Participating Farms	O tons per acre
Cost of Production (\$/ton)	\$38.64 Benchmark Farms	\$28.04 Participating Farms	▼ \$10.60 per ton
Greenhouse Gases (lbs CO ₂ e/ton)	78 Benchmark Farms	82 Participating Farms	♣ 4 Ibs CO₂e/ton
Water Quality		Eligibility Minimum	MINNESOTA WATER QUALITY CEXTIFIED FARM

2021 SOYBEANS RESULTS

Summary Stats include: 352 ACRES 14 FIELDS

Gross Return (\$/acre)	\$515.97 Benchmark Farms	\$631.02 Participating Farms	♦ \$115.05 per acre
Net Return (\$/acre)	\$126.06 Benchmark Farms	\$323.54 Participating Farms	♦ \$197.48 per acre
Yield (bu/acre)	39.85 bu Benchmark Farms	50.56 bu Participating Farms	↑ 10.71 bu per acre
Soil Carbon Soil Carbon Capacity	0.54 Benchmark Farms	0.60 Participating Farms	♠ 0.06
Soil Erosion (ton/acre/year)	1.3 tons Benchmark Farms	0.5 tons Participating Farms	• 0.8 tons per acre
Cost of Production (\$/bu)	\$10.05 Benchmark Farms	\$5.82 Participating Farms	▼ \$4.23 per bu
Greenhouse Gases (lbs CO ₂ e/bu)	12 Benchmark Farms	11 Participating Farms	▼ 1 Ibs CO₂e/bu
Water Quality		Eligibility Minimum	MINNESOTA WATER QUALITY CERTIFIED FARM

RESULTS

Summary

The farmers featured in this report reflect that profitability and environmental stewardship go hand in hand. These farms, on average, had greater environmental and financial performance compared to regional benchmarks, specific to their crop enterprises. Across the four major crop enterprises, these farmers experienced higher returns and increased crop yield, with lower production costs. Soil health was improved through increased soil carbon and decreased soil erosion. Though this study focuses on a small number of farmers, these findings align with other research on the relationship between conservation practices and farm profitability. Additional data in the coming years will continue to expand this area of study.

Available on the **Environmental Initiative** website



- ► 2021 report
- ▶ 2019-20 report
- Featured farmers and their farms.

Trends



NET 252% OVER BENCHMARKS



LESS THAN

BENCHMARKS

40% MORE YIELD



PROJECT PARTNERS





For More Information



GENERAL INFO

Ariel Kagan

Environmental Initiative akagan@environmental-initiativein.org



AGRONOMY

Mark Lefebvre

Stearns County Soil and Water Conservation District mark.lefebvre@mn.nacdnet.net





FINANCE

Keith Olander

AgCentric keith.olander@clcmn.edu





PRODUCER

Steve Schlangen

Minnesota Farmer scdairy@meltel.net



PRODUCER

Steve Peterson

Minnesota Farmer stevenpeterson1958@gmail.com





