

BUSINESS CASE STUDY: BREY CYCLE FARM

RAISING HEIFERS WITH MANAGEMENT INTENSIVE ROTATIONAL GRAZING



FARM STATS

LOCATION: Sturgeon Bay, WI

ACRES: 1,200

WATERSHED: Ahnapee River Watershed

PRODUCER-LED

WATERSHED GROUP:

Peninsula Pride Farms

CONSERVATION PRACTICE

EVALUATED:

- Management intensive rotational grazing

OTHER PRACTICES USED:

- Double-cropping with low-disturbance manure application

Overview

The business case studies series is produced by the Producer-Led Watershed Protection Grants program at the Wisconsin Department of Agriculture, Trade and Consumer Protection to highlight the environmental and financial benefits of conservation practices on farms in Wisconsin.

This specific case study was created in partnership with Brey Cycle Farm, Tilth Agronomy and the Wisconsin Natural Resource Conservation Service (NRCS). It evaluates the financial and conservation benefits of using managed intensive rotational grazing to raise heifers as part of the farm's overall system.

Goals for case study series:

- Compare crop budgets for fields using conventional vs. conservation practices
- Identify benefits and opportunities associated with common conservation approaches
- Help farmers better understand the benefits and costs of conservation practice adoption

Farm and conservation history

Farm overview

Brothers Tony and Jacob Brey are the fourth-generation farmers and owners of Brey Cycle Farm LLC, a dairy farm on the Door Peninsula. The farm has been in the Brey family since 1904. Along with their wives, Moriah and Lauren, and a team of dedicated employees, they have grown the farm from 100 milking cows and 500 acres to 700 cows and 1,200 acres.

In addition to raising their own youngstock, they custom raise heifers for other farms.



They are passionate about Registered Holsteins and place an emphasis on improving the genetics in their herd using embryo transfer and genomics. The Breys also raise Holsteins from birth to finish. Their latest venture, Brey Family Beef, focuses on bringing quality meat and their farm story directly to customers through an on-farm store and an enhanced presence in the community.

Conservation history

Since purchasing the the farm in 2016, Tony and Jacob have increased their emphasis on conservation. Brey Cycle Farm is a founding member of Peninsula Pride Farms, a farmer-led conservation group in their community, as well as a demonstration farm through the NRCS Door-Kewaunee Demonstration Farm Network. The goals of both the producer-led group and demonstration farm network are to find conservation solutions for the climate, soils and shallow, fractured bedrock that farms in the Northeast contend with.

Brey Cycle Farm has focused on using practices such as **cover crops, no-till, double-cropping, planting green and low-disturbance manure application**, which are all strategies used to improve soil health and protect water quality. In 2021, 140 acres of land was converted to pasture for **management intensive rotational grazing** of heifers and beef cattle. The Breys continue to evaluate new practices to implement that make environmental and economic sense.

From the 140 acres converted into management intensive rotational grazing land, approximately half of those acres were put into permanent pasture and the remaining acres are in their double crop system of winter rye and winter triticale (winter forages), followed by a summer annual cocktail mix. Heifers graze the winter forage throughout the spring. In the summer of 2021, the farm no-till planted the summer cocktail mix coupled with a low-disturbance manure application. The heifers grazed that mix at the end of summer and into the fall. Winter rye was no-till planted into the cocktail mix in the fall and will be available for grazing in the spring of 2022. **No commercial fertilizers or pesticides were applied to any of the grazing acres.** The farm is continuing to use alternative forage (sorghum sudan grass, triticale, and corn rotation), which allows them to harvest at least twice throughout growing season (double cropping). **The combination of cover crops and low-disturbance manure application has allowed the farm to lower its fertilizer needs, which is especially important with current commercial fertilizer prices.**

Motivation for change

The farm takes at a systems-based approach for their climate and location which is between Lake Michigan and Green Bay. They have both dairy cows and heifers so there is a need for high quality and mature forage. **They started double-cropping because they can grow forage for the dietary needs of both the heifers and dairy cows.** So far, they have double cropped winter triticale and rye forage to corn silage and then winter triticale and rye forage to sorghum sudangrass. The mix with sorghum sudangrass has worked better with warmer summer temperatures and manure applications.

