NW Panhandle Crop Notes

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October 31, 2021

Thanks to good weather for harvesting, a lot of progress has been made threshing corn and grain sorghum over the past month and a half. Corn and sorghum fields were being harvested for silage during the same time. Pumpkin harvest was in full swing just a few days ago. Sunflowers will soon be harvested if not already. Many cotton fields received an application of harvest aids a few weeks ago. Now, operations with the stripper pickers are well underway and probably continuing for another couple of weeks. Hopefully, the weather will continue to cooperate, and everyone can experience a bountiful harvest.

Summer field crops made steady progress as heat units steadily accumulated in July and August. And, over a considerable portion of our growing season, the Texas Water Weekly map indicated that significant drought conditions had largely faded from the NW Panhandle as well as much of the rest of the state. However, the rains came less frequent toward the latter part of August and early September. It wasn't long until the effects of drought were beginning to reappear in the Water Weekly maps. Additional rainfall would be positive for recently emerged small grain and spur new growth before cooler weather sets in.

We were fortunate this season not losing any of several studies to wind and/or hail damage. Three Replicated Agronomic Cotton Evaluation (RACE) trials have been underway, two irrigated (one each in Moore and Sherman counties) and one dryland in Moore county. In fact, we just finished harvesting the dryland RACE trial yesterday. Crop progress at each of the sites has been monitored as the season went along. We continued to coordinate with staff at the North Plains Groundwater Conervation District (NPGCD) to produce a series of video updates for each of the RACE study sites. These four-minute recordings have been posted for viewing on the NPGCD website. Our staff assisted AgriLife Research with two Corn Performance studies that were underway in Sherman county. A single Grain Sorghum Performance study was recently harvested in northern Moore county.

Plate 1. Demonstration study site for efficacy of corn rootworm and corn fungicide treatments

under irrigation in eastern Dallam county, 2021 (left side). Dryland field planted to a Replicated Agronomic Cotton Evaluation (RACE) trial in Moore county, 2021 (right side).

Two studies were initiated in eastern Dallam county to assess early rootworm pressure, tolerance associated with varying germplasm as well as efficacy of in-furrow products. Given the absence of observed rootworm damage in early July, no further data was collected from the studies. A third study within the same irrigated pivot looked at the efficacy of in-furrow and post flowering fungicide applications for corn. Attendees of our field turnrow meeting in early September rated the plots for visual disease pressure. Yield data has since been collected based on hand harvest of grain from each plot. The results have been summarized and we are in the process of getting that information out to folks.

In eastern Hartley county, applications of two foliar potassium (K) products on were made to cotton starting the second week of flowering as an applied research demonstration. Seedcotton samples were hand collected from all plots in the study this past weekend. The value of applied research result demonstrations is that they help growers to test available products and/or highlight management options that can save or make money, are sustainable, and may be better for the environment.

During late July, we were able to kick off with a Cotton Bollworm Moth Trapping project in Hartley, Moore and Sherman counties. Traps were set up at six sites nearby cotton fields. Weekly counts were conducted, and results distributed to growers and consultants via Remind texts. This effort was continued over seven weeks of monitoring. This information helps recipients pinpoint pesticide application timings that will maximize worm kill and minimize loss in yield.

Plate 2. Bucket trap in place for collecting adult cotton bollworm moths in Sherman county, 2021.

Importance of soil chemistry and organic matter for soil health, sustainability:

Now a days the term "soil health" is frequently mentioned in media airwaves and written about, not only in farm press articles and commentary but in academic, journal publications as well. Soil chemical and physical properties are both integral to building and maintaining soil health.

Soil pH is a soil chemical property or part of soil chemistry. Soil pH or where a sample lies on a scale of acid (low pH or lots of H^+ ions) to neutral (equal concentration of H^+ and OH^- ions) to basic (high pH or lots of OH^- ions) is likely one of the first things that comes to mind when we hear the term soil chemistry and one criterion reported in soil test results. Certainly, soil pH is one of the indicators of the possible outcomes of chemical reactions in soil over time and what effects they might have on nutrient availability for a growing, developing crop. Buffering capacity refers to the level of resistance of a soil to increment changes in soil pH. Soil samples are routinely assayed for soil pH and values will be reported in soil test results. Changes in soil chemistry are dynamic, continuous, and based on interactions of the biology of the soil with soil moisture status, parent minerology of the soil, and about every next environmental factor related to climate.

