

Minnesota Irrigator

PUBLICATION OF THE IRRIGATORS ASSOCIATION OF MINNESOTA **SPRING 2021**



Comments by the IAM President

Jake Wildman

Greetings members of IAM,

I hope everybody is enjoying the spring weather. In my area, there was a little fieldwork that got done before we received some spring moisture.

I'll first start out by giving a recap of some of the events IAM has participated in over the last few months.

On February 18th, IAM hosted its annual meeting via zoom. We had a nice turnout and I want to thank everybody who attended. We brought in a few speakers that included, Senator Howe, who is the author of our bill. Rep. Sundin, Chair of the Agriculture Finance and Policy Committee, and Commissioner Thom Petersen, Department of Ag. We were able to have some good discussion about challenges we face irrigators and also the language in our bill. I would thank those three individuals for joining us.

Next, IAM hosted our annual Day on the Hill via zoom on March 1st. I would like to extend a thank you to our lobbyist for their help in organizing the event. We had a decent turnout of legislators and IAM members and thank you for all of those who attended. It was unfortunate that we only had an hour, because there was a lot of good discussion with legisla-

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IAM Alan Peterson Agricultural Scholarship Available TAKING APPLICATION - DEADLINE MAY 15TH, 2021

The Alan Peterson Agricultural Scholarship serves to Respect natural resources; Embrace innovation; Advocate agriculture at local, regional, and national levels; Protect irrigated production agriculture; and Promote research.



Alan sharing his irrigation practices

This fund will award up to two \$1000 scholarships to students who are either currently attending an accredited post-secondary college program pursuing a career in an Agricultural related field or are High School seniors planning to enroll in an Agricultural related field of study.

Applicant or their family do not have to be members of the IAM to be considered for this scholarship. IAM Directors will

select up to two (2) qualified scholarship recipients and the scholarships will be presented in September when recipients are successfully enrolled in their college program of study. Previous recipients of this scholarship are not eligible to receive another scholarship.

Applicants need to submit the following items:

- A copy of the completed application
- A career plan summary form
- Current student resume
- High school or college transcript
- One (1) letter of recommendation from a non-family member
- Recipients will be required to submit a photo for a press release

Application available to download:

<https://mnirrigators.org/resources/>

Application deadline is May 15, 2021.

Send completed applications to:

Anna Bregier, IAM Board Member
3000 145th Street NW Rice, MN 56367
Email annabregier.pfc@gmail.com
Phone (320) 393-2848



IAM Members Visit to Capitol Feb 27, 2021



Farmers Sharing their Stories with Legislators and Neighbors

**SEE PAGE 15 FOR NEW
SCHOLARSHIP MATCH
OPPORTUNITY!!!**

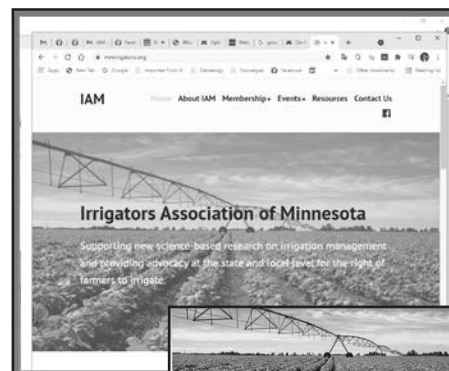
IAM Gets Updated Webpage and Facebook Presence

If you have not visited the NEW IAM website <https://mnirrigators.org/> and Facebook page recently it's time you do so! At IAM, our mission is to "support new science-based research on irrigation management and provide advocacy at the state and local level for the right of farmers to irrigate." This website highlights our work in this area, and we'll provide updates and events via our Facebook page.



"The impact of irrigation on Minnesota's economy not just to the farmer, but also the rural communities where irrigation takes place in Minnesota is significant. IAM wants to spread the message that farmers who irrigate are working hard to be good stewards of our natural resources."

- ALAN PETERSON, FORMER IAM PRESIDENT



Be sure to review the membership section, where you can donate online to our \$0.25/acre legislative fund, renew your membership, or become a sponsor. There is also a place for farmers to find resources from research farms across the state and the latest copy of IAM's Minnesota Irrigator newsletter.

CHECK OUT THE IAM FACEBOOK PAGE and BECOME A FOLLOWER !!!!

Thanks to IAM Board member Anna Bregier and technical staff at Central Lakes College for upgrading and organizing the website layout and creating a Facebook page.

Welcome to the MN Irrigator's Spring/Summer Newsletter



Jerry Wright, 2021 IAM Membership Secretary

This newsletter comes to you thanks to the support of advertisers, current IAM members, Industry Sponsors and Extra Mile Member Supporters listed on page 9.

Your Directors on the IAM Board welcome and strongly encourage you to become a member if you have not already joined. Last year we ended up with only 420 members and at this time we only have 293. The Board and officer would like to see those numbers grow in the next couple months.

We all benefit from each other's ideas, experiences, and partnership in IAM activities this year including keeping a watchful eye on MN Irrigators Water Rights; telling personal stories about benefits of irrigation with Legislators as well as representing the interests of irrigation practices across the state.

To become a member, simply return the signup form included on the last page of this newsletter. As a member, you can also be placed on the IAM email alert list if you submit your email address.

PRESIDENT continued from pg 1

tors about the issues we face as irrigators. We also had some excellent speakers that joined us. Maria Crownhart from Birdseye Foods in Waseca and Jean-Marc Versolato from Bailey's Nursey did an excellent job describing how irrigation plays such an important role in their respective industries. They provided information about the economics that irrigation brings to their businesses, which I feel is so important for legislators to see.

