The University of Georgia
Cooperative Extension
College of Agricultural and Environmental Sciences

Georgia Cotton

August 4, 2010
www.ugacotton.com

Crop Condition (*Collins and Whitaker*)

Georgia has recently experienced some rather hot and dry weather during the month of July, which undoubtedly has influenced the progression of the 2010 cotton crop. Daytime high temperatures during July were higher this year than the average of the past nine years with the exception of eight days, five of which occurred at the first of the month (Figure 1). Differences between July 2010 temperatures and 2000-2009 average July temperatures varied; however the 2010 temperatures were substantially higher than the previous nine-year average during the latter part of the month.

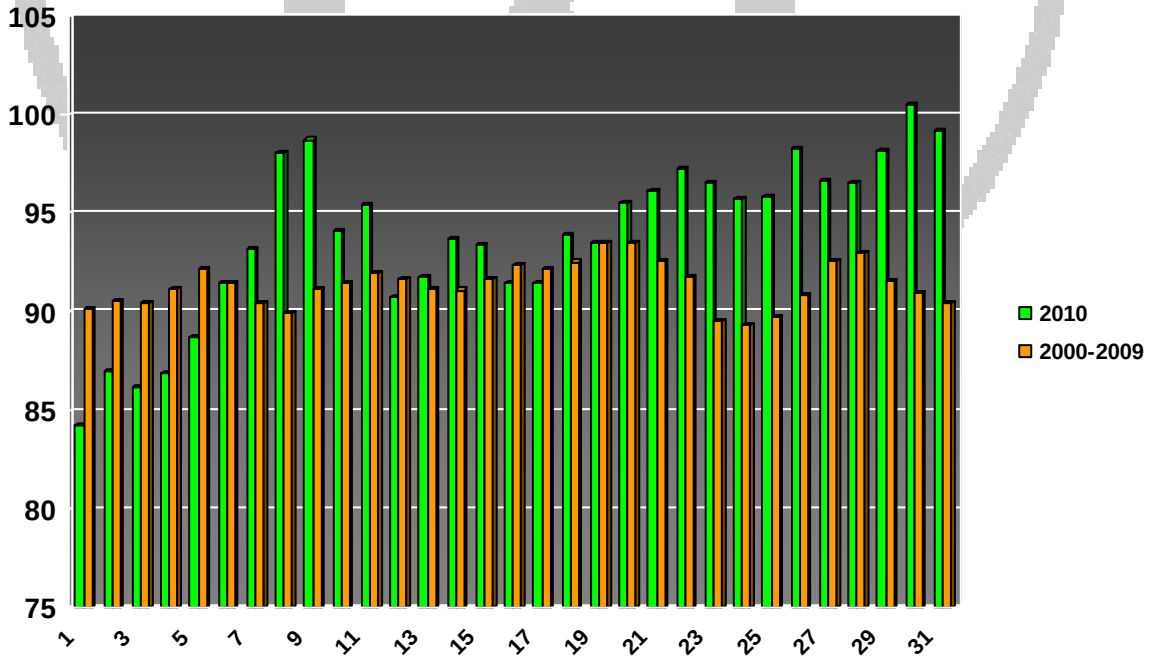

Figure 1. Daily high temperatures (°F) during July 2010 compared to the 2000-2009 average, combined over five locations (Attapulgus, Camilla, Tifton, Vidalia, and Midville). data source: www.georgiaweather.net

Daily nighttime low temperatures during July 2010 were also higher than the nine-year average low temperatures, with the exception of six days near the front end of the month (Figure 2). Nighttime temperatures were elevated everyday from July 9th until the end of the month, and were substantially higher on some days, especially during the latter portion.

