

Cotton Field Check

Late-Fruiting Management Issues - Summer, 2009

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Field Conditions and Situations. The 2009 cotton crop generally started well with very good stands and good early growing conditions. Since that positive beginning significant acreage has seen some difficulties and management challenges. Many fields have been reported to have low to moderate pest pressures and need for insecticide applications to date. As in many years, however, other fields have been hit with square shed likely caused by the infamous plant bug, *Lygus*, resulting in a number of fields experiencing low retention of bolls in the lower and middle part of the plant. Fields experiencing a range of problems will require special attention as we move beyond the mid-season and enter the late season and finishing management stages of the season. As with most years, special care and attention to irrigation, pest and PGR management will be needed over the coming weeks to help deliver a positive result at seasons end.

While there is significant variation in individual field performance, perhaps the most widespread observation noticed recently around the San Joaquin Valley is the large acreage of Pima moving toward relatively early, perhaps premature cutout. The reasons for premature cutout are many, but the primary reasons that apply this year include the many fields that began fruiting lower on the plant, the prevalence of good bottom and middle fruit retention and plant stresses that accumulated during the early season as a result of delayed irrigation scheduling. Managing the first two conditions is a problem most growers don't mind dealing with because high retention fields that begin fruiting lower on the plant often translate to high yields and efficient utilization of agronomic inputs. The key to finishing these fields is to recognize that there may be some physiological shed occurring, especially in the Acala fields, and management should be aimed at keeping the field from moving into cutout too rapidly.

Managing Fields Transitioning Toward Cutout – *Weak or Small Plants with Good Fruit Retention.* If you are trying to avoid rapid transitions into full cutout, high retention fields generally will respond favorably to: (1) lower rates of PGR (mepiquat chloride) applications or even elimination of later PGR applications; (2) irrigations during peak bloom to mid-boll fill that keep water stress moderate; and (3) making sure crop N and K levels are within recommended levels if possible. If you decide to try to push the plants with water or nutrients (N and/or K) to prolong growth, the best response will be within the first 3 weeks past first bloom – probably before plants reach 5 NAWF if possible. Extra 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 plants are likely to 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 fields. If you're unsure of likely responses, keep fertilizer applications moderate (30-40 lbs N/acre, for instance) or do test strips to gain experience.

Numerous SJV cotton fields that have experienced excessive early and mid-season water stress are now showing signs of premature crop cutout. This is very understandable given the 2009 cutbacks in the delivery of surface water and the need to irrigate other crops on the farm. But this can stand in the way of the grower that wants to maintain a highly productive cotton field. Fields experiencing excessive water stress earlier in the season have less vegetative growth and their canopies may not have fully closed the row. While there are often positive outcomes to delaying row closure early in the season, mid to late-July cotton will benefit from moderate vegetative growth going forward. This is accomplished by producing an ample number and size of

newer leaves that are more productive photosynthetically and that can aid in supplying carbohydrates needed for the growth of developing fruit. Similarly, continued development of additional fruiting sites to the outer branch position bolls will result when water stress levels are moderated by timely irrigation events.

Pima Issues in Irrigation Management. Since Pima cotton varieties have a more indeterminate fruiting habit, pushing the crop during the peak bloom period of late July and early August can have a profound effect on the timing of crop cutout and when effective fruit production ceases. Careful attention to water management practices during the next couple of weeks will be especially important for Pima growers that are observing widespread flowering near the top of the plant.

Numerous studies conducted in the San Joaquin Valley show that the latest harvestable bolls come from flowers set on or prior to August 20. After this time, the chances of making additional yield from flowers dramatically drops off. Pima fields that have not gone into strong cutout (>3 nodes above yellow flower) will especially benefit now from timely irrigation schedules that lead up to a final irrigation event that will provide adequate water to the plant allowing late season boll formation and complete fiber maturation to occur. Without timely applications of late season irrigation water to these fields moving toward cutout, the outcome will be for the crop to move toward more complete and definite cutout which will eliminate any real opportunity to produce a generous late season Pima crop. The peak bloom irrigation decisions made over the next couple of weeks especially play a key role in determining final yield potential and crop quality. UC studies have shown that when insect pressures are not limiting and water applications are reasonably efficient, each acre inch of water applied will produce between 50 and 80 pounds of harvestable Pima lint. These water production efficiencies emphasize the benefits and value of applying adequate irrigation water to the crop when possible.

