Moisture. Unlike the weather stations, these sites allow producers to better determine what their crops are using for soil moisture. This NAWMN network adds 13 additional locations. See map listed on page 3 under “Crop ET Information”. 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 Tri-Basin NRD where producers can get crop water use information. This NAWMN network adds 13 additional locations. Map on page 3. Having this information more localized allows producers to use when scheduling irrigations. The information 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.

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

**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: UNL TAPS Summer Field Day at North Platte. Go to https://taps.unl.edu/taps-2023-field-day to register by June 7.

**Tool to Determine Crop Water Use – Part 1**

The Nebraska Agricultural Water Management Network (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.

**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.
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 PRRIP has allocated $2 Million in support.

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

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.

Senninger brand flowmeters

Check Flowmeters Before Starting Irrigation

Excess River Flows Diverted for Intentional Ground
Water Recharge

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.

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 kemele rows per ear (ear girth)
determine 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.
### Inches of Crop Water Use (ET) = Evaporation x Kc

<table>
<thead>
<tr>
<th>Site</th>
<th>May 8 – May 14</th>
<th>May 15 – May 21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evaporation</td>
<td>Rain</td>
</tr>
<tr>
<td>1</td>
<td>NA</td>
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</tr>
<tr>
<td>2</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>3</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>5</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6</td>
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<tr>
<td>12</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>13</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### Crop Coefficients (Kc)

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

### 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](https://nawmn.unl.edu/ETdata/DataMap)

**TBNRD:** [https://www.tribasinnrd.org/tbawmn](https://www.tribasinnrd.org/tbawmn)

**UNL:** [https://water.unl.edu/cropswater/nawmn](https://water.unl.edu/cropswater/nawmn)

**Texting (Daily):** Sasha @ TBNRD: 308-995-6688

**Email (Weekly):** Curtis @ NRCS: 308-995-6612, Ext. 3

### Corn Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2</td>
<td>2 Leaves</td>
</tr>
<tr>
<td>V4</td>
<td>4 Leaves</td>
</tr>
<tr>
<td>V6</td>
<td>6 Leaves</td>
</tr>
</tbody>
</table>

### Soybean Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VC</td>
<td>Cotyledon</td>
</tr>
<tr>
<td>V1</td>
<td>First Node</td>
</tr>
<tr>
<td>V2</td>
<td>Second Node</td>
</tr>
</tbody>
</table>

---

**2023 Map of NAWMN Sites across the Tri-Basin NRD**
**Lake and River Levels**


<table>
<thead>
<tr>
<th></th>
<th>May 25, 2023, 8:00 AM</th>
<th>1 Year Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>El. &amp; Cap. – Lake McConaughy</td>
<td>3234.1 ft - 55%</td>
<td>3243.4 ft - NA%</td>
</tr>
<tr>
<td>Inflows to Lake McConaughy</td>
<td>1070 cfs</td>
<td>500 cfs</td>
</tr>
<tr>
<td>Flows on the North Platte at North Platte</td>
<td>303 cfs</td>
<td>429 cfs</td>
</tr>
<tr>
<td>Flows on the South Platte at North Platte</td>
<td>244 cfs</td>
<td>151 cfs</td>
</tr>
<tr>
<td>Flows on the Platte at Overton</td>
<td>436 cfs</td>
<td>1170 cfs</td>
</tr>
</tbody>
</table>

Video tribute to Memorial Day.
[https://www.youtube.com/watch?v=iCVyeND0b90](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!

*** 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. ***

**WEBSITES OF INTEREST**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRCS Nebraska</td>
<td><a href="http://www.ne.nrcs.usda.gov">www.ne.nrcs.usda.gov</a></td>
</tr>
<tr>
<td>Farm Service Agency</td>
<td><a href="http://www.fsa.usda.gov">www.fsa.usda.gov</a></td>
</tr>
<tr>
<td>TBNRD Home Page</td>
<td><a href="http://www.trinasinnrd.org/">www.trinasinnrd.org/</a></td>
</tr>
<tr>
<td>Central Irrigation District</td>
<td><a href="http://www.cnppid.com/">www.cnppid.com/</a></td>
</tr>
<tr>
<td>UNL Cropwatch</td>
<td><a href="http://cropwatch.unl.edu">cropwatch.unl.edu</a></td>
</tr>
<tr>
<td>UNL Extension</td>
<td><a href="http://extensionpubs.unl.edu">extensionpubs.unl.edu</a></td>
</tr>
<tr>
<td>K-State SDI Website</td>
<td><a href="http://www.ksh.eunl.edu/sdi">www.ksh.eunl.edu/sdi</a></td>
</tr>
<tr>
<td>NE State Irrig Assoc</td>
<td><a href="http://www.nebraskastateirrigationassociation.org/">www.nebraskastateirrigationassociation.org/</a></td>
</tr>
</tbody>
</table>

**Rainfall**

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

<table>
<thead>
<tr>
<th>Location</th>
<th>May 11 – May 24</th>
<th>May 1 – May 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elwood 1.81 mi. NW:</td>
<td>1.50</td>
<td>2.35</td>
</tr>
<tr>
<td>Loomis 0.2 mi. SW:</td>
<td>1.54</td>
<td>2.62</td>
</tr>
<tr>
<td>Holdrege 1.7 mi. W:</td>
<td>1.72</td>
<td>2.62</td>
</tr>
<tr>
<td>Minden 7.2 mi. W:</td>
<td>1.34</td>
<td>1.92</td>
</tr>
<tr>
<td>Minden 5.8 mi. E:</td>
<td>0.79</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Average Rain for May in Holdrege = 4.06 Inches

**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  
308-995-6688

**Nebraska Extension**

1308 2nd Street  
Holdrege, NE 68949  
308-995-4222

308-995-4222  
P.O. Box 146  
Elwood, NE 68937  
308-785-2390

424 North Colorado  
P.O. Box 31  
Minden, NE 68959  
308-832-0645

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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.