

**EFFECT OF SELECTED ADJUVANTS ON THE EFFICACY  
OF DEF-6 PLUS PREP DEFOLIANT MIXTURES**

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**Abstract**

A field study was conducted during 2002 to compare the effects of the combination of Def®-6 cotton defoliant plus Prep™ boll opener applied without adjuvants to the effects of this combination plus each of six selected adjuvants and to the effects of Finish® defoliant. Label recommendations for the use of Def-6 cotton defoliant do not require the addition of an adjuvant; however, the label suggests that the use of certain adjuvants may enhance the rate of defoliation when Def-6 is applied under less than optimum environmental conditions.

In this study, mixtures were applied to cotton var. 'Delta Pine 451 B/R' at 65 to 70% open bolls. Treatments were applied in water at 10 gallons per acre (gpa) to cotton in plots of four rows each, spaced 40 inches apart, 40 feet long, replicated three times, and arranged in a randomized complete block design. Visual ratings were made of the percent defoliation at 7 and 14 days after treatment (DAT), whereby, 0 = no defoliation and 100% = complete defoliation and of the percent shoot regrowth at 21 DAT, whereby, 0 = no shoot regrowth and 100% = complete regrowth of the cotton shoot. The least significant differences (LSD) between means were determined by Fisher's Protected LSD test at the 5% level. The harvest aid chemicals and manufacturers are listed in Table 1. Rates of chemicals applied and results of defoliation and shoot regrowth are shown in Table 2.

Def-6 was applied at 10 oz/A which is below the recommended rate of 16 oz/A in order to detect any increase or decrease in the effect on defoliation or shoot regrowth as caused by the addition of an adjuvant. The percent cotton defoliation at each 7 and 14 DAT with the combination of Def-6 and Prep without adjuvants was 78 and 80%, respectively. At 7 and 14 DAT, the percent defoliation was not significantly altered with the addition of the adjuvants HM 2047 (75 and 75%) or 092601-B (67 and 68%) and was decreased by the addition of HM 8802-A (50 and 50%), HM 8802-A plus HM 2047 (63 and 65%), 092601-A (60 and 63%) and 092601-C (65 and 70%). Defoliation with Finish at the recommended rate of 2.0 pt/A was 82 and 87%, respectively.

The percent shoot regrowth at 3 weeks after treatment was significantly greater with the addition of 092601-A (40%), 092601-B (60%) and 092601-C (50%) than with Def-6 plus Prep alone (25%) or in combination with the other adjuvants in this study (20 to 27%). Shoot regrowth with Finish was 27%.

Table 1. Harvest Aid Chemicals.

<b>Name</b>	<b>Description</b>	<b>Manufacturer</b>
Defoliant		
DEF 6	SSS-Tributyl phosphorotriothoate	Bayer Corporation
Finish 6	Cyclanilide and Ethephon	Bayer Corporation
Adjuvants		
Prep	Ethephon (2-Chloroethyl) phosphonic acid	Bayer Corporation
HM 8802-A	An organosilicone based surfactant mixed with a methylated vegetable oil in undisclosed proportions	Helena Chemical Co.
HM 2047	Proprietary blend of ethanedioic and polyalkanoic acids	Helena Chemical Co.
092601-A	Phosphoric acid (85%)	Helena Chemical Co.
092601-B	Phosphoric acid (64%)	Helena Chemical Co.
092601-C	Citric acid solution	Helena Chemical Co.

Table 2. Effect of the combination of the defoliant, Def-6, and Prep with and without an adjuvant and of the defoliant, Finish, applied to cotton 'Delta Pine 451 B/R' at 65 to 70% boll opening (average of 3 replications) 2002 field study.<sup>1/</sup>

Chemical	Rate Product/acre In 10 gpa	% Cotton Defoliation		% Cotton Regrowth
		7 DAT	14 DAT	21 DAT
Def	10 oz/A	78	80	25
Prep	8 oz/A			
Def	10 oz/A	50	50	22
Prep	8 oz/A			
HM8802-A	0.25% v/v			
Def	10 oz/A	75	75	20
Prep	8 oz/A			
HM2047	1.0 lb/A			
Def	10 oz/A	63	65	20
Prep	8 oz/A			
HM8802-A	0.25% v/v			
HM2047	1.0 lb/A			
Def	10 oz/A	60	63	40
Prep	8 oz/A			
092601-A	1.0 pt/A			
Def	10 oz/A	67	68	60
Prep	8 oz/A			
092601-B	1.0 pt/A			
Def	10 oz/A	65	70	50
Prep	8 oz/A			
092601-C	1.0 pt/A			
Finish	2.0 pt/A	82	87	27
Untreated Check	--	0	0	0
LSD (0.05) <sup>2/</sup>		10	12	8

<sup>1/</sup>Cotton 'Delta Pine 451 BR' was planted on May 8, 2002 and treated on September 5, 2002. Treatments were applied at 10 gallons per acre with TeeJet® Flat-Fan, Extended Range 110015VS nozzles at 52 psi spray pressure. <sup>2/</sup>Means within a column are not different at  $P \leq 0.05$  according to Fisher's Protected LSD test.