Tri-Basin Irrigator

Volume 24, Issue 6 **August 1, 2024**

Program Information

EQIP: **Sign-up now for 2025 funds.**

CSP: **Sign-up now for 2025 funds.**

NSWCP: **For irrigation practices, have your application completed by August 30th for first chance at 2024 funds. 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*.**

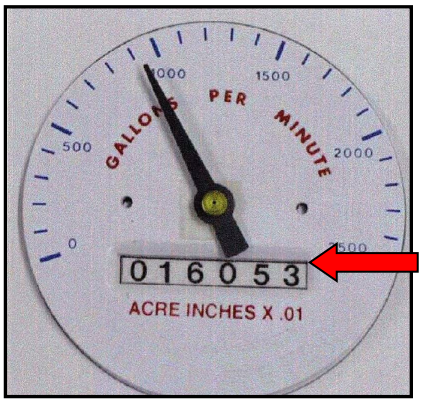
Calendar of Events

Aug 5: CNPPID Board of Directors Meeting
Aug 12-13: TBNRD Annual Tour and Board Meeting
Aug 13: UNL Soybean Management Field Day – See Registration info in article on page 3.

Flow Meter Accuracy!

I get calls from producers wondering if their flow meters are reading accurately. An example of this is, my pivot is set up for 800 gpm, yet the needle on my flow meter says 500 gpm. The majority of the flow meters across the Tri-Basin NRD are McCrometers, so these are the ones I will be focusing on. The same concept may apply on other brands.

The needle on the readout display is a guide. Sometimes the needle bounces around, the unit display is too broad for accuracy, or it can simply be out of sync. To determine actual flow rate, one needs to time the odometer. When timing, I look straight into the odometer, and start the timer when the top of the far-right rotating digit (fastest) hits the bar across the top. See photo. Do the same when recording the ending reading.



Having the same eye angle and reading the same location will provide a more accurate reading.

Depending upon the odometer units, the far-right digit can move faster or slower. The slower it moves, the more critical it is for consistent eye angle, and a very defined start / stop point.

Time the odometer for at least 10 minutes. For a slower rotating odometer, a longer time will help in accuracy.

In closing, the needle is a guide. The odometer is the official and most accurate record.

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

TBNRD TAPS Soil Moisture Sensor: What is it Telling Us?

Attached are screen shots of the soil moisture sensor on the TBNRD's TAPS Plot at the West Central Research Extension and Education Center in North Platte. The charts are current as of 9 AM on Wednesday, July 31st.

The purpose of this article is to hopefully help you understand your own sensors better. All sensor companies look different and maybe do things a bit differently. They are a great tool for irrigation management. However, you still need to know what's going on in the field to understand what the sensors say. And one needs to develop a trust in them. That includes soil probing to see how the soil compares to what they say. And when things don't appear to line up, you need to communicate with your dealer. If they cannot help you, then you probably ought to find a different dealer next year. Then there are ways to make adjustments on some sensors to have it set up the way you want it set up. Some you can tweak, others may take the dealer. Be aggressive in learning how they work and in making them work for you.

The sensor on the plot has 12 sensors recording every 4 inches to a total depth of 48 inches or 4 feet. The first screen shot is a summary chart summarizing all 12 sensors. Some sensors summarize all sensors regardless of root depth. This one summarizes root depth only. So yes, the roots are at least 4 feet deep. You will see that on the chart and from my notes.

The other four charts are separated in 1-foot increments showing the individual sensors themselves. They line up vertically so you can see how they relate to each other. In other words, actions in the top foot may affect what happens in the 3rd foot. You can learn what is going on in the soil by analyzing the individual sensors.

Ultrasonic Flow Meter Measurements Are Available!!!

The ultrasonic flow meter can be used to determine how much water your well is pumping, how much water is going into your irrigation system, how much water you are losing from leaky gates and gaskets, how much water you are applying to your field, or it can be used as a check against your permanently installed flow meter.

