

**NITROGEN RATES AND MEPIQUAT CHLORIDE
EFFECTS ON COTTON LINT
YIELD AND QUALITY**

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Abstract

Interest in increased nitrogen (N) rates in combination with plant growth regulators continues in the Mississippi Delta and has been proposed to enhance cotton productivity. A 5-year study was initiated in 1992 to investigate the interaction of N rates (90, 120, 150, and 180 lb N/A) and mepiquat chloride (Pix) rates. Four Pix rates or systems have been incorporated including 1) an untreated control, 2) 2 oz/A applied four times (4X), 3) 4 oz/A applied 4X, and 4) a variable system dependent upon the growing conditions but sometimes using higher rates of Pix. A 15 to 25 lb seedcotton sample was harvested and processed through a commercial gin sequence including dual lint cleaners. Fiber samples were analyzed with HVI, as well as stelometer and arealometer measurements. Lint yields and HVI data have been summarized over a 4-year period. A combined analysis of lint yields showed a significant lint yield response to N rates up to 120 lb N/A with no additional response to either the 150 or 180 lb N/A rates. Applications of Pix did increase lint yields from 1001 to 1033 lb/A (an increase of 3.2%) over the 4-year period and across N rates. This increase was achieved with 2 oz Pix/A applied in four applications (total of 8 oz/A). In most years there was not a significant response to Pix although in some years there was a trend which lead to a significant response over the four years. Micronaire decreased with increasing N rates at both first and second harvest. Nitrogen had little effect on fiber length or strength, but did cause an increase in yellowness (Hunter's *b*). Pix application resulted in a slight increase (0.01 inches) in fiber length and varying effects on fiber strength. Pix applications did result in height reductions and shorter internodes (data not shown). Increasing N rates and using plant growth regulators to control growth would seem to be a solution for higher yields, however, the data does not suggest this option as the most realistic. Pix has been shown to hasten maturity in some cases while increasing N rates has been shown to delay maturity. Putting these two factors together usually results in no change in maturity. The final analysis must weigh the cost of the practice,

including materials and application, against the realized benefit.

Introduction

The use of increased nitrogen (N) rates to increase yields has been proposed for years as the means to increase production in most annual crops. With perennial crops such as cotton, increasing N rates above recommended levels may not be the answer for increased production. Increased N rates in combination with plant growth regulators have been proposed for several years as another means of increasing lint yield levels in the Mississippi Delta. Studies across the country during the 1970's and early 1980's examined the use of mepiquat chloride as a growth regulator for cotton. Early research in the Rio Grande Valley (6, 7, 13) was primarily concerned with the growth regulating component of Pix (mepiquat chloride). Results indicated reduced height, shortened internodes, and reduced leaf area. The results also indicated no significant effect on yields. Treatments with Pix caused no significant difference in earliness, yield, boll size, seed weight, or lint quality.

Researchers in Arizona (14) reported a 10% increase in petiole nitrate levels for Pix treated plants, with no effect of N rates on petiole nitrate levels, and a 2 to 3% increase in lint yield with Pix. In California (9), 35 studies over a 5-year period showed an average lint yield of 1169 lb/A for Pix treated plots and a lint yield of 1160 lb/A for the untreated control. Research in the Mid-south (1, 2, 8, 10) had similar findings as other areas of the Cotton Belt. In Louisiana (2), seedcotton yields were 3.3 to 9.3% lower where Pix was used, with reduced boll set under drought stress conditions. In Tennessee (8), Pix use resulted in yield increases in only two of six studies with no adverse effect on fiber. In studies to measure cotton's response to planting date and mepiquat chloride, researchers in Mississippi (1) observed a lint yield decrease of 4.5% to a yield increase of 12.7%, depending on planting date. Later plantings can generally produce plants that grow faster and taller, with more vegetative growth and less reproductive growth, a situation in which Pix application can be beneficial.

