



Cotton Comments

OSU Southwest Oklahoma Research and Extension Center
Altus, OK



July 12, 2011

Volume 1 Edition 9

Crop Update

The disastrous Great Drought of 2011 rolls on. Average daily high temperature for June as recorded by the Altus Mesonet station was 105 degrees and only two days have been below one hundred. The daily high temperature average for July 1-10 has been 106. Through July 10 at Altus we have recorded 47 days of at least 100 degrees. Six of these days have also been at least 110 degrees. The Altus Mesonet station recorded only 0.12" of rainfall for June and thus far July has provided no precipitation. Thankfully, only two July days have seen maximum wind speeds of at least 30 mph. The drought continues to take a terrible toll on southwestern Oklahoma agriculture. Those fields with center pivot irrigation and without diminishing capacity or increasing salinity issues are progressing. Cotton fields irrigated to a stand in early June are squaring, and those planted earlier are either blooming or nearing bloom. Frequent and substantial rainfall will be necessary to supplement irrigation in many fields. The dryland crop is essentially non-existent.

"Four Bract" Squares Observed

A consultant called me last week about what was described as "square abortion" that was not insect related. After a trip to Tillman County, the malady discovered was "four bract" cotton and likely responsible for the square shed. This cotton was no-till under a center pivot and generally in good shape considering the environment in which it has grown up. It was about 14-15 node cotton and 10 days or so away from blooming (would likely bloom around July 15). A cotton prebloom fruit is called a "square." A "cotton square" is not really a square and nobody knows why it is called that, when indeed it is more pyramidal shaped with three bracts surrounding the floral bud. While four-bract cotton can be found in just about any field in any year, in some years it is more pronounced. The last time I saw much four bract cotton was in 2006 (another hot, dry year). This phenomenon resulted in considerable attention across the Cotton Belt during that year. Dr. Sandy Stewart, who was Extension Cotton Specialist at Louisiana State University at the time, generated an excellent newsletter including photographs which eloquently described the situation.

In some cases, there are simply four bracts with a normal floral bud as shown in Figure 1.



Figure 1. Four-bract square.

In another case, there is an extra bract fused to the floral bud as in Figure 2.



Figure 2. Fourth bract fused to floral bud.

In still others, the floral bud is malformed and appears to have some kind of “extra growth” on the side as shown in Figure 3.



Figure 3. Malformed floral bud. (Courtesy Dr. Sandy Stewart)

What is the cause of this phenomenon, and what can be expected? This is a complicated answer. Observations of four bract squares are generally not specific to variety. It is not related to glyphosate applications; they have been observed in fields that have been treated with and without glyphosate. **Four bract squares are not the result of insect injury or feeding.** Moreover, there is no documented evidence that the occurrence of four bract squares could be related to the application of any crop protection chemical or growth regulator.

In Cotton Physiology Today, Volume 4, Number 1, which was printed in 1993, Dr. Mac Stewart and others discuss square development. These authors state that high temperatures (average day and night temperature above 80 degrees F) during early

season can contribute to the formation of a fourth “bract.” Basically, as a cotton fruiting branch begins to form a subtending leaf, these conditions can cause the meristem to produce another leaf in addition to the subtending leaf for the branch. This extra leaf becomes the fourth “bract.” The authors state that high temperatures later in the season (i.e. on older cotton) do not have the same effect. They also state that four bract squares are more susceptible to shed than normal three bract squares. For a normal square, see Figure 4.



Figure 4. Normal three-bract square.

The old “rule of thumb” is that it takes about 21 days or so to go from a pinhead square to a bloom, and this field was estimated to be about 10 days from blooming on July 8th. From the microscopic initiation of a square, it takes about 40 days to produce a bloom. Therefore, the microscopic square initiation would have occurred around June 8. When we look at the average temperatures for June, we can see that AVERAGE temperatures during this time frame actually hit around 90 degrees on June 8 however, every day in June was over 80 degrees. The entire

month of June averaged (high and low average for each day then averaged across all days) about 90 degrees. The 1971-2000 average “normal” for Altus for June is 79 degrees. The average temperature for the first 10 days in July has been 92 degrees.

To see the June 2011 temperature chart, [click here](#).

For a copy of the Cotton Physiology Today article, [click here](#).

Mesonet Irrigation Planner Update

The Mesonet can produce useful irrigation requirement information. For more information, see the June 29th issue.

