

# Door-Kewaunee Demo Farm Network

*Year 2 Annual Report*



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# Door-Kewaunee Demonstration Farm Network



The Door-Kewaunee Watershed Farm Network, a collaboration between USDA-Natural Resources Conservation Service, the Wisconsin Department of Agriculture, Trade and Consumer Protection, and Peninsula Pride Farms, was formed in 2017 to show how different conservation practices can be used to protect surface and groundwater

in Northeastern Wisconsin. The four demonstration farms, Augustian Farms LLC, Brey Cycle Farm LLC, Deer Run Dairy LLC and Kinnard Farms, implement a variety of conservation practices to demonstrate the effectiveness of those practices in reducing soil erosion and nutrient runoff specifically for areas that contend with shallow, fractured bedrock. All of the farms focus on increasing organic matter and soil health.

## 2018 recap:

- The project received an increase in funding of \$300,000 and an additional two years to the agreement
- All of the farms are interested in “planting green” in 2019 meaning no-till planting directly into living cover crops
- The weather brought a very wet fall which led to difficulties with equipment in the field and potential management changes that need to be made for next year
- A few of the demo farms are looking into dewatering systems to incorporate into their manure management to decrease the volume of manure and increasing the flexibility of spreading times
- On two of the farms, the Discovery Farms Program installed surface water monitoring and the farms are excited to see the results. Monitoring will allow the project to quantify benefits of conservation practices being installed on cropland.

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# Farm overviews for project year 2

## Kinnard Farms

### Highlights

- Planted 1,500 acres of cover crops
- Planted multi-species cover crop field that was prone to pests – the planted sudangrass grew above and took care of pest issues
- Denitrifying bioreactor using woodchips to reduce nitrogen runoff was installed with USGS monitoring

### In 2018:

- The farm tried various practices to build soil organic matter. Tests were conducted on one field and improvements were seen through both visual observations and the infiltration tests.
- Kinnards sell about 35% of the manure that is applied in summer on fields harvested as small grains and straw. They prioritized selling to farms that put a cover crop behind after manure application.
- They shortened corn silage varieties by 3 to 5 days, allowing more time to plant cover crops.

### Goals for 2019:

- The farm is working with several companies to view some unique technologies:
  - Vanderloop toolbar that can apply manure into standing corn
  - Rowbots for applying cover crops to demonstrate at Breakfast on the Farm



- Monitoring will continue on bioreactor with USGS
- Continue to work towards installing a center pivot for leachate water applications
- Continue experimenting with cover crops on fields with straw
- Considering planting green into living covers in spring
- Side-dressing manure on growing corn

### Lessons learned:

- Because of a very wet fall that caused major tracks on the fields, the farm shortened up silage varieties by five days and are considering sorghum sudangrass as a low cost cover crop and forage crop that also improves soil health.
- Kinnards have used several low disturbance manure application toolbars including the Bazooka Farmstar and a specialized tool from Jesse Dvorcheck: the Soil Star made by Braun Electric. Field conditions and fertilizer placement are the key items to focus on when selecting this piece of equipment.
- Multi-species cover crops are an excellent way to condition the soil and build soil health. Kinnards used a multi-species mix consisting of sudangrass, annual ryegrass, purple-top turnip and sunflowers. Overall this mix worked well because the cost was low, soil health was increased and it benefitted pollinator species.

## Augustian Farms

### Highlights

- Success with interseeding into corn with alfalfa, eliminating establishment year of alfalfa
- Increasing interseeding using four-species mix (ryegrass, crimson clover, red clover and tillage radish) into corn at the v4 stage of development. Following seeding, the farm spins on urea and cultivates. The farm is considering increasing the seeding rate of the red clover in 2019.
- Clear soil health improvement from utilization of



multi-species cover crop planted after 4th crop of alfalfa in 2017

- One-third of the farm was planted in cover crops last fall:
  - Went to strictly rye
  - Looking to evaluate better closing wheels for the corn planter in a no-till or possibly even “planting green” system

### Lessons learned:

- In 2018, Augustian Farms harvested 4th crop alfalfa and then incorporated manure before planting a cover crop. In the future, the farm is planning to burn off the alfalfa with an herbicide and instead surface apply manure, allowing cover crop to be no-tilled into the field. This practice will preserve the benefits of no-till from the alfalfa years and allow for several different management options for applying manure.

### Goals for 2019

- Would like to custom fabricate an old grain drill for interseeding into standing corn
- Want to experiment with a Schuitemaker (low disturbance manure injector) on all rye ground
- Would like to install system for irrigating leachate water
- Interested in evaluating and installing a manure system that can increase the solids content of manure by removing some of the water

# Farm overviews continued

## Deer Run Dairy

### Highlights

- No-tilling corn into an established cover crop
  - Drag hose application of manure 1-2 days after corn was planted
  - Although some of the winter rye cover crops got quite tall, the corn crop was still very successful
- Hosted a field day where manure was side-dressed into established corn with a tanker
- No-tilled oats and peas and new seeding into a multiple species cover crop, providing a good establishment of alfalfa
- Applied manure on alfalfa after every cutting
  - Left a 5th crop out as well
- Tried row of compost, 250ft row, with biosolids and bed pack
  - Biosolids and bedded pack
  - Jason Fuller with Carbon Cycle provided the turner
  - Spread the composted manure on hay fields
  - Will try another test this year
- Participating in Nitrogen Use Efficiency study with UW Discovery Farms

### Lessons learned:

- Putting manure in between rows with a tanker worked well. During a field tour in the 2018 season, Deer Run Dairy applied manure to knee-high corn using a tanker that applied the manure between



the corn rows. The results were positive, however having to come back to the same end of the field to refill the tank for each pass may have its challenges.

