Tri-Basin Irrigator

Volume 17, Issue 10 *September 28, 2017*

Program Information

EQIP: Sign-up for new center pivots, SDI systems and soil moisture sensors. Installation cannot be started until a contract is obligated. Earliest obligations could be the first of March 2018 meaning a pivot could be installed prior to 2018 crop if a NRCS design is done as well. If not, then a fall 2018 installation. An application after this deadline pushes everything back a year.

EQIP

Cutoff deadline to be signed up for 2018 funds

October 20, 2017

Stop by your local NRCS office.

CSP: Contract participants need to schedule appointments with their local NRCS office to review contracts, turn in 2017 enhancement job sheets, and sign a form indicating if you wish to be paid in 2017 or 2018.

CSP

Sign-up for 2018 funds can be taken anytime.

No cutoff deadline has been announced yet.

Stop by your local NRCS office.

NSWCP: Applications must be signed by the owner. Applications must be approved prior to starting any installation work.

NSWCP

Applications for flow meters and soil moisture sensors can be taken anytime.

Stop by your local NRCS office.

ENERGY EFFICIENCY GRANT:

ENERGY EFFICIENCY GRANT

Cutoff deadline to be signed up for 2018 funds

October 31, 2017

Contact Kelley Messenger at Rural Development at the Kearney USDA Service Center or at 308-237-3118, Ext. 4.

Calendar of Events

Oct 2: CNPPID Board of Directors Meeting - 9 am
Oct 9: Columbus Day – Gov't offices closed
Oct 10: TBNRD Board Meeting -7:30 PM

May your irrigation off-season ECLIPSE all of your expectations!!!

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

FINAL Tri-Basin Irrigator for 2017!!!

Closing the light on another season of the Tri-Basin Irrigator. I hope that you received helpful information during this past irrigation season. If you have questions or would like to receive this newsletter via email in 2018, contact Curtis Scheele at 308-995-6121, Ext. 3 or at curtis.scheele@ne.usda.gov.

Soil Health Series: Important or Not?

How important is the health of our soil? Is soil something we know as present to grow our food and it will always be present for us to use? Or is it a valuable natural resource that can be abused over time? Does soil contain living organisms that are important for its health or do they not have value at all? How valuable is the soil economically?

A few years back I did a presentation on Desertification and the demise of civilizations. Desertification is land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities (United Nations Convention to Combat Desertification Art.1.a). Climatic variations include high temps or drought over periods of time. Human activities include our culture, government policies, economics, overgrazing, tillage, irrigation, sodbusting, etc. An example America managed through is the dust bowl.

The dust bowl led to the creation of the Soil Conservation Service, now the Natural Resources Conservation Service. It led to conservation practices such as windbreaks, conservation tillage, terraces, erosion structures, livestock tanks and pipelines, etc. We apply a lot of conservation practices to protect our soils from what we see above ground, erosion.

For productivity and economics, we study our crops, fertilizer, pesticides, irrigation, etc. We study our livestock, feed, clean water, etc. All these things we study are called inputs. Good inputs provide for healthy, well-producing crops and livestock. Thus helping the bottom dollar.

Do we consider soil an input? Are we better off with an unhealthy soil or a healthy one? What if we have an unhealthy soil and our culture shifts, we need to feed a larger population, economics play a factor, or government policies are different? Will a healthy soil help sustain the nation through these times? Do we want to leave our grandkids and future generations with degraded soils that can't produce?

I hope this year I shed some light on different soil quality indicators. To help you measure the health of your soil and how it changes over time, attached is a Soil Quality Card. Also, here is a website to learn more about soil health: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/

I enjoy quotes. Here are a few about soils.

*** "We know more about the movement of celestial bodies than about the soil underfoot." – Leonardo da Vinci**
*** "The nation that destroys its soil, destroys itself." – Franklin D. Roosevelt**
*** "While the farmer holds the title to the land, actually it belongs to all the people because civilization itself rests upon the soil." – Thomas Jefferson**

CNPPID NOTES

Central Staff;

You are likely to be familiar with the Irrigation Division staff and the work we do but you may not know about others working across the District; each critical to getting our daily work done. For example, all USA power generators and the electric grid are a favorite target of computer hackers worldwide. Our IT (Information Technology) group is tasked with tracking attempts and keeping them out in addition to keeping our hardware, software, and servers current and providing staff support.

There is a dam foreman and technician at Lake McConaughy. The Gothenburg Office houses the Gothenburg division manager, control room operators, an electric crew, a biologist and technician, land administrators, light, medium and heavy equipment operators, a mechanic, two supply canal patrolman, a purchasing agent and a secretary/receptionist.

