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## Cotton Insights Newsletter

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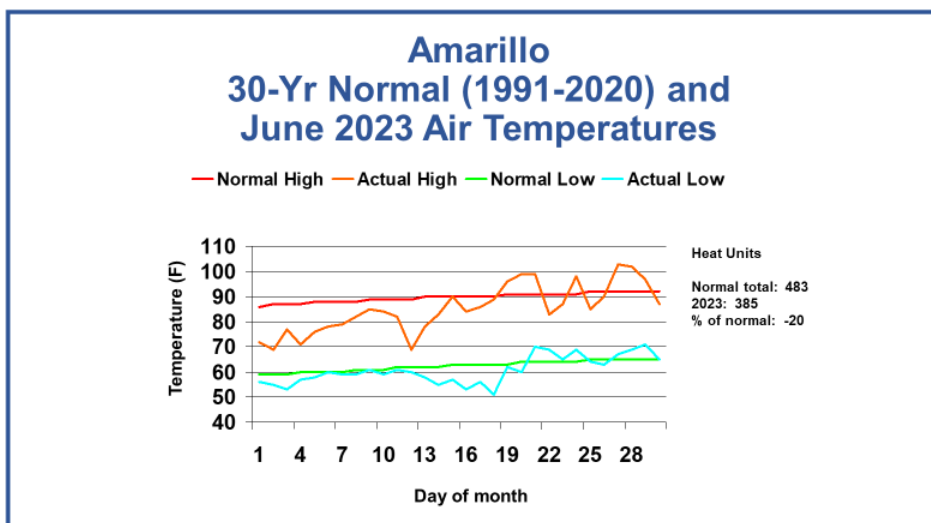
July 10, 2023

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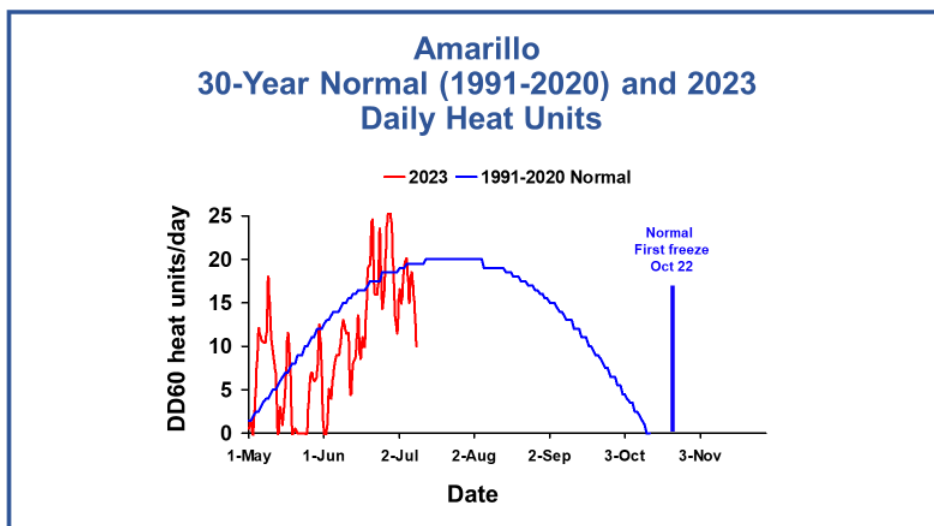
### Crop Update

The 2023 crop year continues with its significant challenges. There's not a lot of cotton left north of Tulia, and much of what remains is in a less than desirable condition. We have lost most of our 2023 applied research trials, and at this time only 3 remain in Texas, and 2 in Oklahoma. The Texas trials range in condition from what could be considered "good" to "fair." Thunderstorms continue across the region, and some areas in western Oklahoma have received up to 8 inches of rainfall in the past week. Also, hail has been encountered, and some fields have been recently damaged or destroyed.

At Amarillo, the month of June finished with about 385 DD60 heat units, which is about 20% below normal. Also, the daily heat unit graph (see below) indicates that we have been substantially below normal for much of the growing season (from May 1).



