

Oct./Nov., 2006

University of Wisconsin-Madison

UW-Extension

Volume 5, Issue 4

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**SPECIAL POINTS OF INTEREST:**

- ◆ Get updates on all the latest data from Discovery Farms!
- ◆ Some suggestions for fall manure spreading
- ◆ New additions to the website!
- ◆ Important tile maintenance information!!
- ◆ And Much More!!

### Director's Column- A Harvest of Information

It's snowing in Western Wisconsin. I don't know



about you, but it seems early and it's caught me unprepared. I knew winter was coming and I should have all my chores done, but there are a lot of items on my to-do-list and I haven't gotten to all of them. Now I have to prioritize and work on the items that are critical and hope the really cold weather and snow holds off for a few more weeks.

The staff at the UW - Discovery Farms Program has had a busy and productive year. We spent three days at a staff retreat reviewing the data coming off our farms.

What we heard and saw was very interesting. There is so much valuable information that needs to be shared with producers, policymakers and the citizens of Wisconsin.

Over the next several months we will be working with producer groups, UW - Extension and others interested in hosting meetings to get the information to the people.

As you work on your to-do-list, add a workshop/seminar or two to the list. Attending meetings and staying abreast of new information and technology is important. If you would like to hear more about the information being generated by the UW - Discovery Farms Program, please visit our website or contact our office anytime.

\*\*For a list of upcoming events, please see page 3 of this newsletter or visit our website at [www.uwdiscoveryfarms.org](http://www.uwdiscoveryfarms.org)

*Rennid R. Frame*





## Discovery Farms Data Update

Written by Amber Weisenberger  
Student Website Coordinator

During September, the entire UW-Discovery Farms Program staff met in Stevens Point, Wisconsin, to discuss and analyze the complete set of data collected from the Discovery Farms thus far. This three day meeting allowed us to formulate information and guidelines to share in presentations, on the website, and in newsletters like this one.

In the coming months, fact sheets will be available for farmers, industry representatives, policy makers and other interested parties. These fact sheets will be organized by topic, such as identification of runoff periods, sediment losses, nitrogen losses, phosphorus losses, and managing manure. Because the Discovery Farms are located in different areas around the state, another set of fact sheets will be organized based on geographic regions.

This article will serve as an introduction to those fact sheets. Below you will find a preview to the information that will be featured on the fact sheets. The guidelines below have originated from data collected from in-field monitoring stations. These guidelines are also general guidelines that were common across several of the farms in different areas of the state.

### Surface Water Losses

- Data from field sites suggests that a majority of surface water runoff occurred when the ground was frozen (or thawing).

*Because the frozen ground and snowmelt period is so vulnerable to surface water losses, extra precautions must be taken during the rest of the year to harvest the precipitation and minimize surface losses.*

- Annual runoff cannot be predicted by annual precipitation amounts.
- Runoff amounts during the frozen ground period can not be explained by the total amount of snowfall.

*Annual runoff rates are largely determined by percent of soil moisture. Data from one of our farms indicates that 96% of the surface water runoff events occurred at soil moisture levels at or above 35%. This number is very specific to this farm and these soils, but it helps us identify a critical factor for predicting surface water runoff events. If the soil on this farm is >30% moisture and we apply 13,500 gallons of liquid manure, we have added about ½ inch of water to the field. Any amount of rainfall at or around this application period could generate a surface water runoff event. While we cannot control the amount of precipitation added to soils, we can control moisture added from liquid manure applications, and this is an important management consideration.*



The data in the article originated from in-field monitoring stations, much like this one



## Discovery Farms Data Update, Continued...

### Sediment and Nutrient Losses

- Nearly all sediment losses to surface water occurred when the soil was not frozen.
- A significant amount of total nitrogen losses to surface water occur when the ground is frozen.

*This is an important management concern when spreading manure to credit nutrients for the next crop year. Over application of nutrients, especially nitrogen, in the fall spreading season can lead to higher nutrient losses during the frozen ground period.*

- Ammonium losses are significant when manure is applied to frozen, snow-covered ground shortly preceding snowmelt.
- There are significant phosphorus losses when the ground is frozen, suggesting that these losses are not correlated with sediment losses.
- When soils are thawed, most of the phosphorus losses are particulate, showing a strong correlation to sediment loss.