The District Office in Holdrege houses the general manager, electrical and civil engineers, a land and an electrical draftsman, a land management group for the lake and farm leases, a surveyor, mechanic, public relations group, an accounting group, purchasing agent, administration assistants that; help the General Manager and Board of Directors, maintain the website, draft legal documents and comply with all federal and state reporting regulations, a secretary/receptionist and a custodian.

Including irrigation staff, Central employees currently number near 100; many less than the number of employees needed before the introduction of computers and cell phones, the replacement of stop logs in the canals with automated gates/remote transmission and the sale of the Canaday Station steam plant to NPPD. All of us are tied together in our common commitment to sustaining the Platte Basin water resource.

TRI-BASIN NRD NEWS

Irrigation Water Management Forms are Available Now!

We have Irrigation Water Management (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. As you are finishing up irrigation, remember to note the ending readings on your meters to fill in on your reports. Water Use Forms are due November 17, 2017.

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.

Consider Planting Conservation Trees:

It's not too early to think about planting conservation trees next spring! Windbreaks and shelterbelts provide many benefits, including reducing soil erosion along field boundaries. We can provide tree planting services for your windbreak, as well as bundles of trees that you can plant yourself. You can contact us or your local NRCS office to determine the type and number of trees and shrubs you will need. The form for ordering hand plant trees will be available later this fall on our website, www.tribasinnrd.org.

NEBRASKA EXTENSION EXTRAS

Why Grain Test Weights Matter?

Grain test weight is a volumetric measurement, based on an official bushel being 1.244 cubic feet, and can be used primarily as a grain quality indicator. For corn, the official minimum test weight for U.S. No. 1 yellow corn is 56 pounds per bushel. If test weights drop below this standard; then the grain price is discounted. Usually, test weights are determined by weighing grain samples filled in a standard dry one-quart cup.

Lower test weights are more common when crops have endured stress at some point during the grain filling period or when the growing season is ended prematurely by frost before physiological maturity is reached. Any disease, insect, or environmental condition that reduces the movement of nutrients to the kernel during grain fill (once it is filled) will likely lower grain test weights.

However, test weights can be misunderstood; and attributing strong correlation between test weight and grain yields may be incorrect. High test weights are not automatically associated with high yields; and lower test weights do not always mean lower yields. Many factors influence test weight.

Grain wetting between maturity and harvest can lower test weights. Research indicates that the number of times grain experiences wetting and drying cycles impacts test weights more than the total amounts of precipitation received. Prior to wetting at maturity, normal mature kernels are smooth, well-shaped, and fit well into a volume. If a wetting event penetrates the outer husks on mature corn ears, the kernels may swell; and upon drying, the kernels may not shrink back to their original volume, shape and smoothness. This results in more space between kernels; thus, the kernels will not pack into a bushel volume as well as before the grain wetting event. Even though, the total dry weight harvested from the field(s) will be the same regardless of the moisture events; it may require extra trucking trips to haul the same field production when test weights drop.

Higher test weight grains have more nutrient density, since the grain has a greater proportion of starch rich endosperm and less bran and hull. As a result, livestock producers may prefer purchasing higher test weight grains due to higher energy values. Lower test weight grains can also be good energy sources; but their value per bushel will likely be lower than higher test weight grains.

During harvest, farmers may appreciate higher test weight grain; since theatrically more pounds can be hauled using the same grain trucks (full capacity). This translates into less trips hauling grain to the elevator or storage facility to move the same total grain weights.

Farmers, though, must be cautious when moving high test weight grain on highways to not exceed "truck hauling weight limits." Higher test weight grains take up less storage 'volume' for equivalent 'bushel weights' versus lower test weight grains. Therefore, combine operators may easily overfill trucks when filling trucks to the same usual volumes. Further, harvesters may need to recalibrate their truck 'full' lines (based on volume) if grain test weights are higher.

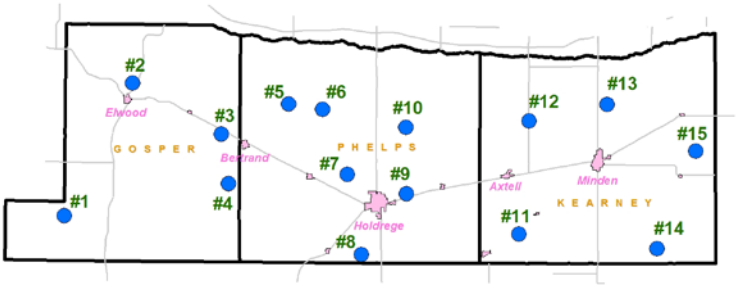
Department of Transportation (DOT) fines regarding over-weight grain trucks on the highway may exceed the value of the extra grain being hauled in over-weight trucks. So, especially when grain prices are lower and test weights are higher, it makes sense to check truck load weights prior to the loaded vehicles travelling on the highway. Also, truck drivers may need to communicate to combine operators if trucks are being overloaded.

