Tri-Basin Irrigator

Volume 23, Issue 11 **September 28, 2023**

Program Information

EQIP: **Funding has ceased for 2023 applications. Projected cutoff date for 2024 funds is mid-November.**

CSP: **Funding has ceased for 2023 applications. Projected cutoff date for 2024 funds is mid-November.**

NSWCP: **For irrigation practices, have your application complete by Thanksgiving for the next opportunity for 2024 funds. The exception is flow meters are funded each month. Applications must be signed by the owner.**

ENERGY EFFICIENCY GRANT: **Next sign-up deadline is December 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

Oct 2: CNPPID Board of Directors Meeting
Oct 9: Columbus Day – Gov't offices closed
Oct 10: TBNRD Board Meeting

Extra, Extra, Extra!!!

Nitrogen Efficiency Forum

Locally developed nitrogen communication tool to share thoughts, trials, etc. related to nitrogen fertilizer. Goto: *https://nitrogen-efficiency.com/* to read. Register to add your own comments or start a new topic.

Fertilizer and Water Management for Irrigated Pasture
UNL Video: *https://www.youtube.com/watch?v=g8nYIzYUXAc*

What is 1 inch of water?

- It is one 130 acre pivot pumping 800 gpm for one circle.
- It is 3.5 million gallons.
- All pivots in the TBNRD saving 1 inch of water equates to supplying the TBNRD population for 6.8 years based on Holdrege's average annual water consumption.

Take time to stop and enjoy the simple pleasures of life.

Until next season, may you be blessed with a safe and wonderful harvest, winter, and spring!!!

Curtis's Column

USDA United States Department of Agriculture
Natural Resources Conservation Service

FINAL Tri-Basin Irrigator for 2023 with Closing Comments!!!

It's time to close the door to another season of the Tri-Basin Irrigator. I hope it provided you with valuable information. More focus was on nitrogen this season, and deservedly so. Both water QUANTITY and QUALITY for both GROUND and SURFACE water are terribly vital in so many ways.

A number of years back I did a presentation on desertification to students through a program run through the local ESU. In developing that presentation, it was very eye opening learning that areas across this planet were once viable and prosperous. The resources became abused and were depleted to a point that these viable areas no longer exist or are barely surviving.

I work with water so that is where I lean. But protecting all of our natural resources is so critical. Another big one is soil health. Watching cover crops grow in this area has been a nice change in the positive direction towards soil health.

Nebraska is blessed to be enriched with ground water, the sandhills, and some of the best soils in the world. In our local Tri-Basin NRD, we are blessed with the same things along with the Nebraska State Soil (Holdrege Silt Loam) and CNPPID's canal system bringing surface water from the mountains.

Can these resources be degraded to a point of no return? Can desertification ever take place here? If your answer is, that will never happen here, well, then I disagree. Never is a mighty long time and I just can't commit to NEVER. You see it just outside the water mound along the southwest and southeast part of the TBNRD. Ground water depletions to the point of needing allocations. If we understand and fear that it can happen, then we have a tendency to focus on it and protect what causes our fear. An example of this for me is going to the store with $20.00 to purchase a soda pop. Not much fear. But with $5.00, now I fear the lack of money after the purchase. Therefore, I need to focus on the choice of that immediate want of a soda pop or what I may need that money for in the future.

Back in high school, the Husker football team continues their 9 win seasons and were always in the hunt for National Championships. I remember asking a buddy, what do you think it will be like when the Huskers start losing? His answer was that would never happen. Now I age myself, but some 20 years later, it happened. So I hope that is not our mindset when it comes to protecting our water, both quantity and quality. Maybe it's inevitable, maybe not, but I do think it's our duty to protect what we have today so that our kids, grandkids and future generations can enjoy life's pleasures like we benefit today.

Parents work towards putting their kids in a better place, whether it be getting them through college, investments, more land, etc. What about our natural resources? Are we striving to provide the best water and soil for our kids? And are we showing them how to care for the land and the water? A quote from Antoine De Saint Exupery relates to this: **"We do not inherit the earth from our parents, we borrow it from our children."** Maybe our kids are taking care of us. Hmmm?

In closing out 2023, I sometimes feel like my purpose in life is to either make people think or to say things, right or wrong, to stir up conversation. We are all in this together and we all need to play our part in trying to make a better life for tomorrow.

