

# 2017 Annual Report

## Red Cedar Demonstration Farm

Promoting Soil Health and Water Quality through Education

### What is the Dunn County Soil and Water Health Partnership?

The Dunn County Soil and Water Health Partnership is just that – a partnership which consists of community members who are all dedicated to the improvement of soil and water conservation practices. The partnership was formed in the fall of 2014 after several conversations amongst members on ways to benefit the agricultural community of Dunn County.

### Why was the partnership formed?

Over the past few years, Dunn County has experienced heavy spring rainfalls. Soil is one of the most important fixed assets on a farm. These rainfalls have emphasized to farmers the importance of conserving this precious asset. Farmers, as well as community members, have expressed concerns regarding soil erosion, improving conservation practices, and better water management practices. These concerns were brought to the attention of the Dunn County Board of Supervisors and government agency staff. After many conversations, the Dunn County Soil and Water Health Partnership was formed.

### What is the Red Cedar Demonstration Farm (RCDF)?

The Red Cedar Demonstration Farm was started by the Dunn County Soil and Water Health Partnership. Red Cedar Demonstration Farm is dedicated to promoting soil health and water quality through education in Dunn County. Field days are planned at the farm to allow for hands-on demonstration and further understanding of soil and water conservation practices and how they affect farm fields. Ongoing research projects, demonstrations, and informational reports allow for year-round education at the farm.

### The goals for the Red Cedar Demonstration Farm

- Demonstrating soil and water conservation management practices for the Dunn County community, area farmers, and Chippewa Valley Technical College (CVTC) students.
- Providing an opportunity for soil and water conservation education, on-farm research, and field demonstrations.

CVTC is the lessor of this farmland and will be responsible for the management of the crops, including a farmland rental payment to Dunn County. The steering committee members of the Partnership continue to meet and guide the management of the property during the terms of the 5 year lease agreement (2015-2019). This farmland is located within the Red Cedar River Watershed, which runs through a large portion of northwest Wisconsin, so the Partnership has named this project the **Red Cedar Demonstration Farm**.



## **2017 Summary Report**

The year 2017 was the third year of crop production and continued to have growth of research, demonstration, and education at the Red Cedar Demonstration Farm. The following is a description of the projects completed in 2017:



**Soil Sampling, April 2017**

- Soil sampling for site-specific management, or grid sampling, was completed in April 2015 and 2017. Points in each one acre of the grid were located with GPS. Multiple cores were collected for each soil sample.
- Soil samples provided an estimate of the current fertility of the farmland. Students and researchers can review variations within the fields and how nutrients are distributed spatially.
- Soil samples also estimate the amount of nutrients that should be applied to provide the greatest economic return for future crops.

### **On-Farm Research—Closing Wheel Study**

- Research is needed to develop best management practices for producers for no-till planting into cover crops. The specific objectives for this research were to assess closing wheel type, down pressure settings, and use of starter fertilizer to determine the optimal settings when no-till planting into density and residual from cover crops.
- Closing wheels cover the furrow with soil once the seed has been dropped into the furrow. Closing wheel performance can be affected by soil type, soil moisture conditions, and level of residue remaining from the previous crop or cover crop. After-market closing wheels have been developed to improve seedbed conditions by improving closing, reducing sidewall compaction, and improving soil-seed contact. However, some of these manufacturer claims have not been thoroughly evaluated. The type of closing wheel and the down pressure used during operation can have an effect on soil compaction (Stephens & Johnson, 1993).
- This study was conducted with Dr. Brian Luck, Biological Systems Engineering Extension Specialist. Response variables measured by 2017 Dunn County intern and Ag Agent.
- A randomized complete block design with four locations in Wisconsin (Dane, Dunn, Rock, and Marathon Counties) and four types of closing wheels (standard, paddle, curvtine, and spike) was conducted. The differences in the ratio of number of emerged plants to the known seeding rate ( $E^*$ ) for each wheel, as a function of growing degree units, was plotted for each location. Preliminary data was not conclusive due to a limited data set and the large variance of the data. Visual inspection of the furrow after planting highlighted differences between the standard and aftermarket models which could lead to differences in early season emergence and growth. For example, the aftermarket models performed a small amount of tillage over the seedbed, which cleared the residue and could lead to increased warming of the soil.

