Tri-Basin Irrigator

Volume 23, Issue 2 **May 25, 2023**

Program Information

EQIP: **2023 applications are being pre-approved as funds become available.**

CSP: **2023 applications are being pre-approved as funds become available.**

NSWCP: **New funds come July 1st for all conservation practices so have your applications complete by June 30th. Applications must be signed by the owner.**

ENERGY EFFICIENCY GRANT: **Next sign-up deadline is June 30th. For more information contact Jolene at Rural Development at the Kearney USDA Service Center at 308-455-9840 or at *jolene.jones@usda.gov*.**

Calendar of Events

May 29: Memorial Day – Gov't offices closed
June 5: CNPPID Board of Directors Meeting
June 5: CNPPID 12 week irrigation run schedule starts
June 13: TBNRD Board Meeting
June 14: No-till on the Plains Whirlwind Event and Jody Saathoff Memorial Field Day near Franklin. Goto *https://www.notill.org* to register by June 6.
June 14: UNL TAPS Summer Field Day at North Platte. Goto *https://taps.unl.edu/taps-2023-field-day* to register by June 7.

Tool to Determine Crop Water Use – Part 1

The **N**ebraska **A**gricultural **W**ater **M**anagement **N**etwork (**NAWMN**) is underway for the 2023 crop season across the Tri-Basin NRD. This network is a tool for participating and area producers to use when scheduling irrigations. The information gathered is used to determine how much soil moisture their crops are using. This information can be found on the websites listed on page 3 under "Crop ET Information".

There are 7 weather stations within or neighboring the TBNRD where producers can get crop water use information. This NAWMN network adds 13 additional locations. See map on page 3. Having this information more localized allows producers to better determine what their crops are using for soil moisture. Unlike the weather stations, these sites allow producers to use their own crop stage of growth. Having these sites closer to a producer's fields and being able to use their own crop stages, this network serves as an excellent tool in determining crop water usage by field. Knowing your crop water use allows you to better schedule irrigations.

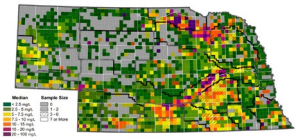
On page 3 of each Tri-Basin Irrigator issue, information from the prior two weeks will be provided for all 13 sites. Because this newsletter is sent bi-weekly, it's highly recommended to use the websites for the most accurate and current information. The websites are updated by Tuesday of each week. Also, I will be emailing crop water use information from this network weekly to those who wish to receive it. In the next issue of this newsletter, an example of using this network will be provided.

If you have any questions, call Curtis Scheele at 308-995-6121, Ext. 3 or email to *curtis.scheele@ne.usda.gov*.

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

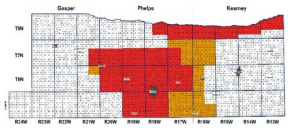
Nitrogen – Introduction



High nitrates in our groundwater. Not only is it here, but it's in all areas of the country. In Nebraska it seems to follow the high fertilizer and water input corn producing areas. See map above. Urban lawn care, golf courses, etc. may also play a factor, but we are not a high urban populated state.

The Environmental Protection Agency set the safe drinking water standard for nitrates at 10 parts per million (ppm). Anything over that is unsafe. Blue Baby Syndrome is a known health issue and there could be other health issues caused from it as well. Who knows about the future?

When NRD's were created in Nebraska, one of their assigned responsibilities is to protect groundwater quantity and quality. The Tri-Basin NRD (TBNRD) and others across the state have Groundwater Quality Management areas with regulations to help in solving this issue. See map on the left showing the TBNRD's regulated areas. Will these regulations need to be amped up in the future if high nitrate levels don't decline???



I have heard that way back during early gravity irrigated years with continuous corn, 300+ lbs of nitrogen per acre was applied. Today, it's closer to 200-250 lbs per acre with higher yields. Knowing what we know now, that was not a good combination of over applied nitrogen and lots of irrigation with a high leaching irrigation system. Is the nitrogen from back then still feeding our groundwater today? Or has enough time elapsed? Over the last 13 years, the nitrates in the groundwater across the TBNRD has risen 0.5 ppm on average.

