

## Conditioning Cotton for Defoliation

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Most cotton growers rely on harvest-aid chemicals to help prepare their crop for picking. Properly used, defoliant cause leaves to shed earlier than normal, while reducing trash and green stain in the lint. This results in improved grades. There is an urgency to find new defoliants because of an objectionable odor associated with certain compounds currently used.

The test was planted to Stoneville 825 cotton on June 5, 1981 at the University of Arizona, Marana Experimental Farm. This planting followed plantago, which was harvested on 13 May. First flower occurred about July 25. The test area was managed to induce poor defoliation. Factors favoring poor defoliation were late planting, frequent irrigation, last irrigation on September 18, and nitrogen fertilizer at 44 pounds per acre in the last irrigation.

The test design was a randomized block with 7 treatments and 6 replications. Plots were 4 rows 40 inches apart by 39'5" (12 meters) long. The treatments were an untreated check, four defoliation conditioning treatments, and two defoliation treatments. Conditioning treatments (2-5) were applied on September 30 and the defoliation treatments (6 and 7) were applied on October 1. Application was in a water mix with a two-row hand sprayer at approximately 40 p.s.i. and at the rate of 20 gallons per acre. Treatments and rates of application are shown in Table 1. The plots were subsequently defoliated during the farm defoliation which was applied by air on October 10 using 2 gallons of sodium chlorate and 1 pint of Acceerate per acre applied in a water mix at 7 gallons per acre. Visual estimates of percent defoliation were made on October 9, 12, 13, and 19. Defoliation estimates are given in Table 1.

Three different people were involved in estimating defoliation, never more than two at one date. This accounts for the lower estimates on 13 October than 12 October.

Extended summer temperatures hampered our efforts to produce cotton that was difficult to defoliate. The check treatment had 70% defoliation nine days after farm defoliation. Further defoliation occurred in the following few days. Cotton treated with Roundup caused slightly more defoliation than the untreated check. This was not consistent with the successful use of Roundup for defoliation conditioning in three previous years. The explanations for the different responses in 1981 are unknown. Ethrel speeded defoliation early, but by the last observation, the difference between this treatment and the check were small. Harvade plus surfactant and Dropp used as pre-conditioners produced about equal effects throughout the test. By the date of last observation, defoliation from these two treatments was equal to the twice defoliated treatments. The treatments rates for Harvade and Dropp may have been too high for the conditions of this test.

Defoliation with the two rates of intensify-paraquat indicated the high rate was superior in the early evaluations, but at final evaluation, there was little difference between them.

Less favorable conditions for defoliation are necessary to adequately test the defoliation conditioners and the defoliant rates. Success with defoliation conditions would improve defoliation and permit better planning of harvest.

A second test to determine when to apply defoliation conditioner for maximum efficiency of defoliation was unsuccessful due to the selection of Roundup as the conditioner. Preliminary results indicate defoliation conditioners are more effective when applied eight days or more before defoliation. Benefits were not obtained by applying conditioners three days or less before defoliation.

Table 1. Visual estimates of percent defoliation of DPL 55 cotton treated with four defoliation conditioning treatments (2-5) applied on September 30, 1981 and two defoliation treatments applied on October 1, 1981 followed by farm defoliation with 2 gallons of sodium chlorate plus 1 pint of accelerate applied on October 10, 1981 at the Marana Experimental Farm, Marana, Arizona.

Treatment	Application rate, lbs./acre	Percent defoliated				
		10/9	10/12	10/13	10/19	Mean 10/12, 13, 19
		-----Days from farm defoliation-----				
		<u>- 1</u>	<u>2</u>	<u>3</u>	<u>9</u>	
1. Untreated check		2d*	17c	20c	70c	40b
2. Roundup	0.5	7d	18c	28c	75bc	45b
3. Ethrel	1.0	11d	40b	36bc	78b	54b
4. Harvade+UBI-]262	0.25 + 3 oz.	37b	71a	64a	90a	75a
5. Dropp	0.05	27c	72a	62a	90a	75a
6. Paraquat+Intensify+ X-77	0.125+2.0+.05%	41b	63a	53ab	89a	70a
7. Paraquat+Intensify+ X-77	0.25+2.0+.05%	51a	78a	71a	92a	81a

\*Means within a column are not different at the 5% confidence level if followed by the same letter.

#### Use Of Ethrel As Harvest Aid

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#### Summary

Recently the growth regulator Ethrel has been used to aid defoliation and has been reported to open bolls more rapidly. Ethrel was applied at one - pint and one-quart rates in a 20-gallon mix by ground applicator on October 24 and followed with defoliation five days later. First harvest at the one-pint rate yielded over 300 pounds more lint than the control or the one-quart rate.

Hayden Farms-Buckeye							
Treatment		1	Seed Cotton Per Plot			Ave	Lbs. Lint Per Acre
			2	3	4		
1 pt. Ethrel	-1st	1960	2090	1760	2080	1973	1967
	-2nd	205	140	155	125	156	<u>133</u>
						Total	2100
Check	-1st	1820	1670	1670	1760	1730	1677
	-2nd	135	155	130	120	135	<u>114</u>
						Total	1791
1 qt. Ethrel	-1st	1870	1540	1780	1560	1688	1670
	-2nd	135	135	125	140	134	<u>114</u>
						Total	1784