If you wish to request an ultrasonic flow meter measurement, you can contact Curtis Scheele, NRCS, at 308-995-6121, Ext. 3 OR Pat Nott, TBNRD, at 308-995-6688 to schedule an appointment.

CNPPID NOTES

"Intentional" Ground Water Recharge Delivered in July

The last article of the Tri-Basin Irrigator discussed long-term recharge agreements between Central and their partners (NeDNR and PRRIP) to divert excess flows from the Platte River into Central's Tri-County area for "Intentional" ground water recharge. The PRRIP and NeDNR pay Central for this water because it supports benefits that provide value to them.

In 9 days, this July, over 5,000-acre feet of excess flows were brought into our region for intentional ground water recharge. How can you relate to 5,000-acre feet of water?

- Equivalent to a three-year water supply for the City of Holdrege.
- Covering all of Holdrege with two feet of water.
- 1,629,255,000 gallons (yes… that's 1.6 billion).
- Mile wide strip approximately 8 miles long, covered with one foot of water.
- One-acre foot of water is equivalent to one foot of water covering one acre of land.

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

TRI-BASIN NRD NEWS

Irrigation Season Reminders

Chemigation: Staff at the Tri-Basin NRD are busy wrapping up chemigation inspections. New permit inspections must be conducted prior to use. But routine inspections, due this year, must be completed by the end of this irrigation season. If your system is due for a routine inspection, we have tried to contact you to schedule. Please call us to schedule your inspections.

Water Samples: Annual crop reports need water samples from your irrigation wells. The time to take them is now while you are irrigating. These samples are for your 2024 reports.

NRD staff are also taking samples from irrigation wells for our Water Quality testing program.

Irrigation Meters: Periodically check your irrigation flowmeters to make sure they are working correctly. If you do not think your meter is working correctly, our staff or Curtis Scheele at the NRCS office can check flow rates using an ultrasonic flowmeter.

If you have a meter repaired during the irrigation season, please contact the NRD and note the meter reading before removing. Doing so will make it easier to reconcile any movement of the propeller while the meter is repaired. If you have questions about reinstalling your flowmeter or about your meter readings, contact our office at 308-995-6688.

NEBRASKA EXTENSION EXTRAS

2024 UNL Soybean Management Field Day

Tuesday, August 13 – Holdrege NE (Blake Johnson farm)

6:00 p.m. to 8:00 p.m. (5:30 p.m. – Registration)

Topics: Soybean TAPS competition, dectes stem borer, and irrigation management

Learn what's new with soybean management, dectes stem borer, and new tools for irrigation scheduling.

·Chris Proctor, Nebraska Weed Management Extension Educator

·Justin McMechan, Crop Protection and Cropping Systems Specialist

·Bruno Patias Lena, Nebraska Extension Educator

·Todd Whitney, Nebraska Extension Educator

For meal planning: please pre-register by Aug. 11.

Register: *https://go.unl.edu/soydays* **or call 402-624-8030**

Google Map: *https://go.unl.edu/smfd1*

Blake Johnson farm

Coming from East – From the intersection of U.S. 34 and Highway 183 in Holdrege, head west on U.S. 34/U.S. 6 W/W 4th Avenue for .5 miles, then take a slight right to head west onto NE-23W for 1.6 miles, then turn north onto L Road for .6 miles, then turn west onto W 18th Ave/733 Road for .2 miles.

Coming from West – From Loomis, head southeast on Highway 23 for 4.1 miles, then turn east onto 733 Road for .9 miles. *Shop is on north side of the road.*

Corn Yield Potential Estimation

The 2024 row crops growing season may have been the most harsh weather conditions that most irrigators have ever experienced. For many, corn yield estimation may soon begin, since corn maturity will be moving into the milk stage (R3) kernel development.

Our UNL Hail Information network is available free-of-charge at: *https://cropwatch.unl.edu/hailknow*.