By 2010, 67% of the irrigated acres in the TBNRD was under pivot irrigation. Subsurface Drip Irrigation (SDI) systems are also replacing gravity irrigation. Pivots and SDI systems along with technology have greatly reduced water and nitrogen inputs. Adding soybeans to the rotation from those long-ago days of continuous corn has also helped with total nitrogen applied.

The fact remains, today we have high nitrates in our groundwater. I plan to focus this newsletter more on nitrogen this year. Hopefully I can help you save fertilizer money without losing yield while cleaning up the water at the same time.

Cleaning up the groundwater will not be an overnight success. This will take many years, hopefully through proper fertilizer management and without additional regulations.

Receive FREE Crop ET Data via a daily texting service.

Daily (D) and Future 3 Days (F3d) estimated water use will be given for Corn and Soybeans (Beans) at three locations across the district: Holdrege 5N (Hld), Axtell 5NE (Axt) and Smithfield 2E (Smfld).

There are 3 ways you can subscribe:

1. **Text START to 855-743-2457**
2. **Call the Tri-Basin NRD (308-995-6688) with your cell #.**
3. **Scan the QR code on the attached flyer to enter your name and cell #. You can also click the QR Code.**

CNPPID Notes

Excess River Flows Diverted for Intentional Ground Water Recharge

Central finalized two long-term agreements for intentional groundwater recharge from its system of canals and laterals in Phelps, Kearney and Gosper counties. Central's agreements are with the Platte River Recovery Implementation Program (PRRIP) and the State of Nebraska (*through the Department of Natural Resources who have partnerships with both the Tri-Basin and Central Platte Natural Resource Districts*). The agreements became effective at the start of 2023.

Between May 16 and May 24, Central delivered nearly 4,000 acre-feet of excess flows into seven different locations due to rainfall in Colorado. The locations include five US Fish & Wildlife Service - Waterfowl Production Areas (WPAs); Funk, Johnson, Linder, Cottonwood, and Victor. Water was also delivered into PRRIP's Cottonwood Ranch and into Central's irrigation storage reservoir at Elwood.

The use of Elwood Reservoir is limited due to dam seepage concerns. Dam repairs will hopefully be completed by August 2024 and the dam repair costs are expected to be ~ $6 Million, of which PRIPP has allocated $2 Million in support.

Visit www.cnppid.com or follow @CNPPID on Facebook, Instagram and Twitter for updates throughout the year.

Tri-Basin NRD News

Check Flowmeters Before Starting Irrigation

Producers, please check the flowmeters on your wells before starting irrigation this season. Make a note of the meter reading at the beginning of the season, to make sure it matches the reading from the end of last season. Checking the meter periodically throughout the season to make sure it is working properly benefits both Tri-Basin NRD and you, the irrigator, so that you can keep accurate irrigation records. It is the responsibility of the producer to make sure the flowmeter is functioning properly during the irrigation season.

It has also come to our attention that producers who have **Senninger brand flowmeters** may want to make sure the batteries they are using are the correct size. **These meters take lithium 3.6-volt batteries, NOT standard 1.5-volt AA batteries.** Using standard AA batteries will cause these flowmeters to not work properly.

Nebraska Extension Extras

New LeafTech Ag Rapid Crop Tissue Analysis

LeafTech Ag developed a new leaf hand-held digital tissue scanner. This tech tool assesses geo-referenced 3"x5" leaf samples for nutrient content & water stress within 3 minutes.

Free UNL Ag Site Planner

UNL "Ag Site Planner" is a free online tool developed by the UNL Manure Management team and is designed for those: considering livestock facilities expansion; better neighborhood odor management; rules/regulations and management to maintain high water quality standards.

