

EFFECTS OF ADJUVANTS ON ACTION® DEFOLIANT

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Abstract

A field study was conducted during 2000 to determine the effect of Action® cotton defoliant applied alone or in combination with either of the adjuvants, Agri-Dex®, Dyne-Amic®, or Kinetic® each with and without ammonium sulfate and ethephon. Other research has indicated that the addition of ammonium sulfate in combination with ethephon may result in enhanced defoliation with Action defoliant.

These combinations were applied to cotton var. 'Paymaster 1218 B/R' at 65 to 75% boll opening. 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) and percent shoot regrowth at 14 DAT whereby 0 = no effect and 100% = complete effect. The least significant difference (LSD) between means was determined by Fisher's Protected LSD test at the 5% level. The harvest aid chemicals and manufacturers are listed in Table 1.

Rates and results of treatments to cotton are shown in Table 2. Action alone did not result in cotton defoliation at the rate applied in this study. Action plus Agri-Dex resulted in 87% defoliation at both 7 and 14 DAT. The addition of Agri-Dex, plus ammonium sulfate and ethephon was less effective with 82% defoliation at both 7 and 14 DAT. Action applied with Dyne-Amic resulted in 63 and 70% defoliation at 7 and 14 DAT, respectively. The addition of ammonium sulfate and ethephon to Dyne-Amic increased defoliation to 90% at 7 and 14 DAT. Action applied with Kinetic did not defoliate cotton and the further addition of ammonium sulfate and ethephon resulted in only 27 and 30% defoliation at 7 and 14 DAT, respectively.

The percent of foliage regrowth was less when treated with Action and Action plus Agri-Dex (53 and 57%, respectively) than with the remaining defoliation treatments in this study (63 to 77%).

Table 1. Harvest Aid Chemicals

Name	Description	Manufacturer
Defoliant		
Action	Fluthiacet-methyl	Syngenta Crop Protection, Inc.
Adjuvants		
Agri-Dex	A non-phytotoxic oil/nonionic surfactant; 83/17 v/v	Helena Chemical Co.
Ammonium sulfate	Granular ammonium sulfate	AGRO Distribution, LLC
Dyne-Amic	An organosilicone based surfactant mixed with a methylated vegetable oil in undisclosed proportions	Helena Chemical Co.
Ethephon	Two-chloroethyl phosphonic acid	AGRO Distribution, LLC
Kinetic	Proprietary blend of polyalkyleneoxide modified polydimethylsiloxane and nonionic surfactants	Helena Chemical Co.

Table 2. Effect of various combinations of defoliants and adjuvants applied to cotton 'Paymaster 1218 B/R' at 65 to 75% boll opening (average of 3 replications).

Chemical	Rate product in 10 gpa	% Defoliation		% Regrowth
		7 DAT	14 DAT	14 DAT
Action	0.6 oz	0	3	53
Action Agri-Dex	0.6 oz 1% v/v	87	87	57
Action Agri-Dex Ammonium sulfate Ethephon	0.6 oz 1% v/v 0.8 lb 1.33 pt	82	82	70
Action Dyne-Amic	0.6 oz 0.5% v/v	63	70	63
Action Dyne-Amic Ammonium sulfate Ethephon	0.6 oz 0.5% v/v 0.8 lb 1.33 pt	90	90	77
Action Kinetic	0.6 oz 0.5% v/v	0	0	63
Action Kinetic Ammonium sulfate Ethephon	0.6 oz 0.5% v/v 0.8 lb 1.33 pt	27	30	77
Untreated	--	0	0	40
LSD (0.05)		3	4	7