Tri-Basin Irrigator

Volume 21, Issue 8 **August 19, 2021**

Program Information

EQIP: **Sign up anytime for 2022 funds.**

CSP: **sign up anytime for 2022 funds.**

NSWCP: **First chance at irrigation practice approval, have your irrigation applications in by Aug. 31st. They must be signed by the owner.**

ENERGY EFFICIENCY GRANT: **Signup anytime for 2022 funds. deadline is October 31, 2021. For more information contact Kelley at Rural Development at the Kearney USDA Service Center at 308-455-9837 or *kelley.messenger@usda.gov*.**

Calendar of Events

Aug 26: West Central Field Day at North Platte – Register by Monday, Aug. 23rd at *https://extension.unl.edu/statewide/westcentral/2021-water-and-crops-field-day/*.

Sept 6: Labor Day – Gov't offices closed

Sept 7: CNPPID Board Meeting

Sept 14: TBNRD Annual Tour and Board Meeting

Sept 14-16: Husker Harvest Days – For more info, goto: *https://www.huskerharvestdays.com/en/home.html*

When is My Last Irrigation?

Corn is approaching 1/4 milk line crop stage. At this crop stage, the chart on the right side of this page says you need 3.75 inches of water to finish your corn. Using the example on the right side of this page, you can determine how much more water needs applied to get the corn to maturity. The example ends the season at 60% moisture instead of the recommendations of 40%. I used 60% since it is a more realistic goal to reach. The example starts out with an average moisture level at 1/4 milk line of 80% soil moisture to a depth of 4 feet. If your corn has only rooted down to 3 feet, then 80% average soil moisture to 3 feet in your soil calculates to your needing another 0.45 inches on top of the calculated 1.95 inches in the example. Aah, the benefits of deeper roots. You can use this same procedure for soybeans.

We need to start managing our moisture levels down so we can make room for the FREE off-season moisture. No need to pay for plenty of water at seasons end only to watch it leach on out of the rootzone taking valuable nutrients with it.

However, here are a few thoughts of mine:

1. corn seems to shut down rather quickly. Moisture that we thought was going to be used was not. We've ended up with more moisture at maturity than predicted.
2. from 2011 through 2017, average rainfall from 1/2 milk line to black layer was 0.75 inches. 0.21 inches was the low and 1.56 was the high.
3. In order to learn if that last irrigation you made was worth it or not, put that last 0.5 inch or so on part of the pivot to get a comparison.
4. Be patient. Don't end the season too soon. You may catch a rain. You can always irrigate later if need be. Keep monitoring and making adjustments.

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

Predicting Last Irrigation:

Needed info: **1.** Available Water Capacity (AWC) of soil, **2.** current amount of plant available water to a four foot depth (unless roots are not that deep due to compaction, too much water early, etc.), **3.** current crop stage, and **4.** normal water use from current crop stage to maturity. This prediction assumes no rainfall to crop maturity. If rainfall occurs, the process must be reevaluated.

The following is a chart for normal water use requirements from various crop stages to maturity.

	Growth Stage	Approx. Days to Maturity	Water Use to Maturity
Corn	Dough (R4)	34	7.5"
	Beg. Dent (R4.7)	24	5.0"
	¼ Milk Line (R5)	19	3.75"
	½ Milk Line (Full Dent)	13	2.25"
	¾ Milk Line	7	1.0"
	Maturity (R6)	0	0.0"
Soy Beans	Full Pod (R4)	37	9.0"
	Beg. Seed (R5)	29	6.5"
	Full Seed (R6)	18	3.5"
	Leaves Beg. To Yellow (R6.5)	10	1.9"
	Beg. Maturity (R7)	0	0.0"

You can get a copy of NebGuide G1871 "Predicting the Last Irrigation of the Season" online at *http://extensionpublications.unl.edu/assets/pdf/g1871.pdf*.

