Irrigators Association iam of Minnesota Since 1975
1010 W St Germain St
St Cloud, MN
56301-3002

NON-PROFIT ORG.
U.S. POSTAGE PAID
PERMIT NO. 60
HUTCHINSON, MN 55350

Minnesota Irrigator

PUBLICATION OF THE IRRIGATORS ASSOCIATION OF MINNESOTA FALL 2017

Comments by the IAM President

Dear Irrigators,

As I write this column, it is raining. A very welcome rain to give us a break from irrigating. This is the first substantial rain we have had in a month. It's a lot of work to keep the irrigators running and maintained.

I bring this up, to remind you as irrigators, that we need to educate the non-farming public about the need and importance of irrigation in the state of Minnesota. This includes township supervisors to state senators and representatives.

These are the individuals who will be creating laws we all have to follow. Take the opportunity to invite them out to see your farming operation. Many of these elected officials don't understand the importance of irrigation in our state.

If you are not an IAM member, please clip the membership form on the back of this newsletter and join today. We need strong membership to maintain a strong voice for irrigation in the state of Minnesota.

Alan Peterson
IAM President

INSIDE

Schlichting Farms and Prairie Farm Company

Schlichting Farms and Prairie Farm Company of Rice are certified in the Minnesota Agricultural Water Quality Certification Program (MAWQCP)

Schlichting Farms and Prairie Farm Company operate a combined acreage of 6,811 acres in Benton and Morrison Counties with a crop rotation consisting of corn, edible beans, and potatoes and Conservation Reserve Program acres. Most of the crop land is irrigated with 65 center pivots. Schlichting Farms also finish approximately 3,300 head of swine and farrow 1,250 sows a year. Vegetative buffers are in place along waterways. The nutrient, irrigation and pest best management practices are implemented to maximize production while minimizing negative impacts to water quality. Cover crops are planted after edible bean and potato harvest to maintain vegetative cover which reduces erosion and promotes soil health. Plans are to leave corn stalks not tilled in the fall after harvest. The Schlichting's worked with Casey Gwost from the Benton SWCD and Area Certification Specialist Grant Pearson with the Stearns SWCD in developing their management plans.

The Minnesota Agricultural Water Quality Certification Program (MAWQCP) is a voluntary program and provides an opportunity for farmers and agricultural land-

MAWQCP continued on page 2

Pictured (left to right): Diane Wojtanowicz (Prairie Farm Co.), Rick & Marlene Schlichting, Casey Gwost (Benton Co. SWCD). In the central region of MN the Third Street Brewhouse of Cold Spring recognizes MAWQCP certified farmers and landowners with a gift.

Welcome to the Fall 2017 Newsletter

Jerry Wright, IAM Membership Secretary

Hope your irrigation system and water supply have remained dependable for you this summer. This newsletter comes to you thanks to the support of the enclosed advertisers, current IAM irrigators & industry memberships as well as those Extra Mile Supporters listed in the newsletter.

Directors on the IAM Board welcome and encourage you to become a member if you have not already joined. We all benefit by each other's ideas, experiences and support to continue the IAM activities in the new year including keeping a watchful eye on MN Irrigation Water Rights; telling personal stories about benefits of irrigation with Legislators as well as represent the interests of irrigation practices across the state.

To become a member or renew your membership, return the application form included on the last page of this newsletter. There are many benefits in belonging to IAM with the best one being simply knowing that you have joined in partnership with your neighboring irrigators in supporting your IAM officers and the board of directors' legislative and agency contact activities. As a member, you can also be placed on the IAM email alert list if you submit your email address.

If you are not interested in receiving future newsletters from Irrigators Association of Minnesota (IAM), "please send a note to *wrightsj@charter.net* or IAM, 24 S. Edquist St., Appleton, MN 56208

If you have a topic that you would like to see discussed in a future issue, drop a note to IAM president, Alan Peterson at < *alpetefarm@frontiernet.net* >. Articles for the newsletter are solicited and gathered by the IAM officers and Membership Secretary Jerry Wright whom can be contacted at: *wrightsj@charter.net* Crow River Press in Hutchinson manages the advertiser space and edits, prints and mails the newsletter.

2017 Rosholt Farm Field Day & Research Update

The 2017 Rosholt Field Day will be held on Thursday, August 17th. Registration starts at 8:30 AM with presentations beginning at 9:00 AM. A free lunch will be served.

The field day will provide attendees with the opportunity to hear about current research and practical crop production related issues.

The day will start with Fabian Fernandez, U of M, who will discuss the use of rye cover crop and Kura living mulch in corn and soybeans. He will share early testing results and the impacts to nitrogen movement. The study seeks to determine what impact the cover crop and living mulch have on nitrate losses and crop yields.

Jeppe Kjaersgaard, MN Department of Agriculture, will share current results of a multi-year reduced irrigation study. The study seeks to answer questions such as;

- Does reduced irrigation force crops roots deeper in the soil?
- Will reducing plant populations stabilize crop yield when water is limited?

REASEARCH continued on page 13

MDA - Nitrogen Fertilizer Rules' Draft Language

– Still open for your Comments

The Minnesota Department of Agriculture (MDA) is developing a Nitrogen Fertilizer Rule (Rule), and is seeking public comment. The purpose of the Rule is to minimize potential sources of nitrate pollution in the state's groundwater and to protect our drinking water. The Rule is a draft and may change based on public input. The Rule is expected to be adopted in the fall of 2018.

Full draft can be seen on the MDA website: http://www.mda.state.mn.us/

The Rule is based on the Minnesota Nitrogen Fertilizer Management Plan which recommends steps for the prevention and minimization of the impacts of nitrogen fertilizer on groundwater, and emphasizes involving the local agricultural community in problem-solving for local groundwater concerns.

RULES continued on page 6

REGISTER continued from page 1.

owners to take the lead in implementing more conservation practices that protect Minnesota's lakes and rivers. Farm owners and operators who implement and maintain approved farm management practices will be certified and in turn assured that their operation meets the state's water quality goals and standards for a period of ten years.

The Schlichtings also often implement practices on their own to meet their personal goals and those of the community, bringing a positive public image of agriculture.

Rick and Marlene Schlichting farm was also recently awarded the "2016 Outstanding Conservationist of the year for the State of Minnesota" by the Minnesota Association of Soil and Water Conservation Districts (MASWCD).

Some of the practices that the Schlichtings' have implemented include converting irrigation systems to low pressure and completing irrigation water management on all 65 irrigation pivots they operate. They plant nutrient management test plots, installed a 7,920 foot buffer along Little Rock Creek, built a composting facility for the hog barns, and have completed a prairie restorations.

The MN Ag Water Quality Certification process involves:

1) Signing an application with local SWCD,
2) Review current management practices with local certifier staff (includes planned crop nutrient, tillage, pest, irrigation and drainage management plans along with established conservation practices),
3) Certifier staff make field visits and adjustments to water quality assessment tool,
4) Certifier staff meet to review assessment results and suggested changes to management (if needed) to become water quality certified.

The MAWQCP is delivered in partnership with the Minnesota's 89 Soil and Water Conservation Districts (SWCD)' Board of Water & Soil Resources, the Minnesota Department of Agricultural (MDA), the Minnesota Pollution Control Agency, the Department of Natural Resources, the USDA's Natural Resource Conservation Service (NRCS), and the U.S. Environmental Protection Agency (EPA). The MDA administers MAWQCP.

Through this collaborative effort, the state agencies and SWCDs are able to leverage their individual strengths to work together to recognize and reward farmers for their work protecting Minnesota's most iconic natural resource. This innovative model of conservation planning and delivery has created a program that has been embraced by Minnesota's farm and livestock producers.