Right after the day on the hill, IAM's bill was being heard in the Senate Environment Policy and Legacy Committee and IAM was given the opportunity to testify. The individuals who testified included: Cindy Brown- Chippewa Valley Bean, Jean-Marc Versolato- Baileys Nursey, and Jake Bauerly- IAM member. All three did a fantastic job testifying on behalf of IAM

and I would like to thank them again for participating.

Next, I would like to touch on the status of IAM's bill in both the House and the Senate.

Currently in the Senate, the bill is included in the Senate Environment Policy bill, which was passed and sent on the Environment Finance Committee. Our bill is included in the Senate Environment omnibus bill.

The House has been a little bit more of a challenge, but we continue to have discussion with key legislators to make sure the bill keeps moving forward through the legislative process. I know this is a very high level, but if you would like a more detailed up-to-date summary or have specific questions, please don't hesitate to reach out.

One other legislative piece I want to briefly mention is IAM is again planning

a legislative tour for the summer. We are in the beginning stages of organizing the event, but look for more details in the summer newsletter.

A few more things before I wrap up. The board just got an update from the scholarship committee on where they are at with the scholarship honoring Alan Peterson. I know the committee has provided more details with a write-up in the newsletter so I won't get into too many details, but I encourage you to take a look at that.

As a board, we are still continuing to promote membership and our \$.25/acre legislative fund. I would like to thank those who have joined as new members or have renewed their membership. As well as those individuals who have made a contribution to the legislative fund. Your contributions are what allows IAM to participate in events that I discussed earlier, so thank you again for that. IAM will be

sending out another mailing this summer for you to renew your membership and/or contribute to the legislative fund, so if you haven't I encourage you to and please keep an eye out for that mailing.

Lastly, IAM has recently launched a new website! The url is mnirrigators.org. Anna Bregier worked with Keith Olander and his staff at Central Lakes College and did a fantastic job putting it all together. I would like to thank them for all of the work they did. Please check it out and provide us with any feedback you may have.

Thank you again for all of your support of IAM. As always, we will continue to tackle the issues you face and advocate for you as irrigators in Minnesota. Everybody have a great spring and be safe!

Jake Wildman, IAM-President

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, Jake Wildman at jakewildman@outlook.com. Articles for the newsletter are solicited and gathered by the IAM officers and Membership Secretary, Jerry Wright whom can be contacted at jerrywright1970@gmail.com.

Crow River Media in Hutchinson manages the advertiser space and edits, prints and mails the newsletter.

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Stearns County Soil & Water Conservation District (SWCD) offers Uniformity Testing to Improve Irrigation Water Efficiency

Stearns County Soil & Water Conservation District (SWCD) offers Uniformity Testing to Improve Irrigation Water Efficiency

Identifying water application problems when using a sprinkler irrigation system, such as a center pivot, is vital. Over -and under- irrigation can have an adverse effect on crop yield that can be attributed to poor soil aeration, increased disease incidences, and leaching of the agricultural chemicals and fertilizers to the groundwater.



Tessa Zee, SWCD Conservation Planner, pours the collected water from the cup into a graduated cylinder and records the data.

This risk gets higher in sandy soils where irrigation is more important, since sand is highly porous and cannot hold much water.

Consequently, periodic check-

ing of irrigation system uniformity is important and is the first step in improving water use efficiency and yield, while also reducing the energy costs. These steps have the added benefit of protecting our shared surface waters and underground aquifers.

A uniformity test, also known as a "catch can test," is a tool to check how your irrigation system is applying water throughout your fields. Even if an irrigation pivot is well-maintained, there can still be small discrepancies that could add up in terms of the amount of water being applied at each nozzle.

Typically, the test is conducted by placing cups (catch cans) on stands 10 feet apart in a parallel line down the length of the pivot, then running the irrigator long enough to sprinkle at least 6 tenths over the cups. The next day, the amount of water is measured in each cup using a graduated cylinder and is re-

SWCD TESTING continued on page 5

LCCMR Cropping System Comparison Study

By: Hannah Barrett Research Manager, CLC Ag and Energy Center, Staples

The Ag and Energy Center has completed the second year of the Legislative-Citizen Commission on Minnesota Resources (LCCMR) funded project titled "Farm-Ready Cover Crops for Protecting Water Quality." This project is in collaboration with the University of MN and the USDA-Morris. Last year concluded its second year.

The purpose of this project is to compare three different cropping systems over a period of four years including, Best Management Practices (BMPs), Double Cropping (DC), and Perennial Cover (PC). The BMPs consist of a typical corn-soybean rotation. DC consists of corn harvested as silage the first year, winter camelina established in the fall, soybeans inter-seeded into the following spring, and the harvest of both crops at their respective maturities. The PC treatment consists of establishing a kura clover stand the first year. The second-year soybeans are no tilled into the kura clover. This year corn will be strip tilled into the kura clover.

The trial established at the Ag and Energy Center is the largest with each cropping system being replicated four times in 1.5-acre blocks under a pivot irrigation system. Three other sites located on fields in the surrounding area also have a replicate of each of the three cropping systems under different soils and conditions.