CNPPID Notes

Aquatic Weed & Algae Growth In Surface Water

Central surface water enters the canal system basically free of nitrates, but every irrigation season there is an increased maintenance cost associated with unwanted aquatic growth like moss caused by nitrates. Excessive growth of aquatic weeds and algae slows water movement, clogs water intakes, and makes the delivery of the customers water difficult and expensive to manage. So, why do nitrates cause aquatic weeds and algae to grow in surface water? It's the same reason it helps corn but it's immediate contact in water activates an overgrowth of algae or moss in a very short period of time (it can bloom overnight). Excess nitrogen in the form of nitrate and phosphorus is considered by many scientists to be the main culprit of algae blooms. Nitrogen and phosphorus are essential to aquatic weeds and algae production. The bloom process occurs because as aquatic weeds and algae quickly absorb the nutrients, it then produces more and more aquatic weeds and algae (as the nutrients are available).

The source of these nutrients into the customers' surface water is caused by runoff from agricultural fields and feedlots, pivots going over the canal with chemigation systems and pivots going over the canal that pump groundwater that is already high in nitrates. Steps to prevent excess nitrogen in surface water can be achieved by applying fertilizers at the proper amounts and at the right times, inspecting chemigation equipment, not chemigating over surface water or turning pivot nozzles off while going over surface water. Preventing runoff from agricultural fields and feedlots, keeping livestock and their waste out of surface water and not applying nitrogen directly to surface water protects and will help stop the unwanted aquatic growth, while protecting our property and health.

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

Tri-Basin NRD News

Year-End REMINDERS

Chemigation Inspections

2023 follow-up inspections must be scheduled immediately.

Flow Meter Readings

Irrigation Water Management (Water Use) Forms are ready to pick up in our office or you can call us at 308-995-6688 to mail them to you. When picking up irrigation pipe or bedding down irrigation engines, remember to record the ending meter readings.

Tri-Basin Staff to Inspect Meters

It is time for Tri-Basin NRD staff to begin 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 Ranges 16W, 20W, and 23W, and in 5-22 of Gosper County (Union Township).

If you have irrigation wells in these townships and you put your meters in storage for the winter, please call the Tri-Basin NRD office at 308-995-6688 to schedule an inspection.

Nitrogen Management Papers

Phase II and III Groundwater Management areas can pick up your forms to report your Nitrogen usage for the year.

Nebraska Extension Extras

First Fall Killing Frost Prediction

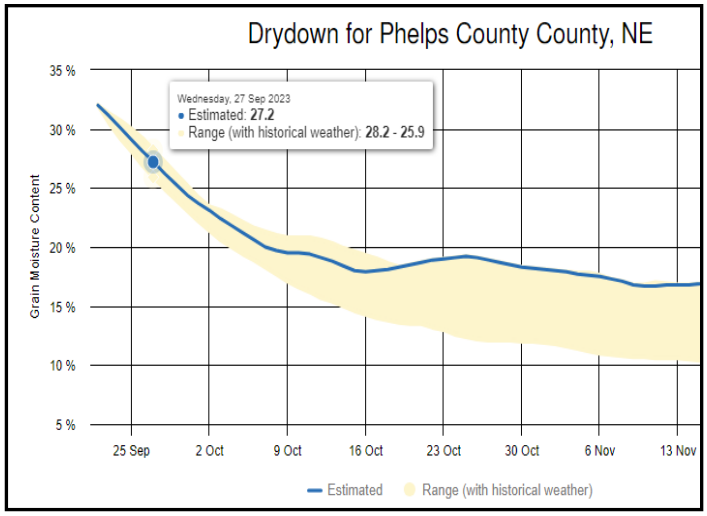
Most producers typically use **28°F** lowest temperature (just before dawn) for crop freezing injury assessment. According to the National Weather Service, historically, this Holdrege pegged low temperature range is **Oct. 5 – Nov. 6** (**average Oct. 19).**

For grain sorghum, the temperature needs to drop lower than **24°F** to actually kill these plants. Historically, this first Holdrege low temperature is **Oct. 6 – Nov. 21 (ave. Oct. 30).**

So, why is this important? Prussic Acid toxicity can occur when livestock graze sorghum tiller regrowth at the base of plants after light frosts. Therefore, pause cattle sorghum fields, grazing after a light frost for about a week. Or, wait for sorghum plants to be actually killed (usually around Halloween) before turning cattle out for grazing. Further, for reducing potential nitrate toxicity on crop stressed stover fields, turn cattle out in the afternoon on a partially or full rumen to reduce risk.

Corn Drydown Calculator

Iowa State University offers a free northern Corn Belt corn drydown algorithm grain moisture content assessment tool. Please note the forecast for our fall corn drydown is predicted to be slower than normal. This is a simple step tool where you can input your field location with a click; provide an initial date; corn grain moisture content; and run (generate a graph). Goto https://crops.extension.iastate.edu/facts/corn-drydown-calculator.



