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Cotton Insights Newsletter

A service provided by Windstar, Inc. affiliated gins.

July 28, 2020

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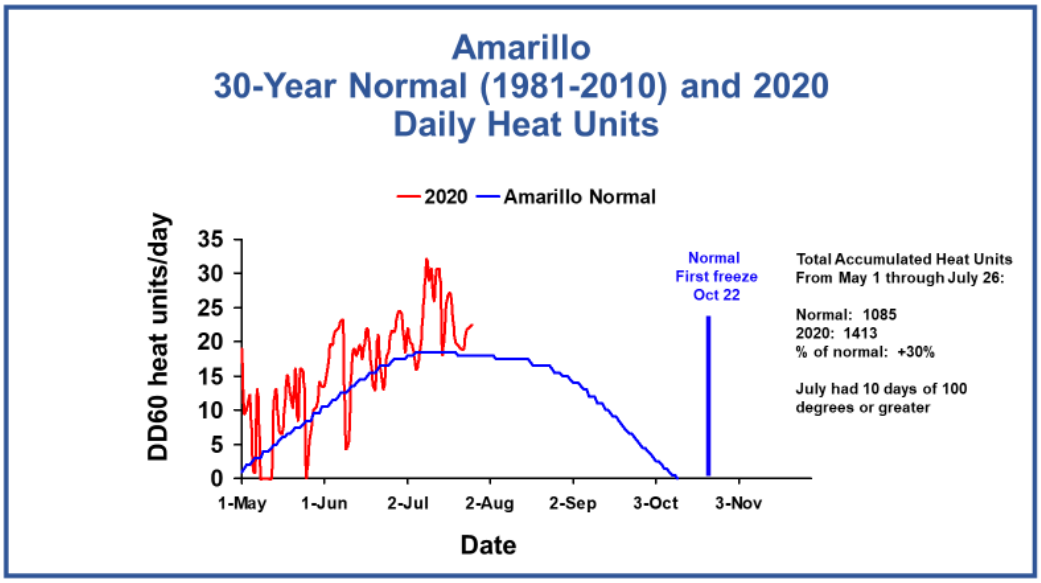
Crop Update

The past month has been a challenge for most growers in our area. Water challenges are weighing heavily on the 2020 crop due to well above normal temperatures for most of the past 30 days. Amarillo June temperatures resulted in 27% above normal cotton heat unit accumulation and July was very similar, with about 25% above normal. During the month of July thus far, Amarillo has experienced 10 days with temperatures of 100 degrees or greater, with 4 of those days with 105 or greater. A high of 110 degrees was recorded on July 13 and 109 was noted on the 11th. This extraordinary heat coupled with flash drought across the southern part of our region has resulted in extreme taxing of irrigation capacity. Some areas north of Amarillo have been blessed with significant rainfall events over the past two weeks or so. Most of our dryland crop failed due to non-emergence or to poor stands. Daily heat units (see graphic next page below) have been well above normal, and with temperatures so high we have been seeing some floral anomalies which will be discussed later.

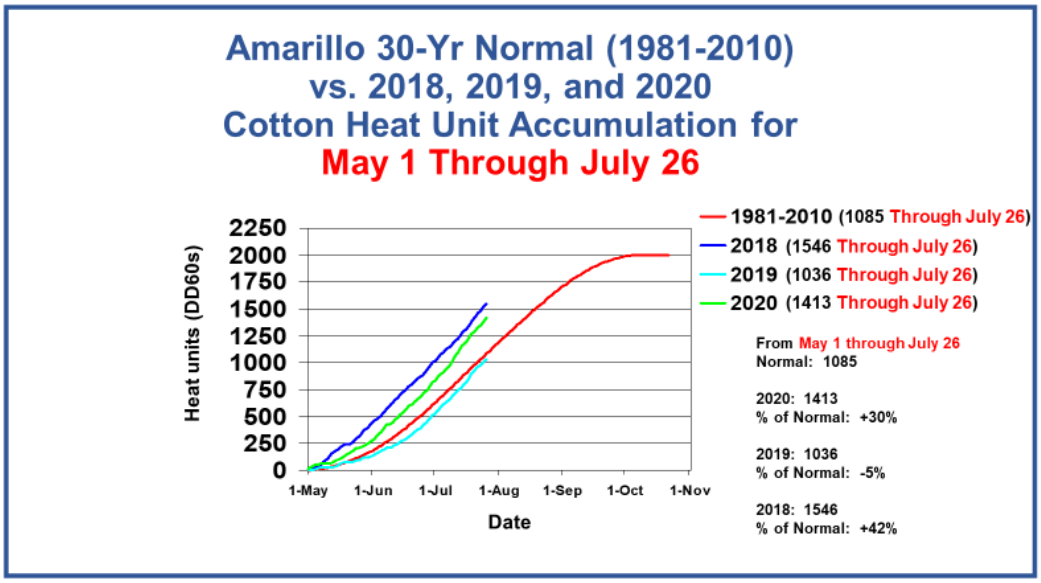
By and large growers are doing a great job with weed control in spite of extreme temperatures. Plant growth regulator (PGR) questions have subsided with the exception of areas receiving rainfall events. It is always good to get mepiquat PGRs started early in the crop during the match head square stage. In the northern part of the territory, early season square retention was not as high as desired. This was attributed in part to physiological square loss due to the extreme wind event on June 9. In my opinion, not all of the square loss could be attributed to this alone, so we must have had some square thieving insects get through in some places. I'm not an entomologist, and these are just my thoughts.

All of our agronomic trials are blooming now with the exception of a dryland trial planted in southwestern OK on June 7. It is about a week out. Days from planting to first bloom in these trials ranged from as few as 61 to as high as 78. Late April and early May planted fields were exposed to more damaging weather events and growth lagged. Mid- to late-May planted fields raced to first bloom in about 61-68 days.

Nodes above white flower (NAWF) observations at first bloom in irrigated variety trials were affected by water stress. A more stressed trial averaged around 6.5 across all entries, and those with ample water averaged as high as 9.6, which is phenomenal. The average across 7 irrigated trials counted as of last week was 7.6.



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 2018. In that year, many growers had great yields in fields where adequate water was available. Last year, we had a cool, wet start, but a hot, dry finish. It was about the middle of June before 2019 turned around with significant and sustained heat.



4-Bract Floral Anomalies Noted

A recent inspection of our dryland trial near Hobart, OK found some floral anomalies called "4-bract squares." This trial was planted June 7 and encountered significant high heat during early square development the 2nd and 3rd week of July. 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 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)