During the first year, three lysimeters were established in each cropping system block for the purpose of monitoring the water quality particularly concerning nitrogen. During the second year, lysimeters samples were collected and processed. The samples collected concerned the water that flowed through soil, also known as soil pore water. The nitrate content in the soil pore water varied during the growing season in the BMPs and

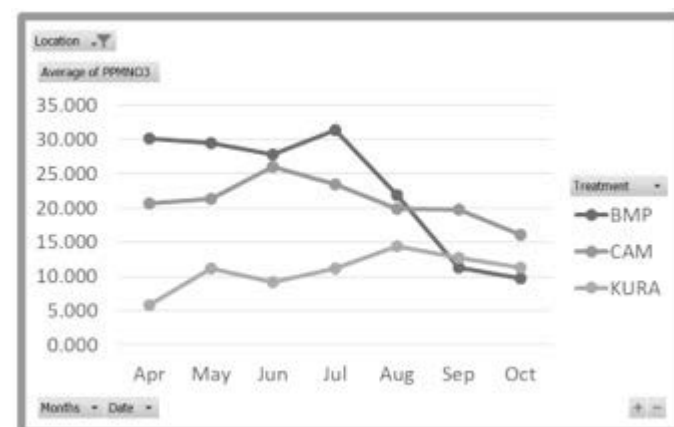


Figure 1: Lysimeter readings of nitrate concentration under different Cropping Systems at the ag and Energy Center.

LCCMR STUDY continued on pg 8

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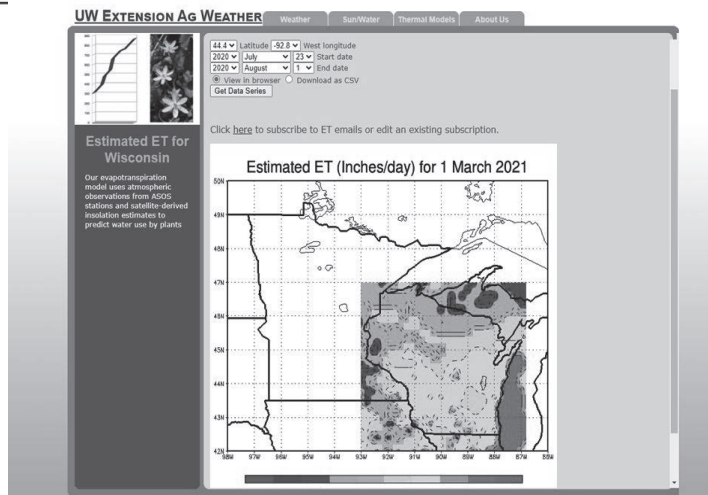
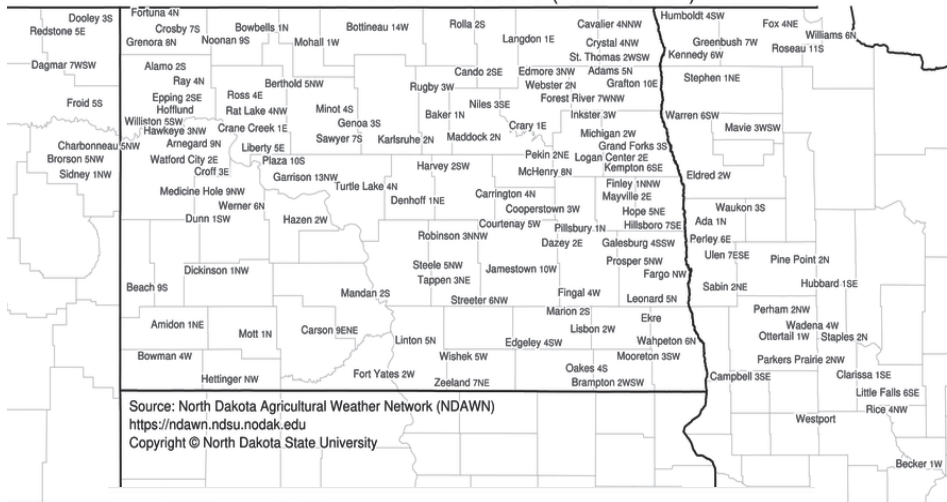
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NDAWN Station Locations (2021-03-01)



DAILY CROP “ET” INFORMATION AVAILABLE FOR 2021

Central MN Ag Weather Network

<https://www.mda.state.mn.us/central-minnesota-ag-weather-network>

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

North Dakota Ag Weather & Crop ET Estimates

Includes Central & NW MN Counties

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

Wisconsin Daily Irrigated Crop ET Estimates (includes SE MN Counties)

https://agweather.cals.wisc.edu/sun_water/et_wimn



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VOLUNTEERS WANTED

DNR Irrigation Flow Meter Study – Phase 2

Little Rock Creek and Bonanza Valley Area Irrigators

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as they were initially rated for. The result was that on average irrigators were reporting more water than was actually used. The DNR aims to help irrigators better understand their water use and improve water volume estimates to support their business and agronomic decisions.

What is DNR offering?

VOLUNTEERS continued on pg 11

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A uniformity test, also known as a "catch can test," is conducted by placing cups (catch cans) on stands 10 feet apart in a parallel line down the length of the pivot, then running the irrigator long enough to sprinkle at least 6 tenths over the cups.

corded. The irrigation pivot can be run at any part of the day, but it is best to run the pivot overnight to reduce evaporation losses from daylight hours. It is also important to run the pivot when there is minimal wind as this helps with the test accuracy and to reduce the risk of the cups potentially tipping over.

Once the irrigation system has completed its runs, our staff are

able to collect the data and review the results with the landowners. Anything over 80% uniformity on a pivot system is adequate. However, if there are areas along the pivot that show less than 80% uniformity, we can look at the pivot itself to identify what may be the cause. Often it is just certain nozzles getting worn out, plugged, or corroded. It is always a good idea to inspect

your nozzles to ensure there is no damage to them. This can be a cost saving benefit and one easy step towards reducing energy and water usage.

