North Plains Water News

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"It Appears My Hypocrisy Knows No Bounds..."

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It would not take a very deep draw into recent history to recall my adamant (and public) statements against pre-watering. "It is a bad practice." "It is only 50% efficient." "You can start water after planting and have plenty of time to fill the profile." On and on and on.

And this season, we pre-watered the pivot corn at the North Plains Water Conservation Center (WCC).

I have taken a lot of flak for that decision, namely in the jocular mocking of "Do as I say, not as I do." A wise friend even called me a hypocrite!

Frankly, the current me is going to need to settle-up with the previous me.

Joking aside, the topic of pre-watering was a recurring discussion point for me all summer amongst conscientious irrigators. I was cornered into making a convincing argument FOR pre-water. I felt like I was in a mirrored point and counterpoint discussion. That is when I realized; the principles of pre-watering have not changed but the parameters of North Plains production systems have.

The first parameter change is the corn and cotton rotation. Cotton and corn are complimentary water users and are proving to offer desirable rotational benefits. In 2008, there were approximately 50K acres of cotton in the region and in 2018 there were approximately 500k acres. The reality is that cotton is highly effective at scavenging water from the soil as the crop finishes. Combined with a droughty

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Well Capping Program Update

In the North Plains Water News Fall 2019 edition, there was an article about the district's Well Capping Program. A capped well is a non-deteriorated well that is properly sealed with a covering capable of preventing surface pollution from entering the well and sustaining weight of at least 400 pounds. The cap must be constructed in such a way that it cannot be easily removed by hand. Over the years, district staff have followed-up on reports of open wells, or insufficiently capped wells, as part of routine well site inspections. Texas law and North Plains GCD rules place the responsibility to properly seal or cap wells on water well drillers, water well pump installers, and landowners.

In the Spring of 2019, the district prioritized assuring that all non-deteriorated wells that were identified as "capped" by well owners throughout the district are properly capped or sealed to prevent groundwater pollution and eliminate a serious safety hazard. When the district finds a well that is not sufficiently sealed or capped, district staff will attempt to temporarily seal the opening to prevent contamination. Members of the district's staff carry 16-inch diameter steel plates that can be placed on open well casings and sealed with adhesive as a temporary cap, if there are no obstructions at the surface. The owner can weld or bolt the owner's own cap on a well, or simply use the steel plate supplied by the district. The steel plate is free if the owner uses it to cap a well.

Sometimes, a well requires more work to properly seal the well casing because of obstructions at the surface. The district requests that those owners address the issue as soon as possible. District staff then rigorously follow-up with the landowner. Most well owners are extremely cooperative when asked to perform additional work to seal well casings.

In the spring of 2021, the district should finish its initial site inspections of almost 2000 wells that were originally identified as capped. The district's program will not stop when it completes the initial inspections. Members of the district staff will continue to reinspect capped wells periodically. Once a well is capped by the owner, or by staff, the well is rescheduled in the district's well inspection program every couple of years to ensure the well stays properly capped and sealed.

You can help reduce the risks of uncapped wells by contacting the district If you find an open hole that you think may be a well. Please maintain a safe distance from the hole and contact the district office at 806-935-6401. The district will address the issue.

As part of the district's open well-capping program, field staff carry 16-inch temporary caps to place over holes. The capping program reduces the risks of contamination of the aquifer and injury to people or animals.

2020 ANNUAL PRODUCTION REPORTS SCHEDULE:

The schedule and requirements for the distribution and receipt of the 2020 Annual Production Reports is as follows:

From December 2 to December 4, 2020, the North Plains Groundwater Conservation District mailed or emailed the 2020 Annual Production Reports to all designated recipients. The recipient could be a specific person, an authorized agent representing the farmer, or the owner or lessee of the property.

The recipients are encouraged to turn in their production reports as soon as possible after the 2020 watering schedule, as there are thousands of reports that must be processed and filed through the district office no later than March 1, 2021. All reports received after March 1 at 5PM are considered late and are subject to daily late filing fees set by the board of directors. Late reports will also not be allowed to accumulate conservation reserves for the year.