**Closing Wheel Study—from left to right: planting in May and plot harvesting in November 2017**



## **2017 Summary Report (continued)**

### **Interseeding Cover Crops—report provided by 2017 UW-Extension Intern Josh Herron**

- Interseeding cover crops is planting cover crops in between row crops earlier in the season to allow cover crops more time for establishment. Wisconsin's shorter growing seasons can make cover crop establishment increasingly risky when harvesting occurs in the fall.
- The goal of our interseeding project was to demonstrate planting of ryegrass, red clover, a mix of ryegrass and red clover, and alfalfa at different stages of corn growth to see the effect on corn yields and cover crop establishment.
- The demonstration plot was 100 feet long and 8 corn rows wide per replication. Each replication consisted of a control (no seeding done), ryegrass, medium red clover, alfalfa, and a mix of ryegrass and medium red clover.
- The seed was broadcasted with a hand spreader at appropriate seed rates per acre. Alfalfa was already established within the field and will be studied solely for yield impact.
- The first replication was planted on June 30, 2017 when the corn was at V6 corn growth stage. The second replication was planted a week later on July 7, 2017 when the corn was at V8 corn growth stage. Weather conditions for both planting days were ideal with rainfall after planting for germination. Two more replications were planted with the corn at black layer stage as the corn began to dry down.
- There were some issues with the success of this study. The last year of cover crops was terminated two weeks prior to the planting of corn on May 25, 2017. Capreno herbicide was used for termination, though the crop didn't terminate completely and a second application took place on June 10, 2017. Capreno's label has a 90 to 120 day residual effect and has the potential to injure cover crops planted after the herbicide application.
- Another factor that may have limited the success of this study was when the cover crops were interseeded. Ideally, the cover crops would have been planted when corn was at V5 and V6 or V7 growth stage. The corn canopy may have limited the sunlight that filtered to the ground, which is crucial for germination and photosynthesis of the cover crop in the early corn growth stages.



**2017 UW-Extension and Conservation Interns interseeding cover crops. Dunn County's no-till planter purchased in 2017 to assist with implementation of drilling cover crops at RCDF and throughout Dunn County.**



## **2017 Summary Report (continued)**

- CVTC utilizes an agreement with local implement dealers for the use of tractors, tillage, planting, and harvesting equipment. This provides the Agri-Science students an opportunity to use the latest field equipment and allows for hands-on education in real-world situations.
- However, these dealers may not always be able to provide CVTC with access to a no-till grain drill. CVTC uses a no-till drill to plant small grains (winter rye in 2017) for 1/3 of the crop production at RCDF.

### **No-Till Grain Drill Purchased by Dunn County**

- An increased demand for the use of a no-till grain drill lead to Dunn County purchasing a drill in 2017. The cost to purchase a grain drill may be restrictive to some farmers. This no-till grain drill is utilized at RCDF and available for rent to Dunn County farmers .
- Funding was provided through Dunn County Forage Council (\$1,000), Save the Hills Alliance grant (\$2,000), UW-Extension—Agriculture fund ( \$8,975), and Dunn County (\$10,000).
- Dunn County's Land and Water Conservation Division rents equipment for use by county residents, such as tree planters, mulchers and this grain drill. The Division is responsible for the annual maintenance and rental of the no-till grain drill.

### **Annual Fall Field Day**

2017 Fall Cover Crops Field Day was held Wednesday, September 27, 2017. Topics and speakers included:

- Use of cover crops with fall manure applications— *Matt Ruark, Associate Professor and Extension Soil Scientist at University of Wisconsin-Madison*
- Cover crop seed varieties update and discussion – *Chad Zutter, Elk Mound Seed*
- Highboy cover crop application discussion and demonstration - *Eberly Ag Services of Thorp*
- Precipitation and nitrogen use efficiency in 2017 – *CVTC and Countryside Cooperative*
- Rainfall simulator demonstration - *Brian Briski, NRCS Area Resource Conservationist*



2017 Fall Cover Crops Field Day pictures



### **Dunn County Soil and Water Health Partnership Steering Committee**

#### **Members Include:**

**Mark Denk:** Farm Business Production Management Instructor from Chippewa Valley Technical College (715) 577-3036 [mdenk1@cvtc.edu](mailto:mdenk1@cvtc.edu); **Daniel**

