

## Northwest Panhandle Crop Notes

**December 2022**

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*Dallam, Hartley, Moore, and Sherman Counties*

### Year End Weather

Looks like we've reached a point where nearly all if not all our warm season crops have been harvested. There were delays with cotton harvest with growers waiting for days that offered better harvest conditions. Of course, there were some sunny, mild, totally enjoyable days scattered throughout the harvest season (plate 1). I am hoping the days we had noticeable winds weren't problematic for producers who still had cotton fields needing to be harvested. This has certainly been one of those years where folks have observed, felt, and discussed at length the effects of drought on production. Even now as we fast approach the holidays and end of December, the situation with drought in the northwest panhandle of Texas lingers and indicated in Water Weekly maps posted at <https://waterdatafortexas.org/drought/twdb-reports> (plate 2). Updated maps are available anytime you want an overview on the status of soil moisture locally and across Texas.

Fortunately, our area has received a light snow or two since mid-October. No one doubts how beneficial the snows are for fall planted wheat, oats, and other small grain crops. But considerably more snow is needed for growth and development of all our cool season crops including those planted for cover and standing residue protection. Additional moisture received now also contributes to needed moisture reserve within the soil profile. One thing to remember is that every drop goes further under cooler conditions and lower evaporative demand. Let it rain, let it rain, or snow. It is time we got back to a more normal amount and distribution of rainfall. Next is a bit of reflection and interpretation on our Extension programming efforts throughout 2022.



Plate 1. Harvest sunset in December at a RACE Trial in Moore County, 2022.

# Water Weekly

For the week of 12/26/22

## Water conditions

This week's drought monitor map, for conditions as of December 20, shows improvements in Central and East Texas and degradations in South Texas. For the first time in more than a year, the total area impacted by drought has dropped to less than 50 percent of the state.

## Drought conditions

- ◆ 49% now
- ◆ 52% a week ago
- ◆ 60% three months ago
- ◆ 65% a year ago

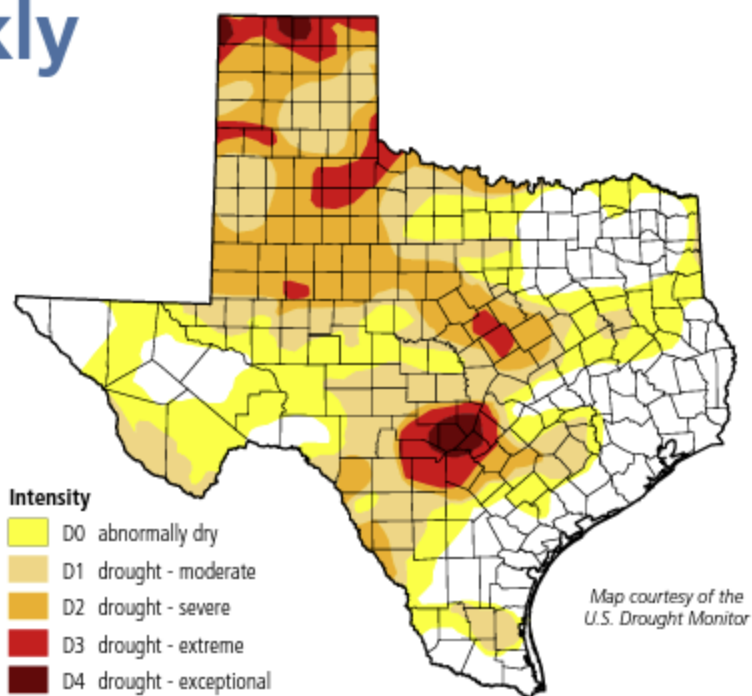


Plate 2. Late December update on the presence of drought conditions around Texas.

## Crop Production Podcasts Available

Starting mid-December 2021 and continuing the first half of 2022, eight live, virtual meetings were held featuring AgriLife Extension Specialists addressing emerging farm production issues such as water management and plant growth regulator use in cotton relative to the High Plains and Panhandle of Texas. Others participating in the recorded meetings included Agents, researchers, producers, ag industry representatives and commodity partners. Each session was posted online as a podcast at <https://agrilifenorthregionag.libsyn.com> and currently available. For additional agronomic and economic insight, simply log on and give the podcasts you're interested in a listen. I would not be surprised that a considerable number of topics discussed by the experts in 2022 will resurface in 2023.

## Adult Moth Trapping for Corn

This was the first year in several of data being reported for 11 weekly moth counts starting mid-June in support of corn production throughout Moore and Sherman Counties. This information helps growers, consultants, and others to keep abreast of moth flights, egg lay potential and likelihood of reaching economic thresholds of worm pressure from four, tracked species. These include the Western Bean Cutworm, Southwestern Corn Borer, Corn Ear Worm, and Fall Army Worm. 16 bucket traps were installed and monitored at two locations in Moore County and two locations in Sherman County (plates 3 & 4). Based on acres of corn planted in Moore and Sherman counties, these efforts have represented a potential impact value of near \$772,000.