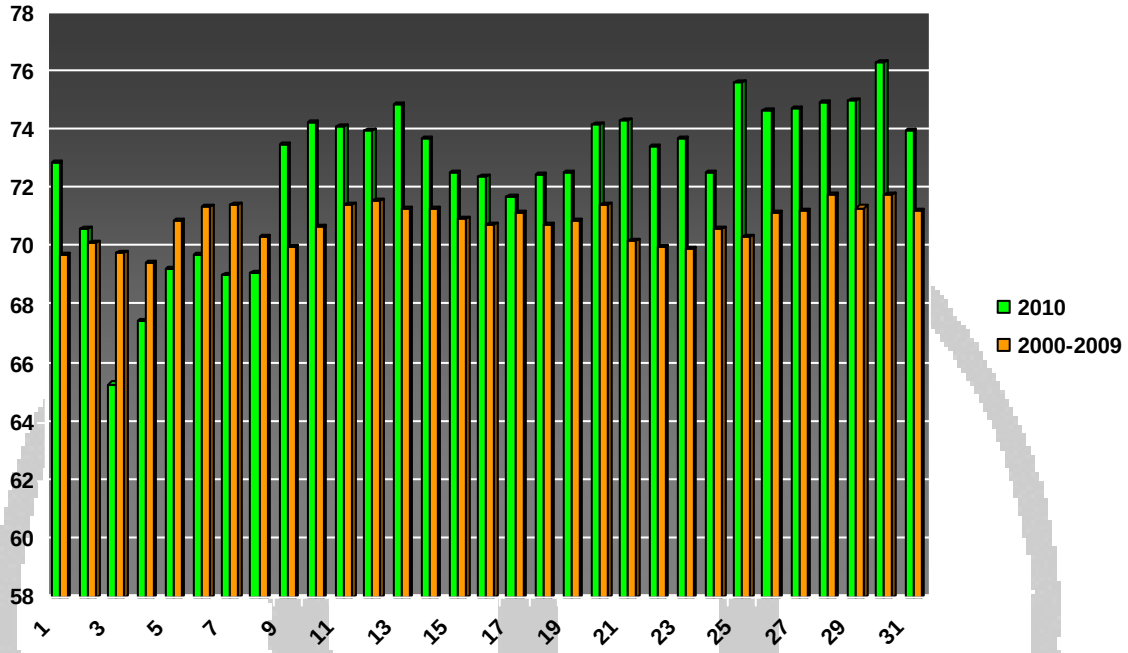

Figure 2. Daily low temperatures (°F) during July 2010 compared to the 2000-2009 average, combined over five locations (Attapulgus, Camilla, Tifton, Vidalia, and Midville). data source: www.georgiaweather.net

Rainfall during July 2010 has been erratic across the state. While some areas have received adequate rainfall, others have received little precipitation and cotton has experienced considerable drought stress. Rainfall averaged across five locations in Georgia during 2010 compared to the average rainfall at these locations during 2000-2009 is illustrated in Figure 3. Daily rainfall during July of 2010 was higher than the previous nine-year average for only eight days, with the greatest deviation from the norm occurring during the middle of the month. However, these locations in 2010 received less than average rainfall for 23 days, most of which occurred during the first week or so, and the last half of July.

Only seven days in July 2010 had more than average rainfall, and rainfall totals for the month were nearly 1.5 inches less than the previous nine-year average (Figure 3). In 23 days during July 2010 average rainfall was less than 0.1 inches, compared to only eight days during the previous nine-year average. These rainfall deficits accompanied by elevated day and nighttime temperatures have likely stressed dryland cotton in much of the state. Although drought stress is not rare in Georgia, we'll have to wait to see the effect of the July weather on the 2010 crop.