*Some phosphorus losses are indeed correlated with sediment losses, but the frozen ground period is a very important time period to consider on farms where reduction in phosphorus is a critical factor. Similar to nitrogen, manure must be properly credited during the fall spreading season to avoid unnecessary losses of nutrients.*

- Frozen, snow-covered ground, shortly preceding snowmelt has been identified as the most critical time of the year for manure applications.

*This point has been covered several times above, but it is important to remember that spreading manure during this time is very environmentally risky. If you must land apply manure during this time period:*

- \* *Manure should be properly credited,*
- \* *Fields with the least risk of runoff to either surface or groundwater should be chosen, and*
- \* *Rates should be equal to or less than those specified in your Nutrient Management Plan.*

***\*\*Look for an article in the next newsletter comparing losses from stream sites to edge-of-field sites\*\****

### Upcoming Events for UW-Discovery Farms

#### \*"Train the Trainer" Meetings

- November 28, 2006; Appleton Fox Valley Technical College
- December 14, 2006; Marshfield Agricultural Research Station
- December 15, 2006; Arlington Agricultural Research Station

–The UW-Extension curriculum for Nutrient Management Farmer Education has recently been updated. Revisions include a number of add-on modules devoted to manure, grazing, row crops, and advanced N and P.

–These sessions are intended for county-based UWEX agents, technical college instructors, LCD and NRCS staff. Contact Judy

Goplin at 715-983-5668 or jgoplin@wisc.edu to register for these workshops.

#### \* 2006 Dairy Business Association Annual Business Conference

- November 29-30, 2006; Monona Terrace Community and Convention Center



## Tile Talk With Discovery Farms, Third Edition

*Written by Eric Cooley  
Outreach Specialist, Eastern Wisconsin*

Welcome to our third edition of “Tile Talk.” Tile maintenance is an important task to ensure both the proper drainage of excess water from agricultural lands as well as minimizing the potential release of manure, nutrients and chemicals to surface waters.

Tile maintenance means a general overview of the tile drainage system if all is working correctly and should consist of an annual inspection of the system at a minimum. This inspection is best performed in the spring of the year when soils thaw and snowmelt infiltrates into the soil. Tile flow volumes are usually highest in the spring of the year and problems are often more easy to identify during peak flow periods.

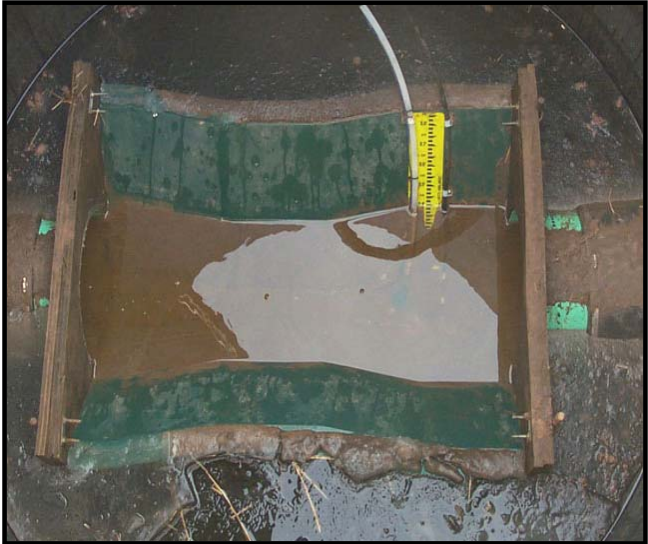
Tile outlet pipes should be inspected to ensure rodent guards in place and working. Rodent guards are important to prevent the obstruction of tile outlets by nest formation and debris accumulation. To verify proper operation and clear flow path, slide hand inside pipe under guard and remove anything behind it.

A clean flow of water should be observed from tile outlets with no evidence of foam or odor. The color of discharge is important in determining potential sources of degraded tile water. Some common color indicators in tile water are:

|             |   |
|-------------|---|
| Black       | Sewage or Swamp water                         |
| Foam        | Soap/Detergent or Excessive organic particles |
| Brown/Green | Manure  |
| Brown/Black | Oil/Fuel                                      |
| White/Gray  | Milk/Milk-house Waste                         |



Left: Clean, clear water exiting a tile line



Right: A tile line with discoloration possibly from sewage.



## Tile Talk With Discovery Farms, Third Edition, Continued...

If color is noted in tile discharge, possible sources should be investigated, identified and fixed to prevent release to surface waters. Tile outlets should also be checked after manure applications and subsequent significant rainfall events to ensure no discharge of manure to tile water.