Later research in the Mid-south (3, 4, 5, 11) and Texas (10) has examined low rate multiple applications of Pix. Results from these studies have been erratic with similar trends as other studies across the country. Studies which began in 1987 in Mississippi (3, 4) have shown no consistent lint yield response to increasing N rates with various levels of mepiquat chloride. Little information was available with respect to the effects of increasing N rates on cotton quality (12) or with the interaction effects of mepiquat chloride and N rates on both lint yield and quality in the Mid-south. The objectives of this research were as follows: 1) to determine the interactive effects of N rate and mepiquat chloride on lint yield and quality, and 2) to evaluate

changes in plant growth characteristics, fruiting patterns, and fruit distribution utilizing plant mapping. The second objective will not be presented or discussed at this time.

Materials and Methods

A 5-year study was initiated in 1992 on a Bosket very fine sandy loam (Mollic Hapludalfs) and Dubbs silt loam (Typic Hapludalfs). The study had a 4x4 factorial arrangement of N rates (90, 120, 150, and 180 lb N/A) and mepiquat chloride systems. The four mepiquat chloride treatments included 1) an untreated control (UTC), 2) 2 oz/A applied four times (8 oz/A total) on a 10 to 14 day interval, 3) 4 oz/A applied four times (16 oz/A total), and 4) a variable rate and timing to be determined for specific years. Applications of mepiquat chloride were initiated at pin-head to match-head square and applied bi-weekly according to treatment schedules. The 16 treatments were arranged in a randomized complete block (RCB) design with four replications. The plots (4 40-in rows 215 ft long) were large enough to harvest 20 to 30 lbs of seedcotton from each plot. The harvested seedcotton was ginned through the USDA Ginning Laboratory using standard seedcotton and lint cleaning procedures. Lint fiber quality measurements including HVI, stelometer and arealometer determinations were completed by STARLAB (Knoxville, TN).

Nitrogen rates consisted of 90, 120, 150, and 180 lb N/A applied as a split application of urea-ammonium nitrate solution (32% N). The N solution was applied 50% preplant and 50% as a sidedressed application in all years except 1992. All N solution was "knifed" 10 inches to both sides of the drill. Cotton ('DES-119') was planted between April 25 and May 2 with emergence between April 29 and May 11. All cultural practices including weed control, insecticide applications, irrigation, and defoliation were held constant across all treatments. In most years, defoliation occurred between September 6 and September 19. In both 1994 and 1995, a second defoliation application was needed to complete leaf removal. All plots were harvested twice with the first harvest occurring two to three weeks following defoliation.

Seedcotton yields were calculated based on the harvest of two center rows from each 4-row plot. The plots were harvested with a commercial spindle picker adapted for plot harvest. Lint yields were then calculated from lint percent determined from the micro-gin for each individual plot. All yield data and components including seedcotton and lint yields from each harvest and the lint percents, were analyzed statistically using the Statistical Analysis Systems (SAS) with Fisher's protected LSD for mean separations. Main effects means were evaluated and presented when interactions were not significant at the 5% level of significance.

Results and Discussion

Four years of the study have been completed through 1995 with the final year pending. The discussion will be limited to yield results and quality measurements. Discussion will include individual year comparisons as well as means over years since the variable Pix treatment changed from year to year. The discussion will also center on lint yields as a true measure of treatment effects. Throughout this study and others involving both N rates and mepiquat chloride rates, lint yields have been significantly reduced with increasing N rates and increasing mepiquat chloride rates.

Lint Yields

Tables 1 through 4 contain a summary of main effect means for 1992 through 1995. The N rate by mepiquat chloride (Pix) interaction was not significant in any of the four years of the study. In 1992, total lint yields were 1105, 1160, 1168, and 1172 lb/A for the 90, 120, 150, and 180 lb N/A rates, respectively. When averaged across Pix levels, there was no lint yield increase above 120 lb N/A. Lint yield with 120 lb N/A was significantly higher than the 90 lb N/A rate. There was a significant increase in lint yields at first harvest with Pix applications (Table 1). There was no difference between the 2 oz/A (4X) system and the 4 oz/A (4X) system. At the second harvest, the untreated control was significantly higher yielding than the Pix treated plots. When both yields are added together, there was no significant lint response. The data does suggest earlier maturity with the Pix treated plots as noted and described in the literature.