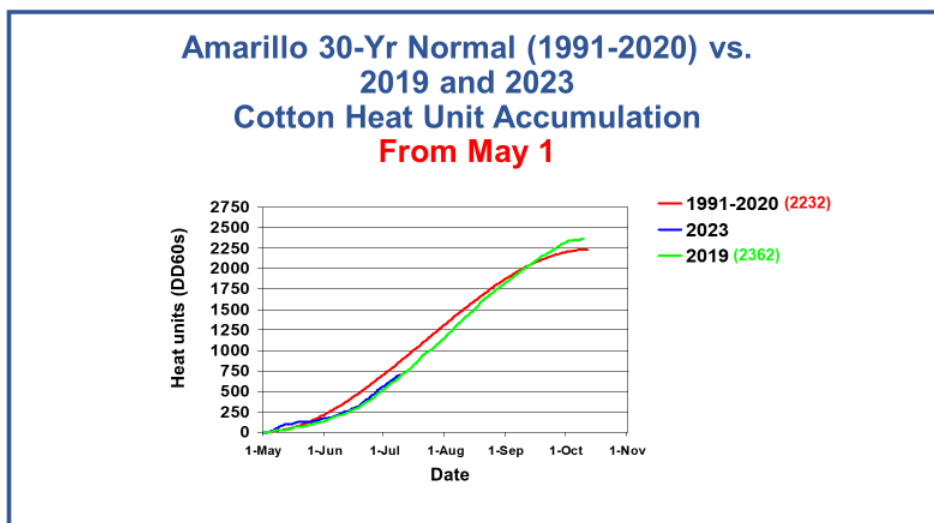
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### Continuing Contrast of 2019 and 2023

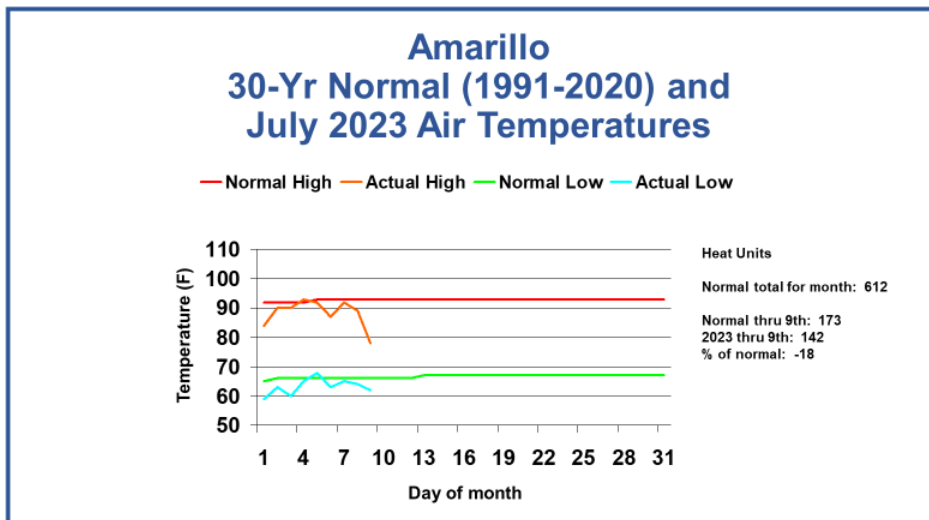
When using Amarillo weather data, 2019 actually had the worst May through early July start for cotton since 2000. The 2023 heat unit accumulation indicates a similar rough start, with the exception of the first two weeks of May, which exhibited warmer conditions (see graph below). The interesting thing about 2019 is that as the season progressed, temperatures were above normal, which was good for cotton production – assuming enough water was there to meet the crop needs. Interestingly enough, the daily heat units stacked up substantially higher later in the season, and by the middle of September we had reached the 30-year normal DD60 accumulation. So, after saying all of this, it is still possible to have a great temperature finish, in spite of cooler conditions early.