Predicting Last Irrigation Example

Crop: Corn Growth Stage: 1/4 Milk Line
Moisture: 80% Water Use To Maturity: 3.75 in.
Soil Type: Holdrege Silt Loam = an AWC of 2.25 in. per ft.
(Soil information available at your local NRCS office)

1. AWC x root zone (4 ft. depth) = **9.0 in. Total AWC**
2. Maximum water depletion of 40% x 9.0 in. = **3.6 in. of maximum water depletion in 4 ft. root zone**
3. Current soil water already depleted (measured) = **1.80 in.**
   80% avg. soil moisture to 4 ft. (20% avg. depletion)
   0.20 x 2.25 in./ft. x 4 ft.
4. Remaining plant available water = **1.8 in.**
   (3.6 maximum water depletion minus 1.8 already depleted)
5. Irrigation requirement = **1.95 inches of irrigation water needed for plant to reach maturity.**
   (3.75 in. of water to reach maturity minus 1.8 in. of water available)

Note: This all assumes no rainfall. Should rainfall occur, the process needs to be repeated. It's also recommended to periodically check soil moisture & crop stages and repeat this process through crop maturity.

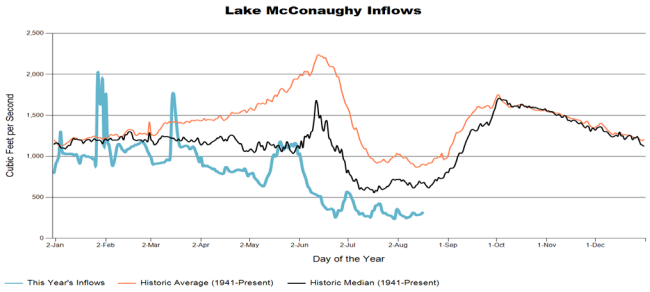
The above example is ending the year at 60% moisture. Recommendations say to end the year at 40% moisture down to 4 feet. I used 60% as it's a more realistic goal.

CNPPID Notes

Irrigation Begins Last Scheduled Run

The scheduled irrigation began its last two week run on Monday, August 16th at Central Nebraska Public Power & Irrigation District, with its last scheduled water shutting off on September 3rd. Water will continue down the canal until irrigation demand decreases, historically the head gates have been closed within the first ten days of September, and then drain down water can be used for irrigation as long as it is available.

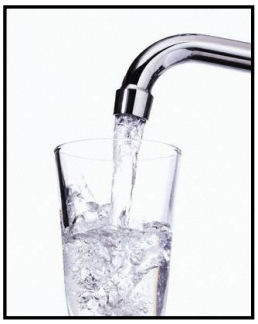
Lake McConaughy is currently at 58.4% full with an elevation of 3236.8, this compares to a year ago of 65.6% full with an elevation 3242.5. With the drought to the west the inflows into Lake McConaughy have been well below average for most of the year, as shown in the graph below.



Find us at www.cnppid.com or @CNPPID on Facebook, Instagram, Twitter and LinkedIn.

Tri-Basin NRD News

Free Domestic Water Testing



Tri-Basin NRD wants rural residents to have safe drinking water. Any district resident who uses a rural household water well can request NRD staff to sample their well once per year at no charge. The sample will be tested for nitrates and coliform bacteria.

Test results are sent to the Tri-Basin NRD office, where they are recorded in a water quality database. The results are forwarded to the homeowner, along with information about protecting water quality.

Free Radon Test Kits

Radon is a colorless, odorless gas that comes from the soil. This gas can accumulate in your home and cause health problems. The only way to know if your home has radon is to test for it.

Tri-Basin NRD has a limited number of test kits available to residents who are concerned about the radon level in their home.

For more information on either of these programs, contact Tri-Basin NRD at (308) 995-6688.

Nebraska Extension Extras

Predicting Last Soybean Irrigation

Our Nebraska Extension NebGuide G1871, "Predicting the Last Irrigation of the Season," provides end of season irrigation worksheets for corn, grain sorghum and soybeans. Usually, soybeans are only 10 days from beginning maturity when the plants reach R6.5 growth stage or when the leaves begin to yellow. At this point, the soybean will likely only need 1.9 inches of water to complete dry matter production.

