

# THE WATERSHED WATCH

- Healthy soils, healthy water, healthy you -

## SUMMER 2020

### What's Inside:

- Meet The Landowner Review
- Get the Scoop on Soil Health
- Brown County Drones
- GLRI Funding & Why it Matters

Meet Your  
Neighbors  
Farmers Making it  
Work: Kane Farm  
*Join us for Field Days*

LOWER FOX DEMONSTRATION FARMS NETWORK





# Meet The Watershed Watch

## Brought to you by: The Fox Demo Farms

We are excited to introduce the first edition of *The Watershed Watch*, which is a newsletter written specifically for you, the landowner. As landowners within the Lower Fox Watershed, there are opportunities for you to learn about conservation practices that will help protect your land, improve water quality, and help build a resilient agricultural community. Articles will be contributed by the partners of the Fox Demo Farms, which is a Great Lakes Restoration Initiative (GLRI) funded project. The Fox Demo Farms is a collaboration between eight local farms, Brown County Land & Water Conservation Department, the Natural Resources Conservation Service (NRCS), Outagamie County Land Conservation Department, the Green Bay Metropolitan Sewerage District (NEW Water) & UW-Madison Division of Extension. The project's mission is to demonstrate the effectiveness and adaptability of conservation practices such as cover crops, no-till, and alternative methods for manure applications. We hope you enjoy!

**For more information:**

**[www.foxdemofarms.org](http://www.foxdemofarms.org) or Follow "Fox Demo Farms" on Facebook!**

**LOWER FOX DEMONSTRATION FARMS NETWORK**



## Our Partners



**Extension**

UNIVERSITY OF WISCONSIN-MADISON





# GET THE SCOOP ON SOIL HEALTH

In the last 150 years of conventional farming, we've depleted about half the organic matter in our farmland soils, lost several inches of the most productive soil to erosion, periodically suffered from drought, and continuously battle weeds and disease. Our soils have remained productive thanks to modern seed genetics, synthetic fertilizers, and pesticides. The problem is that synthetic inputs and monoculture crop rotations severely degrade the soil over the long term. This degradation lessens the soils' ability to hold water and nutrients, withstand environmental extremes (drought, excessive rain, and excessive heat), and resist erosion. All of which results in runoff that contributes to flooding and eroded soil that contaminates rivers and lakes. The good news is that it isn't too late to change and farms across northeast Wisconsin are starting to adopt practices that will help reverse this cycle!

To find the solutions, we must look at how the most productive agricultural soils were initially formed. Prior to human farming the most productive soils in the country were prairie soils. Those soils were home to a diverse plant community: annuals, perennials, grasses, legumes, brassicas, etc. Several different species of insects and animals fed on these plants. The manure deposited by the animals together with the plant's roots and decaying plant matter generated a symbiotic relationship with the naturally occurring microorganisms in the form of fungi and bacteria in the soil. The decaying organic material was the food source for these microorganisms and in turn those microorganisms assisted the plant roots by finding moisture and liberating nutrients in the soil. The existence of these organisms and their interaction with one another are the factors that formed the most productive agricultural soils in the world. Looking at this system, there are five key factors that make this soil building process happen.



**Field that was conventionally farmed. Due to record rainfall in 2019, extreme rutting was experienced during harvest.**

## *Five Key Factors:*

- 1. Maximize diversity*
- 2. Keep soil covered at all times*
- 3. Keep living roots in the ground*
- 4. Minimize disturbance/tillage*
- 5. Integrate animals/  
manure*

**Maximizing diversity:** Maximizing the diversity of the plants and animals that interact with the soil promotes habitat for a more diverse group of supporting microorganisms in the soil. When only one plant is grown in the soil, only microorganisms that are supported by that plant thrive. While it is helpful to diversify crop rotations, it is easier and better to add diversity by integrating a diverse mix of cover crops into the crop rotation.

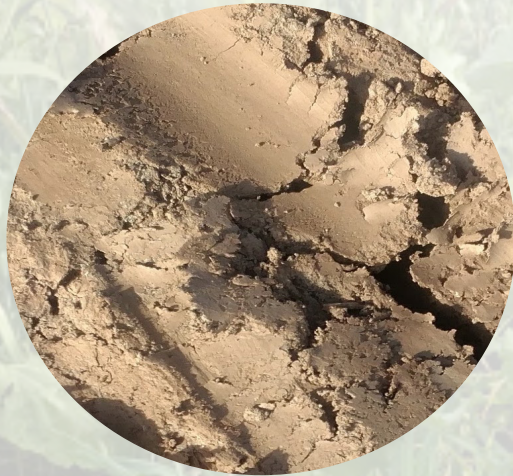
**Soil covered:** Keeping the soil covered at all times buffers the soil from extreme weather, helps heavy rain and snowmelt infiltrate, and keeps soils at hospitable temperatures for microorganisms in the summer heat. Some worry that by keeping the soil covered, planting will be delayed because the soil will be too cold and wet; however, this can be overcome by having a cover crop that overwinters. Similar to the grass growing in your yard, cover crops that overwinter act like water pumps, helping to dry out the soil during wet spring conditions.



