

# Cotton Field Check

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## DEFOLIATION CHALLENGES IN LATE-MATURING FIELDS - October 10, 2003

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*The following discussion is based on information from multi-year field research trials conducted by: Steve Wright (UCCE-Tulare County), Bruce Roberts (UCCE-Kings County), Ron Vargas (UCCE-Madera and Merced Counties) in cooperation with Gerardo Banuelos, Tome Martin-Duvall, Joe Padilla, and staff of the UC West Side Research and Extension Center*

During the first ten days of October, many fields have had first and even second defoliant applications, and recently we are starting to see modules in the fields and even some modules trucked down the roads on the way to the gin. After a year routinely described as “difficult” and characterized by early cool temperatures, late plantings in many areas, and excessive heat during mid to late summer, it is good to see some fields wrapped up and done.

For fields that have not yet received defoliant applications, University of CA Cooperative Extension Farm Advisors have prepared some defoliation guidelines that describe general recommendations for several weather and crop condition scenarios, as well as multi-year results from harvest aid research trials done at the UC West Side Research and Extension Center. These recommendations can be reviewed by looking at “Defoliation Guidelines” available at the UC cotton web site: <http://cottoninfo.ucdavis.edu>

This year, however, defoliation and harvest preparation looks like it may be more difficult than usual in some vigorous, later-maturing fields. Over the past week, several UCCE Advisors have been looking at some later-maturing Acala and Pima fields, both on-farm and in research plots. Many of these fields have some characteristics in common that tell part of the story as to why they appear late-maturing:

- Most, but not all were planted later than normal, in late April through early May
- Plants in some of these fields have: (a) the first fruiting branch one to three nodes higher than typical; (b) poor to only fair bottom crops; and (c) low retention not only in first fruiting site positions, but also in later-developing second and third fruiting sites
- Quite a few of these fields have large plants, in part due to the lack of good early fruit set to help hold back vegetative growth
- In many of these fields, the later-developing middle and top crops are much better than on the bottom, representing a larger percentage of the total fruit on the plants – these top crops are hard to ignore since they represent a big portion of the plant’s total yield potential in such fields
- With all of the August and early September heat, our observations have been that quite a few of these fields received a later-than-typical final irrigation, resulting in more late-season vegetative growth and many plants with green, turgid leaves as we approach mid-October

With these more vigorous plants with a high proportion of later-maturing bolls, it may be desirable to consider some different practices this year to improve chances for acceptable defoliation, desiccation, control regrowth, and to improve chances of getting later-maturing bolls to open. Continued higher than normal temperatures will help in maturing these bolls, but as usual, there is no “magic bullet” that will make all those late bolls mature and open. Growers will need to look at the calendar, judge the likelihood that good weather will continue, and decide which bolls they really can afford to wait for.

## **Harvest Aid Considerations for Vigorous, Late-Maturing Fields in 2003.**

Strategy One: Several UCCE field studies conducted during the 1990's demonstrated a benefit in defoliation and boll opening by applying a pre-treatment of 4-6 oz of Ginstar at 6 nodes above cracked boll (NACB) followed by later treatments (at about 3-4 NACB) of: (1) Ginstar at 8 oz; or (2) Ginstar in combination with a boll opener material (such as Prep, Cotton Quick, Finish or others); or (3) Def/Folex plus a boll opener. UC studies have also shown that in order to avoid freezing leaves on plants, Ginstar rates should be adjusted if major changes in air temperatures occur at application or are anticipated in the days following application. In many cases in both Acala and Pima, a final application of sodium chlorate and Paraquat or Harvade will also be useful in desiccating remaining leaves and improving opening of last-remaining bolls.

Strategy Two: Another approach for vigorous, late-maturing cotton fields, particularly when there are concerns that the fields are just not making progress in opening up bolls, involves use of glyphosate as a pre-treatment. UCCE studies done on Acala varieties during the 1990's looked at several timings for these pre-treatment glyphosate applications. The treatment combinations in these studies consisted of glyphosate pre-treatments at the equivalent of 1 qt/acre rates tested at timings of 8, 9 or 10 nodes above cracked boll, followed 7-10 days later by standard defoliation treatments involving Def/Folex or Ginstar with or without boll openers. Results showed some advantages in earlier opening of later-developing bolls with the glyphosate pre-treatments. However, care should be exercised to make sure of the average NACB status of the field and relative percentages of the total field at various stages of maturity. Glyphosate should not be applied before about 8 NACB for these pre-treatments in Acala varieties, since the research showed yield losses of 5 to 12% with earlier applications at 10 NACB. UCCE field research on responses of Pima to glyphosate as a first treatment is very limited, and has not been clearly proven to improve boll opening and yield with late-maturing, vigorous Pima cotton.

Strategy Three: Another approach is to closely pay attention to the calendar, the weather, and consider how much risk you want to take in choosing a final harvest date. Consider these steps:

1. Keep an eye on predicted trends in the weather.
2. Consider your own experience with how many days of harvest will likely be needed from harvest of your first field to the last field.
3. Decide what you think is the last harvest date you consider to be an acceptable risk.
4. Count back about 21 days from those desired harvest dates, and start with your defoliation program on those dates no matter what maturity stage (what NACB) the crop is in.

Many CA growers are familiar with data sets from Acala and Upland cotton defoliation trials done by Tom Kerby and Kater Hake in the 1980's and 1990's which suggest that, on the average, defoliations initiated at 8 NACB would result in yield losses of about 5% when compared with initiation at 4 NACB, while those initiated at 6 NACB would reduce yields 2 to 3%. However, those same studies acknowledged that when a very large percentage of the total crop consists of bolls on the upper 6 to 9 fruiting branches, losses from early defoliant applications can be substantially more (over 10%). Particularly under circumstances of mostly a mid-canopy and top-crop, the closer you can get to 4 to 6 NACB prior to first defoliant application, the lower the yield loss.

In areas with lingering concerns regarding silverleaf whitefly populations: With continuing concerns for prevention of sticky cotton problems, if you are still dealing with late-season silverleaf whitefly populations at the time of first harvest aid application, it may be worthwhile to consider results from several research trials conducted in Arizona and California, including one conducted last year in the SJV. These field trials suggest that there is a synergistic response (better whitefly control) when pyrethroid insecticides are combined with a first defoliant treatment that is an organophosphate defoliant (Def/Folex).