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winter, this may require starting the irrigation system prior to corn planting to secure adequate soil moisture to depth by the time the corn crop reaches its Critical Management Point.

The Critical Management Point (CMP) is the calendar cross-section when the soil profile must be full to provide sufficient soil water for the duration of the crop. This point occurs when the crop's daily water demand exceeds the irrigation system capacity. The irrigation start date can be strategically planned by working back from the projected CMP. Planting dates and crop water needs influence the CMP as well as irrigation system capacity (Gallons Per Minute (GPM) / Acre). (See Figure 1).

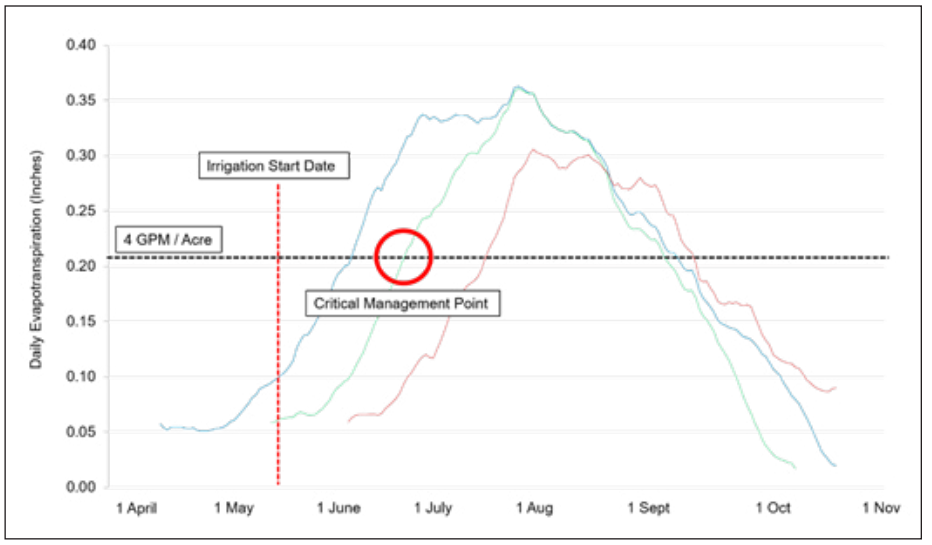

Figure 1: Daily Evapotranspiration for corn crops at different planting dates. Notice the red circle that highlights the intersection of daily corn water use and available irrigation water at 4 GPM / Acre for 15 May planting date. In this specific example, nearly 7 acre-inches can be applied between planting and the Critical Management Point while the plant requires 3.75" during the same period. In this example 3 acre-inches can be added to the soil profile after planting and pre-water would likely not be necessary

This leads to the second parameter change; corn planting dates have moved later in the calendar year. This practice was introduced because corn matures based on accumulated heat but grows based on time. In the North Plains, we can improve early vigor, avoid pollination in late June, and lengthen the grain fill period by shifting the entire crop to the right. We also clip the coupon of dramatically reducing the applied irrigation on corn. However, a late plant corn crop will accelerate very quickly after planting in the warmer soil and atmospheric conditions. Growth that would require 60-days for an April planted crop may only take 40-days with a late-May corn crop.

This early season vigor relates directly to early season irrigation since the time to fill the soil profile between planting and CMP is condensed. This is magnified by the increasing summer temperatures and corresponding crop size. The effect is that irrigation initiation will occur closer to the planting date and in certain situations, the irrigation start date may occur prior to the planting date, thus, pre-water.