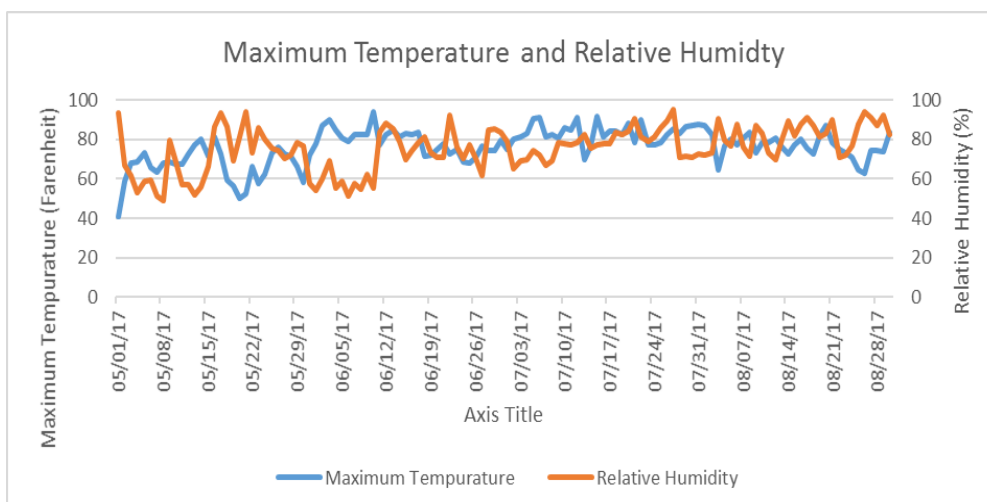
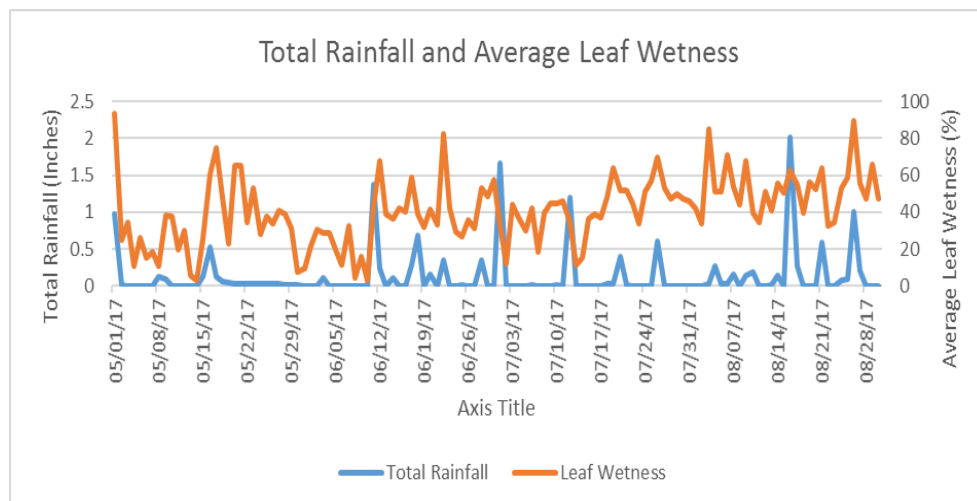
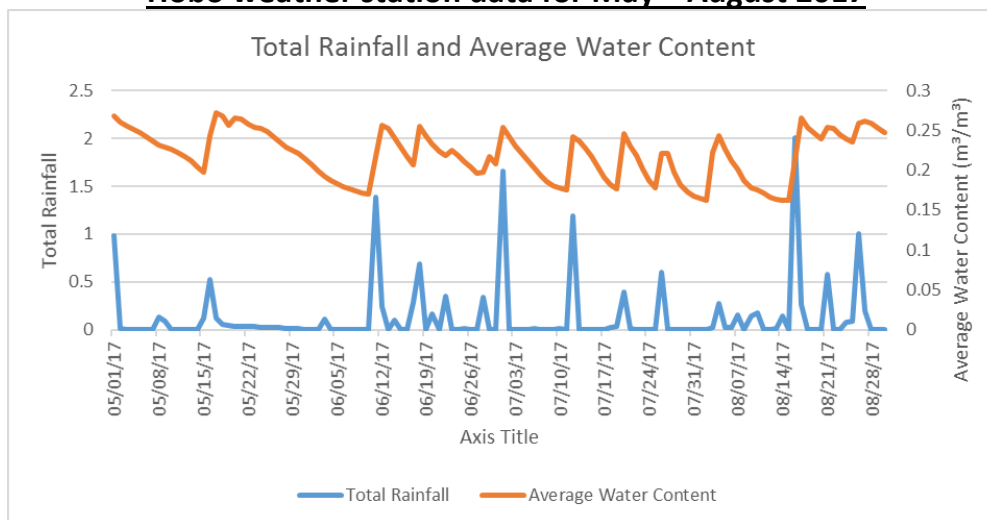
**Prestebak:** County Conservationist for Dunn County Division Land and Water Conservation (715) 232-1496, Ext. 2 [dprestebak@co.dunn.wi.us](mailto:dprestebak@co.dunn.wi.us); **John Sippl:** District Conservationist from Natural Resources Conservation Service (NRCS) (715) 232-2614 [john.sippl@wi.usda.gov](mailto:john.sippl@wi.usda.gov); **Katie Wantoch:** Agricultural Agent for University of Wisconsin—Extension in Dunn County (715) 232-1636 [katie.wantoch@ces.uwex.edu](mailto:katie.wantoch@ces.uwex.edu)

For more information on the Red Cedar Demonstration Farm, please visit UW-Extension Dunn County website at <http://dunn.uwex.edu/agriculture/red-cedar-demonstration-farm/>

## 2017 Summary Report (continued)

In 2015 a weather station was purchased through a UW-Extension Northwest Regional Innovative Grant. The weather station records temperature, rainfall amounts, dew point, relative humidity, and soil moisture levels. This weather station collects data every 10 minutes and is sent to a website where it can be accessed by the public. The website can be found on the Dunn County UW-Extension page under the agriculture drop down menu titled Red Cedar Demonstration Farm—<https://dunn.uwex.edu/agriculture/red-cedar-demonstration-farm/>

### Hobo weather station data for May—August 2017







# Red Cedar Demonstration Farm 2017 Cropping Map

Section 19, T28N, R12W Town of Red Cedar



## 2017 Crops



Corn grain



Oats



Idle Land



Soybeans to small grain cover crop



Winter Rye (grain+straw) to annual cover crop



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