June 23, 2001

From Bob Hutmacher, University of CA Cotton Specialist,
and the San Joaquin Valley UC Cooperative Extension Farm Advisors
(Bill Weir, Ron Vargas, Bruce Roberts, Steve Wright, Dan Munk, and Brian Marsh)

Someone really turned the heat up the last few weeks, and forecasts call for only a moderate cooling trend (into the 90's) for early next week. As we discussed in some of the UCCE Cotton Production meetings the third week of June, cotton is a warm weather plant, but this much heat this early can certainly affect the crop.

Irrigation decisions and the "Heat"

Most fields we have been in have had their first or second irrigations, depending on soil type. In many cases, these irrigations were earlier than normal and earlier than might be expected based upon plant size.

Some of us questioned these early irrigations in some fields until after we looked at quite a few early plantings with injured roots and seedling damage. Particularly in fields from March or early April plantings which sustained seedling disease damage and weakened root system development, these earlier irrigations were a must if the plants were to survive the May and early June heat and drying winds.

Most irrigation timing decisions have seemed to be appropriate. In addition, many earlier irrigations have been made using sprinklers or alternate row irrigation. Since actual total crop water use to this point in the season is not all that high in most fields with smaller plants, these techniques with their smaller water amounts alleviated the water stress some plants were experiencing without wasting water. In a year with such tight water supplies and costly water in many cases, it will be worth considering these and other water conservation measures where soil conditions and available labor can support it.

Square Losses and High Node of First Fruiting Branch

In our research plot fields, Lygus counts in general have been less than 2 or 3 adults per 50 sweeps, with few nymphs. In many cases, averages have been 1 or fewer Lygus adult per 50 sweeps. However, as discussed at the production meetings, we have been observing that in some fields we are missing squares routinely in the first position on the first, second and sometimes third or fourth fruiting branch, resulting in fields with bottom-5 FP1 retention in the 40% to 60% range. This has been observed both in untreated fields and fields with soil-applied systemic insecticide applied prior to the most recent irrigation.

First of all, particularly with rapidly growing plants in this heat, remember that expectations for retention of early fruit fall in the 60% to 70% range. Retention of 50% or less in early or bottom-5 FP1 positions certainly warrants your repeat attention to the fields in order to:

- Track any continuing retention problems. Assess whether insects could be a

cause and are still present, and make spray decisions.

- Determine if the field is developing problems of high vigor associated with low fruit retention. This results in the need for growth regulator applications and consideration of delays in irrigations to keep growth well-managed

Remembering those early retentions of 80-90% or more seen widely at this time during 2000 is nice, but those high retention numbers were not typical, and I haven't heard good explanations other than nearly ideal weather combined with low pest pressure early on in 2000. And while it may be tempting to blame some of these early fruit losses this year on low-level Lygus populations (which is a possibility), it remains important prior to spraying that you verify that the pest is there and in numbers that make the spray worthwhile.

Your decision boils down to a couple of questions: Do you spray and hope for possible benefits, knowing also that it's an added expense and something that might trigger other pest pressure? Or, do you have some room to tolerate a degree of square and early fruit loss?

It might be useful to remember that early square loss is often difficult to clearly explain, particularly with later plantings and with very warm conditions. Air temperatures over the past few weeks, while hot, have not been hot enough alone to cause direct fruit loss according to most studies. Squares are not as sensitive to water stress as they are to heat stress. Leaf water potentials <-23 to –25 bars (fairly severe stress) are usually required to directly cause square loss, and this would be unusual during the early season, even this year.

Some research has shown that plants subjected to high temperatures during the rapid vegetative growth phase (a couple of weeks into squaring through early bloom) tend to set the first fruiting branch at a higher node.

Warm early conditions during the period of rapid vegetative development tend to set up the plant for vegetative growth to be a strong competitor with reproductive (fruit) growth for carbohydrates and nutrients. Under these conditions, some square losses can likely be blamed upon weather and plant growth conditions rather than insect pests.