Tri-Basin Irrigator

Volume 15, Issue 8 *August 27, 2015*

Program Information

EQIP, CSP, Etc.

EQIP – You can sign-up anytime for 2016 funds at your local NRCS office. A deadline will be announced this fall.

NSWCP: The next Sign-up deadline for eligible irrigation practices is November 25, 2015, basically prior to Thanksgiving, in order to be reviewed for approval at the December Tri-Basin NRD Board Meeting. Applications can be taken at your local NRCS office and must be signed by the owner. Work cannot start until applications have been approved at this December board meeting *AND* a design has been completed by NRCS.

ENERGY EFFICIENCY GRANT: You can sign-up anytime for 2016 funds at your local Rural Development office. Contact Rural Development in Kearney at 308-237-3118, Ext. 4.

Calendar of Events

Aug 31: CNPPID 12 week irrigation run schedule ends.
Sept 7: Labor Day – Gov't offices closed
Sept 8: CNPPID Board of Directors Meeting 9 AM
Sept 8: TBNRD Board Meeting 7:30 PM
Sept 15-17: Husker Harvest Days: For more info, go to http://huskerharvestdays.com/.
Jan 26-27 (Conference) & Jan 28 (AIM Symposium): No-till On The Plains Winter Conference in Salina, KS: Early Bird Registration Due Sept. 30th. For more info, go to http://www.notill.org/.

How much water did I apply in 2015?

As your irrigation season comes to an end, you can start reading your flow meters and calculate how much water you applied in 2015. Flow meters vary as to their unit outputs (ac-in * 0.01, gallons * 100, ac-ft * 0.001, etc.). The first thing to do is simply subtract your beginning year reading from the ending year reading to get units of water pumped. No matter what the units of water pumped, you can calculate the net irrigation inches applied using the following calculations:

1. Acre-Inches / Acres = Inches Pumped
2. Gallons Pumped / 27,154 / Acres = Inches Pumped
3. (Acre-Feet * 12) / Acres = Inches Pumped

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4. Inches Pumped x Efficiency Factor* = Net Inches Applied

*Efficiency Factors
Subsurface Drip Irrigation = 0.95
Pivot - low pressure drops = 0.90
- med. & low pressure impacts = 0.85
- high pressure = 0.80
Surge Valve = 0.80
Gated Pipe - with reuse = 0.7
- without reuse = 0.5

If you have any questions, contact Curtis Scheele at 308-995-6121, Ext. 3.

Curtis's Column

NRCS

Dare to Learn:

My observations have been that free moisture is being left in the soil at years end. Using the NAWMN sites as a representation of the NRD, Table 1 below shows moisture levels for corn on silt loam soils at Black Layer for the previous four years. 2014 ended with ample moisture due to rain and 2012 was the dry year. The goal is to get to 40% moisture at years end. It appears there is 30-35% of available moisture left in the soil on average at seasons end. That is 2.7-3.15 inches of free moisture not being utilized. Using the dry year of 2012, at 62% moisture, 2.0 inches of available moisture was left in the soil.

If it's not too late this year, my dare/challenge to you is when you want to run that pivot to get that last 0.5-1.0 inch on, just run it half way around or ¾ depending upon how you can capture a yield difference. If a yield monitor and yield map can pick up the slightest yield difference, then one wouldn't need to trial as large of an area. By not watering a portion of the pivot, this will teach us if that last watering made a difference in yield. How will one know this if it's not tried on a field where one can compare the extra water versus the non-extra water.

If you do this, I would like to see the results. Potentially, this could be an easy way to save a 0.5-1.0 inch of water per year without utilizing any other form of irrigation water management.

Year	Average Percent Moisture Level to 4 Feet of Depth	Average Total Rain Since 1/4 Milk Line
2014	90%	4.29 Inches
2013	72%	1.04 Inches
2012	62%	0.58 Inches
2011	72%	1.90 Inches

Table 1: This table shows the average soil moisture levels at Black Layer for corn on silt loam soils for each of the last four years across the Tri-Basin NRD. It also shows the average total rainfall from ¼ milk line to Black Layer for each of those four years as well.

Predicting Last Irrigation

	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"

CNPPID NOTES

Water and Power Supply:

It is easy to take familiar things for granted. Central's delivered water, recharge water and power generation appear to fall into that category. Most producers in this area were not farming before 1942 when our first full irrigation season began and so this water supply seems to have been here forever. But those who farmed these same lands prior to 1942 still remember the economic reality of 12-bushel corn. Not only did Central customers receive water, but recharge from the canals began building a mound of water beneath the canal system and the surrounding acres. Giant turbines in Central powerhouses generated electric power for area farms as the irrigation water from Lake McConaughy passed through. Around that same time, gas and oil turbine pumps were adapted for irrigation and in 1948, the first two groundwater pumps tapped the aquifer and the developing groundwater mound in the tri-county area.