It is also important to have a good understanding of tile locations and system function for proper management of tile systems. Similar to septic systems, tile lines and trees do not coexist well together. Tree roots like to occupy the open space in tile lines and can block tile lines. Even small willow trees can obstruct tile systems; therefore, tiled waterways and buffer areas should be kept clear of trees.

Tiled fields and waterways should be continually monitored for holes. Holes to tile lines can be created from either animal/rodent digging or from tile outlet obstruction which causes backpressure of water in tiles causing soil “blowouts.” Regardless of origin, these holes from the land surface to tile lines can cause direct introduction of soil, manure, and/or chemicals from the soil surface into the tile lines. These blowouts can be from a few inches in size to a few feet and can often be hard to identify. Although they may appear small in size, these blowouts can transfer large amounts of unfiltered water from the soil surface into tiles.

Holes should be repaired as soon as possible by qualified personnel. Tile repairs should only be performed by knowledgeable individuals, because improper repairs can cause increased problems with blockage and future blowouts. Digger’s Hotline (800) 242-8511 should always be contacted prior to attempting tile repair.

Unusual changes in field wetness may also give evidence for tile blockage. Areas in fields that were traditionally well drained which begin to exhibit prolonged wetness can indicate problems with tile systems. A tile blockage in the middle of a field can cause water to backup upstream of the blockage and discharge to the soil surface through a blowout, thus causing lingering saturated soil conditions that create problems with cropping operations.

Proper tile system design is also a critical aspect of proper tile operation. With the installation of additional tile laterals to tile systems, tile main lines should be adequately sized to allow for additional flow volumes. Improper tile main size will also cause pressure in tile systems and result in tile blowouts.

Adequate tile vent tubes should be installed in the tile system to allow the system to breathe. Tile vents aid in the removal capacity of tile systems and help alleviate over-pressurization and subsequent blowouts. Tile vents also give you the convenience of viewing tile flow and water levels by using a flashlight to shine down the vent.

A well maintained tile drainage system is critical to sustain proper excess moisture removal from tiled cropland and to reduce the potential for release of nutrients and chemicals to tile water, which ultimately ends up as surface water in streams and lakes.

I would like to thank Joe Pagel from Drainage USA for his extensive input on this article and continued collaboration of Discovery Farms tile research.



## Homework: Spreading Livestock Manure in the Fall

*Written by Kevan Klingberg*

*Outreach Specialist*

Three years of surface water runoff monitoring at the edges of crop fields has shown that relatively small amounts of runoff water leave fields in the time period from September to December. Fall is actually a very good time of the year to spread manure. Fall nutrients applied via livestock manure can be fully credited toward next year's crop nutrient needs. Also, for operations that store liquid manure, a complete fall emptying of the pit secures more capacity to store manure through the winter melt and runoff period, into spring.

***Important Note:*** Late winter through early spring is an environmentally risky time to spread manure. Again, three years of surface water runoff monitoring at the edges of fields shows that large amounts of runoff water leave fields in February through April. This runoff water can easily pick up and move nutrients and organic matter from recently applied manure off site. The world gets very complicated if manure tainted runoff water makes its way to waters of the state. Yes, everyone who manages livestock has spread fall manure before. Having said that, what is the thought and action process for spreading manure to both meet crop nutrient needs and protect water quality? Here is a suggested list that incorporates homework and thinking before spreading manure this fall. (Winter manure spreading criteria may be completely different on individual farms due to restrictions on steeper landscape and rate limits for liquid manure.)

***Nutrients Needs:*** Have manure lab analysis run for nutrient content. Identify field specific nutrient needs for next crop, based on soil testing. Identify acceptable field specific nutrient application, based on NRCS - 590 Standard.

***Phosphorus Strategy:*** Review the farm P nutrient management strategy. Do some fields have manure rate restrictions due to either high P soil test values or high Phosphorus Index?

***Landscape:*** Review the farm sensitive landscape and special manure management areas. Surface Water Quality Management Areas (within 1000 ft of lake / pond or within 300 ft of perennial stream) need conservation BMPs and may need a lower manure application rate if surface applied. Do you have waterways, wells, wetlands, sink holes, or other direct conduits to groundwater or surface water? Do not spread manure in those areas.

***Miscellaneous:*** Watch the weather. If rain is forecasted, be very careful where and when manure is spread. Ultimately it is best to wait for good weather and proper soil conditions. Have you conveyed all specific spreading instructions to employees and custom manure haulers?