Lint yields in 1993 were 23% lower than lint yields in 1992. As in 1992, there was no significant total lint yield response with N rates above 120 lb N/A (Table 2). Second harvest yields did increase with increasing N rates up to 150 lb N/A. There was a main effect response to Pix rates at the first harvest similar to that found in 1992. Like 1992, second harvest lint was higher for the control. Total yields were not significantly increased (greatest difference between Pix treatments was 39 lb lint/A which was an increase of 4.5%).

Table 3 includes the main effects summary of lint yields for 1994. The average lint yield ranged from 1057 to 1099 lb/A with the highest yield measured for 120 lb N/A. There was a significant reduction in lint yield for the 180 lb N/A rate compared to the 120 lb N/A rate which had not been shown in previous years. The trends were similar to those discussed for the previous years. There was no response to Pix rates at either first or second harvest and no effect on total lint yield.

The results for 1995 are included in Table 4 and showed no significant increase in lint yield with increasing N rates above 120 lb N/A. The trends were the same as in previous years. Lint yields with Pix were increased at first harvest and for total harvest with no affect on second harvest yields. There was no difference between the 2 oz/A (4X)

and 4 oz/A (4X) Pix rates. The 2 oz/A (4X) rate increased lint yields by 5.3% compared to the untreated control.

Tables 5 and 6 provide a summary of the combined effects of N rates and Pix rates over the four years of the study. In the combined analysis, there was a significant difference among years. The year by N rate interaction was small, yet significant while the other interactions (year X Pix rate and year X N rate X Pix rate) were not. The interaction effects are shown in Table 5. In evaluating production systems, combined analysis over years offers the opportunity to evaluate an entire system over time. The main effects averaged over years are included in Table 6. For N rate, the mean effects across years are similar to individual years. Total lint yield was not significantly increased with N rates above 120 lb N/A. For the soils included in this study, these results support the current N recommendations. With respect to Pix rates, when averaged over the four years and N rates, there was a significant increase in lint yield from 1001 to 1033 lb/A (3.2%) with 2 oz Pix/A (4X). Although, statistics indicates a response to Pix over time, assigning costs to the treatments for materials and application costs, would indicate little economic benefit from the system.

Lint Quality

The HVI fiber data has been summarized in Tables 7 through 14 for individual years 1992 through 1995. The data has been broken down into length, strength, micronaire and colorimeter data for each harvest. In each table, the main effects are listed for both first and second harvests. Tables 7 and 8 provide a summary for 1992 and show that N rates had no effect on either length or strength at the first or second harvest. Micronaire decreased with increasing N rates at both harvests. With respect to Pix rate, there was a minimal increase in length (from 1.11 to 1.12 inches) at the first and second harvest (1.07 to 1.08 inches) compared to the control. First harvest lint strength was up slightly while micronaire was decreased at the second harvest. Hunter's *b* was higher for the 180 lb N/A rate indicating more yellowness in the fiber at the first harvest.

Table 9 and 10 provide a summary of fiber data from HVI for 1993. Micronaire was again decreased as N rates increased (Table 9) and only at the first harvest. In 1993, the majority of the crop was harvested the first time over. Nitrogen rates had no effect on either length or strength at either harvest. There was an increase in fiber length with Pix but no apparent relationship was found between the Pix rates and fiber length. In 1993, there was more yellowness (higher Hunter's *b* values) with increased N at both harvest (Table 10). The Pix had no significant effect on either Rd or Hunter's *b* at either the first or second harvest.