Pre-harvest Stalk Rots Assessment

Corn and sorghum stalks can be impacted two common root rot diseases (Fusarium stalk rot and/or charcoal rot). Both diseases can survive in crop residue and last in soils for many years. Prior to harvest, the most notable symptom is lodged stalks and downed corn and sorghum. However, symptoms generally appear several weeks after pollination with plants appearing to mature prematurely. The leaves become dry (forming a grayish-green appearance similar to frost injury).

During this time of year, diseased stalks can be easily crushed when squeezed between the thumb and finger. Fusarium stalk rot will have a salmon color with the stalk pit having a shredded appearance. In contrast, charcoal rot will have a grayish-black color. Although charcoal rot seems more prevalent during drought, this disease is not caused by dry weather, but weakens plants.

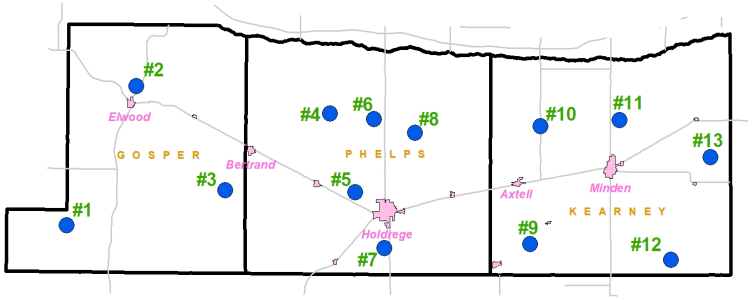
See NebGuide 1898 "Common Stalk Rot Diseases of Corn" https://extensionpublications.unl.edu/assets/pdf/ec1898.pdf.

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) = Evaporation x Kc

	Sept 11 – Sept 17		Sept 18 – Sept 24	
Site	Evaporation	Rain	Evaporation	Rain
1	1.20	0.08	NA	NA
2	1.10	0.26	NA	NA
3	1.10	0.10	NA	NA
4	NA	NA	NA	NA
5	1.10	0.00	NA	NA
6	0.90	0.05	NA	NA
7	1.20	0.02	NA	NA
8	1.10	0.00	NA	NA
9	1.10	0.03	NA	NA
10	1.20	0.00	NA	NA
11	1.20	0.00	NA	NA
12	1.10	0.00	NA	NA
13	1.00	0.00	NA	NA



2023 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 (R5.5-Full Dent – 1/2 Milk Line to R6-Black Layer stage): Black Layer signals the end of the 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%.

Avg. daily water use from Sept 18 – Sept 24 was NA"-NA".

Soybeans (R7-Beginning Maturity to R8-Full Maturity stage): R7 is when 0.0 inches of moisture is needed for yield. At R8 (Full Maturity), is when 95% of the pods have reached their mature pod color.

Avg. daily water use from Sept 18 – Sept 24 was NA"-NA".

Sept 18-Sept 24 (12 of 13 NAWMN sites reporting): Average weekly rainfall was NA (range NA to NA. Average weekly ET for corn was NA and for soybeans was NA.

Crop ET Information

NAWMN: https://nawmn.unl.edu/ETdata/DataMap
TBNRD: https://www.tribasinnrd.org/tbawmn
UNL CropWatch: https://cropwatch.unl.edu/gdd-etdata **NEW**
Texting (Daily): Sasha @ TBNRD: 308-995-6688
Email (Weekly): Curtis @ NRCS: 308-995-6121, Ext. 3

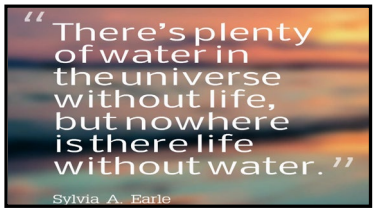
CORN STAGE		DESCRIPTION
R5.5	Full Dent / 1/2 Milk Line	The starch line is 1/2 way down the kernel. Top 1/2 is hard, bottom 1/2 is softer near the cob.
R5.8	3/4 Milk Line	The starch line is 3/4 the way down the kernel, moving towards the cob.
R-6	Black Layer	The starch line has advanced to the cob. Physiological Maturity. Black layer formed, kernel moisture is between 25%-35% moisture. 0.0 inches needed for yield.

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 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*.