The third changing parameter is lower irrigation system capacity. If the soil profile requires a certain quantity of water to be full by the CMP and the irrigation system capacity is known, an irrigation start date can be determined. A reduced irrigation system capacity will require a longer period to fill the profile, meaning that the irrigation system must be started earlier. It was not long ago that 7 GPM / acre was required for corn, then 6, and then 5. In 2020, we are growing "full-yield" corn on 4 GPM / acre. For reference, 4 GPM / acre equates to approximately two-tenths of an inch per day depending on application efficiency. If there is a void of three inches in the soil profile, it would take 15-days of irrigation to fill the profile, above and beyond the early season crop needs. If the young plant is using a tenth of an inch of water, this task will take 30-days, etc.

The last point is that sometimes you don't know what you don't know. In 2019 we advanced from in-season only soil moisture probes and installed permanent soil moisture probes at the Water Conservation Center. The permanently installed soil moisture probes over-wintered at the WCC and allowed monitoring continuity from the start of the 2019 cotton crop. (Recall that traditional probes are installed AFTER germination.) As 2020 planting approached, it became apparent that the cotton-depleted profile would leave our late-plant corn short on water unless we applied 2.75" while watering in the pre-emergent herbicide in mid-April. Immediately following our irrigation event, we had confidence that we had effectively accomplished our pre-watering goal and didn't irrigate again until planting on 21 May. The permanent probes contributed to two early season decisions prior to the date when seasonal probes are typically installed. Monitoring the probes diligently allowed for 8-days with the irrigation system off in late July, also, reclaiming a bit of the gross water applied as pre-water.

At this point, I would be remiss to not state some techniques for good early water practices. Larger applications will promote deep soil filling where water can be stored for in-season use. A good strategy is to slow down the pivot to an application depth just short of irrigation run-off. In Pullman and Sherm type soils, this will be approximately 1.75" to 2" per pass. Larger applications will allow for the volume and momentum to take water deep into the soil profile. Good residue management will allow for deeper applications before run-off and give vertical channels for better percolation.

If pre-watering is necessary, it is wise to use all means possible to reduce evaporative losses. Avoid irrigating in extremely windy conditions and take the effort to place the pivot in bubbler mode with LEPA drops. Timing of pre-water is a pertinent decision as well. A mid-winter application may be merited in a very low irrigation capacity system to take advantage of reduced evaporation days. Delaying pre-water until closer to the planting date can allow for natural soil filling to occur via off-season precipitation. Coordinating pre-water with a rainfall event can help push water deeper into a very dry profile. In many cases, pre-water will not be necessary and filling the profile to 100% full via pre-water is still not advised.

The production systems in the Texas North Plains have changed dramatically in the last ten years. The cotton and corn rotation, delayed corn planting dates, reduction in irrigation system capacity, and the tools to monitor off-season soil moisture all contribute to the fact that sometimes, pre-watering is indeed a good practice. The parameters change, but the principles remain. "My hypocrisy only goes so far."

2020 Cotton and Conservation Series

This year marks the second growing season for the district's Cotton & Conservation video series. With the help and information from Texas A&M AgriLife agents, a total of four locations were covered with updates roughly every three weeks. The series featured the field at the North Plains Conservation District's Water Conservation Center, a field in Dallam County that was involved in the series last year, a new location in Hutchinson County, and another new location just north of Sunray, TX. Over the course of the series, the Sunray location was discontinued due to hail damage on the demonstration portion of the field and the Dallam and Hutchinson County fields started late due to COVID-19 and scheduling conflicts.

The Cotton & Conservation series was designed as a multi-year program, allowing for comparison of conditions from one growing season to another. Each year can present new challenges, as can different locations. Through this video series, the district hopes to give stakeholders well-rounded information and insight into what is happening in other fields in the area. This also provides the opportunity for growers to see what insecticides, plant growth regulators, and other products might be in use and how well those treatments are working. The timeline the Cotton & Conservation video series produces is also important data growers can use to understand things like when to apply treatments and what maturity their crop should be at based on the planting date.

To view these educational videos, check out the North Plains Groundwater Conservation District YouTube channel. All Cotton & Conservation videos can be located under Cotton & Conservation 2019 or 2020 playlists. Also be sure to follow our social media to see more updates on all of our content!