The farmland converted to permanent pasture had previously been a wet, low lying and unproductive field so it was an ideal location to convert to managed pasture. Previous to the pasture, their heifers were in a free-stall barn. With the transition to pasture the heifers maintained adequate body condition for their age comparable to herd mates in the freestall barn. The farm saves on harvesting costs such as fuel, labor and storage (ensiling), plus savings on amount of manure and associated costs for spreading in fall with the animals on pasture. They graze from May to roughly November. During the winter months animals are moved back to the freestall barn to protect them from the elements.



The low-disturbance manure application came into play in 2018. Low-disturbance toolbars were being demonstrated through the producer-led and demonstration farm networks and the farm was able to see the benefits of the practice through these in-field demonstrations. Low-disturbance manure application reduces nutrient runoff due to minimal soil disturbance and allows for applications in fall and/or spring. **The toolbar not only opens up windows for manure applications but requires less commercial fertilizer compared to surface manure application since it can be used at more opportune times for the growing crop(s).** The upfront cost of a toolbar can be high but sharing the toolbar among a watershed or group of farmers can be ideal. Another option could be a manure hauler purchasing the equipment to be used by farmers in the area. In this case, Outagamie County purchased the toolbar for farmers in the area to use and the rental of this has been a great opportunity to try out this practice for many farmers.



"The adoption and implementation of cover crops, especially winter forages rye and triticale, has greatly increased our soil health. In addition, the use of cover crops has become an economically beneficial way to feed our youngstock and dairy cows in a double crop system. We continue to keep our eyes on the future and monitor the results we are seeing and tweak and adapt our conservation strategies for the changing environment on the farm, both literally and economically."

-Jacob Brey

What is management intensive rotational grazing?

Management intensive rotational grazing, also known as rotational grazing, involves subdividing a field into paddocks and rotating livestock through one paddock at a time for a period of 12 hours to three days. More frequent rotations allow the other paddocks to regrow and recover, generally leading to greater forage production per acre. Rotational grazing involves more paddocks, shorter grazing periods and longer rest times for each pasture compared to a continuous grazing system. (NRCS; WI Center for Dairy Profitability)

Benefits

- Less startup costs than confinement systems
- Time savings compared to confinement systems
- Decreased cost of preventative hoof maintenance (copper sulfate foot baths)
- Decreased cost of forage harvest and storage
- Decreased cost of manure spreading in fall months
- Decreased cost per head per day for raising
- Alternative forage sources
- Decreased weed pressure
- Decreased need for chemical fertilizer
- Decreased need for/use of pesticides
- Greater yield potential
- Soil & nutrient runoff reduction



What is double-cropping?

Double-cropping is harvesting two crops from the same field in a single growing season.

Benefits:

- Increased nitrogen management
- Reduction in fuel and labor costs through less tillage
- Reduction in soil loss/erosion due to year round cover
- Increased carbon sequestration
- Increased yield harvested/acre/year
- Allows flexibility in manure applications to more favorable times of the year



What is low-disturbance manure application?

Low-disturbance manure application is injecting manure below the soil surface with minimal disturbance to the soil. This allows for the opportunity to apply manure to growing cover crops and can be used in no-till or other minimal till systems.

Benefits:

- Increases plant available nitrogen, reducing need for commercial fertilizer
- Reduces odor compared to surface application of manure
- Reduces nutrient runoff and volatilization of N
- Increases soil health
- Increases flexibility of manure application windows



Interview with the farm



"Low-disturbance manure application fits well in our no-till and double-crop system and allows us to place the manure in the root zone where the crop can better utilize all of the available nutrients. Today, it is critical to capture the full nutrient value in manure with the high price of chemical fertilizer and also helps reduce our carbon footprint."
-Jacob Brey

What issue(s) were you trying to address with your conservation system/practice change?

- Use of marginal cropland for grazing
- Reducing soil loss and surface water runoff from conventional tillage on fields
- Alternative forage sources via cover crops for animal feed (harvested and grazing)

Did you have to invest in anything up front in order to get your system started?