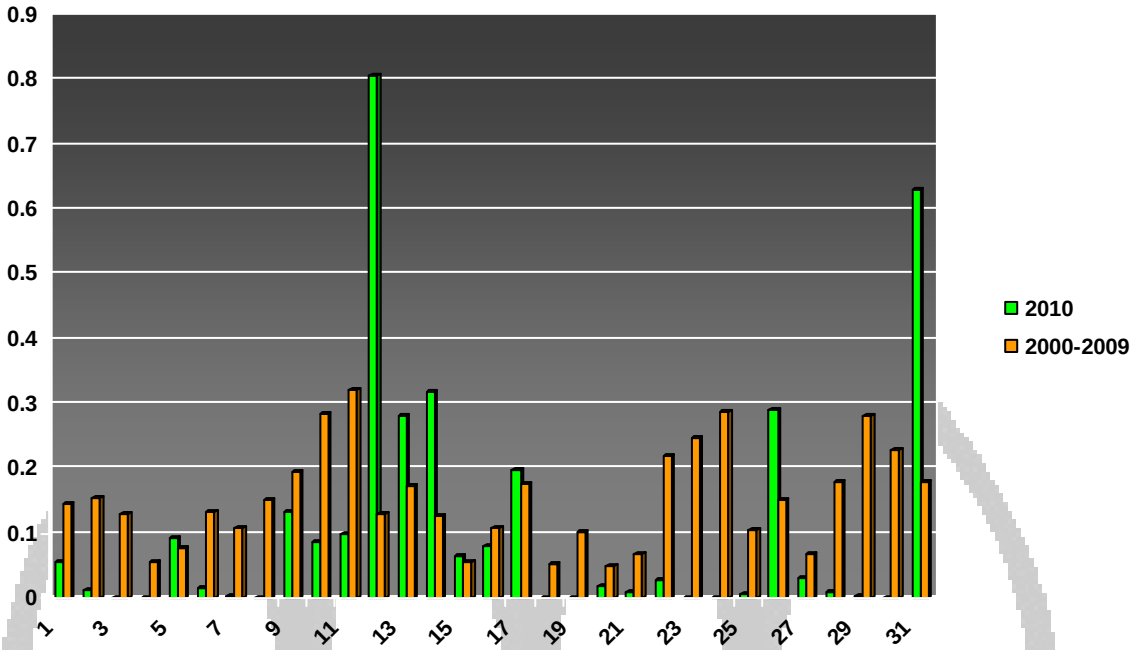

Figure 3. Daily rainfall (inches) during July 2010 compared to the 2000-2009 average, combined over five locations (Attapulgus, Camilla, Tifton, Vidalia, and Midville). data source: www.georgiaweather.net

High temperatures (day and night) with suboptimal soil moisture, which has likely occurred in many areas this year, can have detrimental effects on physiological processes and development of a cotton crop. Additional negative effects could have occurred since the majority of Georgia's cotton was blooming at the first of July or soon thereafter. The effects of hot dry conditions tend to be more pronounced on cotton that is blooming and has developed a boll load. Optimal temperatures and moisture often allow for continued terminal growth and successive boll set on upper nodes of the plant during this time of the season. However, high temperatures accompanied by poor soil moisture often results in stress which slows terminal growth, rapidly reducing the number of nodes above white flower to a point where reproductive demands are far too great to support further terminal growth and boll set (Figure 4). Abortion of smaller younger bolls can also be expected, as the cotton plant directs its remaining energy to the bolls in which the most resources have been invested. Although these processes are normal for well-developed mature cotton later in the year, hot dry weather can cause this phenomenon to happen prematurely, shortening the bloom period. Many fields, especially dryland fields, that we have visited in the past few weeks appear to have reached a defined cutout and/or a complete cessation of effective blooming in some cases. From this point forward, any additional rainfall that may occur will likely only help develop the existing boll load, as renewed terminal growth is unlikely.

Figure 4. Cotton that is blooming and/or setting bolls on very upper nodes has ceased its upward progression of effective blooming. Only outer position or vegetative blooms/bolls are likely to develop from this point forward.

Having illustrated a worst case scenario, there are several situations where certain fields may continue to develop a top crop if adequate soil moisture returns in time. This is most likely to occur in fields with irrigation, in later maturing varieties, in later planted cotton that does not have a heavy boll load, or in fields where PGR applications have not excessively reduced terminal growth. An indicator of continued terminal "horsepower" is a crop with five or more remaining nodes above white bloom (Figure 5), accompanied by adequate soil moisture.

Figure 5. Cotton with five or more nodes above white bloom may still have some terminal "horsepower" and may develop a couple more bolls on these upper nodes, especially if adequate soil moisture returns.