- No-tilling corn into a winter rye cover crop offers many positives. A farm does need to be aware of possible commercial nitrogen needs earlier than what the farm may be accustomed to. Monitoring the amount of winter rye growth is a must.
- Attempted interseeding into established knee-high corn but didn't work due to the fact that the cover crop seed wasn't incorporated and poor soil to seed contact.

### Goals for 2019:

- Bioreactor/bark bed filter to be installed
- More interseeding into corn at about 7 weeks after planting
- Will try composting project again
- Will try winter lentils with winter rye after corn silage
- Want to try companion crops seeded at same time corn is being planted
- Deer Run Dairy is going to continue the planning process with the NRCS to work towards getting a denitrifying bioreactor installed this year.

## Brey Cycle Farms

### Highlights:

- Worked on crop rotations to put manure on at better times
- Used a lot of sorghum sudan forages and surface applied after 1st cut
- Cover crop winter rye forage was harvested as a single cut and corn was no-till planted
- Direct seeded triticale into alfalfa
- Planted 600 acres of cover crops, half was drilled and half was broadcast

### Lessons learned:

- The farm liked sorghum sudangrass and used it for heifer feed. This allowed for the potential for a double cropping system to apply manure during

### Overview of different practices being tried:

- Applying manure on growing crops
- Interseeding cover crops and alfalfa into corn
- Utilizing low disturbance manure applications
- Planting green with no-till
- Using a denitrifying bioreactor with woodchips to reduce nitrogen loss through tile with USGS monitoring



the growing season, harvest extra feed and plant more acres of cover crops in the fall.'

### Goals for 2019

- The farm will plant green into living covers for the 2019 year on limited acres on the home farm. This will be a trial using the neighbor's planter.
- After wheat, they are going to no-till triticale and oats/peas in early August and then apply low disturbance manure equipment using the Schuitemaker LDMI
- They are going to apply a diverse cover crop on fields with less than 2ft of soil over bedrock after taking wheat off
- Will no-till plant corn into living covers
- Will plant diverse cover crop mixes on more acres and consider using 5 to 7 species mixes
- Continuing soil health demonstrations
- Will add annual ryegrass to clover for interseeding

### Project goals

- Test the effectiveness of current and innovative conservation systems for controlling runoff
- Establish a mechanism to transfer technology and provide information on effective conservation systems
- Create opportunities for environmental research agencies and agribusiness to test research, provide technical assistance, and show conservation practices and technologies on the demonstration farm sites
- Host field days, farm tours, workshops, and provide additional outreach to share information and lessons learned

# Field Day and Tour Highlights

## Festival of Nature: Brey Cycle Farm Tour

May 25, 2018

Brey Cycle Farm hosted the first farm tour for the Festival of Nature, which is an annual event hosted by The Ridges Sanctuary in Door County and offers a variety of nature-focused field trips. This was a unique opportunity to engage with an audience that has had limited exposure to agriculture and the conservation practices being implemented by the Brey family and the Door Kewaunee Demo Farms (DK Demo Farms). Guests learned about soil health and the importance of cover crops and no-till practices. The tour consisted of the NRCS rainfall simulator, a tour of a field with cover crops, and the Veris soil mapping technology that helps improve the farm's efficiency. Additionally, the participants toured the barns and learned about the practices the Breys have put in place to keep the cows and calves healthy and happy.



## Bioreactor Tour

August 16, 2018

In 2018, Kinnard Farms installed a denitrifying bioreactor to reduce nitrates from leaving his field. The bioreactor acts as a carbon source and to help tie up nitrates if they leave the field through the tile water. The bioreactor consists of a bed of wood chips (64'x16'x4'), which have a high ability to tie up nutrients. The field day consisted of talks from Lee Kinnard, the NRCS design team, the installation team, and the US Geological Survey, who will be conducting the monitoring component of the project. Over the next several years, they will be collecting data to determine the effectiveness of the bioreactor and its ability to filter and trap nitrates.



## Fall Field Day

November 14, 2018

Despite the snow and bitterly cold wind, we still had 25 people join us for the last field day of the 2018 season. Those who attended were eager to learn about the great work being done on the DK Demo Farms. Our first few stops were at fields managed by Deer Run Dairy, who has been incorporating cover crops into their operation in a variety of different ways. Despite the wet fall, their winter rye field was established and had good growth given the difficult conditions. The second stop featured a field that had been planted with a diversified cover crop mix in 2017 after winter wheat harvest. In the spring of 2018, Deer Run Dairy went in and no-till planted their alfalfa with oats and peas as a nurse crop. After two productive harvests in 2018, the alfalfa field was in excellent condition at the time of our tour. The last stop we made at Deer Run Dairy was their diversified cover crop field, which had been planted after winter wheat. Having taken off winter wheat in late July, they took advantage of the opportunity to introduce diversity into their system by planting a three-way species mix of barley, tillage radish and winter rye. Their plan for 2019 is to no-till plant alfalfa into this field.



The second half of the day took place at Augustian Farms, where we toured a field trial of interseeded alfalfa. Like Deer Run Dairy, this was a new approach to planting alfalfa and it provided an excellent learning opportunity. In August, the alfalfa was thigh high and the practice looked promising. However, after the wet fall and difficult harvest season, the alfalfa took a hit. The Augustians still believe there is potential for this practice to work and look forward to seeing how the alfalfa responds in the spring of 2019. The last stop of the day was Augustians' edge-of-field monitoring site. The farm has partnered with UW-Discovery Farms, DK Demo Farms, and Peninsula Pride Farms to conduct monitoring on their 18-acre field.

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## Door-Kewaunee Demonstration Farm Network Partners



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