In 1994, micronaire values were lower than in previous year (Table 11) and were not significantly affected by either N rate or Pix rate for both harvests. Fiber length was again

increased by 0.01 inches at first harvest when Pix was used and did not vary with rates. In 1994, fiber strength decreased slightly when N rates increased. Hunter's *b* increased (more yellowness) with increasing N rates but only for the second harvest (Table 12).

In 1995 (Table 13), increasing N rates resulted in a significant decrease in micronaire for both first and second harvest and had no effect on fiber length or strength. There was a significant increase in fiber length with Pix rates increasing the length from 1.10 to 1.12 inches. Fiber strength was also significantly higher at the two higher Pix rates. Yellowness again increased as N rates increased for both first and second harvest (Table 14). In 1995, HVI strength reading were much higher than reported in previous years. However T_1 was not higher than previous years.

To summarize the HVI fiber data, micronaire values decreased in most years with increasing N rates, especially at the first harvest which accounts for most of the yield. In most situations, increasing N rates had no significant effect on fiber length and strength as measured by HVI. There was more yellowness (higher Hunter's *b*) in most years and usually at both the first and second harvest. Pix applications did increase first harvest fiber length in most years but increases were usually on) 0.01 inches. Pix rates had no affect on the colorimeter data.

Summary

Increasing N rates with increased use of plant growth regulator mepiquat chloride (Pix) does not offer the answer for increasing lint yields. If N is not the factor that is most limiting production, then increasing N should not be expected to increase production. In the case of perennial plants such as cotton, increasing N rates far above that which is needed for optimum production could result in a shift from reproductive growth back to vegetative growth. While Pix offers management opportunities where reduced vegetative growth is needed, it is not always the means to solve problems associated with unwise management decisions. In general, the best growth regulator is an adequate or better fruit load. Management decisions can affect the fruit load, especially early in the season, if the plants are exposed to insect damage. Pix has been successful in reducing plant size in many situations by shortening the internodes. A producer or crop consultant should examine the economics of Pix applications and increasing N rates. Adding more cost without increasing lint yields is not sound economic decision making.

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Table 1. Main effect lint yield from an interaction of N rates and mepiquat chloride rates. 1992. MAFES - DREC

Main Effect	First Harvest	Second Harvest	Total Harvest
----- (lb lint/A) -----			
N Rate (lb/A)			
90	979	126c	1105b
120	1006	154b	1160a
150	986	182a	1168a
180	975	197a	1172a
LSD(0.05)	---ns	20**	27**

Pix Rate			
Check	949c	190a	1139
2 oz/A (4X)	1005a	156b	1161
4 oz/A (4X)	1016a	152b	1168
6 oz/A (4X)	975b	162b	1137
LSD(0.05)	26**	20**	---ns

LSD's are provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 2. Main effect lint yields from an interaction of N rates and mepiquat chloride rates. 1993. MAFES - DREC

Main Effect	First Harvest	Second Harvest	Total Harvest
----- (lb lint/A) -----			
N Rate (lb/A)			
90	763b	64c	827b
120	813a	77b	890a
150	834a	88a	921a
180	830a	90a	920a
LSD(0.05)	32**	8**	34 **

Pix Rate			
Check	780b	89a	869
2 oz/A (4X)	829a	79b	908
4 oz/A (4X)	817a	74b	890
6 oz/A (4X)	814a	78b	892
LSD(0.05)	32**	8**	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 3. Main effect lint yield from an interaction of N rates and mepiquat chloride rates. 1994. MAFES - DREC

Main Effect	First Harvest	Second Harvest	Total Harvest
----- (lb lint/A) -----			
N Rate (lb/A)			
90	1025b	37	1062b
120	1060a	39	1099a
150	1038ab	39	1077ab
180	1020b	37	1057b
LSD(0.05)	28*	---ns	28*

Pix Rate			
Check	1018	39	1057
2 oz/A (4X)	1038	38	1076
4 oz/A (4X)	1034	38	1073
Variable ¹	1054	37	1090
LSD(0.05)	---ns	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

¹ Variable Pix rate: 2 oz/A, 4 oz/A, 6 oz/A, and 6 oz/A.

