

Cotton Field Check

A Cotton Management Update from UC Cooperative Extension

Early August Field Situations & Management Considerations

Bob Hutmacher, Cotton Specialist, UC Davis Plant Sciences-Shafter & Univ. CA West Side REC

Compared to the status of many of our SJV cotton fields in early July, some things remain similar, while others have changed quite a bit the past month. The past few months, the main stories revolved around a difficult, and in some places late start in many fields, and the persistent threat that lygus were causing in a lot of areas. Lygus problems did develop and expand in many fields and parts of the valley, resulting in some persistent populations requiring several to many pesticide applications as control measures. It has been hard to rely on beneficial insects to provide adequate relief in control of pest populations, and the sequence of pest issues in some fields will be the dominant “story” in those fields, with big impacts on yield potential and production costs. Some of the fields which showed reduced vigor, thin stands and weak root systems continued to cause problems during July, with variable growth across these fields making it more difficult to accurately assess fruit retention and perhaps timing for irrigations.

In many fields, earlier recommendations with a late start were to reduce N fertilizer applications to reflect lower yield expectations. This approach called for a reassessment of fruit retention and yield potential later in fruit development, and then a later, water-run application could be considered if fruit set was better than originally expected. In most fields I am aware of where lower N applications were done, I think it was a good “call”, since fruit retention has been variable or lower than expected early to mid-season and reduced N levels in that situation help with more managed, less rank vegetative growth. There are some late-developing fields where supplemental water-run N or foliar N applications might still be a management consideration within the next week or two, but at this late date, that probably would only apply to fields with lower vigor plants, not yet at cutout, and with a relatively large boll set for the size of the plants. Most fields are either not in that condition (low vigor, high retention, pre-cutout) or are past the period when supplemental N applications are likely to produce a beneficial response. Past research generally has also shown that foliar N or N and K applications produce the best response when applied in the period between about early bloom and peak bloom (the period of about 1 through 3 or 4 weeks after first bloom in Pima or longer season Acala varieties).

Water Stress / Other Stresses. There is no interest in “jinxing” the month of August in a difficult year by talking about at least one thing that has gone right this year so far, but one help the past month or more in my opinion has been the general absence of periods of persistent heat and high nighttime temperatures. Past research has generally shown that direct heat-related damage can occur with peak daytime temperatures of about 110 to 112F and above, and so far, we have not been at those temperature levels during growth stages critical to fruit set in cotton this year in the SJV. Worse damage can often occur when daytime high temperatures are compounded by nighttime temperatures of relatively short duration (several hours) that reach about 82 to 85F, and again, in general we have been spared that additional complication in recent weeks. This doesn’t mean, however, that some plants are not exposed to stresses this year ... water stress in particular. Some of the worst stress-affected areas seen this year probably have been: (a) areas where limited or costly water supplies remain a factor; and (b) where significant irrigation delays have been used in efforts to have an effect on the relative balance between vegetative growth and fruit retention. In some of these fields the level of water stress imposed during these irrigation delays could be evaluated by use of the pressure chamber / pressure “bomb” to measure leaf water potential, or growers could simply evaluate plant condition by looking at changes in leaf color, orientation (wilting) or leaf/plant canopy temperature.

I understand that growers and consultants are using irrigation delays and water stress to help manage potential for rank growth, to try to shift the balance between leaf growth and fruit retention, or to make plants less attractive to insect pests, etc., but in my opinion it remains a good practice to look at these fields at

different times of day to make sure that levels of water stress imposed is not of a severity or duration that could do more damage than good. In terms of visual symptoms, if on a late-summer day with temperatures in the 90 to 100F range, consider a situation where much of the field shows symptoms of significant water stress (leaf wilting) only in mid to late afternoon hours but looks ok most of the rest of the day in most of the field. In this situation, your irrigation delays are imposing significant water stress, but the impacts on the ability of the plant to continue producing photosynthates (carbohydrates needed for growth or to complete boll development) are relatively limited in duration and stress levels (which you could measure as leaf water potential if you wish) are probably moderate. Alternatively, everyone has seen fields where much more significant water stress occurs, with a lot of wilted leaves evident starting in the late morning hours and continuing through the day While this level of stress will certainly limit rank growth and affect plant development, it also essentially shuts down additional production of carbohydrates needed for maintenance of developing fruit and production of additional fruiting sites, which can only occur with at least some continued growth.

Variability Across Fields and Management Decisions. In evaluations of a range of locations so far this year, there is a very wide amount of variability in plant growth rates, fruit retention in bottom versus upper crops, and how these plants might best be managed for the remainder of the season. Within the past week, plant mapping in multiple locations in Fresno, Tulare and Kern County showed us the importance of field by field assessments for management decisions. In multiple places, we had fields near each other, sometimes planted at similar times, with very different growth rates and fruit retention patterns.

WEAKER VEGETATIVE GROWTH AND GOOD RETENTION

While we don't have a lot of plants fitting this description in our research plots, there are locations fitting this description, particularly in water-short areas where lygus have not been as much of an issue (a few areas). Plants of this description are potential candidates for early cutout if retentions remain good and growth limited. For most of these fields, unless you are bold in assuming good fall weather conditions, it is getting pretty late to try to push the plants with water or nutrients (N and/or K) to prolong growth, since the time to get started is within the first 3 weeks past first bloom – probably before they reach 5 nodes above white or yellow flower (NAWF/NAYF) if possible. These water or fertilizer additions much later in crop development (4 weeks+ into bloom) may just kick the plants back into bloom, with a considerable gap between first-set and later-set fruit. Your own past experience with the ground will help tell you if the plants are likely to broadly respond and continue growth with earlier or higher amounts of irrigation and fertilizer used to "push" the plants, or if the response will likely be sporadic across the field.

WEAK VEGETATIVE GROWTH, THINNER STANDS, RETENTION PROBLEMS. There are a lot of issues in these fields, and some variable plant populations to manage all in the same field. These fields are hard to sample (for plant growth and insect counts). Try to go back to the same zones within the field each time to get a handle on how things are going. Some of these fields the past couple of weeks were highly variable in some easy-to-measure parameters such as NAWF, so assessments used for field management decisions should reflect relative percentages of the total field represented by plants of different plant vigor levels.

STRONG GROWTH, VARIABLE RETENTION. Particularly with later plantings, there can be some continued aggressive new growth in the upper canopy of plants, with long internode lengths (3.5 to 4" or more) in the upper 4-5 nodes in many fields. Where this strong vegetative growth occurs in combination with good fruit load, it can still produce some decent yield potentials if fruit retention is under control, but still bears repeated observations to catch any developing problems. In these stronger growing fields, watch carefully to see if the fruit retention situation changes, and be ready to consider delayed irrigations if the situations change dramatically toward reduced retention.

COTTON PRODUCTION MEETINGS (more details in MITEFAX for this week and next):

- Tuesday, August 10th: Kern County (Bakersfield – Hodel's Restaurant; breakfast/registration starts 7:15AM, mtg: 8-9:15)
- Wednesday, August 11th: Tulare/Kings Co. (Hanford, Comfort Inn Irwin Street, breakfast/registration starts 7:15; mtg. 8-9:15)
- Wednesday, August 18th: Merced County (Bowles Farms) – morning meeting, more details to follow in Mitefax
- Thursday, August 19th: Fresno County (West Side Research Ctr., Five Points; 10:30-12 with lunch following meeting)