SoyWater or 'cornsoywater.unl.edu' (free UNL irrigation scheduling softwares) developed by James Specht, UNL Emeritus Soybean Specialist, are also valuable online tools for predicting the final soybean irrigation. Dr. Specht, though, still advises in-field final soybean inner pods evaluation before deciding when to cease irrigating. For example, when soybean plants initiate yellowing (growth stage R6.5) to leaves dropping from stems (growth stage R7), the plants will still use water until the membrane inside the soybean pod separates from the inner pod. So, target the soybean pod development evaluation using the fourth pod cluster from the top of soybean stems, and monitor pod membrane attachment to inner seed pods for final irrigation timing. Note that until the pod membrane detaches from the seed, water is being used for production. Although conserving water and saving irrigation energy costs may make good stewardship sense for the end of the season; shorting the soybean crop by one critical inch at the end of the season can reduce final soybean yields by 3.5 bushels per acre (an especially costly miscue when soybean values are higher).

Generally, irrigators start reducing stored soil profile moisture as crops start drying down four to six weeks before crop physiological maturity. The average target is drying soils down to 40% available profile water by maturity.

Epoch – New Irrigated Nebraska Wheat Variety

New 2021 Nebraska Extension Winter Wheat Varieties Performance Test Results are now on our CropWatch website: *https://cropwatch.unl.edu/winter-wheat-variety-test-results*. These results include both irrigated and rainfed.

For irrigators, the UNL Nebraska Small Grains Breeding Program has released (**Epoch),** a new hard red winter wheat variety available this fall. This "Hitch"/"NW03666" wheat cross has significantly higher yield than Wesley. Epoch is a bright chaff, short statured semi-dwarf with very good straw strength (i.e. lodging resistant) under irrigation and strong yield potential.

UNL Hard Red Winter Wheat Performance 'Rainfed' test plot results are also posted online. Todd Anderson hosted a 2021 South Central plot location drilled directly after soybeans (south of Elwood) featuring 29 different wheat varieties. The top 8 highest yielding varieties were: MS **Maverick;** AP **Bigfoot;** WB **4401**; UNL **NW15443;** UNL **NHH17612**; AP **Roadrunner**; UNL NEDH-14-83W; & **Overland.**

Land Lease Termination Deadline – Sept. 1st

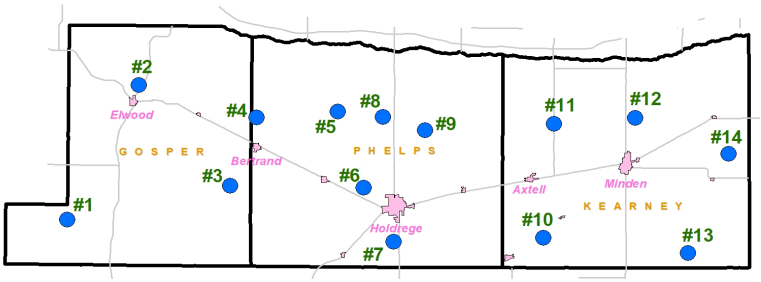
The Nebraska Supreme Court requires, that for verbal (or handshake) land leasing, notice to terminate or change of agreement for the 2022 growing season must be given six months in advance of the end of the lease; OR no later than **Sept. 1, 2021.** Then, the new lease year will begin Mar. 1, 2022; and end Feb. 28, 2023. The new tenant (or new buyer) will take over the lease Mar.1, 2022. If the notice to quit is given (or received) after Sept. 1, 2021; the existing tenant would lease until Feb. 28, 2023.

