

PROGRAM INFORMATION

EQIP: PROJECTED SIGNUP CUTOFF FOR 2020 FUNDS SHOULD BE MID-NOVEMBER. GET IN AND GET SIGNED UP BEFORE HARVEST IN CASE IT'S A LENGTHY ONE. IF SIGNING UP AFTER THE CUTOFF, YOU ARE LOOKING AT 2021 FUNDS WITH INSTALLATION STARTING IN FALL OF 2021. YES, IT CAN BE THAT FAR DOWN THE ROAD.

CSTWP: PARTICIPANTS WITH COMPLETED 2019 RECORDS CAN TURN THEM IN AT THEIR LOCAL NRCS PRIOR TO HARVEST. ESPECIALLY IF YOU WANT 2018 PAYMENTS. THIS WILL DEFINITELY BEAT THE RUSH AT SEASONS END SHOULD HARVEST BECOME A LONG SEASON.

NSWCP: FLOW METERS AND SOIL MOISTURE SENSORS ARE APPROVED AT EACH MONTHS TBNRD BOARD MEETINGS. THE NEXT APPROVALS FOR UNDERGROUND IRRIGATION PIPE WILL BE AT THE DECEMBER BOARD MEETING.

ENERGY EFFICIENCY GRANT: APPLICATIONS DUE OCTOBER 31, 2019. CONTACT KELLEY AT RURAL DEVELOPMENT AT 308-455-9837 OR KELLEY.MESSENGER@USDA.GOV.

CALENDAR OF EVENTS

- SEPT 2: LABOR DAY – GOV'T OFFICES CLOSED
- SEPT 3: CNPPID BOARD OF DIRECTORS MEETING 9 AM
- SEPT 10: TBNRD BOARD MEETING 1:30 PM

NO-TILL ON THE PLAINS EVENTS: GOTO [HTTP://WWW.NOTILL.ORG/UPCOMING-EVENTS](http://www.notill.org/upcoming-events) FOR MORE INFO.
- SEPT 10: SOIL HEALTH FIELD DAY @ ALMENA, KS

SEPT 10-12: HUSKER HARVEST DAYS – FOR MORE INFO, GOTO [HTTPS://WWW.HUSKERHARVESTDAYS.COM/EN/HOME.HTML](https://www.huskerharvestdays.com/en/home.html)

How Much Water did I Apply in 2019?

How to Calculate Gross Inches Pumped

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

How to Calculate Net Inches Applied to the Crop

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

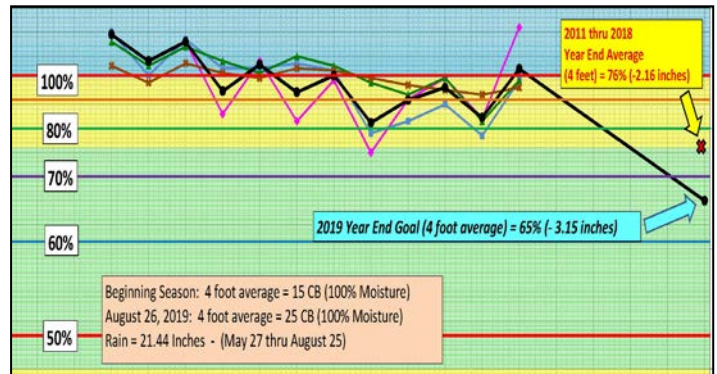
If you have any questions, you can call Curtis Scheele at 308-995-6121, Ext. 3 or email him at curtis.scheele@ne.usda.gov.

CURTIS'S COLUMN



Corn Soil Moisture – Where Are We?:

We are nearing the end of the crop season and thinking about last irrigation. I hear producers pulling some gated pipe. I hear some not willing to write the year off yet. Depends on rains, crop stage, tillage, etc. Where do I see us sitting on average across the TBNRD? As of Monday, August 26th, at 4 foot root depth, Holdrege Silt Loam soil, we are at 100% moisture. See chart below. The 2, 3, & 4 feet range from 95% to 100%. So there is moisture all the way to 4 feet.



Let's try some bullet statements to hopefully better explain all the info I am about to provide.

- On the chart above the black line is the average moisture readings based on root depth.
- Average crop stage on Aug. 26th is R4.7 – Beginning Dent.
- Holdrege Silt Loam holds 9 inches of moisture to 4 feet.
- The red X with the yellow box pointing to it is the average moisture level across the TBNRD at Black Layer (corn maturity) from the years of 2011 through 2018. This is 76% moisture or a soil moisture usage of 2.16 inches.
- The spot where the black line ends is a year-end goal of ending the year at 65% moisture or a soil moisture usage of 3.15 inches. I believe this is a very good goal. The rule of thumb from NRCS and UNL Extension is to be at 40% at years end to a 4 foot depth. That's a soil usage of 5.4 inches. For now, we just need to try and get to 65% on average across the TBNRD at seasons end. That would be 1.0 inch of additional free water from the profile used for the crop and provide that same amount of additional room for off-season moisture. This would help reduce nitrogen leaching.
- If you are at R4.7 – Beginning Dent on Aug. 26th, according to the "Predicting Last Irrigation Chart" which was in the last issue of this newsletter, you need 5.0 inches to Black Layer.
- If you are at 1/4 milk line (1/4 of the way to the cob), then you need 3.75 inches. You are basically done if 100% moisture and roots to 4 feet.
- On average from 2011 through 2017, average rainfall from 1/2 milk line to black layer is 0.75 inches. I tossed out 2018's 3.15 inches. The low recorded was 0.21 inches.
- **If you want to put on that last irrigation, I challenge you to not. If you wish not to try it on your entire pivot, try it on half. If you have a good way of determining yields, go smaller. See if that last irrigation makes a difference.**