Table 4. Main effect lint yields from an interaction of N rates and mepiquat chloride rates. 1995. MAFES - DREC

Main Effect	First Harvest	Second Harvest	Total Harvest
----- (lb lint/A) -----			
N Rate (lb/A)			
90	859b	55c	914b
120	915a	60b	974a
150	926a	63ab	988a
180	910a	64a	974a
LSD(0.05)	32**	4**	32**

Pix Rate			
Check	878b	59	937c
2 oz/A (4X)	925a	62	987a
4 oz/A (4X)	912a	60	972ab
Variable ¹	895ab	60	955bc
LSD(0.05)	32*	---ns	32*

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

¹ Variable Pix rate: 6 oz/A, 6 oz/A, and 4 oz/A.

Table 5. Lint yield from an interaction of N rates and mepiquat chloride rates. 1992 - 1995. MAFES - DREC

Pix Rate	Nitrogen Rate, lb N/A			
	90	120	150	180
----- (lb lint/A) -----				
First Harvest				
Check	898ef	922c-f	914def	892f
8 oz/A	913def	944bcd	985a	955abc
16 oz/A	912def	969ab	965ab	933b-e
Variable	903ef	959ab	920c-f	954abc
LSD(0.05)		36 **		

Second Harvest				
Check	84cd	89a-d	101ab	103a
8 oz/A	68ef	76def	91abc	99ab
16 oz/A	64f	83cd	91abc	87bcd
Variable	67f	82cde	89a-d	98ab
LSD(0.05)		14 **		

Total Harvest				
Check	981efg	1011def	1014c-f	995efg
8 oz/A	982efg	1020b-e	1075a	1054ab
16 oz/A	976fg	1052abc	1055ab	1020b-e
Variable	970g	1041a-d	1010d-g	1052abc
LSD(0.05)		40 **		

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 6. Main effect lint yield from an interaction of N rates and mepiquat chloride rates. 1992-1995. MAFES - DREC

Main Effect	First Harvest	Second Harvest	Total Harvest
----- (lb lint/A) -----			
N Rate (lb/A)			
90	907b	71c	977b
120	948a	83b	1031a
150	946a	93a	1039a
180	934a	97a	1031a
LSD(0.05)	18**	7**	20**

Pix Rate			
Check	906b	94a	1001b
2 oz/A (4X)	949a	84b	1033a
4 oz/A (4X)	945a	81b	1026a
Variable	934a	84b	1018ab
LSD(0.05)	18**	7**	20*

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 7. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1992. MAFES - DREC

Main Effect	Length (inches)	Strength (g/tex)	Micronaire (Reading)
----- First Harvest -----			
N Rate (lb/A)			
90	1.12	28.2	4.16a
120	1.12	28.1	4.08ab
150	1.12	27.8	4.00bc
180	1.12	27.9	3.96c
LSD(0.05)	---ns	---ns	0.09**
Pix Rate			
Check	1.11b	27.6b	4.09
2 oz/A (4X)	1.12ab	28.3a	4.06
4 oz/A (4X)	1.12a	28.0ab	4.04
6 oz/A (4X)	1.12a	28.0ab	4.02
LSD(0.05)	0.01**	0.4*	0.09ns
----- Second Harvest -----			
N Rate (lb/A)			
90	1.07	26.9	3.44a
120	1.07	26.8	3.37b
150	1.08	26.5	3.29c
180	1.08	26.7	3.35bc
LSD(0.05)	---ns	---ns	0.07**
Pix Rate			
Check	1.07b	26.5	3.48a
2 oz/A (4X)	1.08ab	26.8	3.30b
4 oz/A (4X)	1.08a	26.8	3.34b
6 oz/A (4X)	1.08ab	26.9	3.34b
LSD(0.05)	0.01*	---ns	0.07**

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 8. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1992. MAFES - DREC