At the Stearns County SWCD, our staff work one-on-one with landowners on evaluating and understanding their irrigation systems. Staff walk through the process of uniformity testing and help implement any irrigation water management practices through state and federal conservation programs.

Now is a great time to set up an appointment with the Stearns County SWCD office to discuss your irrigation water management needs. If you are interested in preparing for the upcoming growing season, contact our office at (320) 251-7800 ext. 3 or via email at info@StearnsCountySWCD.net to get started today.



University - Irrigation Crop Management WEBSITES

[University of Minnesota Extension](https://extension.umn.edu/soil-and-water/irrigation)

<https://extension.umn.edu/soil-and-water/irrigation>

[North Dakota State Extension](https://www.ag.ndsu.edu/irrigation)
<https://www.ag.ndsu.edu/irrigation>

[University of Wisconsin Extension](https://fyi.extension.wisc.edu/cropirrigation/)
<https://fyi.extension.wisc.edu/cropirrigation/>

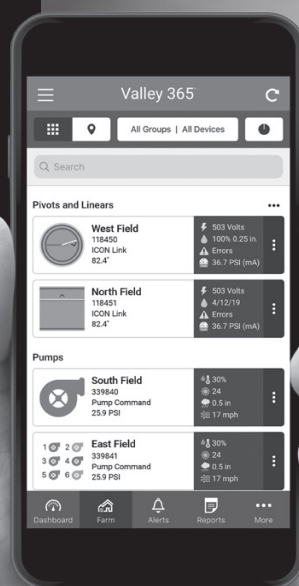
[South Dakota State Extension](https://openprairie.sdstate.edu/extension_circ/461/)
https://openprairie.sdstate.edu/extension_circ/461/

[University of Nebraska Extension](https://water.unl.edu/category/agricultural-irrigation)
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Minnesota Agricultural Weather Network Update

By: Stefan Bischof, Hydrologist, MN Department of Agriculture

Access to real-time, local weather information is key to many farming decisions. To help Minnesota producers, the MDA is working to improve and grow this access through a partnership with the North Dakota Ag Weather Network (NDAWN). This established network offers free online tools for quick, real-time data. A total of 29 Minnesota ag weather stations throughout Central and Northwestern Minnesota will be in the NDAWN by the end of the year. The Central Minnesota stations were added in 2020, and this year a new station in Dakota County will be added.

Weather station data available includes:

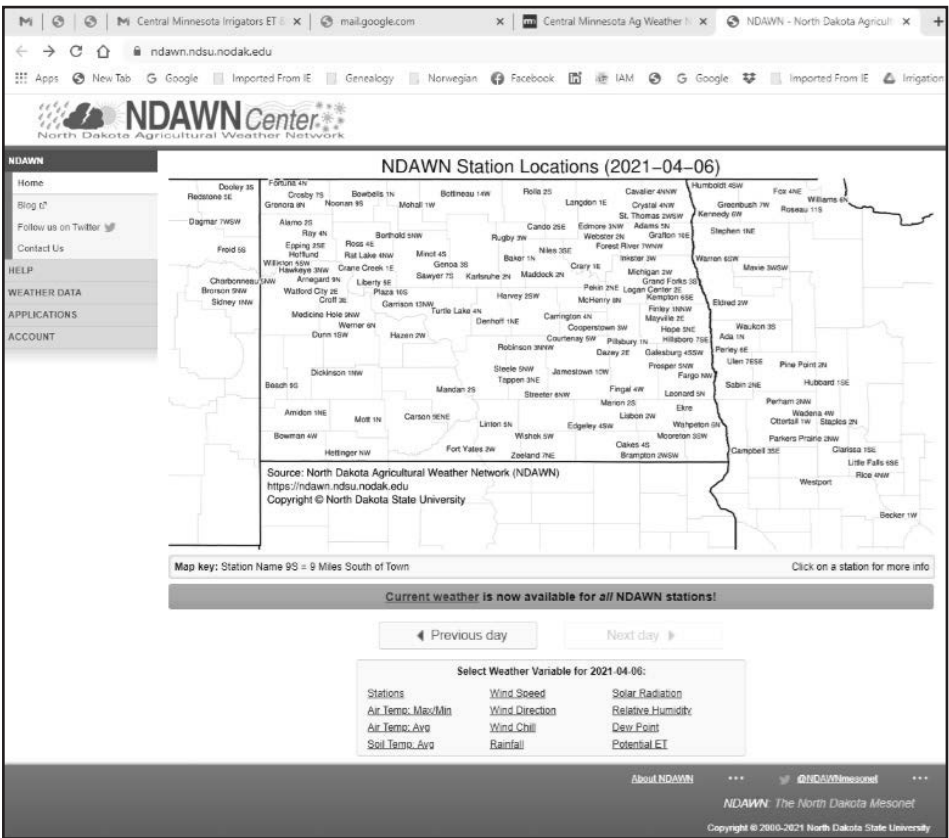
- Daily Rainfall
- Air Temperature (Max/Min)
- Air Humidity (Max/Min)
- Wind Speed (Max/Min) and Direction
- 4-inch Bare Soil and Turf Temperature
- Solar Radiation and Avg. Dew Point



Real-time weather data is available at: <https://ndawn.ndsu.nodak.edu>

In addition to current weather data, the stations are integrated into the NDAWN crop modeling, crop PET (potential evaporation transpiration), air temperature inversion, potato blight, and mapping applications to bring more tools to Minnesota producers. The two mobile applications include “NDAWN Inversion” providing basic real-time weather information and air temperature inversion alerts and “NDAWN Potato Blight” providing an early and late blight prediction tool.