News came in a few weeks ago of the proposed new groundwater regulations for May and Elk Creek townships in the eastern tier of Kearney County townships and the southern tier of Gosper County townships, both are outside the Central recharge zone. It offers testimony to the luck of the townships that lay within Central's recharge zone and the immense value that water holds for those producers and irrigated agriculture.

However, we know that an adequate supply of water does not equal an endless supply of water. The mound can go away, just as it came. Our area groundwater monitoring program may be showing hints of a downward trend. No matter where one farms, the trick is to match average pumping to average recharge as a sub-basin group; long before a water shortage begins. Texas producers may have waited too long. The time to jump into precision ag in this area is now; it cuts input costs and conserves water supply for the next generation.

TRI-BASIN NRD NEWS

Year End Flow Meter Readings for Water Use Reports:

As the irrigation season winds down and you are picking up irrigation pipe or bedding down irrigation engines, remember to record the ending meter readings for your Water Use reports.

Tri-Basin Staff to Inspect Meters:

With irrigation season winding down, Tri-Basin NRD staff members will be beginning annual irrigation meter inspections. Each year, we take readings from meters in about one-third of the townships in the district.

This year we will be doing inspections in the following townships: Kearney County: 5N-16W, 6N-16W, 7N-16W, and 8N-16W; Phelps County: 5N-20W, 6N-20W, 7N-20W, 8N-20W; and Gosper County: 5N-22W (Union Township), 5N-23W, 6N-23W, 7N-23W, and 8N-23W.

If you have irrigation wells in these townships and you put your meters in storage for the winter, you can call the Tri-Basin NRD office at 1-877-995-6688 to schedule an inspection.

If there is no meter at the site when we come to inspect, you will receive a letter requesting access to the meter for inspection.

NEBRASKA EXTENSION EXTRAS

Climate Outlook:

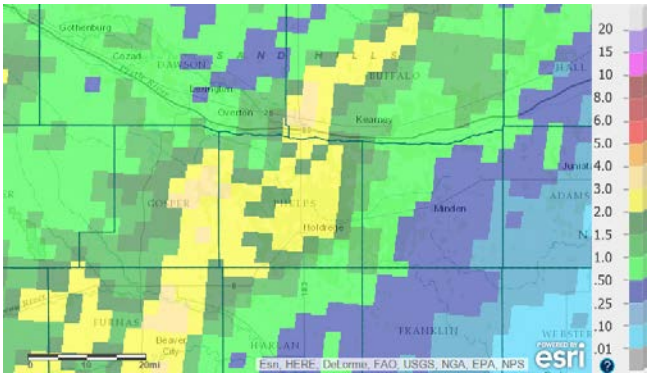
The first big cool down for the late summer time period arrived this week. Temperatures dropped to the low to mid 40s and places in the Panhandle of Nebraska even had some frost. Fortunately, we were far from freezing temperatures, but it was too close for comfort. The first part of the month was fairly warm, but temperatures over the last 7-14 days have been much below normal. The area has been 4 to 5 °F below normal over the past 14 days.

The precipitation pattern was also as drastic as the temperatures. Most of the rainfall over the past couple weeks fell between Elwood and Funk, with some places receiving more than three inches. The rainfall events were part of a big upper level system that brought precipitation to the Central Plains and Midwest, along with cool air from Canada.

Table . Precipitation and temperature summary

	8/12-8/25 Precip		4/1-8/25 Precip		8/12-8/25 Temp		
Station	Total (in)	% of normal	Total (in)	% of normal	Avg. Temp (°F)	Depart. (°F)	Range (Hi:Lo) (°F)
Holdrege	0.36	28%	15.29	96%	68.4	-4.4	90 : 44
Holdrege 4N	2.26	174%	17.34	107%	67.9	-4.8	89 : 46
Minden	0.29	21%	15.19	91%	68.4	-4.5	89 : 45
Smithfield	2.78	219%	17.28	109%	67.8	-4.9	89 : 46

Figure. Radar estimate rainfall from August 12-25



The deep trough that cooled us down has moved off to the east and a ridge will continue to build in behind it. A shortwave trough will move through tonight and Friday and will bring in a chance for precipitation and a slight cool down, but it will be short-lived. Temperatures will be seasonal over the weekend and will warm into the upper 80s to low 90s next week. The ridge moving in will allow warm, dry air to come in from the south, decreasing chances of precipitation over the next 4 to 5 days.

The main weather pattern over the next couple weeks will have a trough in the western U.S. and the ridge over the Central Plains. This will bring cool air to the Northern Rockies and some much needed precipitation to the northwest U.S. The main storm tracks look to stay north of Nebraska for the time being. Eventually, the ridge over our area will give way to the deep trough over the west, but the timing of that is unknown. The 1-Month Outlook from the Climate Prediction Center for September has Nebraska in the area for increased odds for cooler than normal temperatures and above normal precipitation. The deep trough over the west may alter that forecast moving forward, but it is too early to tell.