Several corn yield estimation methods can be used. However, the *Corn Yield Component Method* is still very popular. This method is based on:

Ears per Acre x Kernels per Ear (# rows per ear * kernels per row) **= Kernels per Acre.**

Final yield is then calculated: **kernels/acre divided by estimated kernel size.**

- Large corn kernels = 75,000 kernels per bushel versus
- Small corn kernels = 105,000 kernels per bushel.

2024 UNL Wheat Varieties Performance Plot Results

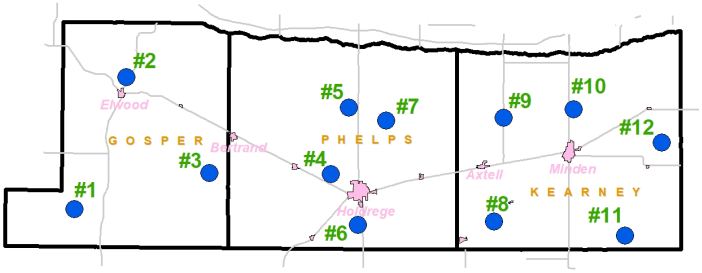
The 2024 UNL Winter Wheat Varieties Performance Plot Yield Results are now posted from UNL replicated studies across Nebraska. Our Furnas County Rainfed wheat plot on the Troy TenBensel field just northwest of Arapahoe featured eight varieties with yields over 100 bu./A. Based on these results, AgriPro Prolific & Bigfoot; Polansky Rockstar; and WestBred WB4422; WB4595 & WB4792 varieties may interest irrigators. Results posted at: *https://cropwatch.unl.edu/varietytest*.

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) = Reference ET x Kc

	July 15 – July 21		July 22 – July 28	
Site	Reference ET	Rain	Reference ET	Rain
1	1.60	0.36	1.90	0.91
2	1.40	0.28	1.50	0.38
3	1.40	0.12	1.70	0.62
4	1.40	0.70	1.50	0.38
5	1.50	1.38	1.60	0.12
6	1.40	0.00	1.50	0.50
7	1.40	1.18	1.60	0.10
8	1.30	1.35	1.60	0.16
9	1.20	1.34	1.70	0.45
10	1.00	1.52	1.00	0.31
11	1.40	2.00	1.70	0.19
12	1.30	2.95	1.50	0.35



2024 Map of TBAWMN 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 (R1-Silking stage to R3-Milk stage): Though not as severe as R1-Silking, stress at R2 through R4 can still have a profound effect on yield. As the kernels mature, the potential yield loss becomes less.

Avg. daily water use from July 22 – July 28 was 0.24"-0.30".

Soybeans (R1-Beginning Bloom to R3-Beginning Pod stage): Environmental stress from R3-Beginning Pod through R6-Full Seed will reduce yield more than any other time. R4-Full Pod is the most crucial period.

Avg. daily water use from July 22 – July 28 was 0.21"-0.30".

July 22-July 28 (12 of 12 TBAWMN sites reporting): Avg weekly rainfall was 0.37 (range 0.10 to 0.91). Avg weekly ET for corn was 1.82 and for soybeans was 1.52.

Crop ET Information

TBAWMN Sites: https://www.tribasinnrd.org/tbawmn

CropWatch: https://cropwatch.unl.edu/gdd-etdata

Texting: TBNRD: 308-995-6688 or UNL: 308-995-4222

CORN STAGE		DESCRIPTION
R2	Blister	The kernels are white on the outside and resemble a blister in shape. The cob should be close to, if not, at full size by R2. The silks are beginning to dryout and darken in color.
R3	Milk	The kernels display a yellow color on the outside. Inner fluid is milky white. Silks are brown and dry or becoming dry.
R4	Dough	Most kernels contain semi-solid, pasty material.

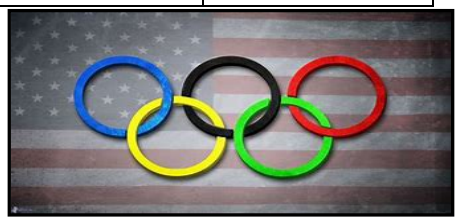
SOYBEAN STAGE		DESCRIPTION
R2	Full Bloom	At least one open flower is present at any one of the two uppermost main stem nodes that have fully developed leaves.
R3	Beg Pod	At least one pod of 3/16" length is present at any one of the four upper most main stem nodes that have a fully developed leaf. It is not uncommon to see pods of greater length at the lower nodes.
R4	Full Pod	At least one pod of 3/4" length is present at any one of the four uppermost main stem nodes that have fully developed leaves.