Free mobile applications avail-



able at the App Store (iOS) and Google Play (Android)

The Minnesota ag weather stations are also an integral component to an online Irrigation Management Assistant (IMA) that provides field specific irrigation scheduling recommendations to irrigators. Access to the IMA tool is

free but limited to certain counties in Central Minnesota.

Irrigation management assistant tool is available at: ima.respec.com

For more information, please contact Stefan Bischof at 218-396-0720 or Stefan.Bischof@state.mn.us



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MODERN FARM EQUIPMENT

What is the New DNR Water Conservation Report all about?

By: Carmelita Nelson, Minnesota Department of Natural Resources

You might recognize the unusual name, Carmelita Nelson, DNR Water Conservation Coordinator. I have had the delightful opportunity to talk with many farmers the past few months, and you have likely received several emails from me.

The most common question people ask me when they call is, "I've never heard of a Water Conservation Report, is this something new?" The answer is yes, the DNR Water Conservation Report is new this year for irrigators and livestock operators. It only takes about 15 minutes to complete. Municipal water suppliers have been reporting their conservation efforts for four years and industries have been reporting for three years. This year, it was the agricultural sector's opportunity to report their water conservation activities.

The second question people ask is, "Is this report mandatory or voluntary?" The new Water Conservation Report is voluntary. However, all crop irrigation water use permits have language that states, "All practical and feasible water conservation methods and practices must be employed to promote sound water management and use the least amount of water necessary." Or, in the case of older permits, "The permittee shall implement adequate soil and water conservation measures in order to protect water quality and prevent erosion and sedimentation." So, the new Water Conservation Report is voluntary, but it is strongly encouraged. There is no penalty for not completing the report or for only implementing a few conservation actions. We want to promote the success stories and highlight the conservation practices of Minnesota farmers, businesses, and cities. Please note that the separate Annual Water Use

Report through MPARS that has been in place for years is mandatory and you must also pay the annual water use fee.

Many people say, "I clicked the link but I couldn't get into the website." The DNR has contracted with ESPWater to operate the Water Conservation Report. Because the site is not open to the public, you

need an invitation to get in the first time. After setting up an account, you can enter through MPARS or directly through the website. As one humorous farmer said, "I don't get many invitations these days, so send me another one!"

I have a lot more stories I would like to share with you. I hope I can join you in Freeport next February

for the annual IAM Conference. If you didn't complete the Water Conservation Report by March 30, you will be getting an email from me again next fall. Conservation is a journey, and we all have a responsibility to use water wisely. Every drop counts.

CONSERVATION continued on pg 11



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DC systems. The greatest nitrogen concentrations were earlier in the growing season through July and began to decrease as the soybeans matured. The nitrate concentrations in the PC system remained at a low level throughout the growing season. The average soil water nitrate content was 22 mg/L and 21 mg/L in BMP and DC systems as compared to the PC system which averaged 11 mg/L.

In addition to the lysimeter data, soybean yield data was collected. The BMP cropping system yielded 52 bu/A. The DC system yielded 33 bu/A plus the camelina yield ranging from 450-650 lbs./A. The camelina yields were lower than expected as compared to prior ex-

perience of the U of M growing the crop on heavier, finer soils. The goal was to harvest the soybeans as grain in the PC system, and after three applications of glyphosate applied at 1 qt/A, the decision was made to harvest the PC systems as forage. The PC system presented a challenge for harvest as the kura clover was green and four inches shorter than the soybeans in overall height. Total yield was 14,000 lbs. at 67 percent moisture equivalent to 1.17 tons/A. Forage quality tests were completed, and relative feed value averaged 154 and crude protein averaged 20.1.

In the upcoming 2022 growing season, the primary crop within the rotation is going to be corn again.



Samples Research Field

Please contact Hannah Barrett via email if you have continued questions about this project hannah.barrett@clcmn.edu.



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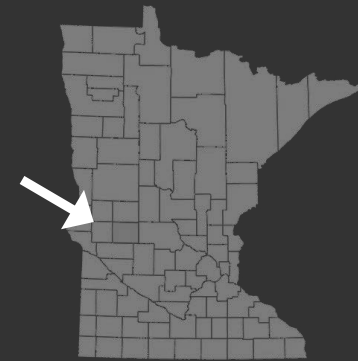
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m DEPARTMENT OF AGRICULTURE



Pope County, Minnesota

Status

Installation: 2020

Data collection: 2020-2022

Contact

Jeppe Kjaersgaard, Research Scientist
Minnesota Department of Agriculture
651-201-6149

Jeppe.Kjaersgaard@state.mn.us

Vasu Sharma, Irrigation Specialist
University of Minnesota
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Pope Soil and Water Conservation District
320-634-5327

Holly.Kovarik@mn.nacdnet.net

www.mda.state.mn.us/rosholtfarm

Partners

Collaborative effort between multiple government agencies, agricultural businesses and organizations, and the University of Minnesota

TO DOWNLOAD

<https://www.mda.state.mn.us/sites/default/files/docs/2020-12/rosholtvarirrigation.pdf>



CONTINUED ON PAGE 13

Mark your Calendars

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Freeport, MN

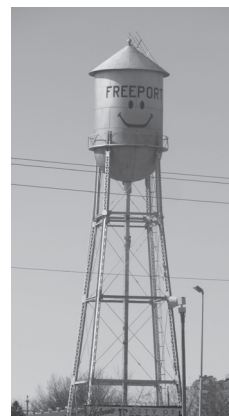
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For more information contact
IAM president Jake Wildman
jakewildman@outlook.com

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Jerry Wright - jerrywright1970@gmail.com



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What is DNR offering?

