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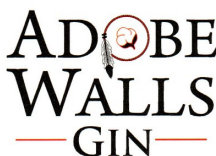
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## Cotton Insights Newsletter

A service provided by Windstar, Inc. affiliated gins.

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### Crop Update

The past month has presented a mixed bag of issues for most producers in our region. Significant and continuing rainfall has been a huge blessing across the Texas panhandle and western Oklahoma. The 2021 rainfall has resulted in optimism for the cotton crop, and has generated several simultaneous emerging concerns including weed, insect, nitrogen, and plant growth regulator (PGR) management. The shortage of various pesticides including herbicides and insecticides hasn't helped the situation. By and large growers are doing what they can with the available products. It is generally best to get mepiquat PGRs started early in the crop during the match head square stage.

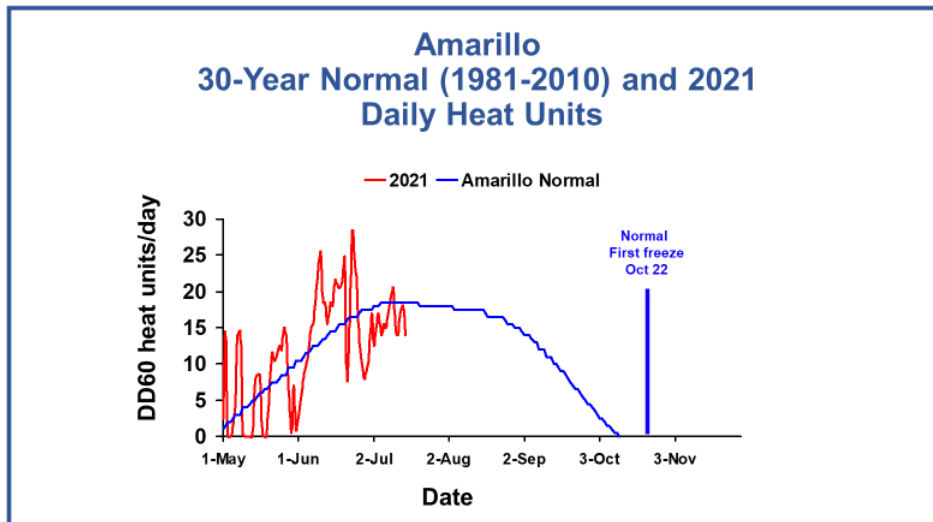
Based on my data collection inspections (conducted over the past two weeks) of our 15 surviving variety and nitrogen input trials across the region from Plainview to Sunray, and over into southwestern OK, I am seeing some concerns. Some of the fields that encountered high intensity rainfall events had some areas where watered ponded. These areas are considerably poorer in growth than others of higher micro-elevation. Many fields were planted a bit later than desired due to the welcomed rainfall delaying planting operations in some areas. Also, nearly all of our trials and grower fields I have seen have stands that are thin (in terms of density), and some are skippy (in terms of lack of uniformity). This is a low plant population year. Early square set is generally not as high as desired. I don't think we can attribute this to physiological square loss due to weather events. In my opinion, we must have had some square thieving insects get through in some places. I'm not an entomologist, and these are just my thoughts. I have seen 4-bract squares on from one to three fruiting branches on many plants. There is more about 4-bract squares below. Our agronomic trials are not blooming yet. The earliest planted trial (May 2 near Claude) will likely bloom within the next week. We have experienced cooler than normal daytime high temperatures since June 26, or nearly 3 weeks. During this 3-week period, we have encountered only 81% of normal heat units, or expressed another way, 19% below normal.