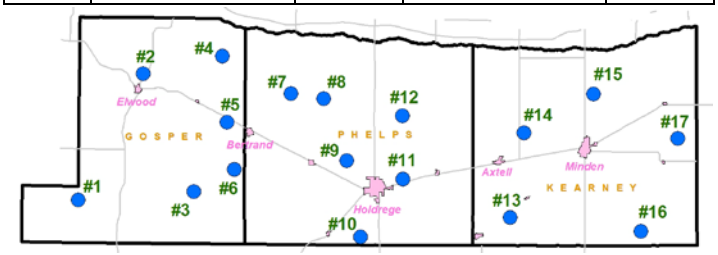
-Tyler Williams, Extension Educator

NAWMN Crop ET Information

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

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

	Aug 10 – Aug 16		Aug 17 – Aug 23	
Site	Evaporation	Rain	Evaporation	Rain
1	1.70	0.91	1.20	0.00
2	1.00	1.45	1.10	0.00
3	1.50	2.55	1.00	0.00
4	1.40	2.30	1.00	0.00
5	1.30	2.35	1.00	0.00
6	1.20	3.10	1.00	0.00
7	1.25	1.87	1.00	0.00
8	1.20	1.00	1.00	0.00
9	1.10	3.15	1.00	0.00
10	1.50	0.65	1.10	0.00
11	1.30	1.00	1.10	0.00
12	1.10	2.30	1.10	0.00
13	1.20	0.87	1.00	0.00
14	1.40	0.36	1.05	0.00
15	1.10	0.28	0.90	0.00
16	2.00	0.27	0.90	0.20
17	1.70	0.00	0.80	0.00



2015 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 (R4.7-Beginning Dent to R5.5-Full Dent ½ Milk Line stage): At R5, ¼ Milk Line, you need 3.75 inches to maturity. Average moisture to 4 feet is 88% (all Silt Loam) at 6 sensor sites across the NRD. If your field matches this, you are done irrigating.

Avg. daily water use from Aug. 17 – Aug. 23 was 0.12"-0.19".

Soybeans (R5-Beginning Seed to R6.5-Full Seed/yellow leaf stage): At R6, Full Seed, you need 3.5 inches to maturity. Average moisture to 4 feet is 90% (all Silt Loam) at 6 sensor sites across the NRD. If your field matches this, you are done irrigating.

Avg. daily water use from Aug. 17 – Aug. 23 was 0.13"-0.19".

Aug. 17-Aug. 23 (17 of 17 NAWMN sites reporting): Average weekly rainfall was 0.01 (range 0.00 to 0.20). Average weekly ET for corn was 1.07 and for soybeans was 1.10.

ET Information Sites

NAWMN Sites:

* http://www.cnppid.com/news-info/weatheret-data/nebraska-agricultural-water-management-network/
* https://nawmn.unl.edu/

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

CNPPID: http://www.cnppid.com/news-info/weatheret-data/

Water Use Hotline: 1-800-993-2507

Corn Stage		DESCRIPTION
R5.5	Full Dent - 1/2 Milk Line	The starch line is 1/2 way down the kernel. Top 1/2 is hard and bottom 1/2 is softer near the cob.
R5.8	3/4 Milk Line	The starch line is 3/4 way down the kernel.

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.
R7	Beginning Maturity	At least one (normal) pod that has attained its final mature color (tan or brown, depending on variety) is present on any main stem node. 0.0 inches needed for yield.

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://www.cnppid.com/news-info/reservoirriver-data/.

	August 27, 2015, 8:00 AM	1 Year Ago
Capacity of Lake McConaughy	90.7%	57.9%
Inflows to Lake McConaughy	1,103 cfs	880 cfs
Flows on the North Platte River at North Platte	1,391 cfs	413 cfs
Flows on the South Platte River at North Platte	N/A cfs	380 cfs

In order to form lives, we must stop being speakers and start being fathers.

- Juan Carlos Ortiz

Websites of Interest

NRCS Nebraska	www.ne.nrcs.usda.gov
Central Irrigation District	www.cnppid.com
TBNRD Home Page	tribasinnrd.org
Farm Service Agency	www.fsa.usda.gov
UNL Cropwatch	cropwatch.unl.edu
UNL Extension	www.extension.unl.edu/home
K-State SDI Website	www.ksre.ksu.edu/sdi
No-till On The Plains	www.notill.org

Rainfall

Rainfall amounts listed below and other locations come from NeRAIN which can be found at website http://nerain.dnr.ne.gov/NeRAIN/docs/report.asp.

Location:	Aug 13 – Aug 26	May 1 – Aug 26
Arapahoe 6.9 NW:	1.07	13.69
Bertrand 6.1 mi. SE:	2.49	17.64
Funk 4.1 mi. NNE:	0.97	12.90
Minden 0.855 mi. W:	0.10	12.78
Minden 8.8 mi. ESE:	0.17	13.14

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@ne.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