The MN DNR is offering to a limited number of agricultural irrigators in certain geographic areas an opportunity to place temporary water flow meters onto their irrigation systems.



Do I qualify?

You may qualify for Phase 2 of the DNR Irrigation Flow Meter Study if you operate center pivot irrigation systems in the Bonanza Valley Groundwater Management Area (<https://www.dnr.state.mn.us/gwmp/area-bv.html>) or the Little Rock Creek Area (https://www.dnr.state.mn.us/waters/groundwater_section/sustainability/lrc/index.html) (see maps below).

What are the details?

If you are selected, the DNR will fit your irrigation system with a “clamp-on” water flow meter for up to five months during the 2021 irrigation season. This is a service and has no cost to the volunteer irrigators. The DNR will measure the system’s water use, pumping rate, and pumping time using hydro-acoustic technology. All equipment will be installed and removed by the DNR. Participants will be asked to describe how they normally record and calculate water use

volumes. The results of the measured water use volume will be compared to the irrigators’ estimated water use volume over the same period of time in a double-blind study.

How do I volunteer?

Send an email to Steve Labuz (stephen.labuz@state.mn.us) if you are interested. Or call Steve at (651) 539 – 2114.

When are the deadlines?

The first round of meter placements will take place in the spring of 2021. If there is high demand, those same meters could be moved to other irrigation systems in mid-summer

Springtime placement:

To determine eligibility for a possible springtime placement, contact the DNR by April 16, 2021.

Mid-summer placement:

If you are interested at any time this summer you should contact the DNR by June 15, 2021 to determine eligibility.

Parts of the flow meter system from upper left to lower right: solar panel, control box, two "clamp on" meters.



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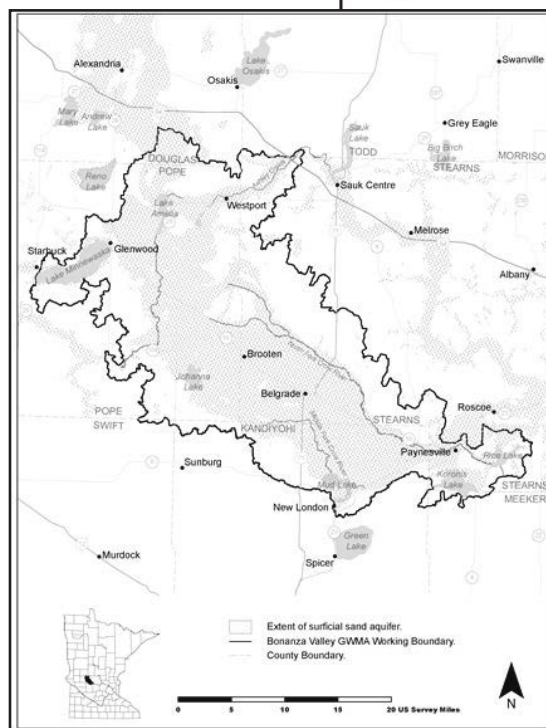
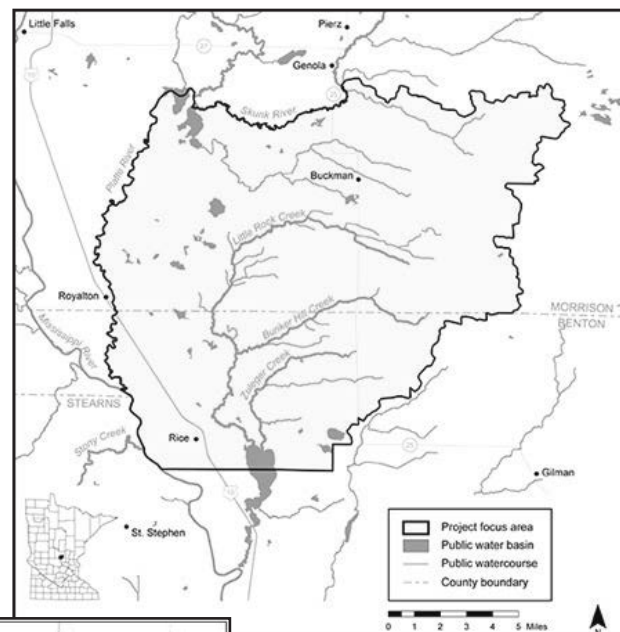
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Little Rock Creek Area



Bonanza Valley Groundwater Management Area



Tom Cherveney / West Central Tribune file photo

An irrigation rig is shown at work in the Bonanza Valley Groundwater Management Area in this West Central Tribune file photo. The Bonanza Valley Groundwater Management Area is now in its fifth year, with plans to continue moving forward.

BONANZA VALLEY

Groundwater Management Area program is now moving forward

By Tom Cherveney
tcherveney@wctrib.com

University researchers at the Rosholt Farm in Pope County did what few farmers who irrigate their crops would dare do: They purposely cut back on the water they applied by 25 and as much as 50 percent to measure the impacts to productivity and the bottom line.