Irrigation Technology:

The days of irrigating with siphon tubes and even gated pipe is becoming old news; that's good for the water supply in Lake McConaughy, grower's backs and freeing up time to irrigate more acres with less labor. Current growers also have access to multiple-sourced technology to help them apply adequate but not excessive irrigation water and increase net profit further.

We have an excellent decision tool in place for our E67 Canal growers on 5,767 acres SE of Johnson Lake. The pilot telemetry project provides growers with an hourly soil water balance for each field. We began hosting the project computer server this irrigation season, allowing us to provide continuous monitoring of the system and address any field issues quickly. Producers can flip through a set of soil water balances for all of their fields through a smartphone app and make irrigation decisions in a minute or two. Accurate and easy.

The remainder of our growers, currently have no-cost access to a spreadsheet developed here that is the semi-automatic version of the fancier telemetry system. This method was used for 15 years to irrigate our sub-surface irrigation demonstration fields. Growers enter 1) inches of crop water use/day (from our website or a daily e-mail), 2) inches of rainfall/day (from a field rain gauge) and 3) inches of irrigation water applied (calculated as [(AF/acres) * 12] or inches applied according to a pivot setting). The spreadsheet formulas produce a daily soil water balance, taking into account available soil water at emergence, crop planted and soil type. That soil water balance is graphed automatically through the season as data is entered. The grower must spend about one minute/field/day to remain current but the information is worth it. Again, accurate and easy.

Drain your chemigation check valve:

When you are preparing your irrigation systems for colder weather, remember to drain your main line check valve to prevent freezing. This will extend the life of the check valve and may help prevent check valve failure.

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 Irrigation Water Management (Water Use) Forms. We have the Water Use forms printed and ready to be filled out! You can stop in our office to pick them up or call us at 1-877-995-6688 to have them mailed to you.



Western Bean Cutworm & Bt Trait Comparison Table:

'The Handy Bt Trait Table' for U.S. Corn Production is now available online at: <https://www.texasinsects.org/bt-corn-trait-table.html>. This free web version incorporates two new finds of resistance; and categories Western & Northern Corn Rootworm separately.

Western Bean Cutworms (WBC) have been potentially our highest corn insect impacting crops in 2019. Research indicates that one larvae per plant at dent stage usually reduces yields by 3.7 bu./A. Despite efforts to slow resistance such as 5% refuge, Cry1F (Herculex, AcreMax and SmartStax) Bt traits from soil bacteria are providing less WBC control. Whereas, the VIP3A proteins (Agrisure Viptera and Leptra) are still providing near 100% WBC in Nebraska Extension research trials.

Julie Peterson, Nebraska Extension WC Entomologist, shares that bred-in resistance to WBC insects is far more effective than relying strictly on insecticide applications during the growing season.

UNL online UV Insect Light Trap data from Mid-May through Sept. is available for four state locations: Concord, Clay Center, Mead and North Platte. See <https://entomology.unl.edu/fldcrops/ligtrap>

Other UNL free support includes the UNL App "Western Bean Cutworm" which incorporates the predicted growing degree days (GDD) of moth first 25% flight (1391 GDD) to begin scouting and NebGuide G2013 "Western Bean Cutworm in Corn and Dry Beans."

Reminder that Bt traits do not prevent adult WBC from laying eggs; non-resistant larvae are killed as they feed on the corn plant.

Nebraska Extension at Husker Harvest Days:

The BIG RED Nebraska Extension Building at Husker Harvest Days on Sept. 10-12, 2019 will celebrate the 150th Anniversary of the University of Nebraska with more hands-on experiences. Nebraska Strong 'Weather Ready' topics will include: Cover Crops, Center Pivot Irrigation Efficiency; Keys to Calving Success; Risk Management Strategies; Staying Nebraska Strong during Disasters; Sustainable Landscapes; and Lifelong Education and Career Opportunities.

Estimating Corn Grain Yield Prior to Harvest:

The University of Illinois developed the Yield Component Method for estimating corn yields as early as the "roasting ear" or milk (R3) stage of kernel development which occurs 18 to 22 days after pollination completed.

The first three yield components (ears per acre, kernel rows per ear and kernels per row) are easily measured. The final weight per kernel is not as easily measured until the grain is mature (kernel black layer). And, technically, the grain moisture needs to be calculated to 15% used for 56-lb. market bushel.

Normal kernel weight is 90,000 kernels per 56-lb bushel OR 282 grams per 1,000 kernels. (Varies from 65,000 to 100,000).

