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Cotton Insights Newsletter

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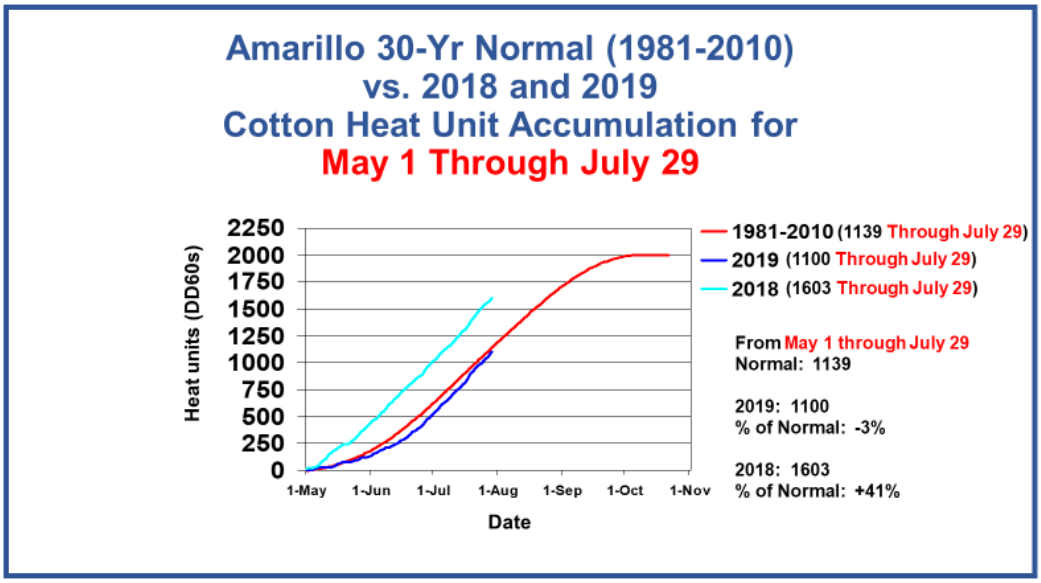
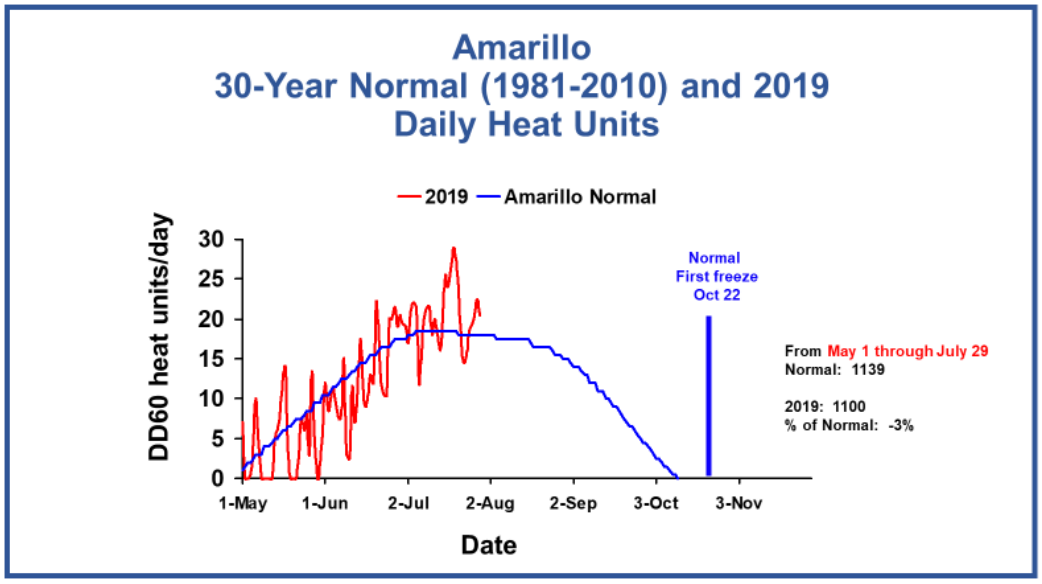
Crop Update