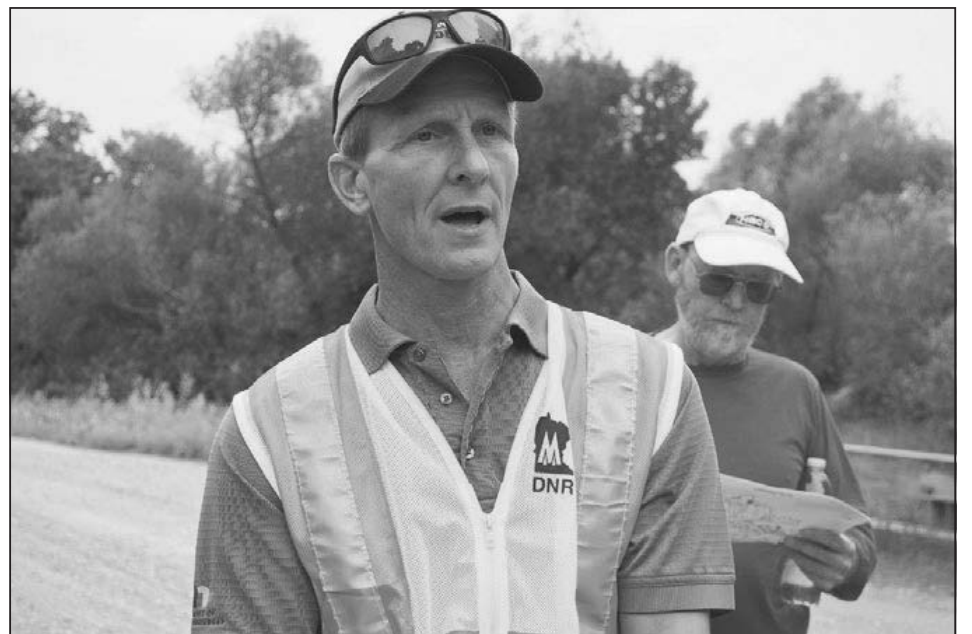
Researchers Jeppe Kjaersgaard and Vasudha Sharma shared what they learned with irrigators in the Bonanza Valley Groundwater Management Area at a March 24 virtual meeting, held in place of the

usual spring clinic for the management area.

Now in its fifth year, the pilot project to create a groundwater management area is making progress toward its goal of sustainable groundwater use in an area running from north of Glenwood to Paynesville. Pope, Stearns, Douglas, Kandiyohi, Meeker and Todd counties comprise much of the area.

One of the state's first groundwater management areas, it was developed in good part to avoid a crisis. In the previous 25 years, the area saw a 175 percent

BONANZA: Page A2



Tom Cherveney / West Central Tribune file photo

Mark Hauck is the project manager for the Bonanza Valley Groundwater Management Area. He is shown during a presentation on surface water monitoring held in August 2018.

GOAL

To evaluate the management and interactions between irrigation and nitrogen fertilizer and their impacts on water quality.

OBJECTIVE

This study evaluates interactions between 4 irrigation rates and 6 nitrogen (N) rates for corn.

1) Evaluate variable irrigation and N rate interaction effects on corn yield, nitrate-N leaching, crop evapotranspiration, crop water productivity, and water- and N-use efficiency;

2) Develop proximal and UAV remote sensing-based non-destructive in-season corn water and N status diagnosis methods and in-season variable rate N and irrigation management strategies.

LOCATION

The study is conducted at the Rosholt Research Farm in Westport, Minnesota. The

Rosholt farm is a 40-acre farm owned by Pope Soil & Water Conservation District and is devoted to water quality research and crop production demonstration. A companion study is taking place at the University of Minnesota Sand Plain Research Farm in Becker, Minnesota.

OVERVIEW OF THE PLOT LAYOUT

The study design includes 24 treatments that are the combination of 4 irrigation rates and 6 N rates in a split plot design. Each treatment is replicated four times. Irrigation treatments serve as the main plot and N-rates as the sub-plot (Figure 1). The four irrigation rates are (i) full irrigation (FI), i.e., imposing no water stress on the crop, (ii) 75% of FI, (iii) 50% of FI and (iv) rainfed conditions. The six N rates are 0, 70, 140, 210, 280 and 350 lbs/ac. Urea-N fertilizer is applied to the plots in two splits, with 30% at V2 and 70% at V9 corn growth stages.

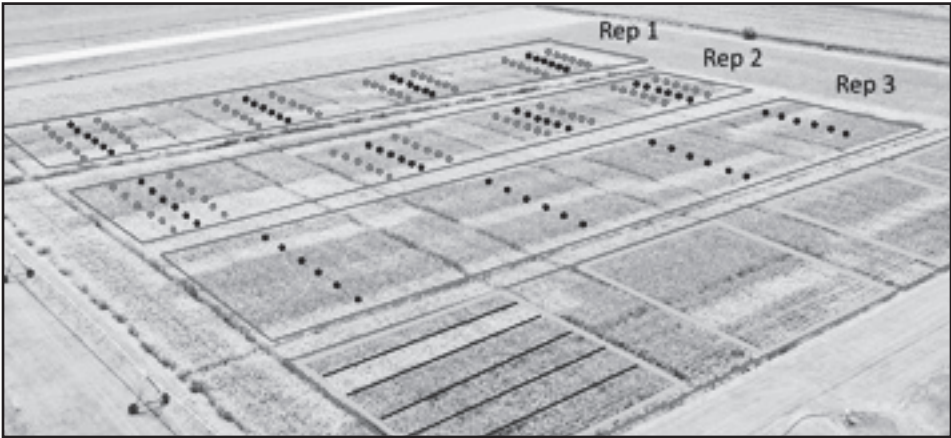


Figure 1. Experimental layout and position of lysimeters and neutron access tubes at the Rosholt Farm