Based on field inspections, it appears to me that in surviving fields, first bloom will likely occur in many of those around July 20-25.



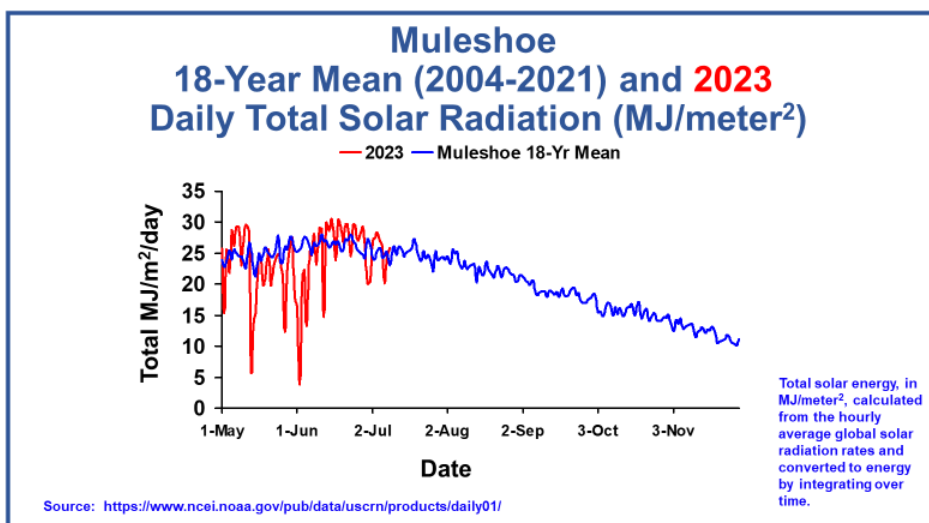
## July Temperatures

At Amarillo, thus far, the first nine days of July have been relatively cool, with cotton heat units calculating about 18% below normal for that period.



## Solar Radiation

Using highly vetted daily solar radiation data from NOAA's Muleshoe, TX site, the graph below was generated. These data indicate that after "below normal" solar radiation from about mid-May through mid-June, it returned to "normal" until around the first of July, which again was somewhat below normal.

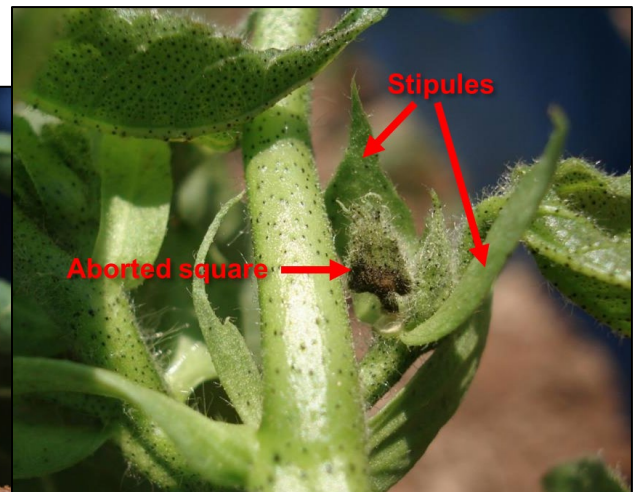
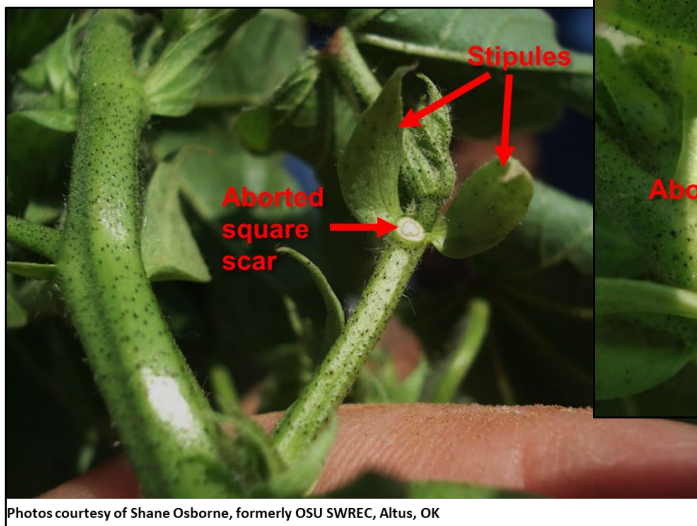