Plates 3 & 4. Adult moth trapping sites for corn at two locations in Sherman County, 2022.

### Cotton and Conservation Videos

Ten video recordings were conducted in dryland and irrigated fields (Dennis and Marcel, respectively) planted to cotton which were part of two Replicated Agronomic Cotton Evaluation (RACE) trials in Moore County in 2022. Videos were posted as vlogs and available at <http://northplainsgcd.org/conservationprograms/agricultural-conservation/cotton/> to educate about the effects of climate on production, availability of soil moisture, crop growth progress as related to heat unit accumulation, updates on pest pressure and factors of growth affected by management.

### Field Monitoring of Late Disease in Wheat

Observations by Ken Obasa, Ph.D. and myself included 40 fields in Moore and Sherman followed by 35 fields in Dallam and Hartley counties, respectively. These efforts are key to tracking severity and spread of known diseases and to identify the emergence of new diseases such as in the field below (plate 5). Our monitoring efforts provide additional insight and benefit grower management of a crop like the 541,125 harvested acres of Northwest Panhandle wheat in 2021 with an estimated value of 79.7 million dollars.



Plate 5. Example wheat field monitored for late disease in Moore County, 2022.



### Field Monitoring of Late Disease in Corn

Ken Obasa, Ph.D. and I observed 40 fields in Moore and Sherman followed by 30 fields in Dallam and Hartley counties, respectively during mid-September (plate 6). These efforts are key to tracking severity and spread of known diseases and to identify the emergence of new diseases. These monitoring efforts provide additional insight and benefits Producer management on the 300,760 acres of corn planted throughout the Northwest Panhandle in 2021. For an estimated benefit of \$5 per acre, the total value across all acres would amount to 1.5 million dollars.



Plate 6. Example corn field monitored for late disease in Dallam County, 2022.

### Soil Carbon Assessments

Soil organic carbon is the fundamental building block of soil physical, chemical, and biological processes. Soil carbon is extremely dynamic in nature and easily influenced by soil characteristics, environmental conditions, farming practices, and species of crop grown. Soil organic carbon can vary a lot between farms and soil types. Generally, reduced tillage can be equated to greater soil carbon storage over time and less of an adverse impact on soil physical properties which are the building blocks of better soil health.

Marcel and Dennis coordinated with nine growers in Moore, Sherman, Dallam and Hartley Counties to collect soil samples at interval depths from fields that involved corn, cotton and grain sorghum cropping systems under both conventional and conservation tillage (plates 7,8,9). These efforts should improve our understanding of how soil organic carbon reacts to management practices. Grower cooperators will be able to compare their baseline levels of soil organic carbon to that measured on other farms throughout the northwest Panhandle and to other parts of Texas. We continue waiting for an update on the sample results; will communicate with our Grower-Cooperators and others as soon as we have more information.



Plates 7,8 & 9. Using a tractor-mounted hydraulic probe to extract soil samples at profile depth for carbon analysis in northern Dallam County, 2022.

### Applied Research on Irrigated Corn Response to Tillage

Previous research has identified management practices that promote greater stability of nutrient cycling, increase the infiltration of water, improve water holding capacity of soils, reduce the detrimental effects of erosion, and ultimately improve crop yields over time. These same management practices might also promote the sustainability of agricultural production in the northwest Texas Panhandle.

This was the first year of a long-term study that seeks to focus on tillage comparisons for continuous, irrigated corn production. A seed idea was discussed in the fall of 2021 followed by a considerable amount of planning and progressed with efforts on-farm to implement a replicated, applied, research study in spring of 2022. Main objective of the new study was to compare in-season agronomics, production outcomes, and economic aspects of three tillage treatments supporting pivot irrigated, continuous corn production. Treatments were established in late April which included conventional versus strip-tillage (plate 10) and no-till versus strip-till (plate 11). The field and study area were planted on May 12<sup>th</sup> to corn hybrid Pioneer 1828. Row spacing is 30 inches and dimension of individual plots is 48 rows across and 150 feet long. Rows of all plots was oriented in a north-south direction.



Plate 10. Adjacent strip- (left hand) and conventional-till (right hand) treatments in a pivot-irrigated field in Dallam County, 2022





Plate 11. Adjacent no-till (left side) and strip-till (right side) treatments in a pivot-irrigated field in Dallam County, 2022.