The Cotton and Conservation video educational series is a cooperative effort between the district and Texas A&M AgriLife. The series highlights some of the principles and challenges of growing cotton in the northern Panhandle.

The Marvel of Telemetry

by Dakota Young, Natural Resource Specialist

Telemetry sounds like a comic book hero's superpower, but in practice, it is not that complex, and does not require a flying man in spandex to maintain. Telemetry is simply a precise communications process that allows you to measure and collect data at remote or hard-to-reach locations. This kind of system is used in a lot of fields and occupations, from agriculture to healthcare to meteorology. Each application can look different.

Sensors and information transmission from a weather balloon is a form of telemetry, and so is the use of patient monitoring devices in a hospital. Although they can look different, each telemetry system is made up of four basic parts:

- Sensors are used to measure and collect information in remote locations.
- Devices such as transmitters, Remote Terminal Units, and Programable Logic Controllers are connected to these sensors so they can submit all collected data to the rest of the system.
- The communications technologies found in a system can use a wire (e.g. telephone lines) or utilize wireless technologies, such as radio, satellite, or bluetooth.
- Various programs allow the data to be turned into useful and accessible information for system users.

The district uses telemetry in a very important way. Technical staff track the water level in various locations using 45 telemetry wells across the district. After the equipment is installed and maintained, it records a water level. Once a night it sends the data to the water district's monitoring technologies. That data is used for research, presentations and conservation insight.

NPGCD field staff routinely monitor telemetry wells, perform planned maintenance, clean and mow around well sites, replace damaged parts, and complete inspections to ensure proper conditions to send data. You can help by reporting any well concerns to the district at 806-935-6401.

Technical staff monitor wells remotely to collect data and ensure proper function.

PRODUCTION REPORTS SCHEDULE:

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The reports are not considered filed until they are checked for accuracy. A complete report includes all required documents attached based on the metering method selected for reporting.

For instance, 12 months of gas bills are required for those who are reporting based on natural gas usage. Gas usage may be shown by separate months or using a one-page summary for the year. Printed PivoTrac reports are required for those who choose to report using PivoTrac.

Please contact the district office if you have questions about filling out the report or what is required. Due to Covid – 19 restrictions, you are encouraged to do all business by phone, email or mail as much as possible, as we will have to limit the number of people in the office at a given time. If you absolutely need to come in, please schedule an appointment with one of the administration staff. All in-person district business will be conducted at the front desk or in the general manager's office to ensure compliance with CDC social distancing requirements. Please be sure to call before you come to the office as we may or may not be able to accommodate you at that specific time.

There is also a drop box located on the north side of the building, if you wish to hand-deliver the reports.

Please ensure all your reports have a signature on the front page and all required documentation is attached. A report that is not signed or missing required documentation is considered an incomplete report and subject to late fees and loss of conservation reserve for the year.

Thank you for your cooperation. Visit www.northplainsgcd.org or call our office for assistance with reporting, at 806-935-6401.

Preventive Maintenance on Well Check Valves Can Head-Off Common Problems

by Lewis Orthman, Natural Resource Specialist

With irrigation wells being shut down for the winter, it is prime time to conduct some preventive maintenance on well systems. One item of particular interest is the well's check valve or chemigation valve, which normally includes the spring-loaded swing check flapper valve, a vacuum-relief device, and an automatic low-pressure drain (LPD) for short.