	Sept. 28, 2023, 8:00 AM	1 Year Ago
El. & Cap. – Lake McConaughy	3230.9 ft - 51.3%	3217.8 ft - NA%
Inflows to Lake McConaughy	1850 cfs	1040 cfs
Flows on the North Platte at North Platte	NA cfs	404 cfs
Flows on the South Platte at North Platte	238 cfs	60 cfs
Flows on the Platte at Overton	705 cfs	565 cfs



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:	Sept 14 – Sept 27	May 1 – Sept 27
Elwood 1.81 mi. NW:	4.35	19.80
Loomis 0.2 mi. SW:	3.03	19.28
Holdrege 1.7 mi. W:	1.64	15.85
Minden 7.2 mi. W:	1.93	15.06
Minden 5.8 mi. E:	2.63	13.62

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@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
308-955-6688

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

Nitrogen – Can we save money!!! Can we Clean up the Water!!!

As an NRCS employee, my job is to protect our natural resources by working with landowners and operators. This year I focused on nitrogen. I do not claim to know everything, but I feel like I do know some things. I do not make money off the information I provide. My goals are 1. To try and save producers money with their nitrogen and irrigation management; and 2. To keep ground water quality in our thoughts since I believe it will affect us some day in some way. If we can **manage our nitrogen applications to the 4 R's (Right Source, Right Time, Right Rate and Right Place)** and maximize our net profit, then we can pat ourselves on our backs.

We have come a long way from the gravity days of over applied nitrogen, applied all up front, and then losing it to leaching and runoff. Today, pivots and SDI systems can split apply nitrogen at proper times when the crops need it (**Right time**). Application equipment can apply varying rates across the fields and pivots can shut nozzles off to avoid nitrogen applications on areas it's not needed such as CNPPID's canal, old reuse pits, or wetlands, all of which can leach nitrates into the ground water as well (**Right Place**). There are varying sources of nitrogen to fit our operation (**Right Source**). However, there is still more to do in getting everybody converted to precision and split applications and reducing gravity irrigated fields.

Once everything is in place, the last of the 4 R's (**Right Rate**) is yet to be accomplished. I believe there is room to improve the amount of nitrogen we apply to our crops which would be more dollars in our pocket. I stressed proper irrigation over the last number of years with this newsletter. This year I shifted my focus to nitrogen.

Tri-Basin Irrigator nitrogen articles in 2023.

If you lost your newsletters, you can go back and look at these on the TBNRD website at: *https://www.tribasinnrd.org/information-outreachnews/tri-basin-irrigator-newsletter*. Or you can contact Curtis Scheele at *curtis.scheele@usda.gov* or call him at 308-995-6121, Ext. 3 to request a copy.

- Issue 1 dated May 11th: Free nitrogen from irrigation water.
- Issue 2 dated May 25th: Nitrogen introduction in the TBNRD.
- Issue 3 dated June 8th: Research, demos, and other information.
    - UNL's On-Farm Research: *https://on-farm-research.unl.edu/*
- Issue 4 dated June 22nd: UNL nitrogen calculator.
    - UNL Nitrogen Calculator: *https://cropwatch.unl.edu/download-your-corn-nitrogen-calculator*
- Issue 5 dated July 6th: Realistic yield goals.
- Issue 6 dated July 20th: Curtis's UNL calculator example.
- Issue 7 dated August August 3rd: UNL TAPS comparisons.
- Issue 8 dated August 17th: UNL On-Farm research results with Pivot Bio.
- Issue 10 dated September 14th: Lawn fertilizer.
    - UNL turfgrass: *https://turf.unl.edu/turf-fact-sheets-nebguides*
- Issue 11 dated September 28th: CNPPID's article on nitrates in the canal system.

There are high nitrates in our ground water. It's not a secret. The public sees it. Do we continue to do what we are doing or do we try to clean up the water ourselves before someone else requires us to? Will we ACCEPT or will we COMPLAIN about the requirements? Will the results be positive or negative? Do we bury our head in the sand and hope the nitrates magically disappear; that result passes it on to our children and grandchildren. Is that truly what we want? I believe we ALL need to do our best with our current abilities. It will not be an overnight success. But, as someone once said, to eat an elephant, we must take one bite at a time.

In an attempt to try and clean up the water ourselves, what would it look like for us in the TBNRD area to clean up our ground water? What roles would people have to play or adjust to?

The first thing in my mind that needs to happen is to know who we are and what roles we need to play as individuals for the common good of cleaning up our water. We need to be honest with ourselves. This could strike some of us harder than others. Once we are past that point, then positive work can be done. If we are afraid to tackle this, then someone else can tell us how to clean up our water. Is that what we want?