In all likelihood recent weather patterns have affected boll distribution in many cases. Premature cutout, that has primarily been observed in dryland fields, has likely prevented blooming and development of a few upper bolls that would otherwise be present had suitable environmental conditions prevailed. The bloom period for these fields has likely been shortened to some extent, resulting in a boll population that is spread over fewer nodes than normal. These bolls are also more similar in terms of age and maturity, resulting in a relatively compact or compressed fruiting crop (Figure 6).

Figure 6. A compact fruiting crop, resulting from the hot, dry weather. The boll population is spread over fewer than normal nodes, resulting in an earlier maturing crop.

A compact fruiting pattern can influence other production decisions from this point forward. Some of the lower bolls are beginning to crack open, which is especially observed in early-planted cotton, but also in some fields that were planted in early to mid May. This may be related to the hot dry weather in part, however it is a sign that defoliation may not be too far away, and slightly earlier than normal. The rate of boll opening is usually more rapid in a compact fruiting crop, especially when warm sunny conditions prevail, which further promotes an early crop. Potential for hard locked bolls, yield loss, and lint degredation can occur when bolls open in August since this month tends to be relatively wet in Georgia.

With the potential for continued high temperatures, adequate to excessive soil moisture could induce new vegetative growth in fields that have ceasedd blooming, which could complicate defoliation. Defoliation timing decisions in terms of boll opening rates, defoliant product selection, and the calendar date of defoliation will all likely be affected by the weather that we have recently experienced, and the resulting effects on the current cotton crop.

Leaf Spots Common on Cotton; Management Options Elusive (*Kemerait, Harris, and Brock*)

In recent weeks, growers, consultants and county agents have reported numerous fields where spots have speckled cotton leaves, bracts, and bolls. These reports stretch from Clay County on the Alabama border to Thomas County bordering on Florida and Screven County on the South Carolina border. The dramatic appearance of these spots has caused concern to many producers. The majority of the leaf spots sent to the UGA Diagnostic Clinic in Tifton have been diagnosed as 'Stemphylium leaf spot" thus far. As most of our producers are aware, Stemphylium leaf (Figure 1) spot is linked to a nutritional deficiency in the cotton plant, primarily potassium, which greatly increases the cotton plant's susceptibility to this disease. Typical symptoms include numerous medium-sized spots on the leaves, often with a purplish margin, and a tan-to-gray center that becomes brittle and may give the leaf a "shot hole" appearance. In severe cases, rapid and complete premature defoliation can occur over a matter of weeks. In my experience, Stemphylium leaf spot is typically found on the leaves and much less frequently on bolls and bracts. I believe that much of the Stemphylium leaf spot currently plaguing our cotton fields is a result of extremely hot and dry weather that is affecting the uptake of potassium in the cotton.

Figure 1. Extreme example of Stemphylium leaf spot associated with potassium deficiency in Colquitt County, 2 August 2010. Photo by Glen Harris.

Effective management of Stemphylium leaf spot is tied to ensuring that sufficient potassium is not only available in the soil to the cotton plant but that the potassium is also adequately transported to throughout the plant. There is some indication that a fungicide such a Headline (pyraclostrobin) could be a part of the solution in the management of Stemphylium leaf spot. However we still struggle to develop a recommendation that provides a grower with reasonable expectation of successful control with the use of a fungicide.

Corynespora leaf spot is another disease that is of particular interest and concern to producers in Georgia. This disease was first diagnosed in Georgia in 2009, though it was likely reported by consultants and agents for several years before that. Corynespora leaf spot has been again identified in Georgia in 2010 and is most common in the southwestern areas of the state. Severe outbreaks of Corynespora leaf spot (Figure 2) were observed in Colquitt County on 2 August and premature defoliation had already occurred in some instances (Figure 3). Spores of the Corynespora pathogen were found associated with spots found on the bolls and the bracts in these fields (Figure 4).

Figure 2. Corynespora leaf spot in Colquitt County, 2 August.
Photo by Glen Harris.

Figure 3. Premature defoliation in Colquitt County associated with Corynespora leaf spot. Photo by Glen Harris.

Figure 4. Bolls collected in field in Colquitt County where outbreak of Corynespora leaf spot was severe. Cause of spots remains unclear; however spores of Corynespora pathogen were associated with some spots.

