REGULATING COTTON GROWTH WITH BACILLUS CEREUS IN ARKANSAS -A TWO YEAR STUDY Chet Chaney Chaney Agvisory Service Inc. England, AR

<u>Abstract</u>

Plant mapping is used to evaluate various plant growth regulators containing the natural bacterium *Bacillus cereus*. Comparisons are made to the in field performance of mepiquat chloride, i.e. PIX. The results of 1996 and 1997 trials are presented.

Introduction

Cotton producers routinely use mepiquat chloride, MC, to control plant height and promote earliness. Achieving consistent yield increases with mepiquat chloride has proven difficult. Unfavorable growing conditions have periodically resulted in inadequate plant structure on MC treated fields. This inadequate structure offsets yield increases from higher fruit retention. This test was conducted to determine if plant growth regulators with *Bacillus cereus*, BC, would increase yields, but still control plant height comparable to mepiquat chloride.

Treatments

The treatments investigated were:

MC - a 4.2% solution of mepiquat chloride; PIX MFXMB94 - where: MFX - Micro Flo Experimental M - rate of MC B - grams / gal. *Bacillus cereus* 94 - first year studied

Specifically:

MFX 2294 - a 2.1% solution of MC + 2.0 grams of BC MFX 2494 - a 2.1% solution of MC + 4.0 grams of BC MFX 3294 - a 3.15% solution of MC + 2.0 grams of BC MFX 3394 - a 3.15% solution of MC + 3.0 grams of BC MFX 4294 - a 4.2% solution of MC + 2.0 grams of BC; MepPlus MFX 4494 - a 4.2% solution of MC + 4.0 grams of BC UTC - untreated check

Procedures

Plots were 4 rows wide, (40"), and 140 ft. long. Treatments were replicated 4 times in a strip block design. All applications were made with a CO2 backpack sprayer with a spray volume of 15 GPA broadcast. Height, number of mainstem nodes, height / node ratio, as well as yield was recorded in both years of the trial. Test parameters and

results are reported in Table 1. Height and node data is reported in Table 2. Number and percent open bolls, as well as boll weights were recorded in 1997 to quantify any potential yield differences between the treatments. This data is presented in Table 3 and Table 4. Micro Flo Company received a federal label for MFX 4294 under the trade name MepPlus in July, 1997. Because of this, MepPlus will be the only *Bacillus cereus* data reported.

Conclusions

There was no significant difference in plant height, height / node ratio, or maturity between the Pix and MepPlus treatments. The untreated check displayed significant increases in plant height and height / node ratios as compared to all treatments. Maturity differences between treatments were not significant. Boll weights were lower in the Pix treatment than all *Bacillus cereus* treatments and the untreated check.

MepPlus yields were significantly higher than the Pix and untreated check. Yield increases from MepPlus were attributed to higher boll counts as well as increased boll weight. There was no significant difference in yield between the Pix and the untreated plots.

The addition of *Bacillus cereus* to MC did not impair the PGR's ability to reduce plant height. The MFX4294, MepPlus formulation did however show strong tendencies to increase yield over Pix and untreated cotton in Arkansas.

Table 1. Test parameters and yield.

	1996	1997	Mean
Variety	NuCotn 33B	PM 1215 RR	
Dry/irr	irr.	irr.	
Application dates	6-16,6-25,7-18	6-27,7-5,7-15,7-24,8-16	
Oz/app (broadcast)	4,4,6	4,4,4,4,8	
	Yield (lb l	int/ac)	
MC (PIX)	1062.8	827.3	945.1
MFX4294(MepPlus)	1129.1	995.5	1062.3
UTC	1047.1	809.1	928.1

Table 2. Summary results, last mapping date.

	1996	1997	Mean	
	Heigh	t (inches)		
PIX	39.5	46.5	43.0	
MepPlus	40.3	44.9	42.6	
UTC	56.8	57.2	57.0	
	Mainst	tem nodes		
Pix	19.9	21.4	20.7	
MepPlus	20.5	21.9	21.2	
UTC	24.0	23.4	23.7	
	<u>H/1</u>	N ratio		
PIX	1.98	2.17	2.07	
MepPlus	1.97	2.05	2.02	
UTC	2.37	2.44	2.41	

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Table 3. Boll counts	in 8 feet of row and p	percent open bolls.
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Treatment	# open bolls	# total bolls	%open
PIX	44	488	9.0
MepPlus	64	707	9.1
UTC	58	542	10.7

Table 4. Boll weight.

Treatment	Boll weight (grams / boll)
PIX	6.260
MepPlus	6.613
UTC	6.645

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