**Living roots:** Living roots create structure in the soil. Soil structure allows water to infiltrate, which reduces runoff. Additionally, good soil structure improves the soil's carrying capacity, which helps farmers get out in the fields sooner, while also preventing compaction and equipment from getting stuck. Cover crops can also provide habitat and food for pollinators and beneficial insects that prey on crop pests.

**Minimize tillage:** While tillage temporarily loosens soil, it destroys soil structure created by roots and makes it susceptible to erosion. Tillage also introduces excessive oxygen, which leads to rapid decomposition of organic matter. This is why approximately 50% of the organic matter in our soils has been lost. Roots are needed to keep the soil loose and structured, not iron and diesel fuel.

**Integrate livestock:** While it is not always possible to integrate livestock onto cropland, it is possible to get manure to our cropland. In fact much of our farmland already receives manure applications; however, manure applied at high rates overwhelms the soil biology, which is why we encourage low rates and applications on ground with a living root that can hold the manure.



**Moving from tilled, hard, and dry soils (left) to healthy, well structured soils (right). Roots & fungi build structure, which resists compaction and improves infiltration.**



By integrating cover crops and no-till, we are mimicking the natural soil formation process by taking carbon out of the atmosphere (where it is detrimental to us) and building organic matter in the soil (where it is beneficial to us). We increase our soil's ability to infiltrate and store water so that it is available to our crops, which significantly reduces surface runoff. Creating a habitat conducive to beneficial insects and other beneficial organisms significantly lessens our reliance on synthetic fertilizers and pesticides. A healthy, properly functioning soil environment makes our system of agriculture and food more sustainable.

There is a lot of work being done by the Fox Demo Farms and farms throughout the watershed to embrace this system, to determine the best ways to integrate cover crops into current crop systems, and how to manage manure without tillage. The transition to these practices takes time and patience, but farms who have adopted the practices are seeing continual benefits. While it is true that it takes years to build soil organic matter and decades to get back to Wisconsin's original levels, farms who have adopted conservation practices are seeing immediate benefits. In 2019, fields that had only one year of cover crops and no-till saw improved structure and trafficability, despite record rainfalls. With predictions of increased precipitation rates, these benefits will be extremely important in building a resilient farming community.

*For more information about these practices:*

***Brown County Land & Water Conservation Department***

***(920) 391-4620***



# GALLERY FROM THE FIELDS



**Rotational grazing** involves dividing pasture into smaller paddocks. Animals are moved daily, giving resting paddocks time to recover. Benefits of rotational grazing include: improved soil health, time & financial savings, improved animal health & welfare.

**Earthworms** are one of the most beneficial organisms to soil health. They are nature's tillage system! Cover crops feed the soil biology, including earthworms and other microbes that are essential to building soil health & structure.



**The Fox Demo Farms** host field days featuring experts in the field and farmers who are making cover crops and no-till work on their farms. We plan to host field days for landowners, so we hope to see you there!





# Farmers Making It Work - Kane Farms -

Every issue of the *Watershed Watch*, we will showcase a farm that has adopted conservation practices on their farm and who is demonstrating that conservation agriculture not only works, but is beneficial to their operation. For this issue, we have selected seventh generation farmer Pat Kane, who along with his two sisters, own and operate a 800-cow dairy operation in Denmark, WI. Pat manages their 2,700 acres of crops, while his sisters oversee the dairy operation.

In terms of conservation adoption, Kane Farms is relatively new to the game, but Pat has quickly become a leader in the watershed and setting a great example for what's possible. In 2017, Pat chose to put aside their tillage equipment, which included several plows, two field cultivators, and a disc. This iron was replaced by roots. By using cover crops and building soil structure, Pat is able to retire expensive equipment, which is costly to operate and maintain.

So how is he making this work? There is a common misconception that cover crops cannot grow this far north. While it's true that our shorter growing window adds a unique challenge, Pat, and other local farmers, are making it work! Seed selection is one tool that can help overcome the cooler temperatures of northeast Wisconsin.