For Altus for a May 15 planting date and for the last 10 days:

Last Irrigation Date	Evapotranspiration (inch)	Accumulated Evapotranspiration (inch)	Rainfall (inch)	Accumulated Rainfall (inch)	Water Balance (inch)
7/10/2011	0.36	0.36	0	0	-0.36
7/9/2011	0.35	0.71	0	0	-0.71
7/8/2011	0.31	1.02	0	0	-1.02
7/7/2011	0.31	1.33	0	0	-1.33
7/6/2011	0.29	1.61	0	0	-1.61
7/5/2011	0.26	1.88	0	0	-1.88
7/4/2011	0.26	2.14	0	0	-2.14
7/3/2011	0.27	2.4	0	0	-2.4
7/2/2011	0.25	2.66	0	0	-2.66
7/1/2011	0.29	2.95	0	0	-2.95

For Hollis for a May 15 planting date and for the last 10 days:

Last Irrigation Date	Evapotranspiration (inch)	Accumulated Evapotranspiration (inch)	Rainfall (inch)	Accumulated Rainfall (inch)	Water Balance (inch)
7/10/2011	0.31	0.31	0	0	-0.31
7/9/2011	0.24	0.55	0	0	-0.55
7/8/2011	0.27	0.83	0	0	-0.83
7/7/2011	0.25	1.08	0	0	-1.08
7/6/2011	0.24	1.32	0	0	-1.32
7/5/2011	0.22	1.54	0	0	-1.54
7/4/2011	0.22	1.76	0	0	-1.76
7/3/2011	0.25	2.01	0	0	-2.01
7/2/2011	0.23	2.24	0	0	-2.24
7/1/2011	0.27	2.51	0	0	-2.51

For Tipton for a May 15 planting date and for the last 10 days:

Last Irrigation Date	Evapotranspiration (inch)	Accumulated Evapotranspiration (inch)	Rainfall (inch)	Accumulated Rainfall (inch)	Water Balance (inch)
7/10/2011	0.38	0.38	0	0	-0.38
7/9/2011	0.34	0.72	0	0	-0.72
7/8/2011	0.25	0.97	0	0	-0.97
7/7/2011	0.29	1.26	0	0	-1.26
7/6/2011	0.28	1.54	0	0	-1.54
7/5/2011	0.25	1.79	0	0	-1.79
7/4/2011	0.24	2.04	0	0	-2.04
7/3/2011	0.25	2.28	0	0	-2.28
7/2/2011	0.26	2.54	0	0	-2.54
7/1/2011	0.29	2.83	0	0	-2.83

For Fort Cobb for a May 15 planting date and for the last 10 days:

Last Irrigation Date	Evapotranspiration (inch)	Accumulated Evapotranspiration (inch)	Rainfall (inch)	Accumulated Rainfall (inch)	Water Balance (inch)
7/10/2011	0.29	0.29	0	0	-0.29
7/9/2011	0.26	0.54	0	0	-0.54
7/8/2011	0.24	0.78	0	0	-0.78
7/7/2011	0.29	1.07	0	0	-1.07
7/6/2011	0.24	1.31	0	0	-1.31
7/5/2011	0.21	1.52	0	0	-1.52
7/4/2011	0.19	1.71	0	0	-1.71
7/3/2011	0.22	1.94	0.05	0.05	-1.89
7/2/2011	0.21	2.14	0	0.05	-2.09
7/1/2011	0.25	2.4	0	0.05	-2.35

Insect Update

After conversations with various consultants and conducting surveys of fields in seven counties this week, the insect outlook is as follows:

Cotton fleahopper: Populations continue to be light to non-existent, if applications are triggered by plant stage instead of infestations, then historically June 20 is the latest

these applications will have any benefit. Every field needs to be scouted and evaluated separately. (Please refer to the June 17 newsletter for more information).

Beneficials: A growing concern in many fields is lack of beneficial arthropods. This indicates that pests for these predators are either

missing or are present at very low levels. It will be important to not disrupt the beneficial population by unwarranted insecticide applications. This indicates that any insecticide application needs to be well pondered. Don't confuse four-bract cotton issues with insect damage. If you have any questions, please contact Extension personnel.

Moth activity: Bollworm moth trap counts have been lower this past week but Beet armyworm moth trap counts have remained constant.

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