## Thoughts on Nitrogen Fertilizer for Dryland Fields

- For most dryland fields, after water needs are met, nitrogen (N) is the most limiting mineral nutrient.
- The optimism for any surviving dryland cotton at this time indicates that growers will be challenged to get N fertilizer needs addressed as soon as possible. Remember that all applied nitrogen will need to be pushed into the soil profile and activated by rainfall.
- There is a bit of a lag between the time the fertilizer is moved into the soil and the ammonium-N form gets converted by mineralization processes to the “plant preferred nitrate-N form.”
- Therefore, once the fertilizer is pushed into the soil by an incorporating rainfall event, it may take 5 days or so to get the ammonium-N mineralized to the nitrate form, and available for plant uptake.
- With many dryland fields in the early squaring stage at this time, it will be important to get fertilization accomplished as soon as possible.
- Generally speaking, for each bale of yield goal, the crop will remove from the field (found almost exclusively in seed) about 40-45 lbs of actual N per acre. Due to inefficiencies in uptake and in the soil, about 50 lbs N/acre from all sources (including applied fertilizer N, soil profile residual  $\text{NO}_3\text{-N}$ , any possible  $\text{NO}_3\text{-N}$  in irrigation water) are generally recommended for each bale of yield goal.

## Insects

- Protecting early fruit from insect damage is critical for 2023. Remain vigilant for cotton fleahoppers, lygus and other square robbing insects.



Photos courtesy of Shane Osborne, formerly OSU SWREC, Altus, OK



## Photos of First Position “Blasted” Pinhead Squares



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## Pre-Bloom Fruit Retention Goals

- It takes about 21 days to go from a pinhead sized square to a bloom
- Many times we can enter bloom with 100% square retention if factors align.
- Probably should target at least 85% square retention



### Square Retention Concerns

- With all of the May and June rainfall, we have a lot of alternate hosts for various “square thieves” growing in weedy dryland corners planted to grass, ditches, and other non-cropland. These areas can harbor multiple pest species including cotton fleahoppers and lygus bugs that can rapidly migrate into cotton as the weeds dry down or get mowed by growers.
- On any given fruiting branch, the difference in age between adjacent sequential fruit development on that branch (e.g. first and second position squares) is about 6 days or so.
- If the earliest first position square is lost, then a second position square on the same fruiting branch will be depended upon to produce the first bloom. For a given plant, this loss of the earliest first position square means that the first bloom date can be delayed around 6 days or so.
- This early season square loss is not something we need to encounter. This may necessitate higher plant growth regulator applications depending upon the planted variety’s growth potential and subsequent growing conditions.
- Pre-bloom cotton squares need to be protected through the bloom stage. At the bloom stage, cotton fleahoppers typically cease to be a problem, but lygus and other species can still be problematic well into bloom.
- If proper insect management has been implemented, growers have really done all they can do.

