COTTON FIELD CHECK

Management Updates from UC Cooperative Extension

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HAIL DAMAGE AND YOUR COTTON CROP

May 23, 2019 – Bob Hutmacher, University of CA West Side REC and UC Davis Plant Sciences Dept.

We have had some unusual weather so far in 2019, with repeated cool spells, thunderstorms and rain, and within the past week, some widespread locations getting hail. While hail damage can be a fairly common late spring and early summer occurrence in many cotton production regions across the U.S., it is a much more unusual problem here in the San Joaquin Valley. In addition, cotton has been growing more slowly than usual this year due to cloudy, generally cool conditions that have prevailed well into May, so a further set-back is not at all welcome. In trying to decide what to consider after a hail storm hits your field, here are some recommendations to consider:

FIRST – After a hail storm, it is likely best to wait to assess hail damage and potential impacts for perhaps 3 to 5 days after the storm. Then, after the plants have a chance to recover a little, and the damaged leaves either fall off or the percent of plants in the field that are light damaged or more severely damaged becomes more evident, look over fields with the following questions / assessments in mind:

1) Is the hail damage seen in the field really severe in some areas but much lower impact in other areas? *Sometimes hail comes through as a "band" affecting a limited zone within the field, with severe plant damage (stem breakage, heavy leaf loss, severe terminal damage) limited to a small portion of the field and lesser damage in the remainder of the field. Severity of damage can be evaluated according to the discussions below, but if the % of field affected is relatively small then decisions to abandon, replant, or modify management practices going forward can be directed just to those limited areas. Early-season light to moderate hail damage in other field areas that is limited mostly to some shredded leaves (without much stem or terminal damage) will not have much impact on your crop's yield potential when compared to impacts of insect pressure or cold or hot weather problems.*

2) What % of plants in the field have significant or severe terminal damage? *The "terminal" of plant is the newest forming small leaves at the top of the plant stem, representing the new growth on the main stem as well as where future vegetative and fruiting branches are initiated. Damage to terminals can be light (just breaking of small, developing leaves) all the way to complete terminal loss, with the upper stem breaking off or killed. Loss of the terminal part of the plant will have the greatest impact on yield potential when plants are very small (at the 2 to 4 leaf stage) since there isn't a lot of leaf area, and there will only be a couple of nodes where new vegetative branches can start to develop. Severe terminal damage and especially terminal loss will definitely delay maturity and will produce at least moderate reductions in yield potential. Plants will recover, regrow by pushing out vegetative buds, but will typically produce multiple vegetative branches which will have delayed fruit production. Reduced yield potential and growth management problems associated with delayed fruiting can be a problem, but not necessarily a reason to terminate the crop.*

3) What % of plants have main stems that are broken off at the cotyledon or below the first main stem leaf*? These plants will likely die or will have very delayed production and low yields. If the stems aren't completely broken, are they bent and damaged enough that you think they will fall over later in the season when the fruit loads up? Again, if that level of damage is widely seen, impacts on yield potential will be significant and potential for plant recovery is greatly reduced.*

4) What % of plants have major leaf loss? *While the impacts of leaf damage and leaf loss can look terrible and give the appearance that your field was shredded, damage to or loss of even 50-75% of leaf area can be tolerated quite well when plants are young (maybe in the 3-leaf to 7 or 8-leaf stage) particularly if the terminal is only lightly damaged and can re-start leaf growth quickly. Again, if the terminal is present to provide new sites for leaves to develop, recovery can be pretty quick under good weather conditions, since root systems are decently established by that time. In some ways, impacts of early leaf damage or loss with hail can be similar to those seen with early thrips damage, where we often see good recovery, with not a lot of lasting impact on growth and only slightly reduced yield potentials.*

5) Is replanting a viable option to consider at this time of year*? Since most of the hail damage reported recently has occurred in the third week of May, replanting would not generally be a good option to consider for the currently-available Pima cultivars, since they were developed with full-season production in mind. Under "typical" fall weather conditions in the SJV, there is a considerable likelihood that you will run out of heat units to mature out the later-season bolls, or will have to take a chance on very late harvests for replanted fields. There are many Upland varieties with potential to set and mature out a decent crop in a significantly shorter growing season than most Pimas, but you may have to settle for lower yields and employ practices to terminate the crop earlier to avoid late-season insect pest control costs and losses. Another consideration with replantings that occur in May or early June is that seedlings developing during warm to hot weather often exhibit very fast vegetative growth and delayed timing of first fruiting branches, making late plantings even more likely to produce late-maturing fruit.*

6) Management practice changes with hail-damaged plants? *Particularly with small plants with fewer than 7 to 8 leaves at the time of the hail damage, plants will produce multiple (sometimes many) vegetative branches in response to main stem damage. If weather conditions are decent, vegetative growth can be very vigorous following this type of damage. Vegetative branches have potential to produce flowers and bolls, but bolls set on the plants will be delayed. Under this combination of conditions, plant growth regulators may be very beneficial in helping manage growth while trying to get acceptable fruit set.*