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*.

	August 1, 2024, 8:00 AM	1 Year Ago
El. & Cap. – Lake McConaughy	3233.5 ft - 54.4%	3234.3 ft - NA%
Inflows to Lake McConaughy	797 cfs	546 cfs
Flows on the North Platte at North Platte	799 cfs	258 cfs
Flows on the South Platte at North Platte	142 cfs	421 cfs
Flows on the Platte at Kearney	117 cfs	125 cfs

USA



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:	July 18 – July 31	May 1 – July 31
Elwood 1.81 mi. NW:	0.63	11.90
Loomis 0.2 mi. SW:	0.72	13.53
Holdrege 1.7 mi. W:	0.31	11.07
Minden 7.2 mi. W:	0.80	9.53
Minden 5.8 mi. E:	1.93	11.53

Average Rain for May-July in Holdrege = 11.32 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

USDA United States Department of Agriculture
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

CENTRAL Nebraska Public Power and Irrigation District

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

Tri-Basin Natural Resources District

Tri Basin Natural Resources District

1723 Burlington Street
Holdrege, NE 68949
308-995-6688

Nebraska Extension

N 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

Irrigation Sensor on TBNRD TAPS Plot - What's Going On in the Soil as of 7-31-24?

Corn Hybrid: Pioneer 1185AM planted at 34,000 in soybean residue

Corn is currently at Blister Stage under Pivot

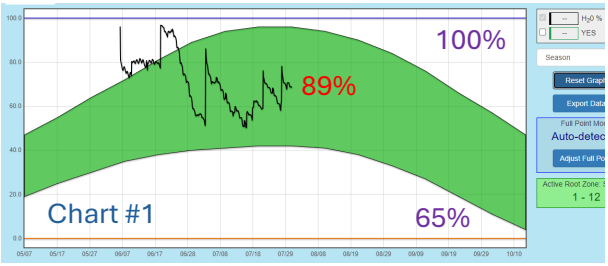


Chart 1: Summary Chart

- 89% average moisture to 4 feet.
- Green is advertised as optimum moisture area.
- Orange refill line at bottom, we have set at 65% moisture. Company is usually at 70% moisture. Check with your dealer to see where your refill line is set. Have them reset it to where you want it. For us, this is where we would like to end the year.
- Blue line at top is full moisture at 100%.
- Bottom of green area during peak water use is at 80% moisture.
- Black line summarizes the sensors at root depth. Our roots are at 48" therefore all 12 sensors are used in this summary.
- Black line up is increase in moisture (rain or irrigation). Black line stair stepping down is day and night water use. Would like to have had this black line a bit lower during peak water use.

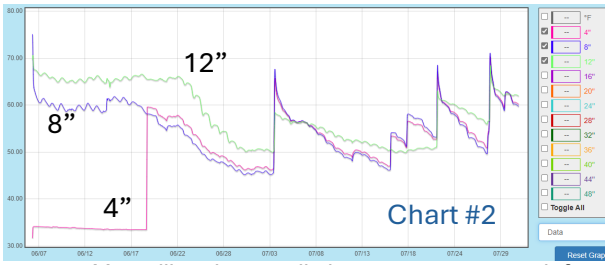


Chart 2: Sensors – 4" (red), 8" (blue), 12" (green)

- 97% average moisture for the top foot.
- Up and down is more drastic near soil surface due to rain and irrigation (up) and water use (down)
- Sensors level on left side with hiccups. Roots not there. No crop water use.
- Level on left side is usually 100% full if off-season moisture replenished it completely. On this plot, these 3 are full at start of season.
- Stair stepping down is when crops are using water. Dates go left to right. You will notice on all charts as one moves left to right, the next deeper depth starts stair stepping just to the right of the shallower depth (as long as the roots keep moving deeper).
- The right half of the chart shows rains and irrigations. A lot more ups. Notice how these affect lower depths on charts below. Also, see how the trend is moving higher as you move to the right. That indicates increasing soil moisture.