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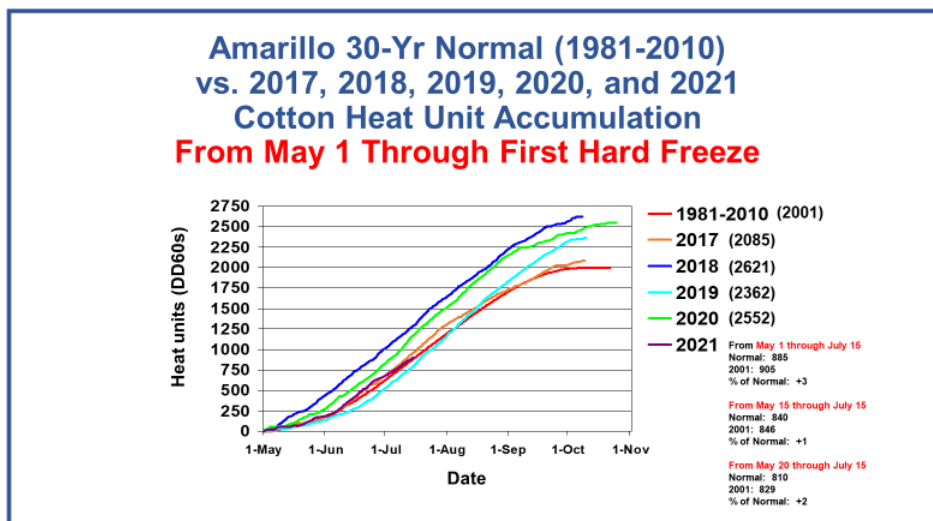
After mother nature provided ample rainfall in many areas and cooler conditions, we planted a bit later than desired, lost some early fruit, and now need to get back to more normal temperatures. Nitrogen and insects were covered in the July 2 newsletter, and PGRs were discussed in the June 24 issue. Many new varieties have high growth potential, and N fertilizer applications have been made by many producers. Therefore, with good rainfall, and lower than normal fruit retention (perhaps due to insect or 4-bract square abortion issues), many of these fields are going to need focused PGR management and a good fall.

## Weather Update

Daily cotton heat units are running below normal and can be readily seen in the graphic below.



Based on the graphic below, it appears to me that if this weather pattern holds, we are in a year that looks somewhat similar to 2017.



#### 4-Bract Floral Anomalies Noted

During recent inspection of our trials I found some floral anomalies called “4-bract squares.” The region encountered significant high heat during early square development the 2<sup>nd</sup> and 3<sup>rd</sup> weeks of June. Four-bract square initiation is poorly understood, but I have seen this many times during my career. I don’t like remembering 2011, but that year we experienced an excessive number of these types of square anomalies during the mega-heat.

- The best published information I can find on this is in the vintage publication Cotton Physiology Today, Volume 4, Number 1 (1993). This publication can be accessed here:

<https://www.cotton.org/tech/physiology/cpt/plantphysiology/upload/CPT-Jan93-REPOP.pdf>

- This publication states: *After the fruiting branch meristem forms the subtending leaf, it starts to form the bracts. High spring temperatures (average day/night temperature above 80 degrees) can cause this meristem to attempt to produce another leaf after the subtending leaf, but before the bracts are formed. This extra leaf forms a fourth "bract", and is located just outside the normal 3 bracts. The lowest fruiting branches appear most susceptible to 4-bract squares, because high temperatures later in the season do not have the same effect. Four-bract squares are more susceptible to shed and thrips injury - the fourth bract provides an opening for thrips to enter the young square - than well-developed 3-bract (normal) squares.*
- My experience with 4-bract squares is that this doesn’t end well. Virtually all of these types of squares which have a tissue appendage on the floral dome (bud) will eventually abort.
- The 4-bract squares will usually be associated with the first and oldest squares. Initially, if 2-3 nodes of 4-bract squares are noted on the first few fruiting branches, these will no longer be found in younger fruit higher up the plant. It’s almost as if the plant “gets accustomed to the heat” or perhaps the extreme temperatures are no longer encountered and subsequent squares are normal.
- When 4-bract squares are observed, many times the aborted squares found on the ground will have this condition.
- Four-bract squares WITHOUT any tissue appendage on the floral dome will many times set and make normal bolls, with the exception of having 4 bracts on the boll instead of the normal 3.
- In my opinion, the take-home-lesson is to recognize 4-bract squares, and don’t confuse these as having been impacted by insect damage and start spraying insecticides for possible “stealth insect feeding.” This just adds additional input costs and pyrethroids can trigger secondary pest outbreaks (such as aphids) if the beneficial arthropods are removed from the agroecosystem by various insecticides.
- **This is caused by a physiological phenomenon and is attributed to high heat when the first squares are forming in the terminal.**
- Photos below will provide some clarity to this situation.

**Normal Square Development – Note 3 Bracts and Normal Floral Dome (Calyx and Petals Normal)**



**“A Normal Square with 4-Bracts” (Note There Is No Tissue Appendage on Floral Dome)**



**Abnormal 4-Bract Squares (Note Presence of Tissue Appendage on Floral Dome)**





## Additional Abnormal 4-Bract Squares (Note Presence of Tissue Appendage on Floral Dome)