Main Effect	Colorimeter	
	Rd	Hunter's b
----- First Harvest -----		
N Rate (lb/A)		
90	71.4ab	7.7b
120	71.5ab	7.9b
150	72.3a	7.9b
180	71.2b	8.3a
LSD(0.05)	1.0*	0.3**
Pix Rate		
Check	70.6b	8.0
2 oz/A (4X)	72.2a	7.9
4 oz/A (4X)	72.1a	7.8
6 oz/A (4X)	71.6ab	8.0
LSD(0.05)	1.0*	---ns
----- Second Harvest -----		
N Rate (lb/A)		
90	70.8	7.1
120	70.7	7.1
150	70.9	7.1
180	71.2	7.3
LSD(0.05)	---ns	---ns
Pix Rate		
Check	71.2	7.2
2 oz/A (4X)	70.8	7.2
4 oz/A (4X)	70.3	7.2
6 oz/A (4X)	71.2	7.0
LSD(0.05)	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 9. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1993. MAFES - DREC

Main Effect	Length (inches)	Strength (g/tex)	Micronaire (Reading)
----- First Harvest -----			
N Rate (lb/A)			
90	1.13	26.9	4.31a
120	1.13	27.6	4.23b
150	1.13	27.5	4.16bc
180	1.13	27.4	4.12c
LSD(0.05)	---ns	---ns	---**
Pix Rate			
Check	1.12c	27.3	4.21
2 oz/A (4X)	1.14a	27.7	4.17
4 oz/A (4X)	1.13bc	27.1	4.23
6 oz/A (4X)	1.13ab	27.3	4.20
LSD(0.05)	0.01**	---ns	---ns
----- Second Harvest -----			
N Rate (lb/A)			
90	1.07	27.8	3.66
120	1.08	27.8	3.63
150	1.08	27.6	3.69
180	1.08	27.4	3.64
LSD(0.05)	---ns	---ns	---ns
Pix Rate			
Check	1.06c	27.7	3.57c
2 oz/A (4X)	1.07bc	27.6	3.65b
4 oz/A (4X)	1.09a	27.7	3.73a
6 oz/A (4X)	1.08ab	27.5	3.67ab
LSD(0.05)	0.01**	---ns	0.07**

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 10. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1993. MAFES - DREC

Main Effect	Colorimeter	
	Rd	Hunter's b
----- First Harvest -----		
N Rate (lb/A)		
90	72.4	8.0c
120	72.7	8.1bc
150	73.0	8.2ab
180	73.0	8.3a
LSD(0.05)	---ns	0.2**
Pix Rate		
Check	72.5	8.1
2 oz/A (4X)	73.0	8.1
4 oz/A (4X)	72.8	8.1
6 oz/A (4X)	72.8	8.2
LSD(0.05)	---ns	---ns
----- Second Harvest -----		
N Rate (lb/A)		
90	69.8	7.8c
120	69.8	8.0b
150	70.0	8.0ab
180	69.8	8.1a
LSD(0.05)	---ns	0.1**
Pix Rate		
Check	70.0	8.0
2 oz/A (4X)	69.6	7.9
4 oz/A (4X)	69.8	8.0
6 oz/A (4X)	70.0	8.0
LSD(0.05)	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 11. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1994. MAFES - DREC

Main Effect	Length (inches)	Colorimeter	
		Rd	Hunter's b
----- First Harvest -----			
N Rate (lb/A)			
90	1.12	26.1	4.03
120	1.11	26.1	4.07
150	1.12	26.2	4.04
180	1.11	26.1	3.99
LSD(0.05)	---ns	---ns	---ns
Pix Rate			
Check	1.11b	26.1	4.06
2 oz/A (4X)	1.12a	26.2	4.01
4 oz/A (4X)	1.12a	26.0	4.02
6 oz/A (4X)	1.12a	26.2	4.05
LSD(0.05)	0.006**	---ns	---ns
----- Second Harvest -----			
N Rate (lb/A)			
90	1.08	25.6a	3.71
120	1.09	25.1ab	3.65
150	1.09	25.0b	3.59
180	1.08	24.8b	3.62
LSD(0.05)	---ns	0.6*	---ns
Pix Rate			
Check	1.08	25.1	3.68
2 oz/A (4X)	1.08	25.2	3.62
4 oz/A (4X)	1.09	25.3	3.65
6 oz/A (4X)	1.08	24.8	3.61
LSD(0.05)	---ns	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 12. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1994. MAFES - DREC