Since cover crops are planted after the primary crop is harvested, maturity rates matter. The maturity rate is the number of days between emergence and when the crop will be ready for harvest. One of the biggest challenges to planting cover crops is having enough growing days once the primary crop is harvested. For Pat, planting a shorter day corn "helps to harvest a little bit sooner in the fall to give us proper time to get cover crops planted." By planting a shorter day corn, Pat has been able to maximize the number of growing days for his covers, while not sacrificing yield hits on his corn.

## **Maturity Rates**

### **Grain Variety**

*Conventional:* 95-90 day corn

*Suggested:* 93-86 day corn

### **Silage Variety**

*Conventional:* 110-105 day corn

*Suggested:* 95-90 day corn

the soil profile not only helps reduce runoff, but it also helps prevent standing water, which can delay planting for days or like last year, weeks. So prioritizing cover crop establishment is an investment in the following year's success.

We want to thank Kane Farms and all of the great farmers in the watershed who are working hard to find ways to make conservation practices work. Management changes take time to implement and there is a learning curve to adoption, but as Pat has demonstrated, if a farm is committed and seeks proper assistance, they can begin to see positive changes in the first few years.



*Kane Farms hosting a field day for farmers. Cover crops interseeded in June when corn is around 6 inches tall. This gives the farm a head start with planting covers in the fall.*



# BROWN COUNTY DRONES

Brown County Land & Water Conservation Department has recently started using an Unmanned Aerial System or drone to gather photos of the landscape and projects. We will be using the drone for cropland inspections as required for the Farmland Preservation Program. We hope this will save time and make us more efficient. Instead of someone taking hours to walk a piece of land, that same piece of land can be surveyed by a drone in minutes. Additionally, it will open up windows for inspections when fields are too wet to walk.



Please note that we will not be using this tool to trespass. We will continue to seek permission prior to surveying your land and will provide notifications as we have done in the past. We also hope this technology will allow us to better monitor and showcase the good work landowners are doing by getting some action shots of conservation practices that have been installed.

Photo Credit:  
Green Bay Metropolitan Sewerage District, NEW Water

## GLRI Funding & Why it Matters

You may have heard people talking about the term “GLRI funding” and how important it is for our farmers and local natural resources, but what exactly does this term mean and why is it so important? The mission of the Great Lakes Restoration Initiative (GLRI) is to ***accelerate efforts to protect and restore the largest system of fresh surface water in the world - the Great Lakes***. Since it began in 2010, the GLRI has received approximately \$3.48 billion to fund projects that focus on one of the five focus areas: toxic substances and areas of concern (Lower Green Bay and mouth of Fox River is an Area of Concern), invasive species, nonpoint sources pollution (such as sediment and nutrients like phosphorus), habitat and species, and foundations for future restoration actions.

The Lower Fox River Watershed, which spans between Appleton and Green Bay, has benefited greatly from GLRI funding. Local, state, and federal agencies, universities, non-profits, and tribes have been awarded GLRI funding to work on a wide range of projects, including programs that provide conservation support to farmers to reduce soil loss and nutrient loading into the Fox River and bay of Green Bay. Northeast Wisconsin has a large impact on the Great Lakes. Green Bay, while only representing 7 percent of the surface area and 1.4 percent of the volume of Lake Michigan, contains 33 percent of the watershed and receives 33 percent of the basin’s total nutrient load (National Centers for Coastal Ocean Science). Phosphorus is one of the most common nutrients because it helps grow crops, as well as residential lawns and other green spaces (i.e., golf courses, parks, etc.). It helps provide a strong and resilient root system, which ultimately helps the plant grow. However, phosphorus also promotes the growth of aquatic vegetation. High levels of phosphorus results in unhealthy levels of plant growth and specifically, harmful algal blooms.



Light green  
on areal image  
indicates algal bloom  
on the bay of Green Bay  
and Lower Fox River.  
Photo credit:  
Sam Battle

Projects like the Fox Demo Farms depend on GLRI funding to help move conservation practices forward in northeast Wisconsin. Helping farmers access the technical support and valuable resources such as equipment rentals are some of the ways that GLRI funding is helping the agricultural community. To learn more about how the GLRI is helping to protect our natural resources, please visit: [www.glri.us](http://www.glri.us)



<<Landowner Name>>  
<<Address>>  
<<City>><<State>><<Postal Code>>

Brown County  
Land & Water Conservation Dept.  
2019 Technology Way  
Green Bay, WI 54311

Postage

# ***THE WATERSHED WATCH***

*- Healthy soils, healthy water, healthy you -*

The newsletter  
written for you, the  
landowner!