MAWQCP also provides an opportunity to tell positive stories about the efforts landowners and farmers are making to produce a bountiful source of food while implementing practices that help protects Minnesota's water quality at the same time.

Why should you participate?

- Protect and improve water in local lakes, rivers and streams.
- Receive recognition that you are doing all that is being asked to protect water quality.
- Gain regulatory certainty: certified farms are not subject to new water quality rules during their certification.
- Earn priority access to financial and technical assistance.
- Achieve greater stability to plan for and invest in conservation practices.
- Demonstrate leadership and stewardship.

MAWRC
MINNESOTA AGRICULTURAL WATER RESOURCE CENTER

As of mid-July, 430 farms have been certified across the state on over 252,000 acres.

For more information about the MAWQCP see: *http://www.mda.state.mn.us/awqcp*

Also visit your local SWCD Office for more information.

IRRIGATORS ASSOCIATION OF MINNESOTA, OFFICERS & DIRECTORS

Irrigators Association iam of Minnesota Since 1975

PRESIDENT
Alan Peterson
9200 57th Street
Clear Lake, MN 55319
320-743-2551-Home
alpetefarm@frontiernet.net

VICE PRESIDENT
Jeff McManigle
c/o West Central Irrigation
810 Industrial Park
Starbuck, MN 56381
320-239-2230
jeffmcmanigle@hotmail.com

TREASURER
Fletcher J Syltie
24 S. Edquist,
Appleton, MN 56208
Cell 320-241-1767
fsyltie@hotmail.com

SECRETARY
Jake Wildman
21648 Cty Rd 28
Glenwood, MN 56334
jakewildman@outlook.com

LEGAL ADVISOR
Lee W. Hanson
Gray, Plant, Mooty, Mooty and Bennett, P.A.
1010 West St. Germain
Ste. 600
St. Cloud, MN 56301
320-202-5313

TECHNICAL ADVISOR/ MEMBERSHIP SECRETARY
Jerry Wright
490 2nd St. NE,
Glenwood, MN 56334
wrightsj@charter.net
320-760-6388Cell
320-634-4306H

AFREC REPRESENTATIVE
Grant Anderson
44868 225th St.
Belgrade, MN 56312
320-905-9006
andersongrant.ga@gmail.com

SOUTHEAST
Terry Stoudt
27247 Cannon Falls Blvd.
Cannon Falls, MN 55009
Terry.Stoudt@hastingssnomos.org

John Conzemius
25024 Cannon Falls Blvd
Cannon Falls, MN 55009
651-210-5842
jconz@frontiernet.net

DAIRYLAND
Dave Kolb
24941 Co. Rd 10
Paynesville, MN 56362
320-548-3628
davekolbfarms@yahoo.com

CENTRAL
Ben Deuel
12095 Co Hwy 71
Parkers Praire, MN 56361
tatorman270@yahoo.com

Cordell Huebsch
38132 470th Ave.
New York Mills, MN 56567
218-841-2364
precisionfence@arvig.net

BONANZA
Jim Anderson
45086 Glendale Road
Belgrade, MN 56312
320-352-6356
jranderson52@gmail.com

Robert Jacobs
13685 CO RD 25
Villard, MN 56385
rkjacobs@wisper-wireless.com

SOUTHERN
Kevin Rohwer
60650 State Hwy 56
Dodge Center, MN 55927
507-456-1525
twincreekfarms007@gmail.com

Larry Schmeling (alternate)
riveroakfarminc@gmail.com

POMME DE TERRE SANDS
Dan Smith
1690 20th St. NW
Holloway, MN 56249
320-394-2184
dasmith@fedteldirect.net

Johnny Carruth
932 70th St. SW
Danvers, MN 56231
320-567-2127

EAST CENTRAL
Jeff Edling
13562 Sunset Dr.
Becker, MN 55308
320-249-9511
jedling@izoom.net

Alan Peterson
9200 57th Street
Clear Lake, MN 55319
320-743-2551
alpetefarm@frontiernet.net

UPPER MISSISSIPPI
Dean Zimmerman
21331 Kettle Rd
Royalton, MN 56373
320-630-5318
DeanFZim@gmail.com

Marlene Schlichting
3001 145th St NW
Rice, MN 56367
320-293-6291
marlene@schlichtingfarms.com

INDUSTRY REPRESENTATIVES
Jeff McManigle,
West Central Irrigation
810 Industrial Park
Starbuck, MN 56381
320-239-2230

Rob Vix, Traut Wells
141 28th Ave South
Waite Park, MN 56387
32-309-4881
drill@trautwells.com

Dan Bauer
Kimmes – Bauer Irrigation
22100 Lillelhei Ave
Hastings, MN 55033
kimmesbauerirrigation@Hughes.net

AT LARGE DIRECTORS
Jake Wildman
21648 Cty Rd 28
Glenwood, MN 56334
jakewildman@outlook.com

Norm Krause
43035 CO 21
Staples, MN 56479
218-894-3761
krause0328@gmail.com

Ross Imholte
8136 Trappers Ridge Drive
Clear Lake, MN 55319
320-760-6388
320-333-8700/Home
Rimholte25@gmail.com

Fletcher J Syltie
24 S Edquist St
Appleton, MN 56208
320-289-2062

Water Use of Commonly Irrigated Crops

By Tom Scherer, NDSU Extension Agricultural Engineer

During most growing seasons, lack of water in July and August can have detrimental effects on crop yields. Irrigation can overcome those effects to ensure that you harvest the best yield possible.

In general, you could say that July is for vegetative growth and August is for developing the "fruit"of the crop. In other words, good irrigation water management is very important during these two months.

Below is a chart showing the average water use for many of the commonly irrigated crops in North Dakota. Note that for all these crops, the water use is about 70 percent of the growing season total from emergence to harvest.

Figure 1. Location of current irrigation projects along the McClusky Canal.

AVERAGE WATER USE	JULY	AUGUST	TOTAL INCHES
Corn (grain and silage)	6.6	6.3	12.9
Pinto beans	7.0	5.8	12.8
Potatoes	7.0	5.5	12.5
Soybeans	6.5	5.9	12.4
Sunfl owers	6.6	6.01	2.6

The two most commonly irrigated soil textures are sandy loams and loamy sands; both have about 1.5 inches of plant available water per foot of soil depth.

Reprinted from -
water spouts No. 293 July 2017
www.ag.ndsu.edu/extension-aben/irrigation/water-spouts

Tom Scherer, 701-231-7239
NDSU Extension
Agricultural Engineer,
Thomas.Scherer@ndsu.edu

water spouts
www.ag.ndsu.edu/extension-aben/irrigation/water-spouts

NDSU EXTENSION SERVICE

County Commissions, NDSU and U.S. Department of Agriculture Cooperating.
This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.

Assessing and documenting yield loss due to dicamba injury in soybean

by Jeff Gunsolus, Extension weed scientist, University of Minnesota Extension – St Paul, Minnesota

As we enter August, the big unknown in fields presenting dicamba injury symptoms will be dicamba's impact on soybean yield. Unfortunately, due to the sensitivity of non-Xtend soybeans to dicamba, injury symptoms are not reliable indicators of yield loss. The level of yield loss depends on exposure at vegetative or reproductive stage of growth, persistence of injury symptoms, and growing conditions post-exposure.

Relationship of injury symptomology to yield

Dicamba injury symptoms range from cupping and strapping of newly emerged leaves to height reduction and injury to growing points. Symptoms will reflect the level of exposure to dicamba. A publication written by Richard Proost and Chris Boerboom contains color photos of dicamba injury symptoms, mimics and assessment of yield loss: http://ipcm.wisc.edu/download/pubsPM/dicamba2004.pdf

Due to the challenges of associating dicamba injury symptoms to yield loss, the only equitable way that I can think of to assess impact of dicamba on yield is to determine the most accurate in-field assessment based on the criteria presented above and have all affected parties agree to accept the yield comparison results at harvest.