***Spread Manure:*** Apply manure at correct rates to deliver appropriate nutrients. Credit manure nutrients toward next year's crop nutrient need during winter crop planning sessions.

A little bit of homework and thinking will make a positive difference toward keeping water quality in your neighborhood swimmable, fishable and drinkable. Spread manure, be smart and stay safe this fall.



## Prepare For Fall Soil Sampling

*Written by Kevan Klingberg,  
Outreach Specialist*

The summer growing season is done, and farmers are busy servicing machinery, combining grain, chopping forage, spreading manure, as well as preparing the farmstead and livestock facilities for winter. While the 2006 crop season is still finishing, remember to review your soil testing program. How current are individual field soil test reports? If they are more than 3 or 4 years old, arrange to have new soil samples taken yet this fall. Make the call or do it yourself.

Accurate and current soil testing is crucial for understanding crop nutrition and managing soil fertility. Routine soil tests identify measured values for pH, organic matter, phosphorus and potassium in the soil, as well as provide lime and fertilizer recommendations for indicated crops.

Is 65 cents per acre a fair price to pay for crop nutrition and soil fertility information? Let's look at the math. Lab fees for routine soil analysis cost approximately \$ 7.00 per sample. One soil sample should be collected for every 5 acres. Pay yourself or someone else \$ 10.00 per hour. Work at a rate of 4 samples per hour (20 acres worth), and utilize the same soil test information for 3 years: \$ 7.00 lab fee per 5 acres + \$ 10.00 labor fee per 20 acres = \$ 1.90 per acre, spread over 3 years = \$ 0.63 per acre each year.

Anyone who plans to purchase fertilizer for the 2007 season knows that the cost of DAP, potash, 28 % N and starter fertilizer will be significant.

The only way to know how much fertilizer, livestock manure or lime to apply is to soil test and then have that soil fertility information translated into a nutrient recommendation for crops you plan to grow. That information is available for around \$ 0.65 per acre, each year. Soil testing is an investment that allows you to best manage livestock manure, fertilizer and lime applications for crop production, farm profitability and environmental stewardship.

## New and Exciting Website Changes!

*Written by Amber Weisenberger  
Student Website Coordinator*

Over the past few months, the UW-Discovery Farms staff has been working to bring you information in an easily understandable, more accessible form. We continue to receive positive feedback about our website and want to make more of our data and information available to you all day, every day. Here are some new and improved changes to our website.

- \* Our website address was changed in August. Our new address is [www.uwdiscoveryfarms.org](http://www.uwdiscoveryfarms.org). The UW has been added to our address to stress our connection and partnership with the University of Wisconsin and UW-Extension. We are sorry for any inconvenience that this has caused, but the new address will allow us to serve your information needs better. **Please update your bookmarks and favorites pages!**
- \* We have added a new "Education and Environmental Training" page. This page will include links to recent workshops, featured articles, and information sorted by topic. Check this page frequently as updates will be added often. Visit this site after presentations to obtain handouts and fact sheets relating to the meeting you attended. We hope that this page will be your "one stop shop" for all your UW-Discovery Farms information needs! Add this page to your bookmarks! <http://www.uwdiscoveryfarms.org/education/index.htm>
- \* We also added a "Rules and Regulations Updates" page. This page is meant to help keep you up to date on the latest news with rules and regulations that may affect you or your operation. Links to DATCP, NRCS, and DNR websites gives you access to the most recent developments with legislation.

UW-Discovery Farms works hard to bring you useful, accessible, and current information through our website. Please let us know if there is something that you would like to see on our website that is not currently there. We will do our best to make it accessible to you! Happy surfing!



This newsletter is an information source about the Discovery Farms Program. Regarding the mailing list, call/e-mail 715-983-5668 or jgoplin@wisc.edu.

This newsletter can be found on the web at www.uwdiscoveryfarms.org.

Discovery Farms is a program from the University of Wisconsin, and is part of UW-Extension and the College of Agriculture and Life Sciences at UW-Madison. It has a relationship with WASI, as does UW-Platteville's Pioneer Farm.

Discovery Farms receives funding through UW-Extension, UW-Madison, UW-Stevens Point, UW-River Falls; with help from DATCP, DNR, NRCS, USGS, county Land Conservation Departments and county Extension offices; as well as ag industry organizations, such as WMMB, PDPW, WPPA, and DBA.

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