



# Cotton Field Check

Management Updates from UC Cooperative Extension  
July 22, 2005

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## Field Situations and Management Considerations For San Joaquin Valley Cotton – late-July, 2005

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Compared to the situations we had about a month ago (late June), some things remain the same, and others have changed quite a bit during the month of July. Last month, it seemed that the main stories revolved around a difficult, and in some places late start in many fields, and the persistent threat that lygus problems could really cause problems in a lot of areas. Lygus problems did develop and expand in some fields and parts of the valley, resulting in some persistent populations requiring control measures. Some of the fields which showed reduced vigor, thin stands and beat up root systems continued to cause problems during July, with variable growth across these fields making it much more difficult to accurately assess fruit retention, timing for necessary irrigations, and likely supplemental fertilizer applications – here in July, these highly variable fields continue to make management decisions more difficult.

**High Temperature Stress / Other Stresses.** The big change in the past ten days or more has been the persistent heat, including relatively high nighttime temperatures in many parts of the San Joaquin Valley. Based on a variety of research trials in California and other states, the daytime temperatures we have been experiencing (generally less than 110F) and nighttime temperatures below 85 after midnite or so are generally not assumed to be high enough to cause pollen sterility problems. Peak temperatures of about 110 to 112F and above, and nighttime temperatures of about 82 to 85F have been associated with pollen viability in controlled research done in greenhouse or growth chambers, and there also have been good correlations with field measurements. When temperatures are high enough to damage pollen, the direct heat damage is done mostly when flower buds are small, and is not seen right away. Typically, damage is seen as aborted positions about 2 ½ weeks or so after the first very high temperature events.

However .... life in the fields for plants is never quite as simple to explain as results from research trials, as we grow different types of cotton and plants are exposed to multiple stresses at some times.. We have multiple types of cotton grown here in the SJV, each with potentially different characteristics:

- non-Acala Uplands with origins outside of CA (likely more heat-tolerant)
- Acala varieties with SJV origins (generally considered more heat-sensitive, but little new work has been done to compare Acalas in recent years)
- Pima (generally considered more heat-tolerant due to screening and variety development work done in Arizona – but less known from evaluations of more recently-developed varieties)

We haven't had many instances recently of temperatures high enough (over 110 to 122F) to cause these direct injuries during the past 10 days here in the SJV, but it has been close. An indirect effect of long-lasting hot spells on plants is similar to what it does to people around here – a cumulative stress associated with hot daytime temperatures combined with nighttime temperatures that have remained over 90 to 95F well toward midnight. Day and night temperatures in the ranges seen the past week or more generally are less conducive to high photosynthetic rates, and favor higher daytime and nighttime respiration rates in plants, reducing available carbohydrates needed for maintenance of developing fruit and continued growth. If this continues for long, without relief, it certainly represents another stress for beleaguered plants already dealing with fruit losses and perhaps water stress.

With all this in mind, it is certainly possible that not all fruit losses seen this year will be pest-related – identify the presence of pests prior to making control decisions.

**Variability Across Fields and Management Decisions.** In evaluations of a wide range of locations so far this year, we are still somewhat surprised by the 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 and Kern County showed us the importance of field by field assessments for management decisions.

In multiple places, we had adjacent fields, planted within ten days of each other, with very different growth rates and fruit retention patterns. Even some fields receiving systemic pesticide applications prior to the first irrigation had bottom-5 fruit retention problems, with very high growth rates (long upper-canopy internodes). Some of these had excellent upper canopy fruit retention (>90%), so growth may remain under control if many of those are retained ..... other nearby fields had difficult-to-explain poor to moderate upper canopy fruit retention. In these fields, in addition to getting the fruit loss under control if it is insect-related, they will need delayed irrigations and/or PGR's soon to manage the plants and avoid a very late, difficult to defoliate crop. *More than ever, field management recommendations this year still come down to individual field assessments:*

#### WEAKER VEGETATIVE GROWTH AND GOOD RETENTION

These are potential candidates for early cutout if retentions remain good and growth limited. If you decide to try to push the plants with water or nutrients (N and/or K) to prolong growth, the time to get started is within the first 3 weeks past first bloom if at all possible – probably before they reach 5 NAWF 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. If you are unsure of the response, keep fertilizer applications moderate (30-40 lbs N, for instance) or do test strips to gain experience

**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 be at lower rates or unnecessary. However, keep a watch to see if good growth rates develop in some areas, 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.

**STRONG GROWTH, VARIABLE RETENTION.** Particularly with some of the later plantings that escaped a lot of the rain and cooler weather, recent warm 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 many fields. Where this strong vegetative growth occurs in combination with good fruit load, it can join together to produce some very high yield potentials, but still bears repeated observations and decisions at the right time. Some of these fields 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 situation changes, and be ready to use multiple applications of PGR's and/or delayed irrigations if the situations change dramatically toward reduced retention). Especially this year with later plantings, there may not be adequate time to grow very large plants and mature late developing bolls.

**Reminder – Information on Fusarium Issues in Cotton.** In University and industry meetings this year, we have reminded PCA's and growers to be on the lookout for signs of the 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 early bloom to late bloom, 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. Additional information is available in COTTON MANAGEMENT GUIDELINES and FUSARIUM UPDATES available on our UCCE cotton website at: <http://cottoninfo.ucdavis.edu> or from your county UCCE Farm Advisor.

#### **A REMINDER – PRECISION AGRICULTURE FIELD DAY**

##### **FOURTH ANNUAL PRECISION AGRICULTURE FIELD DAY**

*(equipment displays, grower panel on farm experiences with Precision Ag – lunch provided)*

**Where:** Ted Sheely's Farm, near Stratford, CA

**When:** July 28, 2005 8:30 to 11:30 AM

\* continuing education credit applied for

\* sponsors: UCCE, CSU Fresno, Western Plant Health Association, West Hills College and AZCAL Mgmt.

#### **FOR MORE INFORMATION:**

Contact Steve Wright (UCCE Farm Advisor, Tulare and Kings Counties) at (559) 685-3303 or contact Judy Hopper (UCCE Kings County) at (559) 582-3211, ext. 2730