How much of the soybean injury is due to dicamba volatility?

The short answer is that I have no idea, at least at this time. The Proost and Boerboom publication addresses the three primary causes of dicamba injury to soybean: 1) Spray drift; 2) Contaminated spray; and 3) Dicamba vapor. Currently, the greatest number of questions that I have received are about volatilization. This is likely due, in part, to the great efforts by the agrichemical industry to reduce the volatilization potential of the dicamba molecule and assurance that this route of injury had been addressed. Data presented to the EPA has indicated a significant reduction in the volatility of dicamba; however, non-Xtend soybeans are extremely sensitive to dicamba and reduced volatility does not mean no volatility. Environment may have also played a role in enhancing volatility. Proost and Boerboom note that the potential for dicamba vapor movement is greatest under hot, dry conditions during and after application.

Photo 1. Leaf cupping symptoms of dicamba injury in soybean. Photo: Bruce Potter

Photo 2. Xtend soybeans (left) planted next to a non-dicamba-tolerant soybean (right) that is showing injury symptoms. Photo: Liz Stahl

Documentation of dicamba injury to the Minnesota Department of Agriculture (MDA)

As I stated in my July 26, 2017 Crop News, in order to determine next steps for this technology, it is important to have good data regarding the conditions under which the off-target events occurred. This would include suspected particle drift, tank contamination and volatility.

Contacting the MDA to document this issue will help determine the scope of the problem. Reporting to the MDA provides the agency with valuable information that will aid in future discussions as the MDA engages with the dicamba registrants and inquiries about actions the registrants are taking to address these concerns. The MDA will also report their findings to the EPA.

Reporting to the Dicamba Damage Survey does not equate to litigation. It is up to the caller to determine if they want to also pursue a field investigation and litigation/enforcement action.

News Release from the MDA regarding reporting dicamba injury:

The Minnesota Department of Agriculture (MDA) is concerned about the reports of damage from dicamba use. To assess the scope of the issue, the MDA is collecting information from various sources. Traditionally, drift complaints are caused by a pesticide not being used in compliance with the label. However, with the new formulations of dicamba that are approved for dicamba-tolerant soybean varieties, there are significant concerns about the incidence of dicamba injury to non-target crops when the label is being followed. If you suspect damage has been caused by the off-target (drift or volatilization) movement of dicamba, complete the Dicamba Damage Survey. This survey is meant to address the concerns that about half of the dicamba complainants have had, where they do not wish to initiate pesticide misuse complaint and the ensuing investigation.

If you believe dicamba was used in violation of the label or law, and you wish to request an MDA investigation, you will also need to complete the pesticide misuse complaint form or call the Pesticide Misuse Complaint line at 651-201-6333.

If you have already contacted the MDA, you do not need to report again. If you would like to report, please do so now rather than wait until harvest, because a lot of valuable information will be lost by that time.

Posted by Phyllis Bongard , Educational Content Development & Communications Specialist, University of Minnesota Extension 4100 220th St. W. Farmington, MN 55024 651-480-7757, http://blog-crop-news.extension.umn.edu/2017/08/

MINNESOTA DEPARTMENT OF AGRICULTURE

Irrigating Farmer Share's Opinion on MDA's NFMP

By Cordell Huebsch, New York Mills, MN., 218-841-2364 or precisionfence@arvig.net

Another spring is upon us. Hopefully this article finds you having a successful planting season. When budgets get tight, every problem seems to have a bit larger amplitude. We will persist. Over the course of this winter, like many of you, I have attended dozens of farm meetings and seminars. If nothing else, they serve as a great pep talk to get us pumped up for the upcoming season.

A couple of the meetings I attended this winter were put on by the Minnesota Department of Ag in regards to the upcoming Nitrogen Fertilizer Management Plan (NFMP). This is what I would like to discuss in this article. I want to start out by saying that these are my opinions, not policy positions of IAM.

The premise of the NFMP is that the Department of Ag is establishing small local fertilizer management zones based on nitrate levels in well testing. If 80% of the farmland in these localized areas can voluntarily subscribe to adhere to a not yet determined plan, no formal laws or regulations will be placed upon us. The Department has been working on this project for about seven years now. We are now in the formation of local Advisory Teams phase. This is where I am encouraging farmers to get involved.

While it appears that the plan will center on Best Management Practices (BMPs), each township area or wellhead area will be working with the Department and other affected parties to establish the final rules.

Instead of looking at this from a negative point of view, i.e. "the big bad government is going to come tell me how to farm my land.", I am hoping we can look at this from a positive point of view. Listen, I understand and agree that we in ag are not the only polluters of our groundwater. But we really need to understand that we are at the very least contributing to the problem. How does the saying go - "The raindrop never feels responsible for the flood."

If we look at this NFMP as an opportunity to come together as an industry, voluntarily regulating ourselves without mandated laws, and at the same showing the public we are making a concerted effort to address their concerns – we will be 400% ahead than if we sit in the corner crying about the big bad government.

Let's get involved, write common sense reporting and assessments of BMPs ourselves, and show urban Minnesota that we do in fact care about our water and can work together independent of government regulation. Achieving the 80% threshold will only happen if there are local farmers willing to stand up and make responsible stewardship, reporting and assessment the cool thing to do.

Get on these local advisory teams and let's show Minnesota irrigated agriculture is working hard to protect their water.

Cordell Huebsch

Now is the Time to Check the Soil Moisture in Your Fields

We are experiencing drought in some parts of North Dakota, and because of spotty rain and snow since last fall, soil moisture in many fields is highly variable. The soil in the top foot could be dry but much wetter below, so the only way to know is to probe the field.

Knowing the status of the soil moisture at various depths in your field is necessary for good irrigation water management. The soil in the root zone provides storage for nutrients and water that plants need for growth and development.

Monitoring the amount of soil moisture not only indicates when to start irrigating but also the amount to apply.

Measuring soil moisture accurately always has been difficult. The makeup of soil and the way it interacts with water poses many problems. Soil is composed of grains of minerals that can vary in size from less than 8/10,000 of an inch (0.002 millimeter) to more than 1/32nd of an inch (1 millimeter) that are all mixed together. Mixed in with the grains are pieces of organic matter (old roots, crop residue, manure, etc.) that act like sponges and can make up from 0.5 to 6 percent of the soil volume in the root zone. Add water to this mixture, in liquid or vapor form, and you can appreciate why measuring soil moisture is difficult.

Many methods have been developed to measure soil moisture, and many companies offer measurement devices for irrigation water management. Some devices measure soil water content and some measure soil water potential. However, the standard for soil moisture measurement is the "gravimetric method," in which a soil sample is obtained from a certain depth in the root zone, weighed, then dried in an oven and weighed again. The difference between the wet and dry weight, along with the soil bulk density, provides an estimate of the volume of water in the soil at that depth.

The gravimetric method is used to calibrate and check all other soil moisture measurement methods and devices. The "feel method" is the oldest and most common method of checking soil moisture for irrigation management because it can be done anywhere in the field and at any time during the day. It involves obtaining a handful of soil from a desired depth and location in the field, then squeezing to see if it makes a ball. Based on how the soil reacts to the pressure, the moisture content

MOISTURE continued on next page

RULES continued from page 1.

Public Comment Period:

The current public comment period is June 7 - August 25, 2017. After reading the Rule, take a look at frequently asked questions. If you have additional questions please contact Larry Gunderson by phone or email. See MDA Contact below. This is the second opportunity for public comment. The comments received from the first comment period are available: Initial Public Comments: Winter 2016.