This risk management tool provides Google (GPS) site location updates for odor footprint management; sensitive areas; hydrological summary regarding registered wells and groundwater levels along with climatic data. The critical questions segment evaluates potential livestock expansion sites such as recommended distances from current residents. Review at: https://agsiteplanner.unl.edu.

Sidedressing Fertilizer Application

Early planted corn fields are moving past V4 (4-leaves) development; so nodal roots are now occupying more volume than the early seminal roots. Thus, attention is shifting to timely sidedress fertilizer application.

Since the potential number of kernel rows per ear (ear girth) are determined between V6 to V10 (Tenth-Leaf = brace roots development), sidedress fertilizer applied prior to corn fields reaching five- to six-leaf stages may protect potential yield loss.

Several free nitrogen software tools are available for assisting with calculating sidedress rates including: **UNL "Maize-N"; UNL "Corn Nitrogen Calculator"**; and **"Corn Nitrogen Rate Calculator" from Iowa State University**. The latter two web-based tools can be used to compare nitrogen returns based on different nitrogen sources and corn prices.

Broadcast application of UAN (ammonium nitrate) fertilizer, Minnesota research indicated that when corn plants were at the V3 growth stage (3-leaves), reduced growth rates due to leaf burn were worse at fertilizer rates greater than 60 lbs. nitrogen per acre (study rates were: 0, 60, 90 and 120 lbs. N per acre). When plants were larger than V3 stage, plant damage was worse and some yield depression occurred with the 120 lbs. per acre nitrogen rate.

Sulfur Needs for Soybeans and Corn

Sulfur is now receiving more focus especially when growers want higher yielding soybeans. Our Nebraska Extension EC155 publication, "Nutrient Management for Agronomic Crops of Nebraska" illustrates nitrogen and sulfur deficiency. The biggest difference is that nitrogen deficiency is most notable on the older lower leaves first. Whereas, sulfur deficiency first appears on the upper leaves (new growth).

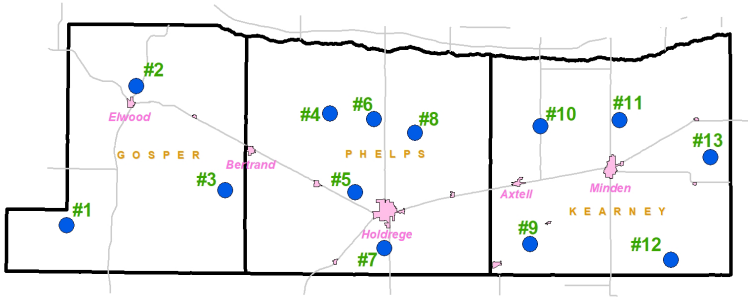
In the past, sulfur deficiency was mostly associated with lower organic matter and coarse (sandy soils) thus, manure applications help build lower sulfur levels. When sulfur soil tests values are less than 30 lbs. per acre; then supplemental sulfur is recommended. Further, higher crop yield goals have shifted soybean recommendations. Sulfur (S) needed per bushel yield for normal plant growth are as follows: Corn & Grain Sorghum – 0.2 lbs.; Wheat – 0.60 lbs.; and Soybeans – 0.40 lbs. Thus, some soybean growers are supplementing 10-15 lbs./A of sulfur during pod development for target 80 – 100 bu./A yield goals.

NAWMN Crop ET Information

Additional Information and other ET resources can be found at websites listed under "Crop ET Information" below.