Main Effect	Colorimeter	
	Rd	Hunter's b
----- First Harvest -----		
N Rate (lb/A)		
90	64.3	7.49
120	64.9	7.60
150	65.5	7.69
180	65.2	7.62
LSD(0.05)	---ns	---ns
Pix Rate		
Check	64.5	7.57
2 oz/A (4X)	65.1	7.64
4 oz/A (4X)	65.0	7.60
6 oz/A (4X)	65.3	7.57
LSD(0.05)	---ns	---ns
----- Second Harvest -----		
N Rate (lb/A)		
90	53.3	7.32b
120	52.9	7.46ab
150	52.8	7.60a
180	51.7	7.56a
LSD(0.05)	---ns	0.17*
Pix Rate		
Check	52.1	7.47
2 oz/A (4X)	53.1	7.53
4 oz/A (4X)	53.2	7.49
6 oz/A (4X)	52.3	7.46
LSD(0.05)	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 13. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1995. MAFES - DREC

Main Effect	Length (inches)	Colorimeter	
		Rd	Hunter's b
----- First Harvest -----			
N Rate (lb/A)			
90	1.11	28.8	4.76a
120	1.11	29.2	4.66a
150	1.11	28.8	4.55b
180	1.11	29.0	4.49b
LSD(0.05)	---ns	---ns	0.11**
Pix Rate			
Check	1.10b	28.4b	4.56
2 oz/A (4X)	1.11a	28.7b	4.59
4 oz/A (4X)	1.12a	29.4a	4.66
6 oz/A (4X)	1.12a	29.2a	4.66
LSD(0.05)	0.01**	0.5**	---ns
----- Second Harvest -----			
N Rate (lb/A)			
90	1.07	27.0	4.46a
120	1.07	27.1	4.46a
150	1.07	27.0	4.37a
180	1.07	26.9	4.20b
LSD(0.05)	---ns	---ns	0.10**
Pix Rate			
Check	1.05c	26.4b	4.32b
2 oz/A (4X)	1.07b	27.0a	4.34b
4 oz/A (4X)	1.08ab	27.4a	4.38ab
6 oz/A (4X)	1.08a	27.1a	4.46a
LSD(0.05)	0.01**	0.5**	0.10*

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).

Table 14. Main effect HVI Classing Data from an interaction of N rates and mepiquat chloride rates. 1995. MAFES - DREC

Main Effect	Colorimeter	
	Rd	Hunter's b
----- First Harvest -----		
N Rate (lb/A)		
90	70.5	7.52b
120	70.8	7.58b
150	71.0	7.66ab
180	71.2	7.74a
LSD(0.05)	---ns	0.16*
Pix Rate		
Check	70.6	7.57
2 oz/A (4X)	71.1	7.67
4 oz/A (4X)	71.0	7.63
6 oz/A (4X)	70.8	7.64
LSD(0.05)	---ns	---ns
----- Second Harvest -----		
N Rate (lb/A)		
90	64.8	7.94b
120	65.1	8.27a
150	65.2	8.32a
180	64.9	8.39a
LSD(0.05)	---ns	0.20**
Pix Rate		
Check	65.1	8.17
2 oz/A (4X)	64.9	8.24
4 oz/A (4X)	65.0	8.21
6 oz/A (4X)	64.9	8.31
LSD(0.05)	---ns	---ns

LSD's are also provided for mean comparisons at the 5% level (** = <0.01, * = 0.01 - 0.05, ns = not significant).