All comments regarding the proposed rule must be submitted in writing. After consideration of comments received, the MDA expects to publish the final draft of the rule in the fall of 2017. The rule is expected to be adopted in the fall of 2018.

Please submit written comments to Larry Gunderson by August 25, 2017 through mail, email (larry.gunderson@state.mn.us) or use the online comment form.

Larry Gunderson
Pesticide and Fertilizer Management Division
Minnesota Department of Agriculture
625 Robert Street North
St. Paul, MN 55155

DRAFT RULE

The Rule is based on the nitrogen fertilizer best management practices (BMPs) developed by the University of Minnesota. Use of nitrogen fertilizer BMPs can minimize the loss of nitrogen in the environment. The Rule is designed to involve local farmers and agronomists in adopting and promoting BMPs and other alternative management tools that can reduce nitrate in groundwater.

The Rule contains two parts. Each part contains separate criteria and requirements. Depending on a farm's location, the Rule may apply in one part, both parts, or not at all.

PART 1: Fall and frozen soil fertilizer restriction

If a farm is located in a vulnerable groundwater area, nitrogen fertilizer application in the fall and on frozen soils will be restricted. Soil hydrology and geology information will be used to identify vulnerable groundwater areas.

PART 2: Follow nitrogen fertilizer BMPs

The MDA and the Minnesota Department of Health extensively monitor both private and public drinking water wells for nitrate. If a farm is located in an area that has high concentrations of nitrate in groundwater, the Rule lays out a process for mitigation. Mitigation is the action of reducing the severity of a problem. The Rule proposes four mitigation levels with increasing restrictions. Use of nitrogen fertilizer BMPs and alternative practices are key components of Part 2 of the Rule.

can be determined. For finer soils, an additional indicator is how the soil ribbons when pressed between the thumb and forefinger. Many crop consultants and experienced irrigators use the feel method, but for new irrigators, it can be a challenge. Go to this website – http://tinyurl.com/SoilMoistureFeelMethod – for an example of how to use the feel method.

Checking the soil moisture content at many locations in a field a couple of times per week can be time-consuming, so you have to select representative locations. Selection of ideal locations for soil moisture checking should be based on ease of access, and crop and soil types in the field.

The best access for soil sampling would be next to roads or near the pivot access road.

Daily Crop "ET" for 2017 Available

Central MN Ag Weather Network

http://agweathernetwork.com/

Benton SWCD

http://www.soilandwater.org/

320 968 5300 ext 3

East Ottertail SWCD

http://www.eotswcd.org/

218-346-4260 ext 3

Pope County SWCD

http://www.popeswcd.org/

320-634-5327

Sherburne SWCD

http://www.sherburneswcd.org/

763 241 1170 ext3

Wisconsin & Minnesota Crop ET

http://agwx.soils.wisc.edu/uwex_agwx/

North Dakota Ag Weather & Crop ET

https://ndawn.ndsu.nodak.edu/

Source: Jerry Wright
Associate Professor Emeritus
and Retired Extension Engineer,
wrightsj@charter.net

Tom Scherer, 701-231-7239 NDSU Extension Agricultural Engineer Thomas.Scherer@ndsu.edu
Reprinted from the NDSU Water Spouts No. 292 - June 2017, www.ag.ndsu.edu/extension-aben/irrigation/water-spouts

water spouts

NDSU EXTENSION SERVICE

Acid Rain and Phosphorus in Surface Waters

By George Rehm, Emeritus Professor

In the past five years, there has been considerable discussion about phosphorus and algal growth in surface waters. This discussion is stimulated by the highly publicized algal blooms in Lake Erie and Lake Winnipeg.

More recently, some have promoted a theory that there is a connection between the documented decrease in acid rain and an increase in the amount of phosphorus leaving the landscape. Could this be reality or is this a false theory? To answer this question, it's important to describe the facts as we know them today. Minnesota irrigators are concerned about water quality. So, this issue is of interest to irrigated agriculture.

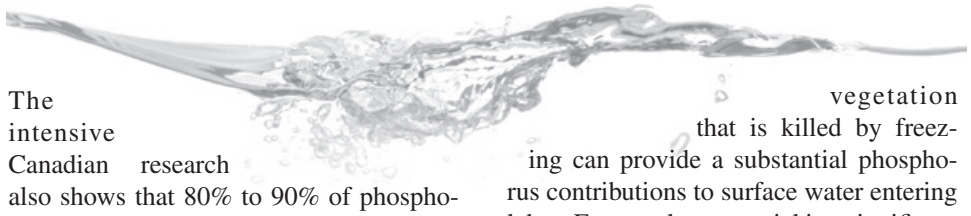
Principles of soil chemistry tell us that a reduction in acid rain could lead to an increase in soil pH. In acid soils, the solubility of phosphorus increases as soil pH increases to a value of about 7.3. In calcareous soils (pH greater than 7.3), solubility of phosphorus decreases with an increase in soil pH. So, any impact of a reduction in acid rain is not universal. Therefore, any change in acid rain in watersheds with soils having a variety of pH values is not consistent.

But, a reduction in soil pH occurs in all soils – both natural and cultivated. In soil, a breakdown of organic matter to compounds containing ammonium nitrogen with subsequent formation of nitrate-nitrogen via the nitrification reaction is the primary cause of acidity.

Does the increase in soil acidity caused by mineralization become more important than any increase in soil pH attributed to the reduction in acid rain? There are no data that provide a good answer to this question. Common logic suggests that even though acid rain is diminishing soil pH where soils are not calcareous decreases over time. These decreases are small and difficult to measure. So, we can conclude from an understanding of soil chemistry that the impact of soil processes has a greater impact on soluble phosphorus than acid rain.

Soil pH is not the only factor that can affect phosphorus losses from the landscape. Tillage, rate of phosphorus applied in fertilizer and/or manure, and placement of these two inputs are factors to consider.

Researchers at the University of Manitoba led by Dr. Don Flaten have conducted detailed research to document the importance of these various factors on the amount of phosphorus entering Lake Winnipeg. Movement via surface flow over a relatively level landscape is responsible for 70% to 80% of the phosphorus that enters the lake. Surface flow measurements from Discovery Farms in Minnesota show approximately the same percentages. (see the following table)



The intensive Canadian research also shows that 80% to 90% of phosphorus in surface flow occurs when soils are frozen. These measurements are consistent with values recorded from the Minnesota Discovery Farms measurements. This phosphorus originates from water that flows over frozen plant material. Plant cells rupture when they freeze and phosphorus in these cells is dissolved in water flowing over the soil surface. Based on this information, it is possible to argue that vegetation that is killed by freezing can provide a substantial phosphorus contributions to surface water entering lakes. Frozen plant material is a significant factor when no-till planting systems are used and when cover crops are grown in the crop rotation.

We have always accepted the fact phosphorus leaves the soil surface attached to soil particles. This is documented in the Canadian research. But, larger amounts of phosphorus originate from the frozen plant material.

