

Causes of Poor Defoliation

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Across the Cotton Belt, growers experience fields that defoliate poorly. Whether these same fields also suffer quality loss depends partially on seed cotton moisture. We can harvest middling cotton from poorly defoliated fields if the plant is very dry. This unfortunately is a rarity in most regions. For a successful defoliation, three components must be put together properly; the Plant Status, the Weather, and the Chemicals. If any one of these is outside of an optimum range then poor defoliation will result. The following list of causes of poor defoliation may help growers identify problems in their own fields.

- High residual nitrogen will universally inhibit cotton leaf drop. In fact, cotton leaves will shed naturally if leaf N drops low enough.

- Rapidly growing juvenile plants defoliate poorly. This condition can result from poor boll set or late cotton. These plants have high levels of juvenile hormones (auxins and gibberellin) that interfere with defoliation.

- Ample soil moisture retards defoliation. Sandy streaks in a field where cotton is water stressed defoliate much better than the rest of the field.

- Disease free plants often suffer poor leaf drop. Where fields have been extensively rotated to control disease we often observe poor defoliation. In regions where Verticillium wilt is prevalent, this disease increases the level of ethylene in the plant, the same compound released by the plant growth regulator PREP.

- Regrowth does not defoliate, regardless of weather. This young developing tissue does not form abscission zones (separation areas), and usually must be desiccated prior to harvest because of its high moisture content.

- Cool temperatures for 5 days following defoliation retard the activity of defoliant. Since defoliation is an active living process of cell division and development, cool weather will slow the entire defoliation process. Additionally, uptake of defoliant is decreased with cool weather. Even if the weather warms after the first 5 days we still observe poor defoliation.

- Low humidity and/or high temperatures before and during defoliation causes toughening of the waxy layer on the outside of leaves (the cuticle). Cuticles decrease the uptake of all chemicals, especially charged molecules such as Gramaxone® or chlorate. Wetting agents or cotton seed oil are often added to enhance uptake under these conditions.

- Excessive defoliant or desiccant application rates can cause leaves to die prior to abscission zone formation, with frozen leaves as the result.

- Inadequate chemical rates also can cause poor defoliation, especially under cool conditions or with rank vigorous plants.

The worst defoliation imaginable occurred not in a grower's field but at a university research station. The field had been solarized to control disease, which also released excess soil residual nitrogen. The fertilization was miscalculated, resulting in 220 of N applied in two sidedress applications. The early fall weather was hot and dry causing tough leaves on the 6 foot plants. But the defoliation was applied late when the weather was cool. It took 3 applications to kill the plant, minimal leaf drop actually occurred, but the plot did yield over 1800 lbs of lint. Bringing up one last point; we don't grow cotton to obtain an ideal defoliation but rather for lint and seed. If we do experience a "perfect" defoliation, we may have shorted our yields by not providing adequate moisture and nitrogen.

Cotton Physiology Seminar

There's something new and exciting for cotton growers at the 1990 Beltwide Cotton Conferences. It's the first physiology seminar for growers, presented as part of the new Cotton Physiology Education Program, CPEP.

This seminar, like all aspects of the CPEP, is designed to break technical topics down to the language and everyday experience of growers. It's a translation we think will mean improved crop management and increased profitability for growers across the Cotton Belt.

For the first Physiology Seminar we've enlisted the wisdom and experience of many of the Extension cotton specialists, innovative growers and consultants. They'll be presenting the latest information on two topics of widespread interest and concern among growers.

"Plant Mapping: A Tool to Increase Profitability" will offer you an overview of cotton development and growth, a look at how plant mapping allows your cotton crop to "speak" to you about its stresses and needs, how to plant map Pima, and how to use the new Plant Mapping Kits being developed by the CPEP.

"Causes of Square and Boll Shed" will examine how and why the plant sheds squares and bolls, insect problems that trigger shed, and environmental causes of shedding. Finally, a panel of leading growers and consultants from across the Belt will discuss how they use plant mapping and how they manage cotton after severe shedding.

The half-day Physiology Seminar kicks off the Beltwide Cotton Production Conference first thing Wednesday morning, January 10, 1990. A question and answer session "Breakfast with the Experts" on Square and Boll Shed, will be held the following morning, Thursday, January 11.

Several other sessions at the 1990 Beltwide should provide valuable information to growers. The Production session will start Wednesday after the Physiology Seminar and continue all day Thursday. Friday morning will start the Technical Conferences on all aspects of cotton production. Focused conferences on fertilization, morning-glory control, and HVI classing and quality should address specific grower problems. Saturday will include a full day session on cotton plant growth regulators and further sessions on cotton quality.

To attend, plan your arrival in Las Vegas no later than Tuesday night. Due to the busy Las Vegas convention season, rooms at the Riviera Hotel are limited and reservations must be made immediately. If you need a registration packet, phone the National Cotton Council offices today (901-274-9030). I look forward to meeting you at the Physiology Seminar.

The Cotton Physiology Education Program is supported by a grant from The Cotton Foundation, and brought to you as a program of the Technical Services Department, National Cotton Council.

The National Cotton Council (NCC) is the central organization representing all seven sectors of the U.S. cotton industry: producers, ginnermen, warehousemen, merchants, cottonseed crushers, cooperatives and manufacturers. A majority of elected delegates from each sector must approve all NCC policies, thus assuring unity of purpose and action.

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