While practical considerations in irrigation management can often be dictated by system capacity and water availability, growers faced with more extreme water shortages will be benefited most by limiting excessive water stress during the effective bloom period and delaying severe water deficits as late as possible. Cotton stressed during the period of peak fruit formation is not only driven to earlier cutout, but is also at risk to shed earlier set bolls, reducing opportunities for future recovery and sustained production. Conversely, delaying more severe water stress, if necessary is best left to the late season when boll set is complete and fiber formation is nearly complete for earlier-set bolls. This approach is particularly successful in crops that have a well developed root system and in high water holding capacity soils.

Variability Across Fields and Management Decisions. In evaluations of a fairly wide range of locations in recent weeks, we saw considerable variability in plant growth rates, fruit retention in bottom versus mid- or upper-canopy fruit positions, and how these plants might best be managed for the remainder of the season. Across different field conditions this time of year, some of the same “themes” still apply for management needs:

- Assess likelihood of early cutout in high retention, low vigor fields (prior section discusses management options/recommendations for these situations)
- Assess any ongoing fruit loss and identify if (a) it is likely insect-related, and if you think so, (b) are the insect pests still there in populations worth trying to control?
- Plants with excessive growth rates associated with combinations such as low retention combined with relatively high water and/or nitrogen availability will need delayed irrigations and/or late higher-dose PGR’s soon to manage growth and avoid a late, difficult to defoliate crop.

As usual, field management recommendations across variable fields still come down to the need for individual field assessments rather than any assumptions based on expected status and calendar date – some observations on different field conditions follow:

WEAK TO MODERATE VEGETATIVE GROWTH, THINNER STANDS, SOME RETENTION PROBLEMS. There are a lot of issues going on 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). If retention remains good, any additional PGR applications may best be at lower rates or might be unnecessary and should not be applied. However, keep a watch to see if higher growth rates develop in some areas, and if so, expect that more intensive sampling will be required to assess both plant growth and insect situations, as a range of things may be going on in the field. Try to go back to the same zones within the field each time to get a handle on how things are going over the next couple of weeks critical to fruit set. Some of these fields this past week 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 some of the later plantings where water availability or price was not as much a factor this year, recent warm to hot weather coupled with good soil moisture from recent irrigations has brought aggressive (sometimes exceptionally 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 these plants. Where this strong vegetative growth occurs in combination with good fruit load, it can join together to produce some high yield potentials, and some of these fields with recent very good retention could continue with productive fruiting for a few more weeks and hit some very good yield potential. However, this good progress toward high yield potentials is not a sure bet, so the fields still can require attention, with repeated observations and decisions over at least the next several weeks. Some of these fields (both Acala/Upland and Pima) have recent square and small boll retention problems (perhaps insect-related, perhaps heat-related). In these strong growing fields, watch carefully to see if the fruit retention situations change rapidly, and be ready to assess pest situations and be ready to use PGR applications and/or delayed irrigations if the situations change toward much reduced retention.

Reminder – Information on Fusarium Issues in Cotton. We continue to remind PCA's and growers to be on the lookout for signs of this fungal pathogen "Fusarium oxysporum" in cotton fields in the San Joaquin Valley, particularly if you see symptoms in areas with no prior known history with this disease. As we transition from late bloom into boll fill, any potential Fusarium problem areas become much harder to identify and separate out from other problems (Verticillium, late season nutrient issues). If you want fields evaluated by UCCE staff, contact us soon with any requests.