WATERS continued on next page

Phosphorus in tile and surface from two Discovery Farms in Minnesota

COUNTY	WATER YEAR	%P IN TILE LINES	%P IN SURFACE FLOW
BLUE EARTH	2012	50	50
	2013	0	100
	2014	14.3	85.7
	2015	50	50
	2016	14.3	85.7
DODGE	2013	5.9	94.1
	2014	11.1	88.9
	2015	0	100
	2016	33.3	66.7
Average		12.6	87.4

Thank you IAM 2017 Industry Supporters

• PLATINUM CIRCLE SUPPORTERS

($1,000 OR MORE)

AREA II MN POTATO COUNCIL

**** GRAND IRRIGATION ****

MN CORN GROWERS ASSOCIATION

**** MINNESOTA VALLEY IRRIGATION ****

**** REINKE ****

**** TRAUT COMPANIES ****

**** WEST CENTRAL IRRIGATION ****

*(**CONVENTION BOOTH EXHIBITORS**)*

• PRESIDENTIAL

($500-$999)

**** AGCOUNTRY FARM CREDIT SERVICES ****

****AG STAR FINANCIAL SERVICES ****

KIMMES – BAUER IRRIGATION **

KLIMEK BROS WELL DRILLING **

LG SEEDS **

NORTHWEST AQWATEK SOLUTIONS **

*(**CONVENTION BOOTH EXHIBITORS**)*

• GOLD MEMBERSHIP

($300-$499)

CENTRA SOTA COOP ** – SANTIAGO
CROP PRODUCTION SERVICES – BIG LAKE
CROP REVENUE MGT/DIVERSIFIED SERVICES HORTAU **
HYDRO ENGINEERING **
INGLESIDE ENGINEERING **
MN AG. WATER RESOURCE CENTER**
MODERN FARMS EQUIMENT **
NELSON IRRIGATION CORP **
THE ANDERSONS – PUREGRADE **
WENSMAN SEED CO **

*(CONVENTION BOOTH EXHIBITORS**)*

• SILVER MEMBERSHIP

($200-$299)

AGDIRECT **
AMUNDSON PETERSON INC **
ANEZ CONSULTING **
ARNOLD'S
BONANZA VALLEY STATE BANK
BUER ELECTRIC CO
CHIPPEWA VALLEY BEAN CO**
CHS PRAIRIE LAKES **
CLC–AG & ENERGY CENTER–STAPLES **
MIDWEST IRRIGATION & ELECTRIC **
OMANN INSURANCE AGENCY
ROW GUARD **
SCHAEFFER OILS–J & H DISTR **
STEARNS COOPERATIVE ELECTRIC ASSOC.
THEIN WELL COMPANY **
WENSMAN SEED–AGRELIANT GENETICS **
*(CONVENTION BOOTH EXHIBITORS**)*

• BRONZE MEMBERSHIP

($150-$199)

BETASEED – SHAKOPEE
LAKESIDE FOODS
TODD-WADENA ELECTRIC COOP
ON POINT AGRONOMY – EAGAN

Irrigators Association iam of Minnesota Since 1975

(AS OF AUGUST 1, 2017)

2017 EXTRA MILE IAM MEMBER SUPPORTERS

THANK YOU!

PLATINUM CIRCLE

AREA II MN POTATO COUNCIL
4 THE BOYS – GLENWOOD
MN CORN GROWERS ASSOCIATION

PRESIDENTIAL

ANDERSON FARMS – BELGRADE
CARRUTH FARMS – DANVERS
CIRCLE G FARMS – CLEAR LAKE
JOE & STEVEN MEYERS – HAMPTON
REICHMANN LAND & CATTLE – VILLARD
SCHLICHTING FARM – RICE

GOLD MEMBERSHIP

A & L PETERSON FARMS – CLEAR LAKE
BAUER FARMS – HASTINGS
CLEAR VALLEY FARMS – CLEAR LAKE
KURT & MICHELL EMERY – STANTON
FARM BOYS – PARKERS PRAIRIE
R.K.S.K. FARMS – HASTINGS
TRIPLE K RANCH – HASTINGS
WILDMAN FARM – GLENWOOD

SILVER MEMBERSHIP

KEVIN BAUER FARMS – HASTINGS
DWAINE BUER – ATWATER
CHRIS FARMS – ATWATER
DAY STAR DAIRY – LITTLE FALLS
JAMES ERICKSON – KENSINGTON
PAUL GERGEN – RANDOLPH
KURT AND MICHELLE GOLD
OLSON & SONS FARM – PARKERS PRAIRIE
JERRY WRIGHT – GLENWOOD

BRONZE

WILLIAM BAUER – HASTINGS
TOM & LEANA BENSON – APPLETON
JOHN BREMER – HASTINGS
RON GIRGEN – HASTINGS
KIFFMEYER FARMS – CLEAR LAKE
WILLIAM & SUZANNE LEGATT – ST JOSEPH
PINECREST DAIRY – FRAZEE
STEVE RECHTZIGEL – HAMPTON
SORG FARMS PARTNERSHIP – HASTINGS
JOHN & CARL TRAUT – SARTELL

Annual IAM Convention

Community Center at Freeport, MN

Thursday - February 15, 2018

For more information contact IAM president
Alan Peterson alpetefarm@frontiernet.net
or Jerry Wright wrightsj@charter.net
IAM webpage www.mnirrigator.org/

Irrigators Association iam of Minnesota Since 1975

WATERS continued

What management practices can be used to reduce the amount of phosphorus entering lakes by surface flow? The Canadian researchers conclude that strict attention to rate of phosphorus applied and placement below the soil surface are the two management practices that have the most influence. We cannot totally ignore the impact of a reduction in acid rain. However, research shows that this impact is minimal. ■

300 Pounds
Waste Pesticide Free

The collection, management and disposal of unwanted and unusable pesticides is very costly. The Minnesota Department of Agriculture (MDA) provides payment for waste pesticides collected by collaborating counties and through MDA single day events.

MDA receives and distributes funding for this program per MN Statute 18B.065. It is important that all pesticide users have an equal opportunity to properly dispose of their waste pesticides.

Therefore MDA limits the amount that a participant may dispose of for free. After 300 pounds are accepted annually at no charge, participants will be asked to help pay a portion of the costs for additional waste. Some exceptions apply. If you have questions please contact Stan Kaminski at 651-201-6562 or at stan.kaminski@state.mn.us.

DEPARTMENT OF AGRICULTURE

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.
File Name: 300 Pounds Waste Pesticide Free.indd 6/13/17

Governor's Town Hall Meetings to Be Held Across Minnesota

Governor Mark Dayton invites Minnesotans to attend one of ten water quality town hall meetings this summer and fall "to discuss the water quality challenges facing their communities and our state, learn from experts, and engage with policymakers," according to the Environmental Quality Board website.

The agenda for each location includes an overview of the Governor's "25BY25" plan, which as the name suggests calls for a 25% improvement in water quality by 2025. Each meeting will also include presentations on water quality concerns specific to that region.

The Minnesota Agricultural Water Resource Center (MAWRC) encourages farmers to attend a town hall in their area to learn more about the Dayton administration's plans and, for those so inclined, to help shape the discussions on water quality strategies and solutions expected to occur during the town hall sessions. The following suggestions may help:

Focus on things you can do or are already doing—and keep things simple. To most farmers, many of the most basic conservation activities have become so natural that they are often taken for granted.

Share your approach to applying nutrients appropriately, soil testing and precision farming tools. Explain your efforts to store and apply manure properly. Help others understand the basics of pesticide safety and handling. Describe how buffers and grass waterways help control erosion. Explain the conservation effects of tile drainage. You know these things as they apply to your farm.

Don't throw other farmers under the bus. When you explain your approach to conservation, recognize that your neighbor may just be doing it differently. Talk about what you do, not what you wish your neighbor would do. Every farm is a unique system that must work for that individual farmer. When talking about changes over time, show your appreciation for those who came before you. Our industry continues to improve and evolve, building on the experience and knowledge of our predecessors. Your tillage system is much different from your grandfather's because you have more options available, but you also have several things in common with previous generations of farmers, including the desire to implement the best practices as shown by the best available science. You simply have the advantage of more advanced science and engineering.