- Replication
- Irrigation main plot
- Nitrogen sub plot

- Lysimeters (suction cup)
- Neutron access tubes

MONITORING

To understand how irrigation and N rates interact with each other and how they impact nitrate leaching and crop water use,

the following monitoring efforts are conducted:

- Collect weekly soil water samples from 96 suction cup lysimeters placed below the corn root zone and analyze the water samples for nitrate-N. The 96 lysimeters were installed permanently at the research site in the spring of 2020 (Fig. 2).
- Measure soil moisture at 72 plots using neutron soil moisture meter weekly.
- Collect above-ground plant samples for plant biomass and N uptake at V8, R1 and R6 development stages.
- Collect post-harvest soil samples at 0-1 ft., 1-2 ft. and 2-3 ft. depths for nitrate-N determination.
- Collect grain yield and grain N content for total N balance and N use efficiency calculations by combining the middle two rows of each plot.
- Collect weekly crop canopy temperature, Leaf Area Index, relative chlorophyll content and photosynthetically active radiation using Crop Circle Phenom proximal sensor until V12 corn growth stage.
- Monitor corn N and water status across the growing season using an unmanned aerial vehicle (UAV) remote sensing system with a multispectral optical camera and a thermal camera.

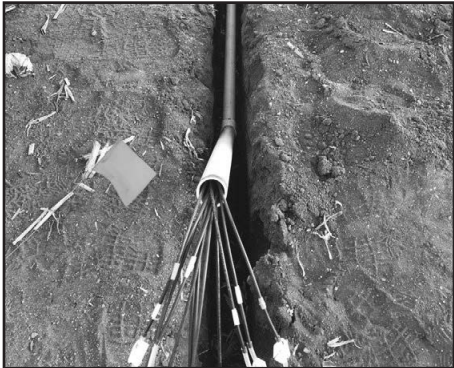


Fig. 2 Suction cup lysimeter installation at the Rosholt Farm in 2020.

PROJECT PARTNERS



BONANZA

Continued from Page 12

increase in groundwater permits, almost entirely for agriculture. The groundwater management area's goals include protecting the aquifers and ecosystem by not negatively impacting surface water, promoting water conservation and water quality, and avoiding well interference and water use conflicts.

The rate at which new permits are being sought for irrigation has slowed since then, in part because much of the area is now irrigated. USDA figures from May of 2015 show that of 89,993 acres cultivated in the area, 74,562 of those acres are irrigated.

Jason Moeckel, section manager with the Minnesota Department of Natural Resources Ecological and Water Resources Division, told the West Central Tribune that there was plenty of skepticism amongst irrigators when the groundwater area project was first launched. Now, he said the relationship that has been forged between the DNR and its agency partners with stakeholders in the area is one of its greatest values.

The conversation that is occurring about groundwater use in the area is one the DNR is committed to seeing continue, Mark Hauck, project manager for the area with the DNR, told those attending the virtual meeting. He said

the DNR intends to hold a session later this year to bring stakeholders together to identify goals for the district going forward.

One of the chief objectives is to meet a statutory requirement that groundwater use in the area be sustainable. "Are we in compliance with the statute or have we authorized too much water to be used? That question is still needing to be answered but we're making progress," Moeckel told the West Central Tribune.

Ongoing research to identify and map groundwater flow in the area is a big part of the effort to answer the question.

The DNR is currently looking for irrigators in the area to participate in a study this season that is looking at the accuracy of irrigation data, Joy Loughry, with the DNR's Ecological and Water Resources Division, told the meeting participants. A study in the Little Rock Creek groundwater management area found that irrigators there were over-reporting their water use by approximately 25 percent. It's believed that as pumps age, they are not moving as much water as their operators are recording.

Obtaining more accurate information is important to the effort to analyze groundwater flow in the area, according to John Seaberg, a hydrologist with the DNR. He is working to develop a model to better understand how climate and pumping can impact water levels in the system. Some of his recent work looked at how groundwater recharges

lakes Amelia and Villard in Douglas County, two popular recreational waters in the groundwater area.

There is growing interest in the Bonanza Valley to increase the supply of groundwater by improving the recharge of the aquifers, project manager Hauck told meeting participants. The information being collected with the help of irrigators has helped the DNR develop a map of the area. To be available on the project's DNR web page, the map helps identify wetland restorations that would be most likely to recharge aquifers, Hauck said.

Moeckel said he is optimistic that groundwater management areas and the involvement of stakeholders that they make possible will continue to play an important role going forward.

"Our sense is that Minnesota is not in the emergency room when it comes to the quantity of water," he said. "We're in the urgency room, meaning we need to be really careful (to plan) and use science to make good decisions. The more informed those decisions are, the better."

"Groundwater is important to Bonanza Valley users," Hauck told participants as he wrapped up the meeting. "The DNR wants users to continue using groundwater to support families and communities," he said, adding that the state is also committed to making sure the groundwater use is consistent with state statutes for sustainability.



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New Scholarship Match Opportunity Available

A huge thank you to everyone who has made a donation to the Alan Peterson Agricultural Scholarship Fund. Since last fall, we have raised over \$37,000 in donations honoring our former president Alan Peterson, who lost his battle with cancer in 2020. A committee of the board has been formed to develop criteria for this scholarship and will make awards during the summer of 2021. Applications are being accepted now for this round and can be found on our website www.mnirrigators.org/resources.

We are excited to announce a new matching opportunity! On April 1st, five friends of the late Alan Peterson came together, donating \$12,500. These funds will be used to match any new donations made over the next year. Right now, your gift to the scholarship fund will be doubled thanks to this group of generous donors.

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