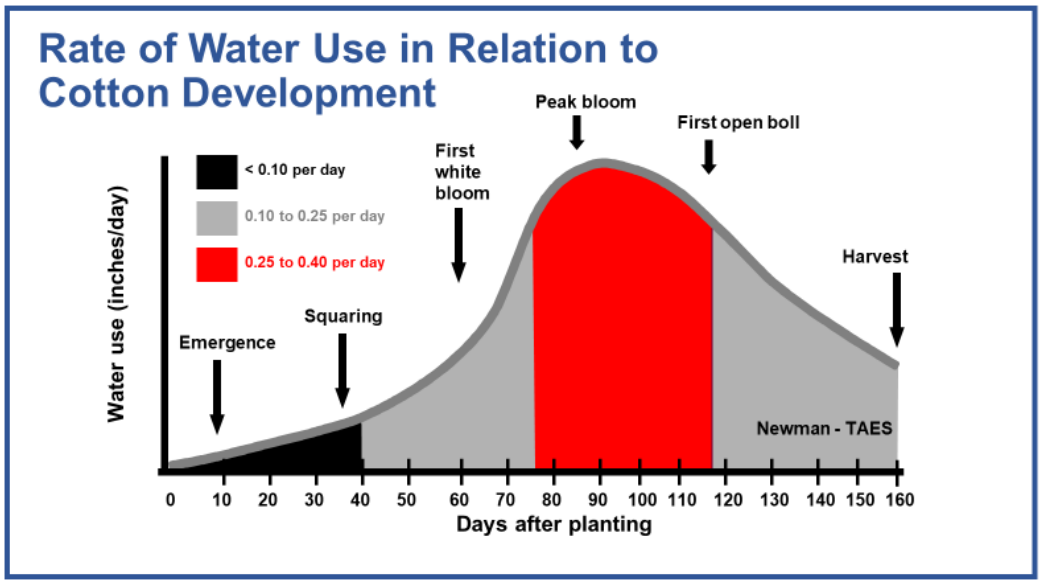
Cotton growth and development continues to progress and many fields are now blooming or getting close. We could use some precipitation to help out the dryland and lower capacity irrigation systems. When using Amarillo temperatures, we are now about 3% below normal from May 1 through July 29 (see graphs below). Thus far for July (through the 29th), it is above normal with respect to DD60 heat units (588 vs. 530 for the normal). This can be seen in the graph below with the 2019 seasonal accumulation approaching the normal line within the past week or so.





Crop Water Demand Is Increasing

- The figure below illustrates the typical seasonal water use pattern for cotton produced in the Texas High Plains region.



- Water use (evapotranspiration or ET) increases to 0.1 to 0.3 inches per day during the square to early bloom stage (40 to 75 days after planting).
- At this stage leaf canopy and roots develop rapidly, and transpiration exceeds evaporation.
- Moisture extraction occurs mainly from the top 2 feet of soil although the taproot and some feeder roots extend to deeper depths if unimpeded.

- From early bloom to the opening of the first bolls (usually 75 to 120 days after planting), ET values of 0.25 to 0.35 inches per day are common.
- At this stage, plants have attained their maximum leaf canopies and root densities. Moisture may be extracted from deeper in the entire soil profile, if available.
- ET values may exceed 0.4 inch per day during the peak bloom period under extreme environmental conditions (extremely high temperatures and high winds).
- Following the opening of the first bolls until crop termination, ET generally declines from about 0.25 inches per day to as little as 0.1 inch per day. Actual water use will vary with the condition of the plant, soil moisture status and general growing conditions.
- Late season water stress may be acceptable or even desirable because it hastens cutout and results in shedding of fruit that would not normally mature and potentially contribute to low micronaire if a cooler than normal fall is encountered.

Nodes Above White Flower at Early to Mid-Bloom

Nodes above white flower at first bloom gives an indication of crop vigor and yield potential. Typically, NAWF should be high at first bloom and then decrease as the boll load ties down the plant, and mainstem node production rate slows or ceases.

Greater than 8 NAWF could be considered excellent, 6-7 – reduced yield potential possible unless adequate irrigation is quickly initiated or rainfall is obtained, 4-5 or less - cutout imminent on more determinate varieties.

Some fields that are stressed for moisture may have a short bloom period due to few NAWF at early bloom, unless timely rainfall or irrigation is obtained.

It will be important to track NAWF averages weekly for each field, as key management decisions later in the season can be assisted if the hard cutout date is known.