Take responsibility without accepting blame and without attempting to assign blame to others. Recognize that food production has the potential to impact water quality, then point out the things you do to reduce those impacts. Ask how others reduce their impacts, then listen as you would expect them to listen to you.

Dates and locations include:

Rochester- Monday, July 31
Mankato- Wednesday, August 16
Marshall- Thursday, August 17
Crookston- Tuesday, September 5
St. Cloud- Wednesday, September 6
Ely- Tuesday, September 12
Bemidji- Wednesday, September 13
Minneapolis- Tuesday, September 26
Burnsville- Wednesday, October 4
Stillwater- Thursday, October 5

All events run from 6:30pm – 8:30pm. For more information, go to https://www.eqb.state.mn.us/Townhalls

Written by MAWRC Executive Director Warren Formo, warren@mawrc.org (952) 237-9822

The MAWRC is a non-profit research and education corporation comprised of 24 agricultural organizations working together to address water issues. For more information, go to www.mawrc.org

Explanation of Center Pivot Irrigation Insurance

Center pivot irrigation insurance is an often misunderstood topic. There are a number of different ways that irrigators can be insured, and it is important to understand the details of your irrigation coverage. Just assuming that they "are covered" can lead to significant financial shortfall if they happened to be damaged in a storm.

For starters, you need to first look at what the coverage type is on each of your irrigators. There are three basic coverage types, Replacement Cost, Actual Cash Value and Stated Value. Each of these coverage types is different, with the main difference being depreciation based on the age and condition of the irrigation system.

REPLACEMENT COST is typically the highest coverage level you can buy. In the event of a total loss, this coverage will pay for the cost of a new unit, in today's dollars, with no depreciation. Typically the only expense to the policy holder is the deductible on the policy.

ACTUAL CASH VALUE is probably the most common type of coverage on irrigation systems. Many insurance companies will not offer replacement cost coverage and insure irrigators just like they would trucks and tractors. The risk of this coverage is primarily based on the age of the system, and the amount of depreciation if the unit suffers a total loss. You are paid the actual cash value of the system. For example, irrigators depreciate at about 3-8% per year. A ten year old unit may be subject to 30-45% depreciation versus. the cost of a new system. If a system cost $100,000 new, and suffers a total loss, you would have $30-40K not covered by the insurance to replace the system. You also have to consider that in the event of a tornado or wind event, many units could suffer the same fate cumulating the depreciation into a rather sizeable amount of money out of pocket needed to put the units back in operation.

STATED VALUE is a coverage type where the insurance company and policyholder agree on a value that will be paid if the system suffers a total loss. This coverage types essentially eliminates the unknown of a depreciation calculation. Losses that can be repaired for less than the stated value are paid by the insurance, subject to the deductible. This type of coverage is common on older systems. The advantage to this coverage is the policyholder knows exactly what they will be paid in the event of a total loss.

Once coverage type has been determined the next step is setting the values correctly on the policy. For replacement cost coverage, the values need to be set at the cost of a new system. Replacement cost policies typically have a requirement that they are insured at 100% of the value, otherwise you could be subject to a penalty in the event of a claim for the difference. Values on an actual cash value policy should be set at the depreciated level of the equipment.

Using 5% per year is a reasonable calculation, but understand that older systems usually maintain 25-30% of the value of a new system as they always have some salvage or parts value. When using stated value, it is between the insurance company and policy holder to determine values. A $35 per foot of system is common but can vary.

Irrigators can often be one of the single largest assets on the farm. They are vulnerable to damage by a number of different perils. You also have to consider that they are critical pieces of equipment if losses happen at certain times, like just before pollination of a corn crop. Getting them back up and running without delay can further reduce financial loss.

Kimmes Bauer Irrigation and On Point Agronomy, LLC have teamed up to offer a replacement cost insurance program for irrigators. Give us a call for more details. Tom Kladar, 612 655 2261.

IF INVOLVED WITH A
Domestic-DNR Well Interference "Complaint"

Contact your IAM Local Representative

or

IAM President – Alan Peterson
320-743-2551 or alpetefarm@frontiernet.net

Irrigators Association iam of Minnesota Since 1975

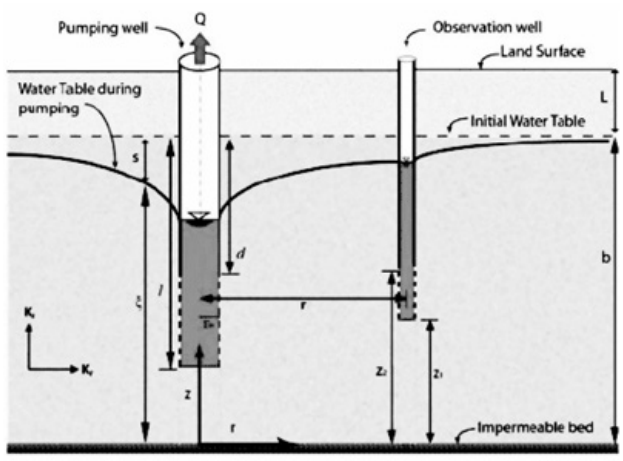
AQUIFER TESTS: What are they and why are they important for managing water use in Minnesota?

In Minnesota, the majority of crop irrigation water comes from pumping groundwater from aquifers. Aquifer tests help in understanding how the pumping of an irrigation well impacts other water users or water-dependent resources. This article describes aquifers, groundwater interaction, and what an aquifer test provides.

Aquifers

An aquifer is an underground layer of permeable rock or unconsolidated material (gravel and sand) that can hold and transmit enough water to be pumped from a well. The most common aquifers are water-table aquifers (unconfined) and buried aquifers (confined). Water-table aquifers are open to atmospheric pressure and tend to be shallow and well-connected to water-dependent resources, such as lakes, streams, wetlands and calcareous fens. Buried aquifers are usually under hydraulic pressure and are generally deeper, with a confining layer above the aquifer consisting of fine-grained materials such as clay or shale. Buried aquifers may also be hydraulically connected to water-dependent resources if the confining layer is leaky or has limited lateral extent.

Aquifers can be recharged with water as rain or snow infiltrates the soil. Recharge varies based on a number of factors including land use (cities, farm land, prairie, forest), soil types (sandy, clayey, bedrock), geologic setting, and vegetative cover (type of crop, lawns, trees, native grasses and forbs). Recharging groundwater from precipitation can take years to centuries. In some parts of the state, groundwater is tens of thousands of years old. Water-table aquifers are generally recharged by local precipitation, while buried aquifers may be recharged locally or from great distances. Pumping too much water too fast can draw down the water in an aquifer and may reduce water availability to the well owner, their neighbors' wells, or water-dependent resources. Some features depend on groundwater to sustain sensitive fish and plant communities. Trout streams and calcareous fens are particularly sensitive to a reduction in groundwater levels.



Aquifer Tests

The DNR is required by law to protect the natural resources of the state for all Minnesotans. State law (MN Statute 103G.287) requires that aquifer test results be submitted to the DNR as part of a complete water appropriation permit application. The DNR may waive the requirement for the aquifer test report, if DNR technical staff determine that adequate information is already available.

The intent of an aquifer test is to provide a better understanding of how the water moves when stresses are added to the aquifer. The stress in this case is pumping groundwater for agricultural irrigation. The information collected by an aquifer test helps determine the potential risk to other users and water-dependent resources in the area. This differs from a pump test, which primarily evaluates the performance of a single well. An aquifer test is a controlled pumping event involving several wells that are used to determine the hydraulic properties of saturated geologic materials below the ground surface. A hydrogeologist studies how groundwater moves through soil and rock in the earth and measures changing water levels in the production well and observation well(s) in response to the withdrawal of water from the aquifer at a constant rate. These data are analyzed to determine aquifer and confining layer properties. The following activities must be performed before, during and after the aquifer test to assure that the data and resulting analysis is useful in making a permit decision.