## Cotton Fleahoppers – Texas A&M AgriLife Extension Entomology Publication

- Earlier planted fields are well into squaring but some later planted fields are lagging behind. Cotton fleahoppers can build up in alternate hosts and move into cotton and feed on developing squares. Fields should be scouted and initial fruit should be protected from these insects. With all of the rainfall across the region, fleahopper populations will likely be able to build up on alternate hosts growing in ditches and other non-cropland areas.
- There is an excellent comprehensive publication available entitled “Managing Cotton Insects in Texas” (ENTO-075, 4/19). This 38-page guide has photographs of nearly all of the insects found in Texas cotton throughout the growing season. It was generated by several Texas A&M AgriLife Extension entomologists including Dr. David Kerns (College Station), and Dr. Suhas Vyavhare (Lubbock). Thanks to all of the team members who assembled this outstanding publication.
- It discusses IPM strategies, sampling techniques, labeled insecticides and rates, as well as other important information on numerous pest species. Many beneficial arthropods (good guys) are also included. If unknown insects are encountered in cotton fields, this is a great reference to aid in identification. Every Texas, Oklahoma, and Kansas cotton producer should have a color hard copy of this publication available as a handy reference.
- To obtain a PDF copy of this publication, click on the link below:  
<https://lubbock.tamu.edu/files/2019/04/ENTO-075-2019.pdf>
- **Fleahopper photographs and discussion can be found beginning on page 10 of the above publication.**

### Fleahopper Action Threshold for Panhandle, South Plains, Permian Basin, Rolling Plains, and Trans Pecos:

Fleahoppers	Week of squaring	Square set
25-30 per 100 terminals (terminal inspection method)	1 <sup>st</sup> week	<90%
	2 <sup>nd</sup> week	<85%
	3 <sup>rd</sup> week	<75%
	After 1 <sup>st</sup> bloom, treatment is rarely justified	

## Additional Reference Publication: 2019 Insect and Mite Pest Control Suggestions for Cotton

- Another cotton insect management guide from Texas A&M AgriLife Extension personnel is also available. This guide provides quick reference tables which includes several foliar insecticide options for various pests. Fleahopper information is found on page 4 of the guide. To download this guide, click on the link below:
- [https://lubbock.tamu.edu/files/2019/08/2019-Cotton-Insect-Control-Suggestions\\_ENTO090.pdf](https://lubbock.tamu.edu/files/2019/08/2019-Cotton-Insect-Control-Suggestions_ENTO090.pdf)

I have fully reproduced text concerning cotton fleahoppers below:

- *“When fleahoppers are abundant early in squaring stages, a heavy square loss can cause poor boll set and reduce yield. The first 3 weeks of squaring are the most sensitive to cotton fleahopper feeding, particularly in dryland cotton production.*
- *Insecticides applied during early bloom can result in outbreaks of aphids, bollworm, and tobacco budworm because of the destruction of predaceous insects and spiders. Avoid using broad-spectrum insecticides after the second week of squaring.”*

### Products labeled for foliar application to control cotton fleahopper include\*:

Product name/ trade name	Insecticide active ingredient/s	Formulated rate (fl oz or oz/acre)	lb active ingredient/acre	Acres treated per gallon/lb
Vydate	Oxamyl	8–32	0.125–0.5	16–4
Orthene 97	Acephate*	4	0.244	4
Acephate 90	Acephate	4.4	0.248	3.64
Intruder Max 70/Strafer Max	Acetamiprid	0.6–1.1	0.025–0.05	26.67–14.55
Carbine 50	Flonicamid	1.7–2.8	0.053–0.089	9.41–5.71
Centric 40	Thiamethoxam	1.25–2.5	0.0313–0.0625	12.8–6.4
Admire Pro	Imidacloprid*	0.9–1.7	0.032–0.061	142.2–75.3
Alias 4	Imidacloprid	1–2	0.0313–0.0625	128–64
Dimethoate 400	Dimethoate*	8	0.25	16
Bidrin 8 / Dicromax 8	Dicrthropos*	4.0–8.0	0.25–0.5	32–16

\*Various generics/brands available

\*Table is reproduced from the publication: 2019 Insect and Mite Pest Control Suggestions for Cotton (Table 5, page 4), and is available here:

[https://lubbock.tamu.edu/files/2019/08/2019-Cotton-Insect-Control-Suggestions\\_ENTO090.pdf](https://lubbock.tamu.edu/files/2019/08/2019-Cotton-Insect-Control-Suggestions_ENTO090.pdf)