Inches of Crop Water Use (ET) = Evaporation x Kc

	May 8 – May 14		May 15 – May 21	
Site	Evaporation	Rain	Evaporation	Rain
1	NA	NA	1.30	0.06
2	NA	NA	1.30	0.13
3	NA	NA	1.30	0.04
4	NA	NA	NA	NA
5	NA	NA	1.50	0.00
6	NA	NA	NA	NA
7	NA	NA	1.40	0.00
8	NA	NA	NA	NA
9	NA	NA	1.50	0.00
10	NA	NA	1.50	0.00
11	NA	NA	1.70	0.00
12	NA	NA	1.40	0.00
13	NA	NA	1.50	0.00



2023 Map of NAWMN Sites across the Tri-Basin NRD

Crop Coefficients (Kc)

Corn Stage	Kc	Soybeans Stage	Kc
2 leaf	0.10	Cotyledon (VC)	0.10
4 leaf	0.18	1st Node (V1)	0.20
6 leaf	0.35	2nd Node (V2)	0.40
8 leaf	0.51	3rd Node (V3)	0.60
10 leaf	0.69	Beg. Bloom (R1)	0.90
12 leaf	0.88	Full Bloom (R2)	1.00
14 leaf	1.01	Beg. Pod (R3)	1.10
16 leaf	1.10	Full Pod (R4)	1.10
Silk – Beg. Dent	1.10	Beg. Seed (R5)	1.10
¼ Milk Line	1.04	Full Seed (R6)	1.10
Full Dent (½ Milk)	0.98	Yellow Leaf (R6.5)	1.00
¾ Milk Line	0.79	Beg. Mat. (R7)	0.90
Black Layer	0.60	Full Mat. (R8)	0.20
Full Maturity	0.10	Mature	0.10

Crop Stage Information

Corn (Planted to V4-4 Leaf stage): Hail, wind, or frost that damages the exposed leaves at the 3-leaf stage have little or no effect on yield due to the below ground growing point. At V3, all leaves and ear shoots that the plant will eventually have are being formed now.

Avg. daily water use from May 15 – May 21 was 0.00"-0.04".

Soybeans (Planted to VC-Cotyledon stage): Loss of one cotyledon has little effect on yield while loss of both can reduce yields by 8-9%. Nutrients and food reserves in the cotyledons supply the plants needs up to V1.

Avg. daily water use from May 15 – May 21 was 0.00"-0.02".

May 15-May 21 (10 of 13 NAWMN sites reporting): Average weekly rainfall was 0.02 (range 0.00 to 0.13). Average weekly ET for corn was 0.14 and for soybeans was 0.07.

Crop ET Information

NAWMN: https://nawmn.unl.edu/ETdata/DataMap
TBNRD: https://www.tribasinnrd.org/tbawmn
UNL: https://water.unl.edu/cropswater/nawmn
Texting (Daily): Sasha @ TBNRD: 308-995-6688
Email (Weekly): Curtis @ NRCS: 308-995-6121, Ext. 3

CORN STAGE		DESCRIPTION
V2	2 Leaves	Leaf stage is defined by number of leaves with visible collars. The collar is a discolored line where the leaf meets the stalk. This line circles the stalk. TIP: Mark the 6th leaf or a higher leaf by cutting a notch in it or some other way so as to know that leaf number. Reason is the lower leaves will be lost as the plant develops. Flag or somehow mark the plant in the field as a reference plant when determining later leaf (vegetative) stages.
V4	4 Leaves	
V6	6 Leaves	

SOYBEAN STAGE		DESCRIPTION
VC	Cotyledon	Shortly after emergence. Cotyledons and unifoliate leaves are unfolded. (1 node)
V1	First Node	One trifoliate leaf has 3 leaflets. V1 is the first trifoliate leaf with unrolled or unfolded leaflets. Leaflet edges are no longer touching. (2 nodes = 1 unifoliate + 1 trifoliate)
V2	Second Node	V2 has 2 nodes on main stem, each with a trifoliate leaf with unfolded leaflets. Plant as 3 nodes total: 1 unifoliate + 2 trifoliates

Lake and River Levels

CNPPID Reservoir Elevation and Capacity as well as Platte River Flow data listed below and other locations can be found on CNPPID's website at *http://cnppid.com/wp-content/uploads/2016/06/lakeRiverData.html*.

