OVERVIEW OF REGIONAL COTTON DEFOLIATION PRACTICES - FAR WEST

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The Far West Region of the United States cotton belt includes the states of Arizona and California. The predominate acreage (70 %) of Arizona's production is located in Maricopa and Pinal Counties with additional production located in the Parker, Yuma and Safford areas. California's 1995 acreage of 1.3 million acres is dominated by the planting in the six counties of the southern San Joaquin Valley. This acreage represents ninety seven percent of California's total production. The other areas of production are the Imperial and Riverside Counties, and more recently, acreage planted in the Sacramento Valley (Source: Pink Bollworm Program). In addition, a significant percentage of US Pima is produced in this two state region.

The Far West's cotton production is characterized by a hot, arid growing season where the entire acreage is irrigated. This lends some advantage in preparing the crop for defoliation from greater control of soil moisture and nitrogen by being able to schedule the season's final crop irritation. The low desert areas of both Arizona and California experience a monsoon period with elevated humidity during late July and extending through August. Following this humid period, weather conditions in both states is characterized as ideal for defoliation and is usually above 80◦F well into October.

Harvest of the Far West crop is performed with spindle type harvesters (Roberts, et al. 1996). Therefore, defoliation practices play an important preharvest role. Although similar materials are used in both Arizona and California there are labeled rate differences for each area. Combination of materials and application methods vary from farm to farm. Normal defoliation usually requires two applications: the first may be a pre-treatment of ethephon or in combination with a phosphate defoliant (Def/Folex). Sodium chlorate is used extensively for cleanup applications. Additives like paraquat and cacodylic acid are included to enhance the dessication of remaining leaves. Ginstar, a recently registered cotton defoliant is providing the highest percent defoliation from a single application.

The trends in harvesting, storage and ginning of seed cotton as described in other regions are very evident in the Far West. The shift to using modules for field storage and seed cotton handling has increased to over 80 % of the entire regions harvested cotton is moduled (US Cotton Ginning Statistics, 3/95, USDA). The convience and economics of this handling system has also lead to many changes at the processing level. The number of active gins for both Arizona and California have decreased by 40% during the past ten years. While the acreage has remained relatively constant the decrease in active gins has been made-up for by a 40% increase in ginning capacity during this same period. (Bureau of Census, 3/95). This harvesting and handling system has allowed cotton growers to take advantage of other production changes that has led to greater benefits from earliness and helped preserve fiber quality. This system also places greater emphasis on the preharvest preparation and timely harvest of well defoliated cotton for safe storage and handling (Curley et al. 1988).

The results from the San Joaquin Valley of a standard set of treatments clearly indicate that rate adjustments are necessary for adequate defoliation. Treatments that produce 80% or greater leaf drop in other regions will only cause minor effects (30% or less) in the San Joaquin Valley. These same treatments will produce acceptable defoliation in the desert areas of California and Arizona. One cause of this difference is the *Verticilium wilt* tolerant Acala varieties grown in the San Joaquin Valley. The results of a variety by defoliation trial conducted at the U.C. West Side Research and Extension Center is presented in Table 1. In this comparison the higher wilt tolerant Acala varieties were much less affected by two applications of sodium chlorate than the less wilt tolerant varieties.

Western preharvest and harvest practices have been criticized for impacting air quality. The production areas of this region are located in fertile valleys that are experiencing significant urban growth. These valleys (closed air basins) are becoming more aware of the various activities that effect air quality. This is true in both an environmental and a regulatory sense. Besides urban encroachment, the cropping rotations within this region offer an additional challenge in managing cotton defoliation. Late summer and fall vegetables are important alternate crops that are actively growing when cotton is being defoliated. Nontarget drift of cotton defoliants onto an adjacent field of leafy vegetables can be a costly addition.

The regional objectives for cotton defoliation are to continue to emphasis crop monitoring for effective late season management that enhances defoliation. That is good water and nitrogen management from cutout to termination and defoliation. Continue field testing for new materials or combinations that improve crop defoliation and harvestability. From these effort environmentally acceptable practices will be available to assist western cotton growers to harvest, store and deliver to the gin the highest quality seed cotton.

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Table 1. Acala Variety Defoliation Comparison 1992

Variety	Vert. wilt rating	% Defoliation (14 DAT)
Maxxa	High	43
GC-510	High	25
DP6166	High	38
SJ-2	Mod	60
DP6100	Low	78
DP90*	Low	90

* DP90 is not approved for SJV production.
Defoliated with sodium chlorate (4.5 lbs/a) on 9/28 and 10/9/92.