- NRCS assisted with rotational grazing infrastructure (fence) and planning
- Created our own water tank on a trailer
- Purchased no-till drill
- Modified existing corn planter for no-till planting
- Low-disturbance manure application toolbar on two manure tankers
- Rented Bazooka Farmstar low-disturbance injector from Outagamie County Land and Water Dept.

How much of the farm's manure do you apply using low-disturbance manure application?

80% of manure is applied via low-disturbance manure application on growing cover crop at rates following nutrient management plan

Has your conservation system positively impacted your time related to farm management activities?

- Less tillage saves time, uses less fuel
- Time is saved in freestall barn with less animals to feed (less feed to mix), less manure in storage, less animals to move to scrape pens but does take a little time to move paddocks, done every other day.
- Takes approximately 1-2 hours/week for watering and pasture rotations

Has your feed quality improved and how has that impacted profitability of feed management?

Improved feed quality through management of cover crops, i.e. harvesting triticale early for lactating cow diets as a replacement for alfalfa

How many years (if any) did it take for a return on investment for using each of these practices?

Grazing infrastructure investment paid for itself in one year through savings on feed costs alone

Financials for raising heifers using management intensive rotational grazing



This analysis looks at the costs associated with the Brey's management intensive rotational grazing for raising 100 heifers on 140 acres. These acres include both their permanent pasture and double-cropping system. The farm had one heifer per acre in the first year. These figures are all as reported by the farm.

Review of costs from management changes

PREVIOUS MANAGEMENT

Freestall barn costs = \$2.50/head/day

NEW MANAGEMENT

Management intensive rotational grazing = \$1/head/day

- Grazing system yields 8 tons of dry matter/acre/year (DM)
- \$555 total input costs/8 tons DM = \$69.38/ton DM
- \$.035/lb DM * 22lb DM/day (heifers eat ~22lbs/day) = \$.77/head/day
- \$.77/head/day + \$.10/day of mineral/head + \$.10/day/head for labor & management = approximately \$1/head/day to raise pregnant heifers

Input costs of system

Expense	Cost/acre
Rent	\$225
Planting costs (\$20/ac * twice per year)	\$40
Seed cost	\$50
Fertilizer (liquid manure = \$0.02/gal * 12,000 gal/ac)	\$240
Total inputs	\$555/per year



Cost savings of switching to management intensive rotational grazing = \$1.50/head/day

\$1.50/head/day savings × 180 days on pasture = \$270/head savings

\$270/head savings × 100 heifers = \$27,000 total savings vs. freestall barn

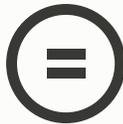
Phosphorus and soil loss reduction estimates:

Management Intensive Rotational Grazing

Conservation practices can provide benefits to **water quality, soil health and climate**. This analysis compares soil erosion, phosphorus loss, and soil-based greenhouse gas emissions for an alfalfa-corn silage rotation to the permanent pasture established as part of the Brey's management intensive grazing system used to raise heifers and beef. The double-cropping and that is part of this system was not evaluated but may provide additional soil, water, and climate benefits across the farm. Reductions were estimated using models.

Converting from alfalfa-corn silage rotation to permanent pasture can provide the following benefits:

Reduces phosphorus loss from the field by 1.8 pounds per acre per year



126 lbs of P

One pound of P that reaches a waterbody can feed 500 lbs of algae!



Reduces soil erosion by 2.9 tons per acre per year



203 tons of soil

One dumptruck can carry about 10 tons of soil!



Reduces soil-based greenhouse gas emissions by 141 tons carbon dioxide equivalents



This is equivalent to emissions from 30 gas-powered passenger vehicles driven for one year



These numbers presented are all **potential** reductions. Actual measured outcomes in the environment may differ. Soil erosion and phosphorus loss were estimated using Wisconsin's nutrient management planning software, SnapPlus. Soil based greenhouse gas reductions were estimated using COMET-Planner.



Recommendations from the farm

- Always continue to learn and fine tune. What we are doing today might not be what we are doing three to five years from now. We are always trying to learn and adapt.
- Don't use your location or climate as an excuse not to try something. We graze heifers on heavy red clay soil and grow forages in a double- crop system in the cooler climate of Door County next to Lake Michigan.
- In wet springs our soil with cover crops is better able to absorb the moisture and reduce runoff and soil loss.



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