Corynespora leaf spot appears to be much less related, if related at all, to nutritional deficiencies as are Stemphylium and Cercospora leaf spot diseases. Therefore, there is optimism that growers may one day be able to manage this disease that seems to be of increasing importance with the judicious use of fungicides. Currently, fungicides like Headline, Quadris, and tebuconazole are labeled for use on cotton. Research continues to determine timing of applications that may provide control of Corynespora leaf spot.

Cotton Die-Back Reported From East Georgia

If numerous outbreaks of leaf spot disease were not enough for cotton growers in 2010, the appearance of dramatic and unusual symptoms in fields in eastern Georgia (for example Bulloch County) have been of additional concern. Symptoms of this die-back include death in the terminal, a "shepherd's crook" appearance of upper foliage (Figure 5), damage to upper limbs (Figure 6) and unusual leaf spots (Figure 7). Jason Brock with the University of Georgia's Plant Disease Diagnostic Lab in Tifton has isolated several "fungi of interest" from the symptomatic plants to include *Choanephora*, *Fusarium*, and *Phomopsis*. It is not clear how these known pathogens are related to these symptoms; however our research continues.

Figure 5. Death of young leaves in upper canopy with "shepherd's crook" appearance. Photo by Jason Brock.

Figure 6. Die-back of upper limbs and foliage.
Photo by Jason Brock.

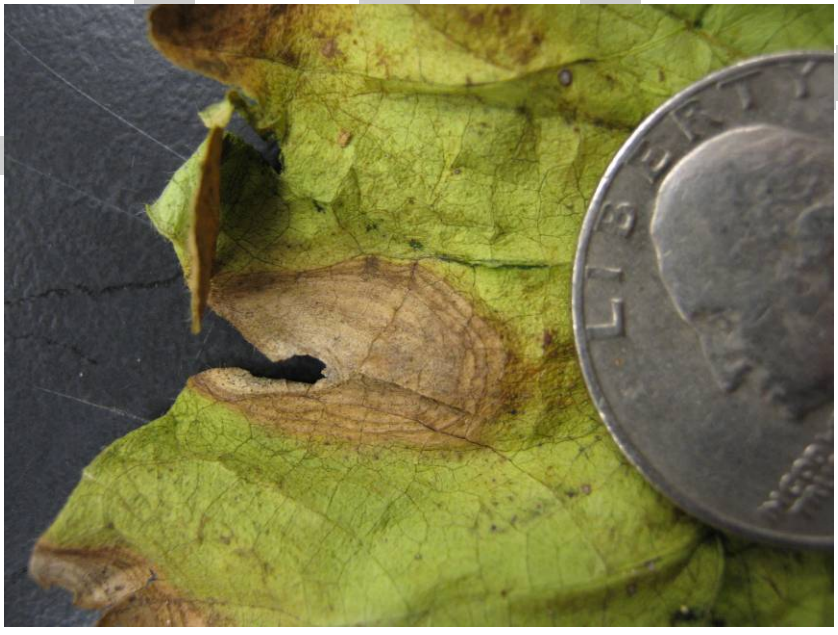

Figure 7. Unusual leaf spot on affected cotton. Photo by Jason Brock.

Upcoming Field Days:
SE GA Research & Education Center in Midville, GA on August 18, 2010
SW GA Research & Education Center in Plains, GA on August 26, 2010

Cotton & Peanut Research Field Day, September 8, 2010 Tifton: Mark your calendars for the 3rd Annual UGA Cotton and Peanut Research Field Day scheduled for September 8, 2010. The tour will begin at 9:00 a.m. and conclude with lunch. The field day is being sponsored by the Georgia Cotton Commission and the Georgia Peanut Commission.

Contributions by:
Guy Collins, Extension Cotton Agronomist
Jared Whitaker, Extension Agronomist
Glen Harris, Extension Soils and Fertilizer Specialist
Bob Kemerait, Extension Pathologist
Jason Brock, UGA Plant Disease Diagnostician

Your local County Extension Agent is a source of more information on these subjects.

Edited by: Guy Collins, Extension Cotton Agronomist