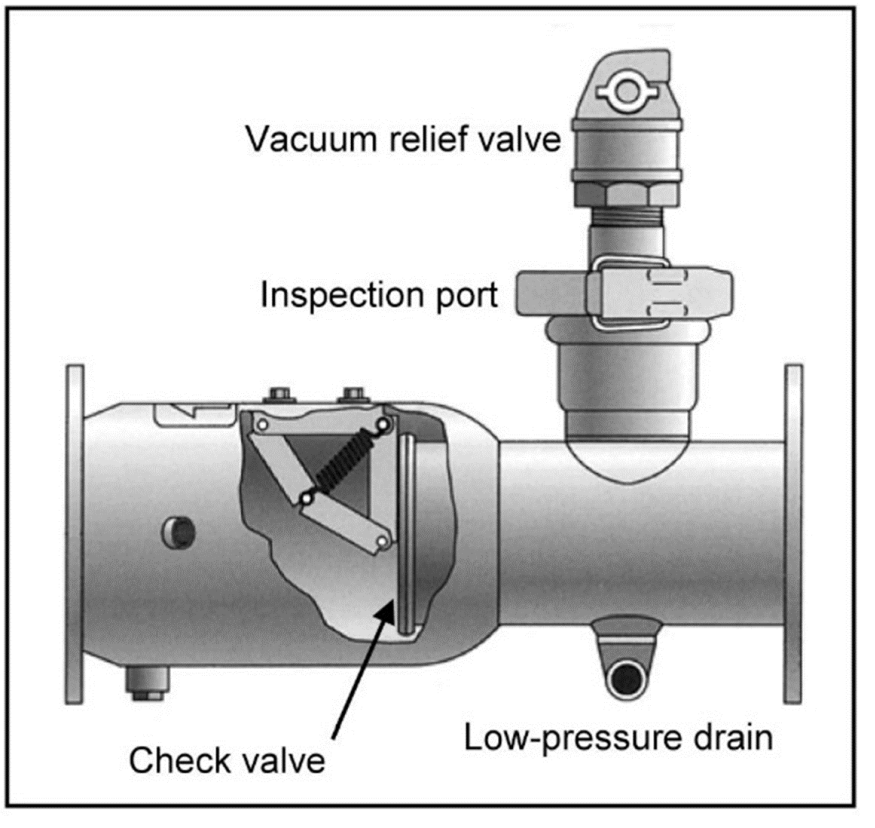
The chemigation valve is an important part of inspections conducted by the NPGCD field staff, since this required piece of well equipment prevents pollutants from running back into the aquifer. One of the main items found out of compliance during inspections is a nonfunctional LPD.

The LPD comes into play when the well is being operated and chemical fertilizers or other foreign substances are being injected into the water system via chemigation valve or downstream of the installed check valve. If the well is shut down for maintenance or it shuts down from mechanical failure, the LPD automatically dumps any water from the internal piping that may have passed by the check valve's sealing seat, so no contaminated water back flow ends up in the well casing.

During the irrigation season a lot of dirt or sand debris picked up from the water source gets carried up into the check valve and will collect in the LPD causing it to leak. The fixes we see when conducting inspections include the LPD capped off, totally removed, plugged, or a valve placed on it to shut it off.

One way to keep the LPD from leaking is conducting preventive maintenance on the check valve prior to operating. First, open the check valve via the inspection port, or vacuum relief valve and clear all sand and debris collected in the bottom, or fitting area where the LPD connects. Next, remove the LPD from the check valve and clean or blow out any small debris lodged inside the valve. While the check valve is open, inspect the check valve flapper assembly to ensure it is operating properly, and the closing mechanism is working correctly. Finally, ensure the vacuum relief valve, normally connected to the inspection port of the check valve, is free of any debris and operating correctly. See the following pictures for a standard check valve installed on a well.

Standard Chemigation Check Valve w/ LPD installed



This equipment must be on all irrigation wells when groundwater is being produced. If the check valve is partially buried from blowing dirt and debris, the LPD is potentially nonfunctional and cannot vent off as designed. See NPGCD Rule 4.5, Subsection 1.F.1-3 for installation and inspection criteria that must be followed for the LPD's. These rules are posted on the NPGCD website and can be downloaded for your convenience. The NPGCD field staff is available to address questions or concerns by contacting our office at 806-935-6401.