Tillage is a management tool and represents varying degrees of soil disturbance as seen above that can affect changes in soil physical, chemical, and biological properties over time. Available soil moisture is a management variable affected by changes in soil properties, directly affects plant growth and may change based on differences in tillage used. Thanks to David Parker, Ph.D., Associate Professor at WTAMU and Extension Water Engineering Specialist, funding was acquired, and arrangements made to purchase 12 AquaSpy soil moisture sensors, making it possible to install one sensor in each of the plots represented in this tillage study. Eric Burton and assistants with Better Harvest provided guidelines and installed AquaSpy soil moisture sensors on May 31<sup>st</sup> at the V3 leaf stage (Plate 12) with daily reporting available via satellite connection soon after.



Plate 12. Installed soil moisture sensors within tillage plots of pivot-irrigated field planted to corn in Dallam County, 2022.

In the Northwest Panhandle, drought conditions have persisted at severe (D2) to extreme (D3) conditions since the time of planting according to classification of the U.S. Drought Monitor.

However, timely irrigation events and about half of average rainfall contributed to development of a healthy corn crop with an impressive yield potential from the standpoint of grain. Stand counts collected at the V6 stage indicated no differences in plant population between each of the three treatments. Leaf tissue samples were collected from each of the plots at varying stages of growth during the season with nutrient analysis performed later. Content of leaf nutrient data will be compared among the tillage treatments. As the season progressed, there were not obvious visual differences in stature of plants and canopy color between tillage treatments.

Thus far, based on combine and hand harvests in early November (plate 13), we have seen no statistical differences in grain yield between tillage treatments. Numerically, strip-till plots had the highest mean yield followed by no-till and conventional-till plots, all ranging from 280 to 290 bushels per acre once adjusted to standard moisture. Additionally, no statistical differences were noted in grain moisture or bushel weights. We are interested in the agronomics of these tillage treatment comparisons but perhaps more importantly, we want to look at economics. Efforts in that arena are currently underway with the input from our partners in the Economics Department. At our January meetings, we expect to report how dollars spent on input costs stack against dollars for grain when comparing these three tillage treatments.



Plate 13. Combine harvest of corn grain from tillage plots in northern Dallam County, 2022

#### Survey of KanSched3 on Irrigated Cotton

A robust soil moisture reserve at planting time means more water is available for drawdown through germination, seedling emergence and well into the growing season. We need to have as much water banked in the soil profile as possible to cover evaporative losses from the soil surface plus water loss from leaves due to transpiration, together known as evapotranspiration (ET) that is associated with a growing crop. For more background and explanation on this topic, look at [L934 Agricultural Crop Water Use \(ksu.edu\)](https://www.ksu.edu/extension/programs/irrigation/irrigation-manual/1934-agricultural-crop-water-use). One such tool that could help with irrigation management throughout the season is KanSched3, a free, online software available at

<https://kansched3.engg.ksu.edu/>. This model and software were developed and extensively field tested in the western part of Kansas (environment not so different from the Texas Panhandle) by researchers at Kansas State University. Thus, a survey of KanSched3 was undertaken to look at relevance for use in crop production in the northwest Panhandle and cotton happened to be the species I looked at. My focus was on an irrigated, center pivot field planted to cotton at the Water Conservation Center near Etter. Part of this effort was to observe the convenience of software use, clarity of generated reports, and how well KanSched3 correlated with reported data from soil moisture sensors installed in the same field. A published report from Kansas indicated that the KanSched3 software correlated well with data from soil moisture sensors <https://newprairiepress.org/kaesrr/vol1/iss5/20/>. The authors suggest that it's best to use both the scheduler and soil moisture sensors as tools for irrigation management when possible.

I found the KanSched3 software to be user friendly as far as setting up a field and adding data needed by the software as the season progressed. Was readily able to monitor water consumption from the soil reserve and plant available water in the soil profile via summary tables and the chart below (plate 14). Besides needing access to amount of daily irrigation, reference evapotranspiration ( $ET_o$ ) and indication of rainfall amounts are also needed from a nearby weather station or other reliable source.