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

	Sept 11 – Sept 17		Sept 18 – Sept 24	
Site	Evaporation	Rain	Evaporation	Rain
1	1.70	0.19	NA	NA
2	1.50	0.21	1.30	2.17
3	1.30	0.11	0.90	2.11
4	1.40	0.10	1.30	2.70
5	1.50	0.50	NA	NA
6	1.20	0.25	1.20	2.00
7	1.50	0.00	NA	NA
8	1.60	0.05	1.50	2.40
9	1.40	0.00	NA	NA
10	NA	NA	NA	NA
11	1.40	0.06	1.30	1.90
12	1.50	0.25	NA	NA
13	1.30	0.14	NA	NA
14	1.60	0.15	1.50	1.00
15	1.40	0.25	NA	NA



2017 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 (R5.8-3/4 Milk Line to R6-Full Maturity stage): Black Layer signals the end of kernel growth for the season. Many husks and leaves are no longer green although the stalks may be. Average kernel moisture at R6 is 30-35%. This can vary depending on hybrids and environmental conditions.
Avg. daily water use from Sept 18 – Sept 24 was 0.02"-0.17".

Soybeans (R7-Beginning Maturity to R8-Mature stage): R8, Full Maturity is when 95% of the pods have reached their mature pod color. 5-10 days are required after R8 before soybeans have less than 15% moisture.
Avg. daily water use from Sept 18 – Sept 24 was 0.0.2"-0.19".

Sept 18-Sept 24 (7 of 15 NAWMN sites reporting): Average weekly rainfall was 2.04 (range 1.00 to 2.70). Average weekly ET for corn was 0.63 and for soybeans was 0.27.

ET Information Sites

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

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
R5.8	3/4 Milk Line	The starch line is 3/4 of the way down the kernel (3/4 hard kernel, 1/4 soft kernel near the cob).
R-6	Black Layer	The starch line has advanced to the cob. Physiological Maturity. Black layer formed, kernel moisture is between 25%-35% moisture. 0.0 inches needed for yield.
R-6	Full Maturity	Husks and leaves are no longer green.

Soybean Stage		DESCRIPTION
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.
R8	Full Maturity	95% of the pods have reached their mature pod color.

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*.

	Sept 28, 2017, 8:00 AM	*1 Year Ago*
Capacity of Lake McConaughy	**74.6%**	**NA**
Inflows to Lake McConaughy	**1897 cfs**	**2826 cfs**
Flows on the North Platte at North Platte	**430 cfs**	**1720 cfs**
Flows on the South Platte at North Platte	**160 cfs**	**166 cfs**
Flows on the Platte at Overton	**2060 cfs**	**2007 cfs**

It is not what we do, it is how much love we put in the doing.

- Mother Teresa

Websites of Interest

Soil Health: *www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/*

Climate	*agclimatenebraska.weebly.com*
SAM Registration	*www.sam.gov*
NRCS Nebraska	*www.ne.nrcs.usda.gov*
Central Irrigation District	*www.cnppid.com*
TBNRD Home Page	*www.tribasinnrd.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:	Sept 14 – Sept 27	May 1 – Sept 27
Arapahoe 9.8 NNE:	**1.67**	**14.70**
Bertrand 6.1 mi. SE:	**2.15**	**13.89**
Funk 4.1 mi. NNE:	**2.18**	**18.19**
Minden 0.855 mi. W:	**2.24**	**19.50**
Minden 8.8 mi. ESE:	**1.42**	**16.99**

Average Rain for May-Sept in Holdrege = 16.38 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

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

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

"The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, D.C. 20250-9410 or call toll free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer."

Field Notes

Current field management
(tillage, fertilizer, irrigation, crop rotation, other)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Ideas for changes in field management

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

USDA NRCS
Natural Resources Conservation Service

University of Nebraska Lincoln

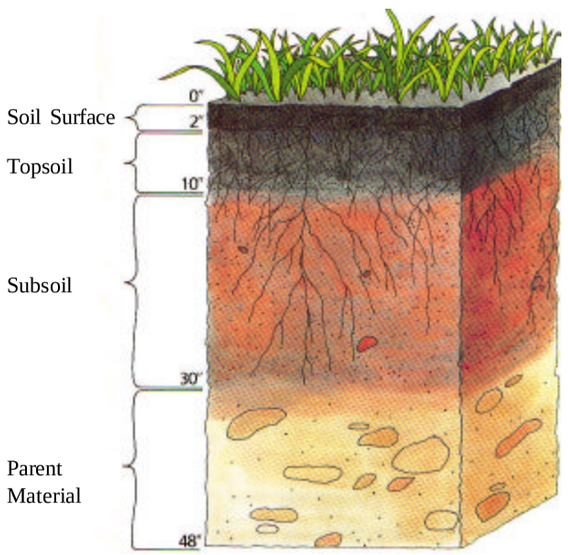
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independance Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Printed by University of Nebraska Cooperative Extension using Environmental Quality Incentive Program (EQIP) educational assistance funds provided by Cooperative Agreement 74-6526-7-951.