Obtain production and observation well construction information (depth, materials used, width, geologic materials, screened interval, open-hole interval, pump depths, etc.)

The aquifer test consists of depth-to-water measurements recorded by a datalogger installed in the production and observation wells during the pre-pumping, pumping and recovery (rising water after the pumped is turned off) periods. During the aquifer test, manual water level measurements are collected frequently at the start of the pumping and the recovery phase, when changes in the aquifer water levels are greatest. The manual measurements serve as a check on the datalogger measurements and serve as a backup data set for analysis.

Aquifer tests often take multiple days of pumping to fully stress the aquifer and to understand the aquifer characteristics and effects of pumping. The length of time for a test depends on the type of aquifer, the requested pumping rate, the annual volume of water to be pumped, and the water use or water-dependent resources of concern.

UNDERSTAND THE GEOLOGY OF THE SITE

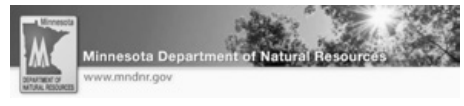
- Develop a conceptual model to be tested by the aquifer test.
- Identify or install appropriate observation wells.
- Calibrate and verify measuring devices.
- Install pressure transducer dataloggers in the wells.
- Maintain a constant discharge flow rate and measure total volume pumped.
- Accommodate changing conditions.
- Collect water level data during the pre-pumping, pumping and recovery period.
- Plot data during the aquifer test.
- Analyze the data to determine aquifer properties.
- Determine if estimated aquifer properties are reasonable, and re-evaluate the conceptual model.
- Forecast water level or discharge changes for water users or water-dependent resources.

Water levels in the production and observation wells respond to pumping based on the aquifer type and characteristics. A cone of depression is usually created when a high-volume well is pumped, resulting in reduced water levels laterally away from the production well. This cone of depression can lower water levels in neighboring wells or reduce water levels or discharge to water-dependent resources in the area (i.e., trout streams, calcareous fens). Information about water-level changes and aquifer properties is critical for understanding the potential for water appropriation pumping to affect other water users and sensitive water resources.

DNR groundwater staff work to balance the economic use of the state's natural resources with the requirement to protect them for current and future generations. This is a challenging task but, with your help in conserving the water resources of the state, we can continue to provide and protect these precious resources for many years to come. ■

Information in this article was obtained from the United States Geological Survey, the National Groundwater Association, and these references:
Fetter, C.W., 2000, Applied hydrogeology, (4th ed.): Prentice-Hall, New Jersey.
Freeze, R.A., and Cherry, J.A., 1979, Groundwater: Englewood Cliffs, NJ, Prentice-Hall, 604 p.
Driscoll, F.G., 1986, Groundwater and Wells, Johnson Screens second edition, 1089 p.
For groundwater mapping information, see: www.mndnr.gov/groundwatermapping.

Co-authored by: Scot Johnson, Professional Geologist, MN DNR Groundwater Specialist and Dan Miller, Water Use Specialist, MN DNR, Minnesota Department of Natural Resources - Ecological & Water Resources
651-259-5731 dan.w.miller@state.mn.us
Website: mndnr.gov



RESEARCH continued from page 1

CHS Prairie Lakes will provide practical and timely information addressing customer questions dealing with crop production. BASF personnel will be on hand to discuss a large herbicide trial on the farm.

Assistant Commissioner of the Minnesota Department of Agriculture, Susan Stokes, will speak during the noon hour and answer questions from the audience.

Activities at the Rosholt Research Farm are supported locally by the Pope & Stearns Soil and Water Conservation Districts, CHS Prairie Lakes (Starbuck & Elrosa), the University of Minnesota, West Central Irrigation and the MN Department of Agriculture.

2017 Rosholt Farm Field Day and Research Update

The 2017 Rosholt Field Day will be held on Thursday, August 17th. Registration starts at 8:30 AM with presentations beginning at 9:00 AM. A free lunch will be served.

Nitrogen Fertilizer Rule Comment Period Ends August 25

Through August 25th the Minnesota Department of Agriculture (MDA) is seeking public review and comment on a draft rule for regulating the use of nitrogen fertilizer in Minnesota. The purpose of the draft Nitrogen Fertilizer Rule is to minimize the potential for nitrate-nitrogen contamination from fertilizer in the state's groundwater and drinking water. Nitrate is one of the most common contaminants in Minnesota's groundwater and elevated nitrate levels in drinking water can pose serious health concerns for humans. The draft rule can be viewed online at http://www.mda.state.mn.us/nfr. The draft Nitrogen Fertilizer Rule is based on the Minnesota Nitrogen Fertilizer Management Plan which recommends steps for minimizing impacts of nitrogen fertilizer on groundwater and emphasizes involving the local community in developing local solutions. The Nitrogen Fertilizer Management Plan went through an extensive development process with input provided by farmers, crop advisors, and others in the agricultural community.

The MDA has held eleven listening sessions throughout the state to discuss the draft Nitrogen Fertilizer Rule. These sessions have been well attended and the MDA has received valuable input on the draft rule. (see page 6)

The MDA is accepting written comments on the draft rule until Friday, August 25, 2017. After consideration of comments received, the MDA expects to publish the final draft of the rule for public review in the fall of 2017. The rule is expected to be adopted in the fall of 2018.

Written comments on the draft Nitrogen Fertilizer Rule should be submitted by Friday August 25, 2017 via mail or email to:

Larry Gunderson, Fertilizer Technical Unit Supervisor, Email Address: larry.gunderson@state.mn.us, 625 Robert Street North, St. Paul, MN 55155-2538

All comments should, but are not required to, include a contact name, phone number and/or email address to provide for follow-up discussion on specific comments.

To stay up-to-date on the rule writing process, please visit: http://www.mda.state.mn.us/nfr

MINNESOTA DEPARTMENT OF AGRICULTURE

How Important is Irrigation to U.S. Agriculture?

Source USDA – ERS website: https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/background/

Irrigated agriculture, which accounts for the largest share of the Nation's consumptive water use (see definitions), makes a significant contribution to the value of U.S. agricultural production. In 2012, irrigated farms accounted for roughly half of the total value of crop sales on 28 percent of U.S. harvested cropland. Irrigated farms also support the livestock and poultry sectors through irrigated production of animal forage and feed crops.

Roughly 56 million acres—or 7.6 percent of all U.S. cropland and pastureland—were irrigated in 2012. Nearly three-quarters of irrigated acres are in the 17 western-most contiguous States (referred to as the Western States hereafter). From 2007 to 2012, irrigated acres declined by nearly 0.8 million acres across the United States. Most of the area decline occurred in the Western United States where drought conditions contributed to water-supply scarcity across the region. Contractions in State-level irrigated acreage exceeded 10 percent in Texas, Colorado, Oregon, New Mexico, and Oklahoma.

In recent decades, much of the expansion in irrigated acreage has occurred in the more humid Eastern States. From 2007 to 2012 irrigated area in the East expanded by roughly 8 percent, with significant acreage increases in Arkansas, Louisiana, Mississippi, and Georgia. USDA's Farm and Ranch Irrigation Survey (FRIS) reports that in 2013, irrigated agriculture applied 88.5 million acre-feet of water nationally, with over four-fifths occurring in the West. (An acre-foot of water is equivalent to 325,851 gallons.)

The U.S. Geological Survey (USGS), which monitors water use by economic sector, estimates that irrigated agriculture accounted for 38 percent of the Nation's freshwater withdrawals in 2010. Agriculture, however, accounts for approximately 80 to 90 percent of U.S. consumptive water use.

