

# What Are We Learning From Our Discovery Farms

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For the past couple of months we have been working hard to get equipment set up on two more farms and our projects in place. We are preparing our monitoring equipment so that sampling can take place before winter. As I reviewed our program, I realized that the past four years have been very busy and full of learning opportunities and challenges. Here is a brief description of what we are learning from our Discovery Farms.

The first farm in the program was the Bragger Family Farm located in Buffalo County. This farm has gathered the greatest amount of data and the farm has provided the framework for the operation and organization of the overall Discovery Farms Program. Sampling at the Bragger farm is occurring at two locations near the headwaters of a stream. This means that we are evaluating nutrient and sediment delivery to a stream which allows us to compare these losses to potential environmental regulations (such as total maximum daily loads, etc.). The data from this operation is helping us determine whether farms in the driftless region of the state will be able to comply with proposed rules. This data is also helpful in determining what types of best management practices can be implemented by producers in this portion of the state.

Other Discovery Farms are collecting water quality information from sites located in waterways within a field. These sites do not have continuous flowing water so sample collection and data analysis is faster and easier. Discovery Farms using these types of monitoring systems are providing a great deal of information on:

- The ability of a field to infiltrate water based on the farms cropping system (crop rotation, tillage practices, residue management, etc.),
- Individual field losses of both nutrients and sediment (loads per acre),
- Identification of the periods of a year most susceptible to nutrient and sediment losses,
- How the application of nutrient and/or manure influence sediment or nutrient losses.

This information is critical for the development and calibration of models like the phosphorus index and the Precision Agriculture Landscape Modeling System (PALMS) which will be used to estimate nutrient and sediment losses on farms throughout Wisconsin.

Over the next few months we will finish installing equipment both in streams and in fields which will allow us to gain a better understanding of nutrient and sediment losses over a wider region of the state. Another modification to our monitoring program will be the addition of several tile line monitoring systems so that we can evaluate losses through both surface and tile lines. This information will enhance our understanding of how different farming systems may potentially impact water quality not only during storm events, but throughout the entire growing season.

So, what have we learned?

1. Farmers can adopt systems that produce minimal impacts on the environment. This means that if producers carefully select farming practices that minimize sediment and nutrient losses, the impacts on surface water can be minimal.
2. Adopting farming systems that leave high amounts of residue not only reduce sediment losses, but can greatly enhance water infiltration rates which reduce runoff. This means that slowing the runoff with conservation practices allows for infiltration and crop utilization.
  - a. One farm received 21 inches of rain from March 1 – July 28<sup>th</sup> and this rainfall resulted in less than 2 inches of runoff.
3. In some instances, surface application of manure is the preferred management practice in order to reduce both nutrient and sediment losses. When manure is surfaced applied, care must be taken to apply at the correct rates, locations (based on slope and distance to surface water) and at the proper time (spreading manure when snow is consolidating or melting greatly enhances the potential for nutrient losses).
4. We have a long way to go on the adoption and implementation of Wisconsin Nonpoint Source Pollution Rules. The majority of farms will need a great deal of assistance on the revisions of their soil conservation plans and the development and implementation of a nutrient management plan.

The Discovery Farms Program is poised to help producers adopt best management practices that protect the environment as well as make economic sense for farmers. We are in the process of learning what is working and what is not working and are identifying practices that protect not only our environment but our farming community.