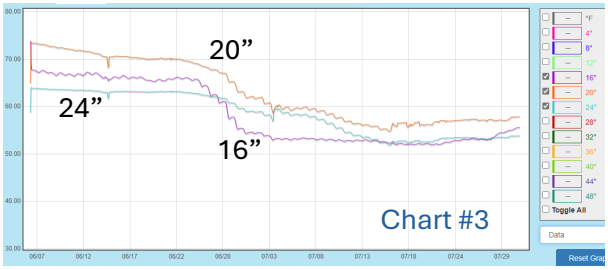


Chart 3: Sensors – 16" (purple), 20" (orange), 24" (turquoise)

- 85% average moisture for the 2nd foot.
- Left side level is full moisture.
- Notice when stair-stepping starts. Roots got there.
- Water use early, left-center. Notice the leveling off in the center of the chart. That represents a balanced playing field of water uptake versus rain and irrigation being added to the soil. NOTE: Level can mean this or it can mean no more moisture to pull from ground (dry) so it stays level. Or it means roots aren't there yet. Know what's going on.
- Notice the climb upward on the right. Rains and irrigations are filling the soil at these depths faster than the crop is removing it. We don't want to fill ours now so we will be backing off some on the irrigations. We are getting to a point of where we want to start drying down towards end of year. Still irrigate but not so much. Unless we run into trouble, then we'll add more.

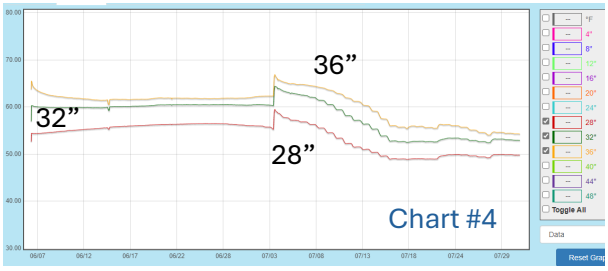


Chart 4: Sensors – 28" (red), 32" (green), 36" (yellow)

- 85% average moisture for the 3rd foot.
- Level on the left, again no water uptake.
- Spike up in middle, then a short level before roots start stair-stepping. This short level after the spike up, tells me the soil reached full moisture just before roots got there. Not full at beginning of season.
- Once rains and irrigations are in full force, these depths leveled off. Again a balance of water use versus moisture addition. That is our situation. Again, level could mean something different. That's why one needs to field verify.

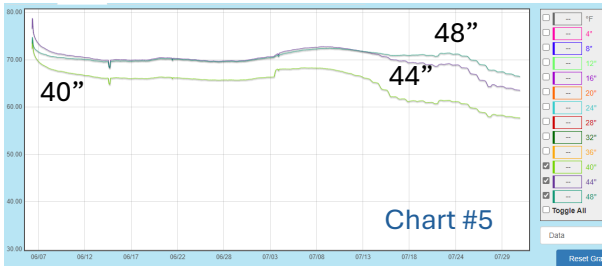


Chart 5: Sensors – 40" (green), 44" (purple), 48" (blue-green)

- 90% average moisture for the 4th foot.
- Not full profile early. Maybe got full before roots reached this depth. After field verification, we feel this got to full or was very close.
- Water uptake by the crop to 48 inches as shown by stair-stepping on the right side.
- A little less water use recently (more level) due to the rains and irrigations in the shallower levels. Slow net loss in moisture. We are going to tap into the lower depth moisture while irrigating on the surface. Kind of a balancing act to utilize deep moisture and to keep enough at the top to prevent stress, but leave room for rain. This is where analyzing the individual sensors is helpful, knowing what is going on beneath the surface.