	May 25, 2023, 8:00 AM	*1 Year Ago*
El. & Cap. – Lake McConaughy	3234.1 ft - 55%	3243.4 ft - NA%
Inflows to Lake McConaughy	1070 cfs	500 cfs
Flows on the North Platte at North Platte	303 cfs	429 cfs
Flows on the South Platte at North Platte	244 cfs	151 cfs
Flows on the Platte at Overton	436 cfs	1170 cfs

Video tribute to Memorial Day.

https://www.youtube.com/watch?v=iCVyeND0b90

Thank you to all who have fought, died, and continue to protect the freedom that we all so enjoy in this great country, the United States of America!

Websites of Interest

NRCS Nebraska	*www.ne.nrcs.usda.gov*
Farm Service Agency	*www.fsa.usda.gov*
TBNRD Home Page	*www.tribasinnrd.org/*
Central Irrigation District	*www.cnppid.com/*
UNL Cropwatch	*cropwatch.unl.edu*
UNL Extension	*extensionpubs.unl.edu/*
K-State SDI Website	*www.ksre.ksu.edu/sdi*
No-till On The Plains	*www.notill.org*
Soil Health:	*www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/*
NE State Irrig Assoc	www.nebraskastateirrigationassociation.org/

Rainfall

Rainfall amounts listed below and other locations come from NeRAIN which can be found at website *https://nednr.nebraska.gov/NeRain/Maps/maps*.

Location:	May 11 – May 24	May 1 – May 24
Elwood 1.81 mi. NW:	1.50	2.35
Loomis 0.2 mi. SW:	1.54	2.62
Holdrege 1.7 mi. W:	1.72	2.62
Minden 7.2 mi. W:	1.34	1.92
Minden 5.8 mi. E:	0.79	1.63

Average Rain for May in Holdrege = 4.06 Inches

**** If you wish to receive this newsletter via e-mail, or have any questions, comments or ideas, feel free to contact Curtis Scheele at the NRCS office in Holdrege or you can email him at curtis.scheele@usda.gov. ****

USDA - Natural Resources Conservation Service

1609 Burlington Street
PO Box 798
Holdrege, NE 68949-0798
308-995-6121, Ext. 3

309 Smith Street
PO Box 41
Elwood, NE 68937-0041
308-785-3307, Ext. 3

1005 South Brown Street
Minden, NE 68959-2601
308-832-1895, Ext. 3

Central Nebraska Public Power & Irrigation District

415 Lincoln Street
PO Box 740
Holdrege, NE 68949
308-995-8601

Tri-Basin Natural Resources District

1723 Burlington Street
Holdrege, NE 68949
308-955-6688

Nebraska Extension

1308 2nd Street
Holdrege, NE 68949

308-995-4222

PO Box 146
Elwood, NE 68937

308-785-2390

424 North Colorado
PO Box 31
Minden, NE 68959
308-832-0645

Free

ET Data

Texting Service

A texting service for ET Data replaced the Water Use Hotline.

ET Data (Evapotranspiration Data) can be useful in making decisions about your irrigation, fertilizer and chemical application schedule. Texts are sent Monday through Friday from June 5th to August 31st. The texts contain:

Daily (D) and Future 3 Days (F3d) estimated water use for both Corn and Soybeans (Beans) at three locations across the district: Holdrege 5N (Hld), Axtell 5NE (Axt) and Smithfield 2E (Smfld).

Additional Weekly Text for all three locations includes: Weekly Precipitation (Wk Precip), Corn Growing Degree Days (Corn GDD), and Beans Growing Degree Days (Beans GDD)

To Subscribe:

- **Scan the QR Code** and enter your information,
- Text **START** to **855-743-2457**, or
- Call Tri-Basin NRD at 308-995-6688 and request to receive ET Data texting.

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Tri Basin Natural Resources District

EXTENSION

CENTRAL Nebraska Public Power and Irrigation District