TBAWMN 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 (ETr) x Kc

	Aug 2 – Aug 8		Aug 9 – Aug 15	
Site	Evaporation	Rain	Evaporation	Rain
1	1.70	0.13	1.90	0.20
2	1.80	0.18	1.80	0.00
3	1.30	0.10	1.40	0.14
4	1.60	0.14	1.70	0.07
5	1.35	0.22	1.55	0.72
6	1.50	0.11	1.60	1.45
7	1.20	0.54	1.40	1.55
8	1.50	0.18	1.50	2.06
9	1.50	0.00	1.50	0.86
10	1.30	0.04	1.50	0.66
11	1.40	0.12	1.60	0.15
12	1.20	0.33	1.60	0.71
13	1.60	1.10	1.50	0.80
14	1.40	0.95	1.70	0.01



2021 Map of NAWMN Sites across the Tri-Basin NRD.

Crop Coefficients (Kc)

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

Crop Stage Information

Corn (R4-Dough to R5-1/4 Milk Line stage): At R4.7, Beginning Dent, kernels are beginning to dent at the base of the ear. R5.5, Full Dent, is when the milk line is ½ way down the kernel. Knowing this will help in determining last irrigation.

Avg. daily water use from Aug 9 – Aug 15 was 0.22"-0.30".

Soybeans (R5-Beg Seed to R6-Full Seed stage): The rapid rate of dry weight and nutrient accumulation begins to slow in the whole plant shortly after R6, and in the seeds shortly after R6.5, Full Seed/Yellow Leaf.

Avg. daily water use from Aug 9 – Aug 15 was 0.22"-0.30".

Aug 9-Aug 15 (14 of 14 NAWMN sites reporting): Average weekly rainfall was 0.67 (range 0.00 to 2.06). Average weekly ET for corn was 1.75 and for soybeans was 1.75.

Crop ET Information

NAWMN Sites:
UNL: https://nawmn.unl.edu/ETdata/DataMap
Tri-Basin NRD: https://www.tribasinnrd.org/nawmn
Email: Contact Curtis at 308-995-6121, Ext. 3
CropWatch: https://cropwatch.unl.edu/gdd-etdata
CNPPID: https://www.cnppid.com/weatheret-data/
Texting: Contact TBNRD at 308-995-6688
Email: Contact CNPPID at 308-995-3555

CORN STAGE		DESCRIPTION
R4.7	Beg. Dent	Kernels at the base of the ear are beginning to dent.
R5	1/4 Milk Line	All or nearly all kernels are dented. Milk or starch line appears shortly after denting as a line across the kernel when it is viewed from opposite the embryo side and will advance toward the base of the kernel (toward the cob).
R5.5	Full Dent - 1/2 Milk Line	The milk or starch line is 1/2 way down the kernel working towards the cob. Top 1/2 is hard and bottom 1/2 is softer near the cob.

SOYBEAN STAGE		DESCRIPTION
R6	Full Seed	At least one pod whose cavities are completely filled with green seeds is present at one of the four uppermost main stem nodes that have fully developed leaves.
R6.5	Full Seed / Yellow leaf	Leaves begin to yellow, beginning in the lower canopy and progressing upwards.

Lake and River Levels

CNPPID Reservoir Elevation and 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 19, 2021, 8:00 AM	1 Year Ago
Capacity of Lake McConaughy	58.1%	NA
Inflows to Lake McConaughy	322 cfs	549 cfs
Flows on the North Platte at North Platte	991 cfs	884 cfs
Flows on the South Platte at North Platte	99 cfs	117 cfs
Flows on the Platte at Overton	230 cfs	373 cfs

If we could spread love as quickly as we spread hate and negativity, what an amazing world we would live in.

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/
HPRCC	hprcc.unl.edu/
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:	Aug 5 – Aug 18	May 1 – Aug 18
Elwood 0.26 mi. S:	0.17	8.41
Bertrand 6.1 mi. SE:	0.36	13.45
Holdrege 0.61 mi. N:	2.02	13.61
Minden 7.2 mi. W:	0.63	11.36
Minden 5.8 mi. E:	1.81	10.50

Average Rain for May-August in Holdrege = 14.21 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

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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
308-832-2280, 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

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