Soil organic matter is a part of soil chemistry and refers to plant, animal, and microbial residues in various stages of decay. Soil carbon content is associated with soil organic matter, generally more is better. The storehouse for reserve nitrogen (N) and micronutrients in soil is organic matter. Additionally, higher soil organic matter contributes to improved physical condition, better water infiltration, greater soil tilth, and reduced soil erosion. Depending on the carbon to nitrogen ratio, decomposition of organic matter in soil tends to release nutrients. Microorganisms in soil are the main participants in this decomposition process and therefore, they play a large role in nutrient availability over time. While indication of soil organic matter can be requested on soil test results from certain laboratories, it may be part of the routine assay from others.

Cation exchange capacity (CEC) is generally known as the nutrient supplying capacity of the soil. This is another soil chemical property and provides valuable insight when reported in soil test results. CEC will be largely governed by the negatively charged clay particle content of a soil as well as its negatively charged, organic matter content. Both particle types provide exchange sites that can temporarily attract and hold positively charged nutrient cations such as Ca^{+2}, K^+, Mg^{+2} and even NH^+. Thus, from the standpoint of nutrient availability and balance of nutrient cations season long, it is favorable that our crops are growing in high CEC soils. This will likely be soils that are managed for higher residue content and those that have greater capacity for water infiltration and profile storage.

For additional thoughts on soil testing, soil sampling and how soil test results can be utilized as a management tool to profitably steer nutrient applications season long, see my previous blog post from May 2021.

Relevance of Potassium (K) for Cotton Production and Managing to Avoid Deficiency:

1. K important in water relations, energy relations, and enzyme activation

2. Texas High Plains soils usually test high in K; however, consider
    a. Differences in varieties
    b. Crop mining – rotation, soil types, seasons
    c. Available K is affected by soil moisture, clay mineralogy and amount of clay
    d. Soil compaction with depth? Can limit root growth and acquisition of K

3. Best management of K based on soil test results
    a. K not needed if soil test > 150 ppm but….
    b. Pay particular attention to soil test K if high yield potential and irrigated
    c. Include tissue analysis (petioles at early flower) if pending deficiency observed or suspected

4. Soil applied K sources:
    a. Granular KCl (0-0-63), K_2SO_4
    b. Liquid (eg. strip-till) injected showed most consistent response versus granular, broadcast incorporated (Central Blacklands and Southern High Plains of TX)

5. Big demand for K begins at flowering and continues until maturity
    a. Bolls are large sinks for K, especially carpel walls
    b. Draw needed water (osmotic potential) to developing bolls
    c. Expand individual fiber cells for adequate elongation
    d. Enough K uptake by plant to meet demand?

6. Roots of modern, high yielding, fast fruiting cultivars may not get access to K fast enough
    a. Less yield
    b. Lower fiber quality or grade
    c. Be aware, soil fertility research and recommendations have not kept up with advance in genetics

7. If needed, address pending K deficiency with foliar-applied K
    a. Monitor closely starting at squares development stage through peak flower
    b. Early application is better
    c. Apply in a least 10 gallons water/A volume
    d. Possibly piggyback K with other liquid applications

8. Liquid K Sources:
    a. K acetate
    b. K nitrate
    c. K sulfate
    d. K thiosulfate
    e. Cost varies, ($10 - $20/A for product depending on number of applications)

Plate 3. Harvest and sampling for fiber quality underway at the dryland Replicated Agronomic Cotton Evaluation (RACE) trial site in Moore county, 2021.

For additional, reference information, see AgriLife Extension articles posted on our county websites under ‘Agronomy’ and ‘Publications’. If there’s information related to cotton or other crop species that you are looking for and not seeing it, let me know and I can help to find it.

This wraps up today’s blog on matters related to soil chemistry, soil organic matter and managing to avoid K deficiency in cotton. Hoping the growing and harvest seasons have gone in a direction that is favorable and what you’d like to see for 2021.