Access the Texas Water Newsroom Online

North Plains GCD invites our stakeholders to stay connected to water news across the state by utilizing this online tool. The Texas Water Development Board website, TexasWaterNewsroom.org, was created to tell the stories of Texas water. Posted articles cover a wide range of topics including Water Data, Conservation, Rainwater Harvesting, Drought, Water Planning and Supply. Visit the site for videos, articles, press releases, and more. Stories are updated regularly, and all content is available for public use and reproduction for informational purposes.

Save Paper and Water by Choosing our E-Newsletter

North Plains GCD now offers our district newsletters by email. If you would like us to send you a digital copy of the newsletter, you can go online at www.northplainsgcd.org/sign-e-news/ and fill out the form, or just email info@northplainsgcd.org. You can also go online to download previous newsletters, and find us on Facebook, Twitter and Instagram.

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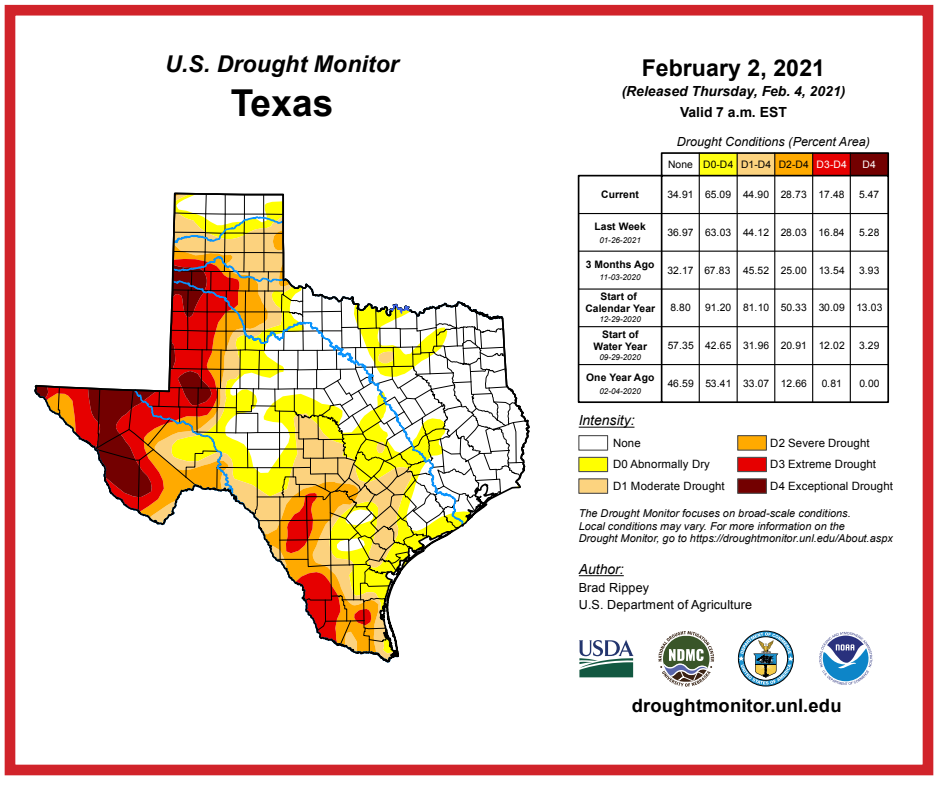

Groundwater Monitoring Shows Declines – Access Full Report Online!

There are over 11,000 water wells in the North Plains Groundwater Conservation District, and they pump an average of around 1.5 million acre-feet of groundwater every year. Dallam, Hartley, Sherman, and Moore Counties are four of the state's top 10 irrigation water using counties. With that much demand on district aquifers there are consequently significant declines in the water table.

Dale Hallmark, district hydrologist, recently completed a summary report on observed declines in groundwater monitoring wells that have occurred over the last 25 years. The report has a summary table of the low and high declines for each county and includes county maps showing 25 years of accumulated declines. The report can be downloaded from the district's website at www.northplainsgcd.org.