Crop uniformity also will influence accuracy. Step as follows:

- 1) Estimate single row equal to 1/1,000th acre. For 30-inch (2.5 feet) rows, this equals 17.4 linear feet.
- 2) Count number of ears on the plants for 1/1,000th acre of row harvestable. (Do not count dropped ears).
- 3) For every fifth ear in the sample row, record number of kernel rows per ear and average kernels/row. Multiply ear row number x kernels/row = total kernels/ear.
- 4) Calculate average kernels per ear by summing the values of all sampled ears and dividing by the number of ears.
- 5) Estimate the yield for each site by multiplying the ear number (Step 2) by the average number of kernels per ear (Step 4) and then dividing that result by the estimated kernel weight (usual).

$$\text{Corn Yield} = \frac{\text{Ears}}{\text{Acre}} * \frac{\text{Kernel Rows}}{\text{Ear}} * \frac{\text{Kernels}}{\text{Row}}$$

$$90,000 \frac{\text{Kernels}}{\text{Bushel}}$$

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

Site	Aug 12 - Aug 18		Aug 19 - Aug 25	
	Evaporation	Rain	Evaporation	Rain
1	1.40	0.22	1.10	1.21
2	1.30	0.65	0.90	3.53
3	1.20	0.37	1.00	3.21
4	1.50	0.52	1.00	3.15
5	1.10	0.42	0.80	2.23
6	0.90	0.45	0.80	1.10
7	1.20	0.29	0.80	1.45
8	1.40	0.65	0.80	1.03
9	1.10	0.83	0.90	1.83
10	1.30	0.60	0.90	1.75
11	1.20	0.52	1.00	1.70
12	1.20	0.39	0.90	0.79
13	1.10	0.46	0.50	1.78
14	1.30	0.53	0.80	1.29
15	1.30	0.35	0.80	3.40
16	1.20	0.56	0.90	0.86

Crop Coefficients (Kc)			
Corn		Soybeans	
Stage	Kc	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 (R3-Milk to R5-1/4 Milk Line stage): At Beginning Dent, kernels are beginning to dent at the base of the ear. 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 19 - Aug 25 was 0.12"-0.17".

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.

Avg. daily water use from Aug 19 - Aug 25 was 0.13"-0.17".

Aug 19-Aug 25 (16 of 16 NAWMN sites reporting): Average weekly rainfall was 1.89 (range 0.79 to 3.53). Average weekly ET for corn was 0.97 and for soybeans was 0.94.

ET INFORMATION SITES

NAWMN Sites:

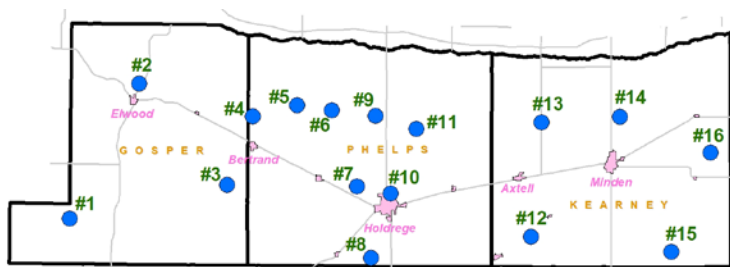
<https://www.cnppid.com/weatheret-data/nebraska-agricultural-water-management-network/>

<https://nawmn.unl.edu/ETdata/DataMap>

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

CNPPID: <https://www.cnppid.com/weatheret-data/>

Water Use Hotline: 1-800-993-2507



2019 Map of NAWMN Sites across the Tri-Basin NRD.

Corn Stage		DESCRIPTION
R5	1/4 Milk Line	All or nearly all kernels are dented. Milk line 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 starch line is 1/2 the 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 the way down the kernel.
Soybean Stage		DESCRIPTION
R6.5	Full Seed / Yellow Leaf	Leaves begin to yellow rapidly, 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://cnppid.com/wp-content/uploads/2016/06/lakeRiverData.html>.

	August 15, 2019, 8:00 AM	1 Year Ago
Capacity of Lake McConaughy	89.2%	NA
Inflows to Lake McConaughy	2907 cfs	951 cfs
Flows on the North Platte at North Platte	1395 cfs	426 cfs
Flows on the South Platte at North Platte	367 cfs	194 cfs
Flows on the Platte at Overton	2676 cfs	241 cfs



WEBSITES OF INTEREST

Soil Health:

www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/agclimatenebraska.weebly.com

Climate agclimatenebraska.weebly.com
 NRCS Nebraska www.ne.nrcs.usda.gov
 Central Irrigation District www.cnppid.com/
 TBNRD Home Page www.tribasinrrd.org/
 Farm Service Agency www.fsa.usda.gov
 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

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 15 – Aug 28	May 1 – Aug 28
Arapahoe 9.8 NNE:	2.95	28.45
Bertrand 6.1 mi. SE:	1.81	25.74
Holdrege 0.99 mi. E:	1.77	24.28
Minden 7.2 mi. W:	2.44	21.58
Minden 5.8 mi. E:	2.93	23.10

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

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

PO Box 146
 Elwood, NE 68937

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

308-995-4222

308-785-2390

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