#### Groundwater Conservation Center Irrigated RACE

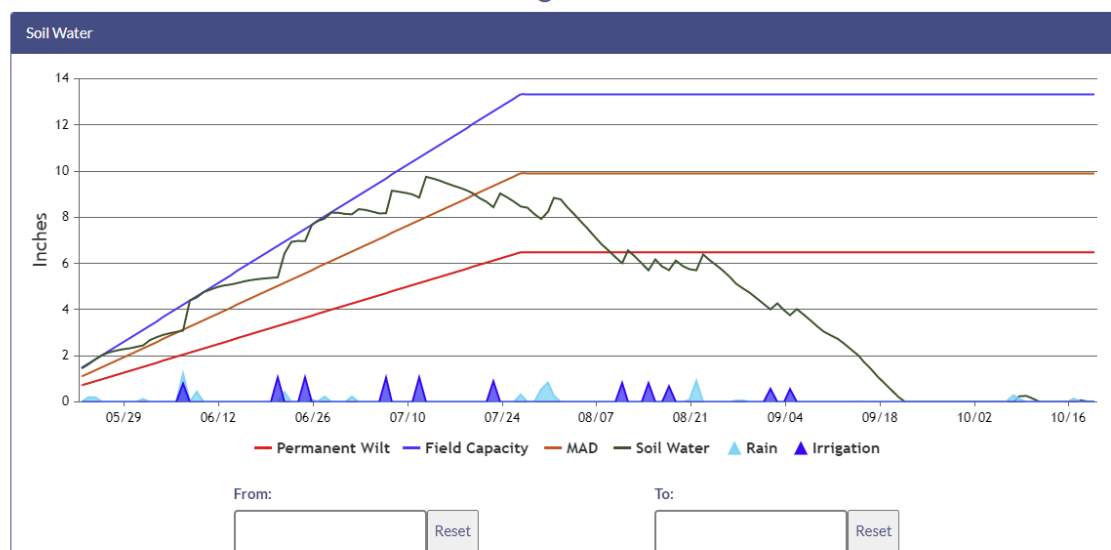


Plate 14. KanSched3 chart of seasonal plant available water plus indicated rainfall and irrigation events at a field site in Moore County, 2022

There are several questions a person could ask related to the particulars of irrigation management toward the end of the cotton growing season such as when the last application of water should be made and how much? What might the water requirements for cotton be once the last effective flowering dates of a crop have been reached? A recent AgriLife Extension publication sheds light on relationships of the last effective flowering dates with yield and fiber quality based on data collected near Etter in Moore county ([Microsoft Word - Last Effective Cotton Flowering Date in the Texas Panhandle Aug2022 \(tamu.edu\)](#)).



Other published literature clarifies that maintaining, filling, and maturing retained bolls post flowering requires a proper water balance. This process entails a significant amount of water in the plant being diverted to bolls for fiber development as well as manufacture of proteins and carbohydrates to fill newly formed seeds. Continuing to monitor soil moisture status based on data from soil moisture sensors plus an evapotranspiration-based irrigation scheduler during this phase of the season is of paramount importance for management. On another hand, too much water applied late in the season could encourage excess vegetative growth at the expense of maturing bolls, more difficult crop preparation for harvest, and possibly delayed harvest.

#### Northwest Panhandle Ag Conferences

Our calendar year got off to a great start with two, prime educational events targeted to growers, consultants, and ag industry on January 20<sup>th</sup> in Dumas and January 27<sup>th</sup> in Dalhart. Our meetings this year were in-person with lunch provided, vendor displays and with great sponsorship. Programming consisted of seven or eight speakers depending on location. Irrigation efficiency, value of conservation measures, improved management of dryland cropping systems, integrated pest management, production of alternate commodities, update on herbicide management, and emerging economics due to high input costs and market outlook were some of the topics covered. Texas Department of Agriculture (TDA) and Certified Crop Advisor (CCA) continuing education units (CEUs) were offered. We look forward to similar meetings planned this coming January, 2023. We have another premium lineup of speakers who'll be presenting in person. Topics to be covered are ones requested over time by producers in the four counties, so we think there'll be something beneficial for everyone attending. As with the previous meetings, CEUs possible for licensed applicators (TDA) and CCAs will be awarded.

#### Crop Producer's Program

Thirty-six producers attended Crop Producers Program at Frank Phillips College facility in Dalhart (plate 15). Our meeting was sponsored by Sklyand Grain LLC with organizational support and participation from Mike and Dennis. This March program offered five CEU's to private applicators including one hour of Auxin training. Agenda of the meeting focused on how to save input cost of fertilizer and soil fertility management, effective weed control management in summer crops and pest control options in organic corn. Due to significant increase of input cost in 2022, producers need to look at opportunities to be efficient and save costs. For example, deep soil testing could credit nitrogen that growers would not have to purchase.



Plate 15. Folks attending the Crop Producers Program at Dalhart, 2022.

Congratulations, you have almost reached the end of my December blog. I have enjoyed reflecting on the challenges of 2022 but also opportunities to revisit about a few research proven ideas and to introduce new ideas that possibly could lead to greater return on investment for your operation. Though it was a tough season in many ways, I hope everyone survived and is looking forward to a better season in 2023. Thanks to the efforts of Growers, Consultants, and Ag Industry folks season long to meet the challenges that arise. It all counts to ensure that farms and ranches across this great Country continue generating food, feed, fiber, and energy that we all rely on. Special thanks to all who kindly sponsor of our meetings and programs as well as to Grower Cooperators, County Commissioners and Judges.