UPDATE AND ADVISORY
From Bob Hutmacher and San Joaquin Valley UCCE Cotton Farm Advisors – July 13, 2001

Weather and Pest Situation.
Variable weather and relatively low insect pest pressure remain with us as we head into peak bloom (more or less) with most San Joaquin Valley cotton fields. Most of our observations and most reports have been that insect pest pressure remains relatively light, with few treatable problems with spider mites in Acalas or Uplands, and very limited areas (so far) with any aphid or armyworm problems reported. With the heat and the stage of crop development here in mid-July, most of us have been assuming that we would have experienced several bouts of spider mite problems earlier on, and more recently would have been expecting mid-season aphids and armyworms based on this being a late-planted year. With the heat and degree-day accumulations during certain periods this past 2 ½ months, however, most fields are not particularly "late" compared with earlier projections, and with continued good fruit retention, many fields may actually be ahead of crop progression seen in a more "average" year.

In many of the fields in which we have research plots, lygus have consistently been present and warrant attention and continued monitoring. However, the relatively high top-5 first position fruit retention seen in many (or even most) fields suggests that with the low to moderate lygus counts we have, they have not been active in high enough numbers to reduce square and fruit retention below levels expected for cotton at this growth stage Lygus counts in fields where some of us have been this past week have in most cases been less than 4 or 5 per 50 sweeps, and often have been at levels of 1 or 2 per 50 sweeps. In many fields, upper canopy fruit retention is either on target or often consistently higher than expected for this part of the fruiting cycle.

As many of the consultants reporting to MITEFAX have observed, this reduced pest pressure so far this year has generally been very good news with the difficult economic times for growers, but it still leaves you nervous about what pest problems might be just around the corner.

High Temperature Impacts – This Time or Next ?
Some of the high temperatures that we experienced about 9-12 days ago, combined with humidity that was relatively high for the SJV certainly had the potential to impact square and small boll retention in the more heat-sensitive Acalas under some conditions. With the heat experienced about a week ago, there certainly were some fields that experienced fruit losses, but I believe they were associated more with the combination of high temperatures and water stress due to delayed irrigations rather than being due to high temperatures alone.

Our field evaluations and limited reports indicate that square and small boll shed following the recent hot conditions were not particularly excessive, so we may have dodged major heat-related losses this time. Two possible reasons why fruit losses did not appear to generally be all that bad following the heat this time:

- This last hot spell occurred during a period fairly early in the fruiting cycle, when fruit loads and therefore nutrient and carbohydrate needs for the developing bolls were quite limited – hot spells during later periods (late July or August) would be more likely to cause heavier losses
- The high temperatures of 9-12 days ago were indeed high, but daytime temperatures of about 107F or more, and night time temperatures that remain above 80-82F are most associated with heat-related square and small boll losses in the more heat-sensitive Acala varieties

Available information on sensitivity of cotton to square and fruit losses during high temperature periods suggests that losses can be related to specific impacts of high daytime temperatures on pollination and parts of the flower, with secondary impacts of high temperatures on carbohydrate nutrition and respiration losses. The following conditions or combination of conditions are likely to result in a greater impact of

high temperatures on fruit set and yield, so you might try to keep them in mind for later this growing season if we see more extremely hot weather:

1. high humidity associated with high temperatures limit the ability of the plant to evaporatively cool the plant canopy, making the problems worse
2. soil waterlogging and aeration problems during the high temperature periods can lead to higher fruit losses – we have confirmed that leaf gas exchange declines during water logging, leading to reduced photosynthesis and less evaporative cooling and resulting impacts on fruit
3. high temperatures combined with a fruit load that is large for the amount of photosynthate (carbohydrates) it can produce – such as later in the fruit development period when boll development and seed maturation requires a lot of carbohydrates and nutrients (N and K)

Available information still suggests that Pima varieties are more heat-tolerant than Upland cotton, and at least some non-Acala Uplands developed for the southern U.S. or Arizona are more heat-tolerant than most Acalas.

Some things to Consider a Few Weeks into Flowering.

The next couple of weeks remain "prime time" in regards to an opportunity to set fruit and move along toward maturing out your crops. There are some opportunities for some specific management decisions now or very soon that can have some big impacts the rest of the growing season, therefore it would be helpful during this period to assess the following:

- determine if vegetative growth is "under control" , too strong and likely to become rank, or too weak to provide locations for and support further fruit set
- determine if there are new or ongoing problems with square and fruit losses, and determine if causal factors (such as insect pests, water stress, etc) are still there and something you need to address
- decide if crop vigor measurements indicate a need for second growth regulator applications
- decide if the crop fruit load (combined with soil or petiole N data) indicates a potential benefit to foliar N or K applications, or water-run N applications

Although late squaring or early bloom is perhaps the best time to really work at some plant mapping to assess management needs, mapping a few weeks into bloom can also be very useful. It gives a chance for another assessment of fruit retention problems, needs for additional growth regulator applications or irrigation delays to deal with fruit retention and rank growth problems, or the potential need for "pushing" the crop with earlier irrigations, foliar nutrient applications or water-run fertilizer applications where the plant has a big fruit load combined with any indicators of a rapid progression to vegetative cutout. Even though many fields in the SJV look good, with good yield potential considering the rough early season, travels around the SJV to grower fields and research plots this past week have also pointed out that there are plenty of fields out there that are:

- low vigor, with limited ability to sustain added fruit set, and significant potential for earlier-than-desirable cutout (particularly true with some water-stressed fields)
- high vigor fields with high soil water and nutrient availability – these fields may be just fine if fruit retention remains high, but watch out that they don't take off vegetatively as retention of newly-developing fruit declines over the next few weeks

See the April, 1998 issue (Volume 47) of the CA Cotton Review on the UCCE Cotton Web site (http://cottoninfo.ucdavis.edu) for recommendations on timing and types of plant mapping during this growth stage or contact your UC Farm Advisor.

With low commodity prices and high costs for some production inputs, it will even more important than usual for consultants and producers to assess likely yield potential in fields and decide whether additional inputs will help boost yields and profits, or on the other hand, delay crop maturity and expose the crops to other late-season problems. It is important not to over-generalize the status of the fields out there, and to make decisions on a field by field basis. We will be trying to spend a little more time this next two weeks to watch for developing problems with plant vigor or fruit retention. Since in many fields there still is time to set a considerable amount of fruit (and it appears, a forecast for favorable weather to help out for the next week), it remains important to keep an eye out for developing problems.