Definitions: Withdrawal, Applied, and Consumptive Water-Use Estimates

U.S. Geological Survey water use estimates generally refer to withdrawals, or the quantity of water withdrawn from a water source—e.g., a river, lake, or aquifer. USDA Farm and Ranch Irrigation Survey (FRIS) reports onfarm applied water use, referring to producer estimates of the quantity of water applied to the field (for a particular crop) via an onfarm irrigation application system—e.g., a gravity-flow system or a low-pressure center-pivot sprinkler system. Annual crop consumptive-use estimates refer to the quantity of water actually consumed (taken up) by the crop plant over its various crop-growth stages for crop retention and evapotranspiration. Withdrawal estimates generally reflect diversion system conveyance losses, while estimates of field water applied do not. Consumptive-use estimates may or may not account for associated system efficiency losses (e.g., evaporation, deep percolation, and runoff) and salt-leaching requirements for a given crop, location, and irrigation system. Which estimate to use and how to use it are important in clarifying discussions of water use and policy.

Where Does U.S. Crop Irrigation Occur?

The most recent Census of Agriculture reported total U.S. irrigated cropland at 55.8 million acres for 2012, some 777,000 acres less than the peak of 56.6 million acres in 2007. From 2002-07, U.S. irrigated acreage had increased by nearly 1.3 million acres. Nebraska accounted for 72 percent of the increased acres, with most of the remainder occurring in the Mississippi Delta and Southeast regions (primarily Arkansas, Mississippi, and Georgia).

California and Florida led the States where irrigated acres declined during this period (0.7 million acres in California and 0.3 million acres in Florida). From 2007 to 2012, the largest decreases in irrigated acres occurred in Texas (521,000 acres), Colorado (351,000 acres), Nebraska (262,000 acres), and Oregon (215,000 acres), with smaller declines in California and New Mexico.

The larger net gains in irrigated acreage during this period occurred in Arkansas (343,000 acres) and Mississippi (283,000 acres), with smaller increases in Louisiana, Georgia, and Kansas. Since the 1997 Census of Agriculture, the dominant pattern of irrigated acreage change across the U.S. reflects a shift from the 17 Western States to the Delta and Southeast (with the exception of Florida).

USDA, National Agricultural Statistics Service (NASS) irrigation map atlases indicate that, for 2012, the vast majority of U.S. crop irrigation occurred across five primary regions: (1 and 2) the Columbia and Snake River Basins of the Pacific Northwest, (3) the California Central Valley, (4) the High Plains Ogallala region, and (5) the Mississippi Delta region. The maps also demonstrate that crop irrigation across the U.S. is not static, but rather dynamic. Irrigated area changes over time in response to local/regional water supply/demand and agronomic conditions, as well as economic and domestic/export crop-market considerations and long-term climate change.

Crops Produced with Irrigation

Irrigated agriculture accounts for a share of harvested acreage for most crops produced in the United States. Corn production accounted for roughly 25 percent of total U.S. irrigated acreage harvested in 2012, with much of that concentrated in the Northern and Southern Plains regions. Hay and other forage productions made up 18 percent of harvested irrigated acreage, with nearly 97 percent of that in the Western States. Nationally, other crops accounting for a significant share of total harvested irrigated acres include soybeans (14 percent), vegetables and orchard crops each (8 percent), cotton (7 percent), wheat (7 percent) and rice (5 percent).

Corn for grain and forage crops (hay, haylage, grass silage, and greenchop) account for the largest share (49 percent together) of all harvested irrigated crop acres in the 17 western States. Wheat, soybeans, orchards, and vegetables are the second largest group of irrigated crops in the West, with crop acreage shares ranging from 7.0 percent to 9.8 percent. In the 31 Eastern States, corn for grain and soybeans account for the largest share (at a combined 54 percent) of harvested irrigated crop acres. Rice, cotton, and vegetables are the second largest group in the East (with crop shares ranging from 9.8 percent to 13.1 percent). Relative to the Western States, the irrigated cropping pattern in the Eastern States reflects a much smaller share of acreage in wheat and forage crops, and an increased share of irrigated acreage devoted to rice, soybeans, and vegetables.

Challenges for Agriculture Under a Changing Water Environment

Population and economic growth, Native American water-right claims, and water quality/environmental priorities are increasing the demand for water resources. Expansion of the U.S. energy sector is also expected to increase regional demands for water. In most river basins of the Western United States, surface-water supplies are fully appropriated, and opportunities for large-scale water-supply development are limited. As irrigation accounts for the largest share of water use in many regions, emerging demands will have to be met through transfers in existing irrigation water supplies.

The effect of climate change may significantly alter regional water-flow regimes during the growing season. In much of the West where irrigation is concentrated, climate change is projected to shrink water supplies as a result of warming temperatures, shifting precipitation patterns, and reduced snowpack, while potentially increasing water demand. These trends place added pressure on existing water allocations, heightening the importance of water conservation for a sustainable irrigated agriculture sector.

The future of irrigated agriculture will depend in part on producers' ability to improve on-farm water management for crop production. Upgrades in irrigation system technologies and improved water-management practices can enhance on-farm water-use efficiency. In addition, coordinating water management at the farm- and watershed-levels may help increase the efficiency of water allocations among competing users. Institutional measures—such as conserved water rights, groundwater and surface-water withdrawal restrictions, drought water banks, and option water markets—can encourage agricultural producers to reduce crop consumptive use while facilitating the reallocation of water to higher valued uses.

Minnesota Department of Agriculture

Chemigation Permit Reminder

Chemigation Permits: Not Transferable;
New Operators Must Obtain New Permit

This is a reminder that chemigation permits are not transferable from operator to operator. If a chemigation system is leased, sold or operated by a new person or business, then a NEW chemigation permit is required.

The Minnesota Department of Agriculture (MDA) issues chemigation permits to operators of chemigation systems. An "operator" is considered a person or business who will use the chemigation system. Operators can change from year-to-year, and existing permits are not transferable so new chemigation permits must be obtained by new operators prior to chemigation.

You can apply for your chemigation permit by completing:

Chemigation Permit Application found on the MDA website
http://www.mda.state.mn.us/chemicals/fertilizers/chemigation.aspx

OR BY COMPLETING AN APPLICATION ON–LINE:
http://www2.mda.state.mn.us/webapp/erenewal/apply.jsp

Please contact the MDA at 651 201–6540 if you have questions or are no longer operating your chemigation system so the permit can be deactivated and MDA records can be updated.

IAM 2017 MEMBERSHIP – WE NEED YOUR SUPPORT!

NAME _____
(PLEASE COMPLETE)

Address _____

City, State & Zip _____

Email Address _____

IRRIGATOR ❑ Ag crop ❑ Horticulture ❑ Wild Rice

IRRIGATION INDUSTRY

❑ Irrigation equipment dealer, well driller, etc.

❑ Agribusiness — seed, fertilizer, financial, etc.

❑ Educational/Agency _____

_____

❑ Other _____

Irrigators Association iam of Minnesota Since 1975

Please mail this form and a check payable to "IAM" to:
Irrigators Association of Minnesota
Attn: Fletcher J. Syltie, IAM Treasurer, 24 S Edquist St, Appleton, MN 56208

ANNUAL MEMBERSHIP DUES

Individual Annual Dues — $100 or $275 for 3 Years	$	_____
Platinum Circle Membership — $1,000 or more	$	_____
Presidential Membership — $500 or more	$	_____
GOLD Membership — $300	$	_____
Silver Membership — $200	$	_____
Bronze Membership — $150	$	_____
TOTAL ENCLOSED	$	_____