Will our local TBNRD Board need to ratchet up regulations? Will there need to be a local groundwater cleanup taskforce? Will fertilizer dealers help or fight the effort in order to protect their bottom dollar? Will crop consultants help or fight the effort in order to protect their jobs? Will producers make an investment in their operation by being involved in fertilizer recommendations and irrigation scheduling? Will producers, fertilizer dealers, and crop consultants work together to hold each other accountable but yet not be so quick to blame the other party when something goes awry? Will cities, golf courses, businesses, homeowners, etc. play a part with proper utilization of nitrogen on lawns, parks, ball fields, etc? Again, work together like the producers, fertilizer dealers, and crop consultants as mentioned above. Does there need to be more government programs, practices, or enhancements to get the infrastructure needed? Do current programs need to be stricter or require more accurate documentation for nutrient management practices or enhancements?

I believe ALL OF US will have to play a part in order to clean up our water. ALL OF US will have to hold ALL OF US accountable. ALL OF US will have to work together for the common good, knowing that each year can be different for various reasons. There will have to be sacrifices. **Or we can let others outside of the TBNRD area tell us how to clean the water.**

What do I see and hear? Points to ponder?

- I have seen both nitrogen recommendations that are respectable and I have seen recommendations that make one cringe; then I hear that those recommendations are what was actually applied. Ouch! How can we have so much variability? I have seen full credits, partial credits and no credits for nitrogen on organic matter and irrigation water. Different folks also have their own starting methods prior to granting the nitrogen credits. There is also a mixed bag of soil tests from none to surface only to surface and deeps to 1 sample per pivot to 4 samples per pivot.
- I hear it many times from many folks, including producers themselves, I have seen it from research, and I have seen recommendations and application amounts. Too much nitrogen is being applied. I have run comparisons from the TAPS program. I have seen UNL's On-Farm Research results. Some have been attachments to my newsletters this year.
- I have heard from producers themselves that have applied less nitrogen from 30-70 lbs with no loss in yield. Are those producers continuing that path or have they gone back to their old ways? I hope they have continued that path and are saving money or increasing their net profit as well as expanding this to the rest of their operation. Along with continuing this effort to keep tweaking their operation.
- I hear that if I continue to apply less, I will mine the soil. I am not sure what is being mined? We are talking nitrogen reduction causing the mining which sounds like mining extra nitrogen. Should that extra nitrogen be in the soil and leaching into the ground water? My thought is the nitrogen recommendations are based off soil tests so shouldn't the tests show all the nitrogen in the soil? As long as we are not losing yield, the organic matter ought to remain the same so shouldn't be mining that. Yet I see folks applying those lesser nitrogen amounts without issues, so is there mining?
- I hear that we need more information. When that information is available, then I hear "That doesn't work on my farm." Maybe so. But everybody does have their own demo fields with their own operation. What better information can one get other than from one's own operation on one's own fields.
- I hear I can't afford to take a yield loss due to nitrogen in a year. So are we to cover the basis every year to guarantee no loss in yield because of nitrogen? Do we really know how many lbs. of nitrogen that guarantee is? Maybe we are above that level? Is that really saving money? Is that really cleaning up the water? How many years of loss is one taking versus how many no loss awesome years? It may appear one is losing money from short term results, but in the long term, maybe one is making more money?

None of this Matters!!!

When all is said and done, no matter what I have written, presented, or said; no matter whether or not you trust the Calculator to make recommendations, no matter whether or not the research works on your farm, no matter all the excuses, no matter anything at all, it is really quite simple. **If you want to save some nitrogen costs and improve your net profit, then here is my simple method to accomplish this.** Manage and monitor your own fields in your own way. That is the true test. Below are my tips on doing that.

- Pick a field.
- Work up a game plan with your fertilizer dealer and/or your crop consultant.
- Apply half the field with your usual nitrogen amounts.
- Apply the other half, or smaller area if you can monitor it, with 5, 10, 15, 20……., 65, or 70 lbs less nitrogen, whatever you feel your risk can handle.
- Monitor the results.
- If no loss in yield, repeat next year with the same consistency in calculating your nitrogen recommendations and apply the same amount less. Or more if you wish.
- Continue lowering the nitrogen amounts until you start to see some negative impacts. Then back off. Finding the minimum nitrogen requirements can take many years depending upon your risk comfort level.
- Monitor multiple years because every year is different due to so many variables. Don't just rely on one year with good or bad results.
- You might be surprised what you might end up learning in this process and how much money you might be able to save in the long haul.

I hope we have a desire to increase our profit margins. Along they way, maybe we can reverse the trend of increasing nitrates in our ground water.

"If you always do what you've always done, you'll always get what you've always got." by Henry Ford.