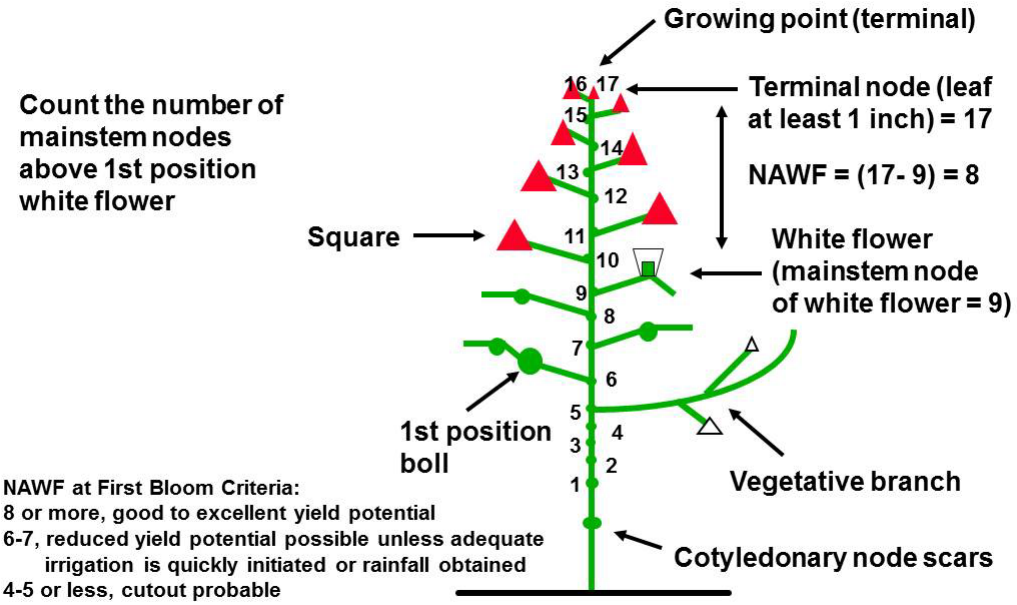
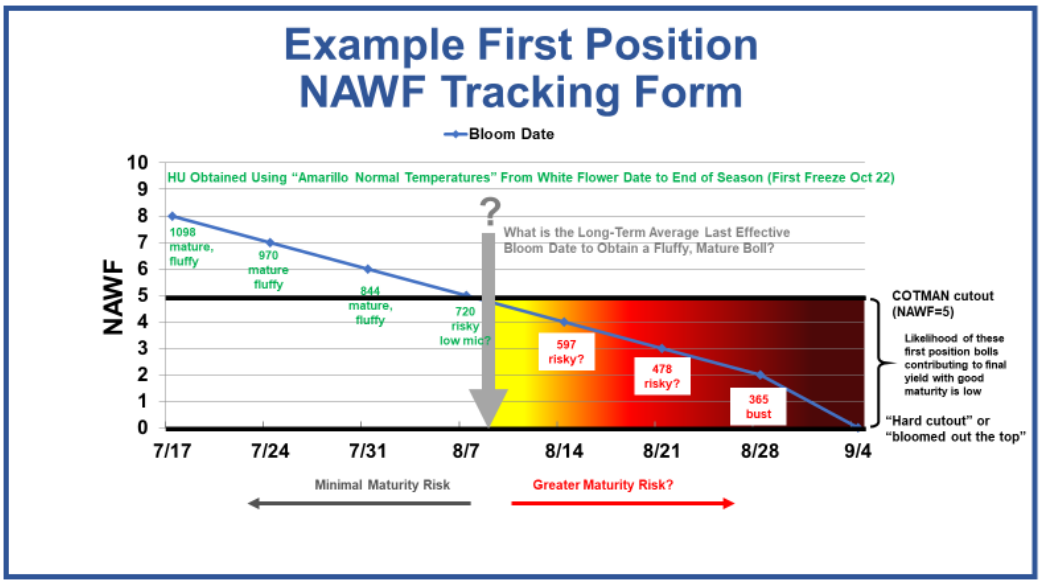


