

**THE INFLUENCE OF MEPIQUAT CHLORIDE  
(PIX) AND NITROGEN RATE UPON  
THE MATURITY AND FIBER  
QUALITY OF UPLAND COTTON**  
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**Abstract**

In a short season environment, measures must be taken to promote early development and mature the fruit load quickly. Controlling the nitrogen rate and the proper use of a growth regulator could aid in promoting an early cutout and boll opening. Three nitrogen rates of 40, 80, and 120 pounds per acre were used. PIX (mepiquat chloride) at 16 ounces per acre were applied in a single application and also divided into four applications of four ounces each. PIX had no harmful effect upon fiber properties. However, it did reduce lint percent but the single application increased lint yield.

**Introduction**

In a short season environment, the cotton crop should cutout early allowing only those bolls that have a chance of maturing to be produced. Excessive rates of nitrogen causes the crop to set fruit late that has little chance of maturing and excessive vegetative growth that is difficult to defoliate. Proper use of a growth regulator should prevent excessive vegetative growth.

**Materials and Methods**

The trial was conducted for a period of three years starting in 1994. It was conducted in Portageville, Missouri using D&PL 50. The three nitrogen rates of 40, 80 and 120 pounds per acre were compared. One treatment of PIX (16 ounces per acre) was applied at early bloom and another treatment of four ounces was applied weekly for four weeks.

**Results and Discussion**

PIX had a significant effect on plant and fiber development. The LRMA (low rate multiple application) was much more effective in reducing plant height than the single application. The single application only had a slight effect on height. Both PIX treatments had a similar effect on nodes above white flower in mid-August. They reduced the number by almost one node indicating an earlier cutout. Percent open in mid to late September was increased with PIX, especially with the single application.

The lint percent was reduced by the use of PIX, especially with the multiple application. The single application yielded more than either of the other treatments which were almost equal.

PIX reduced the micronaire but it was not of a quantity to be of importance. Fiber length was unchanged by the use of PIX. The fiber strength was increased and uniformity was reduced slightly but were not of practical significance. Trash was shown to increase due to PIX treatment, however trash content is erratic due to small samples. The coefficient of variation was very high.

Nitrogen increased the number of nodes above white flower. This indicates that high nitrogen rates delay cutout and the percent open boll was delayed by high nitrogen rates. Lint yields were highest with high nitrogen rates. Fiber length was significantly different but none of the differences in fiber properties were of practical significance.

**Summary**

Lint percent was reduced with the use of PIX. However yields were best with the single application. The multiple application had no effect upon yield. PIX had no important effect upon the fiber quality except with the possibility of trash content. Nitrogen delayed maturity but did not reduce fiber quality.

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Table 1. Influence of PIX on height, nodes above white flower (NAWF), and percent open on Upland cotton for three years.

| PIX                    | Height (in) | NAWF  | Percent Open |
|------------------------|-------------|-------|--------------|
| Control                | 26.3 a      | 4.1 a | 45.8 b       |
| LRMA (4 oz/A x 4 apps) | 21.7 b      | 3.3 b | 48.0 b       |
| EB (16 oz/A)           | 25.6 a      | 3.4 b | 52.4 a       |
| Mean                   | 24.5        | 3.6   | 48.8         |
| LSD 0.05               | 0.87        | 0.25  | 3.16         |
| C.V.%                  | 7.48        | 14.35 | 13.70        |

Table 2. Influence of PIX on yield and lint percent on upland cotton for three years.

| Pix                    | Yield (lb/A) |       |        |        | Lint % |
|------------------------|--------------|-------|--------|--------|--------|
|                        | 1994         | 1995  | 1996   | Mean   |        |
| Control                | 1451 a       | 652 b | 1154 a | 1082 a | 37.1 a |
| LRMA (4 oz/A x 4 apps) | 1377 a       | 687 b | 1162 a | 1085 a | 35.4 b |
| EB (16 oa/A)           | 1433 a       | 714 a | 1199 a | 1116 a | 36.7 a |
| Mean                   | 1420         | 684   | 1172   | 1092   | 36.4   |
| LSD 0.05               | 84.60        | 42.12 | 58.70  | 38.06  | 0.69   |
| C.V. %                 | 7.07         | 7.30  | 5.95   | 7.37   | 4.00   |

Table 3. Influence of PIX on fiber quality on upland cotton for three years.

| PIX                    | Mic    | Length (in) | Strength (g/tex) | Unif    | Trash  |
|------------------------|--------|-------------|------------------|---------|--------|
| Control                | 4.67 a | 1.15 a      | 28.37 b          | 82.63 a | 3.9 b  |
| LRMA (4 oz/A x 4 apps) | 4.56 b | 1.16 a      | 29.42 a          | 82.19 b | 5.2 a  |
| EB (16 oz/A)           | 4.5 ab | 1.15 a      | 28.95 ab         | 82.13 b | 4.6 ab |
| Mean                   | 4.61   | 1.16        | 28.91            | 82.32   | 4.6    |
| LSD 0.05               | 0.08   | 0.01        | 0.74             | 0.41    | 0.90   |
| C.V. %                 | 4.09   | 1.44        | 5.43             | 1.05    | 43.80  |

Table 4. Influence of nitrogen on nodes above white flower (NAWF), percent open, length, and yield on upland cotton for three years.

| