

# EFFECT OF NITROGEN LEVEL AND MEPIQUAT CHLORIDE (PIX) UPON MATURITY

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## Abstract

In a short season environment, measures must be taken to promote precocious maturation of the crop. Controlling the rate of nitrogen and use of a growth regulator could force cotton to slow vegetative development and ripen the bolls early. Three nitrogen rates were used, these being 40, 80, and 120 pounds per acre. Pix (mepiquat chloride) at 16 ounces per acre was applied by two methods. One 16 ounce application at early flower and a second method of 4 applications of 4 ounces each 1 week apart starting 2 weeks before flowering.

Significant differences were found in maturity due to increased nitrogen application. Yields were greatest at the 80 pound rate but not significantly. Lint percent was reduced but not significantly with the application of nitrogen. Fiber quality was not affected.

Application of Pix significantly reduced plant height, with the multiple being the most effective. The yield was increased with one application of Pix but was reduced with the multiple applications.

## Introduction

In a short season environment, the cotton crop needs to cutout and mature only the bolls that have a possibility of maturing. Excess nitrogen promotes vegetative growth and makes the crop difficult to defoliate. Use of a growth regulator should help prevent excessive growth, therefore allowing sunlight to penetrate the canopy and allow improved defoliation.

## Materials and methods

The trial was planted May 18, at Portageville, Missouri using D&PL 50. Three rates of nitrogen, 40, 80, 120 pounds per acre were applied June 13. Pix was applied at 16 ounces per acre in one application at 2 the beginning of flowering. The second rate was four ounces in each of four applications starting 2 weeks before flowering.

## Results and discussion

As the nitrogen rate increased, the date of boll opening was delayed. Increased nitrogen rates delayed the reduction of nitrogen in the petioles. Late in the season, petiole phosphorus levels were reduced with the higher of nitrogen application. The yield was highest at the 80 pound rate at 707 pounds per acre. The 40 pound rate yielded 682 pounds and the 120 pound rate yielded 686 pounds. The yields were not significantly different.

Pix reduced the height significantly. It was very dramatic on the multiple application treatment. The nodes above white flower were reduced with both Pix treatments. Bolls opened earlier with the application of Pix and fiber length and strength were improved. Petiole nitrogen levels were increased with the application of Pix. Pix in one application increased the yield by 34 pounds per acre, however the multiple application reduced the yield by 54 pounds. It appears that the multiple application was excessive.

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Table 1.

Nitrogen	NAWF	Total Nodes	
		Above Vegetative Branch	% Open Bolls Retained
	8/14	9/13	
40 lb/a	4.5 b	16.3 b	45.6 a
80 lb/a	5.0 ab	17.1 ab	41.9 ab
120 lb/a	5.0 a	17.3 a	36.4 b
Mean	4.9	16.9	41.3
LSD .05	.4	.8	ns
C.V.%	10.37	5.9	21.97

Table 2.

Nitrogen	Petiole Nitrogen		
	7/27	8/22	9/15
40 lb/a	9556 b	571 c	185 b
80 lb/a	11805 ab	1969 b	272 a
120 lb/a	13581 a	4004 a	294 a
Mean	11737	2181	250
LSD .05	3072	640	76
C.V.%	31.30	34.84	36.06

Table 3.

Nitrogen	Petiole Phosphorus		
	7/27	8/22	9/15
40 lb/a	2278 a	2601 a	1040 a
80 lb/a	2249 a	2251 b	831 b
120 lb/a	2077 a	2048 c	725 c
Mean	2201	2300	865
LSD .05	ns	202	93
C.V.%	21.76	10.40	12.82

Table 4.

Nitrogen	Percent Open Bolls		
	9/15	9/21	9/30
40 lb/a	36.7 a	38.7 a	72.5 a
80 lb/a	31.7 ab	30.0 b	62.1 b
120 lb/a	27.1 b	31.3 b	59.2 b
Mean	31.8	33.3	64.6
LSD .05	6.8	7.3	5.8
C.V.%	25.44	25.96	10.67

Table 5.

Nitrogen	Yield	Lint
	(lb/a)	Percent
40 lb/a	682 a	36.3 a
80 lb/a	707 a	35.4 ab
120 lb/a	686 a	35.6 b
Mean	698	35.8
LSD .05	ns	ns
C.V.%	11.28	30.07

Table 6.

Pix	Total Nodes		% Open Bolls Retained
	NAWF	Above Vegetative Branch	
	8/14	9/13	
Control	5.85 a	17.9 a	39.0 a
LRMA	4.15 b	16.1 b	38.8 a
EB	4.55 b	16.6 B	46.1 a
Mean	4.85	16.9	41.3
LSD .05	0.42	.84	ns
C.V.%	10.37	5.90	21.97

Table 7.

Pix	Height	
	7/28	9/13
Control	26.9 a	40.4 a
LRMA	20.8 b	25.8 c
EB	24.2 ab	31.2 b
Mean	24.0	32.5
LSD .05	4.27	2.12
C.V.%	21.11	7.76

Table 8.

Pix	Petioles 9/15			
	N	P	K	S
Control	166 b	859 a	1.0 b	1124 b
LRMA	293 a	877 a	1.4 a	1387 a
EB	293 a	860 a	1.1 ab	1292 ab
Mean	251	865	1.2	1268
LSD .05	76	ns	.3	202
C.V.%	36.06	12.82	27.18	18.94

Table 9.

Pix	Percent Open Bolls			
	9/15	9/21	9/30	10/6
Control	27.5 a	30.4 a	55.5 b	65.8 b
LRMA	33.3 a	32.1 a	66.7 a	66.3 ab
EB	34.6 a	37.5 a	71.3 a	71.3 a
Mean	31.8	33.3	54.6	67.8
LSD .05	ns	ns	5.8	ns
C.V.%	25.44	25.96	10.7	8.86

Table 10.

Pix	Yield	Lint
	(lb/a)	Percent
Control	698 a	36.0 a
LRMA	644 ab	35.3 a
EB	733 ab	36.0 a
Mean	692	35.8
LSD .05	65.8	ns
C.V.%	11.3	3.07

Table 11.

Pix	Length	Strength	Uniformity
	(in)	(e/tex)	(%)
Control	1.13 b	30.3 b	82.7 b
LRMA	1.15 a	32.1 ab	83.5 ab
EB	1.14 ab	3.01 ab	82.8 ab
Mean	1.14	31.1	83.0
LSD .05	.02	ns	.7
C.V.%	1.90	5.39	.96