

Cotton Field Check

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A Cotton Management Update from UC Cooperative Extension

Field Conditions (mid-July, 2003) and some Management Considerations

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General Crop Management Considerations. Plants should be monitored routinely to assess fruit retention, insect pest populations, and plant vigor. With this information, informed decisions can be made regarding the need to move up or delay irrigations, apply growth regulators, apply supplemental water-run or foliar fertilizers if boll load is high, and consider pesticide applications if pest populations and fruit losses warrant it.

In observing fields across quite a few SJV locations this past week, there are fields ranging from about 10 or 11 main stem nodes all the way up to fields with over 25 nodes. Square retention and fruit set is in many cases very good in some of the more advanced fields. In such fields, yield potential is good enough to warrant consideration of foliar fertilizers or water-run N or K applications to avoid nutrient deficiencies, particularly since some growers reduced N applications with our strange early season weather. Many April and some early May plantings are in early to mid-bloom, with between 16 and 20 nodes at this point, and these plants may be quite responsive to adjustments in water or nutrient applications if you are concerned about low vigor and too early a cutout.

My observations are that particularly in the central and northern SJV, many fields planted in late-April or May are still just a week or two into bloom here in mid-July. With the likelihood that a lot of additional yield can still be set during the next 2 to 4 weeks in these Acala fields, and the next 3 to 5 weeks in mid to late-planted Pima fields, we will still be trying to set fruit further into the month of August than in most recent years. More than in most recent years, then, retention problems and care to avoid excessive vigor are problems to be reckoned with promptly in these fields to help avoid lower yields and a late crop.

Hot Weather Impacts. It figures that in a year when we complained about a cool and wet spring that we should now have a hotter-than-normal mid-summer in the San Joaquin Valley. Daytime temperatures have been consistently over 100F in most of the SJV for more than a week, and more of the same is forecast through the next week. Although the high temperatures are not comfortable for us, the weather so far has not been particularly damaging to the cotton crop as long as plants were not also seriously water-stressed at the same time. We have not yet had many days with temperatures approaching the 110F or higher range which has been associated with heavy square and even young boll loss in the more heat-sensitive Acala varieties. In addition, up until the past couple of days, night-time temperatures this summer have usually dropped quickly down near 80-85 degrees F in the evening, and continued into the 70's and even upper 60's by morning. Moderate temperatures reduce potential for the square and fruit loss, high plant respiration rates, etc. associated with those >85 degree F nights.

Since it has been a few years since we have had a summer with very hot temperatures during peak flowering and boll set, it may be good to consider a few points that could reduce heat-related losses. To reduce damage to cotton crops during high temperature spells, a few things to consider might include:

- **Combined Effects of Multiple Stresses.** To the degree possible, avoid the combination of severe water deficits or aeration stress (waterlogging) with the high temperature stress that comes with days of about 105F or higher temperatures. Water stress produced by delayed irrigations can be used effectively to manage tendencies for excessive growth, but particular care should be exercised during very hot weather to avoid stress severe enough to cause fruit loss and very early cutout. Aeration stress and water deficits both limit the ability

of plants to cool themselves with evaporative cooling, resulting in a combined effect that can hurt the plant more than either stress alone. High temperature and water stress limit the ability of the plants to produce adequate carbohydrates during the high demand period of fruit set, and can lead to direct losses of squares and bolls, and reduced ability to maintain production of new fruiting sites and vegetative growth

- **PGR Choices During Hot Weather.** One scenario that has played out in recent weeks for many of us is the dilemma of when to apply plant growth regulators relative to hot weather conditions and irrigations? The questions include:
 - Should I apply a plant growth regulator now (on a very hot day) even though I also need to irrigate the field soon to avoid water stress?
 - With the hot weather and concerns about avoiding water stress, would I be better off to irrigate first, and then apply the PGR after irrigation?

This can be a tough call, but a few things to consider are: (1) PGR's can put a mild to moderate degree of stress on the plants, and this can compound effects from water stress if you delay irrigations too much; (2) is the degree of water stress you'll cause by delaying irrigation until after a PGR application likely to cause moderate or even severe stress to your crop?; (3) is vigor management (to avoid a late crop, excessive growth) more of a concern in your field than immediate effects on fruit set?; and (4) will you still be able to apply PGR's at a cost-effective rate that will control growth if you hold off and make your application later?

There obviously are a number of factors to balance here. My bias is that in many cases you may be better off to irrigate first if hot weather and plant stress could damage fruit retention, and adjust PGR application rates for later applications. Consider use of the 4th-5th internode distance approach for PIX decisions if plants are outside the range of the UCCE Acala guidelines by the time you are ready to apply PIX (contact your Farm Advisor for details if needed).

- **Foliar Fertilizer Applications in Hot Weather.** Past research done by Bruce Roberts and Bill Weir of UC Cooperative Extension have generally shown the most favorable responses to foliar N and K applications are when applications are made between 1 and 3 to 4 weeks after first bloom. Many fields have moderate to even very good yield potential, and might benefit from carefully applied foliar fertilizers applied soon. However, be careful with application of some foliar fertilizers under temperature conditions that are too hot (check with your fertilizer supplier for specific recommendations) – the crop may still need and respond favorably to the foliar fertilizer, but you may need to consider a less phytotoxic formulation, lower rates, or just make sure it gets applied under cool enough conditions (such as air temperatures under 85-90F for some materials)

PEST MANAGEMENT OBSERVATIONS: After some early season battles with spider mites, they now are under control in our plots and in most grower fields we have been in during the past week to ten days. After a couple of fairly quiet weeks on the lygus "front", we have seen some increases in lygus counts in the past two weeks in plots at the West Side REC in Fresno County and in grower fields where we have experiments in Tulare County. Lygus counts in most of our plots have been low to moderate, in the 1 to 4 counts per 50 sweeps range. West Side and Shafter REC fields that were treated with systemic insecticides prior to first or second irrigation are generally holding squares and fruit well, but we are starting to see some reductions in upper canopy retention, particularly in some of our Pima plots. Part of this reduction is just due to being later in plant development, but we will also be looking for lygus. Like most of you, we are on the lookout for cotton aphids, but haven't seen many yet in our travels the past week. We are just beginning to see silverleaf whitefly in our plots in Kern County, but have not observed cotton aphids there at this time. There have been a few cotton aphids at the West Side REC, but populations have either declined without sprays or have not expanded. In the past ten days, though, I have seen some very scattered grower fields with the beginnings of silverleaf whitefly infestations in southern and southeastern Kern County, southern Kings County, and eastern Tulare County. So far, the only fields where I have seen silverleaf whitefly have been in older cotton fields (over 20 total nodes in all of them), in both Pima and Acala, which were located near melon fields, near two very weedy alfalfa fields, and in a couple of cases near citrus in the south and east valley. Hopefully, populations of aphids and whiteflies won't build too quickly, but the later-than normal crop and higher temperatures are likely to produce conditions favorable for a sustained threat from both of these pests this year.