Photo of First Blooms in Wildorado PhytoGen Variety Trial

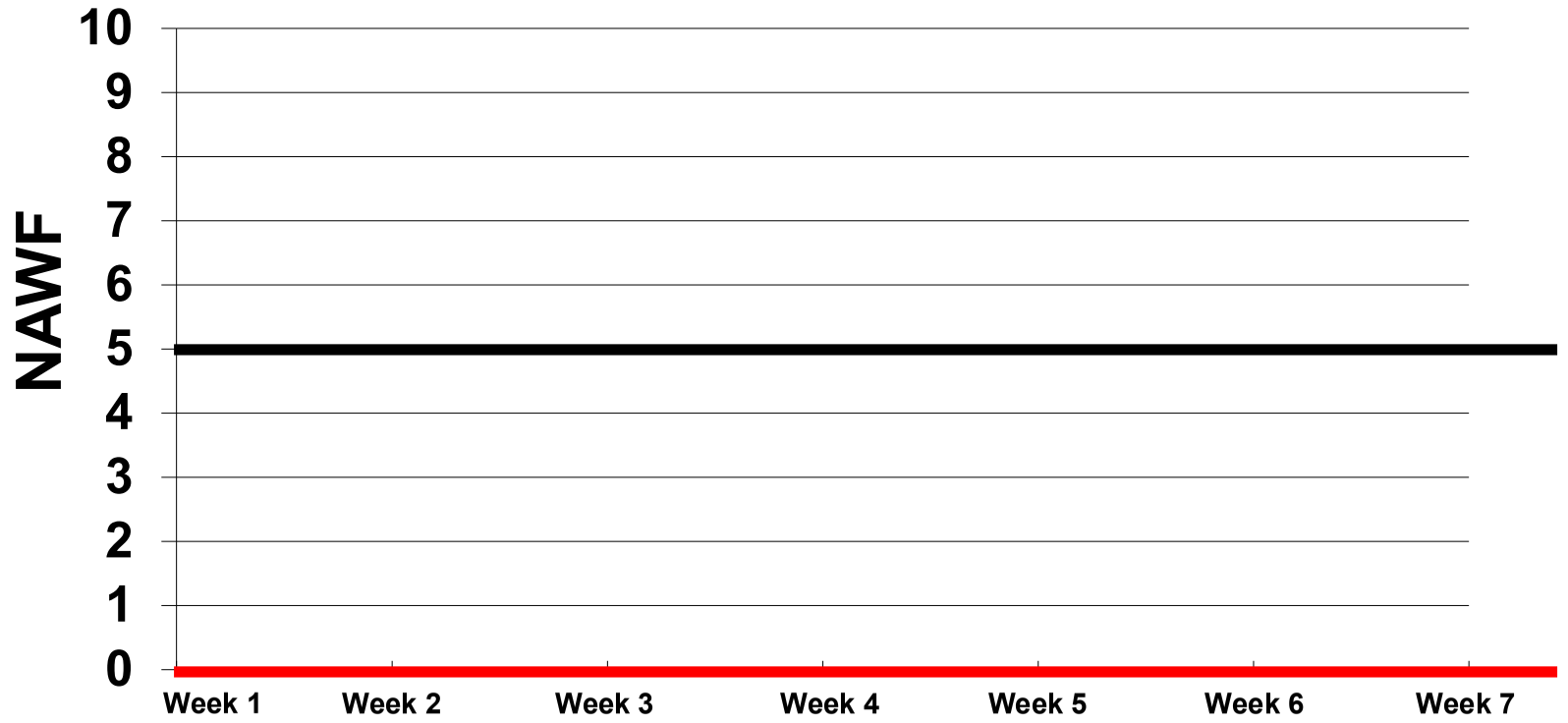
- This photo taken on July 24 in PhytoGen 350 W3FE.
- First bloom had occurred about 3 days earlier on the first position fruit of the first fruiting branch which was located on mainstem node 4 (on left under thumb). First fruiting branch is normally found on the average of node 6.5 or so based on company literature. Bloom tag had fallen to ground leaving pollinated boll behind.
- First position bloom on mainstem node 5 is clearly visible on right.
- The field was planted May 20, and had about 900 DD60 heat units which is about 63 days from planting to bloom. I had to search this field hard for blooms, and the ones that were found were typically located on first positions on nodes 5 to 6.
- The few plants with blooms were averaging around 7.5 nodes above white flower (NAWF).
- Varieties with first blooms included PHY 210 W3FE, PHY 320 W3FE, PHY 350 W3FE and an experimental with the designation PX3B07 W3FE. Other entries (PHY 250 W3FE and PHY 300 W3FE) and should be blooming soon.

Utility of Tracking NAWF

- Tracking NAWF on a weekly basis can be enlightening with respect to crop development, and how late the fruit load is being set on the plant especially under irrigation.
- Fruit set later than the long-term average last date to get a mature boll can be risky considering the typically late cotton we have in the area in 2019. The last date to set a bloom to become a mature boll varies by growing season and is an average of extremes.
- I have always said that heat units are not infallible, but are a useful tool to gain a better understanding of cotton production. The Cotton Incorporated funded COTMAN program is a useful educational tool.
- COTMAN assumes that 850 DD60 cotton heat units past blooming are necessary to produce a reasonably mature boll – a boll with good micronaire that fluffs, not just one that opens.
- Bolls that obtain fewer heat units can likely still open, but be lower quality (lower micronaire). My assumption is that bolls with fewer than 700 DD60s would not open, or if so, would not exert very well and not contribute to yield. If opened, these bolls would be very low micronaire.
- The graphic below illustrates that blooms set around the middle of August would struggle with maturity in a "normal year" based on the DD60s calculated using the Amarillo "Normal Temperatures" dataset. The reality is this varies from year to year depending upon boll distribution and how the heat and solar radiation are encountered.
- Using COTMAN criteria, and weather data analysis, the 2018 crop year would have had around 7 potential weeks of effective blooming beginning in late June/early July with bolls set August 15th having a likelihood of good maturity, hence the extremely high yields and good micronaire. In 2017, the effective blooming period would have been around 4 weeks, with bolls set after August 4th being risky. 2017 had good yields with low mic.



NAWF Tracking Form
Field ID: _____



COTMAN cutout (NAWF=5)

"Hard cutout" or "bloomed out the top"