Nebraska

Soil Quality Card



Developed by:

- Nebraska Farmers
- Natural Resources Districts (NRD)
- Nebraska Cooperative Extension
- **Soils Staff** of the Natural Resources Conservation Service (NRCS)

The soil quality assessment card was developed by farmers in collaboration with the Natural Resources Conservation Service (NRCS), Natural Resources Districts (NRD), and the University Nebraska Lincoln. It has been locally adapted by Nebraska NRCS as a field tool for Nebraska farmers, educators, and agricultural support professionals such as soil conservationists, Cooperative Extension educators, or agriculture industry personnel.

Regular use will allow you to assess current soil quality conditions, record changes in soil quality, and compare fields and management practices. The card is most effective when filled out by the same person over time. It provides you with a qualitative assessment of the soil. Evaluation scores do not represent absolute measures or values. Use the card in more than one spot on your field to obtain a more representative assessment.

For help in using this card or if you have any questions regarding it, please contact your local NRCS Office:
Telephone # _____
Fax # _____

Suggested Assessment Calendar	
1. Soil Structure	After rainfall events or irrigation
2. Biological Activity	At planting
3. Erosion	After harvest and during highwind periods or after heavy rain. Also assess after planting.
4. Soil Test Organic Matter	After reviewing soil test data. Assess in fall or spring.
5. Soil compaction	Spring to when plants are about 10" tall.
6. Plant Health	Summer to late summer.
7. Residue	Post harvest, pre plant, growing season
8. Infiltration	After rainfall events.
9. Water Holding Capacity	After soil is at field moisture capacity. Assess during growing season.
10. Other	
11. Other	

NRCS Soil Quality Card

Date:_____ Crop:_____

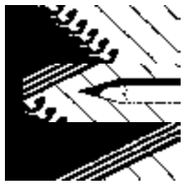
Field location: _____ Year of planting: _____

Soil moisture: ☐ Good for planting ☐ Too dry for planting ☐ Too wet for planting

Indicator	→ Preferred 1 2 3 4 5 6 7 8 9 10	Observations	Rating the indicator 1	5	10
1. Soil Structure			Hard with no surface residue. Powder when dry, crust easily after a hard rain. Large, hard clods, very hard to prepare seed bed.	Crumbles with pressure. Some residue and organic matter. Crust only in areas such as wheel tracks.	Very crumbly. No crusting, residue prevents surface hardening. Mellow, ready to plant.
2. Biological Activity			Very old residue that doesn't decompose; no sign of soil life (insects, worms, etc.)	Moderate decomposition of residue; few soil organisms (insects or worms)	Rapid decomposition of residue; many soil organism and diverse population
3. Erosion			Signs of severe wind stress or gullies throughout field	Adequate control after windy period or hard rain	Excellent control after hard wind or hard rain.
4. Soil Test Organic Matter			Downward trend <0.6% organic matter	Static trend 0.8% to 1.2% organic matter	Upward trend 2.0% or above organic matter
5. Soil Compaction			Hard pan stops roots, roots grow laterally	Few roots grow through, some grow laterally	Roots grow straight down
6. Plant Health			Yellow, thin stalks	Yellow-green, mediium stalks	Dark green, thick stalks
7. Residue			Little or no surface residue Few roots in subsoil	Moderate surface residue, moderate roots	Heavy surface residue Dense roots, tunnels of decomposed roots
8. Infiltration			Ponding visible	Some ponding - visible after 12-24 hrs.	No ponding
9. Water Holding Capacity			Crops wilt quickly after water events	Crops curl or wilt but come back quickly	Crops tolerate droghty conditions
Other					

How to use the card

1 Enter date, location crop, and soil moisture level in the assessed field.



2 Use a shovel or a soil probe to probe the soil. Rate each indicator on a scale from 1 to 10. Refer to the rating guide to determine the score for each indicator.

3 Record your observations. Review and evaluate your scoring.

4 On the back page, write down current management practices. Record ideas for changes in management that you will implement as a result of your assessment.