

**EFFECT OF AMMONIUM SULFATE, POTASSIUM PHOSPHATE,  
AND ETHEPHON ON CGA 276854 COTTON DEFOLIANT**

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**Abstract**

A field study was conducted during 2001 to determine the effect of CGA-276854 cotton defoliant at 10 oz in 10 gpa applied with Dyne-Amic® adjuvant at 0.5% v/v alone and in combination with the fertilizer salts, ammonium sulfate and potassium phosphate each at 1 lb/A, and with the growth regulator, ethephon, at 1.33 pt/A both separately and together. Other research has indicated that the nonionic organosilicone based adjuvant, Dyne-Amic, which is most effective with oil-based formulations, increased the efficacy of CGA-276854 more than the crop oil surfactant, Agri-Dex® or the siloxane based adjuvant, Kinetic® which is a more effective adjuvant with water-based formulations. It has been further shown that the addition of these same fertilizer salts and of ethephon will increase the efficacy of other cotton defoliating chemicals.

These combinations were applied to cotton var. 'Delta Pine 458 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 the 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.

All the results with CGA-276854 include the addition of the adjuvant, Dyne-Amic at 0.5% v/v. CGA-276854 with only Dyne-Amic resulted in 77 and 80% defoliation at 7 and 14 DAT. The addition of ammonium sulfate increased defoliation to 96 and 98% at 7 and 14 DAT. Other combinations of these adjuvants with CGA-276854 increased the percent defoliation but less than that with ammonium sulfate alone. Potassium phosphate was the next most effective adjuvant resulting in 93 and 95% defoliation at 7 and 14 DAT. The remaining combinations of the adjuvants resulted in defoliation between 85 and 90% except with the combination of all three adjuvants which resulted in only 85% defoliation at both 7 and 14 DAT.

The percent of foliar regrowth at 14 DAT was 5 to 15% with CGA-276854 with and without the addition of the fertilizer salts. The further addition of ethephon increased the regrowth to 22 to 43% with the greatest percent regrowth resulting from the addition of all three adjuvants.

Table 1. Harvest Aid Chemicals

<b>Name</b>	<b>Description</b>	<b>Manufacturer</b>
<b>Defoliant</b>		
CGA-276854	Butafenacil	Syngenta Crop Protection, Inc.
<b>Adjuvants</b>		
Dyne-Amic	An organosilicone based surfactant mixed with a methylated vegetable oil in undisclosed proportions	Helena Chemical Co.
Ethephon	Two-chloroethyl phosphonic acid	Micro Flo Co.
Ammonium sulfate	Granular ammonium sulfate	AGRO Distribution, LLC
Potassium phosphate	Potassium phosphate monobasic	Fisher Scientific

Table 2. Effect of various combinations of the defoliant, CGA-276854, and adjuvants applied to cotton 'Delta Pine 458 B/R' at 65 to 75% boll opening (average of 3 replications) – 2001 field study.

Chemical	Rate product in 10 gpa	% Defoliation		% Regrowth
		7 DAT	14 DAT	14 DAT
CGA-276854	10 oz	77	80	10
Dyne-Amic	0.5% v/v			
CGA-276854	10 oz	96	98	5
Dyne-Amic	0.5% v/v			
Ammonium sulfate	1 lb			
CGA-276854	10 oz	93	95	13
Dyne-Amic	0.5% v/v			
Potassium phosphate	1 lb			
CGA-276854	10 oz	87	90	15
Dyne-Amic	0.5% v/v			
Ammonium sulfate	1 lb			
Potassium phosphate	1 lb			
CGA-276854	10 oz	85	90	22
Dyne-Amic	0.5% v/v			
Ethephon	1.33 pt			
CGA-276854	10 oz	85	88	33
Dyne-Amic	0.5% v/v			
Ethephon	1.33 pt			
Ammonium sulfate	1 lb			
CGA-276854	10 oz	87	90	33
Dyne-Amic	0.5% v/v			
Ethephon	1.33 pt			
Potassium phosphate	1 lb			
CGA-276854	10 oz	85	85	43
Dyne-Amic	0.5% v/v			
Ethephon	1.33 pt			
Ammonium sulfate	1 lb			
Potassium phosphate	1 lb			
Untreated	--	0	0	0
LSD (0.05)		5	3	6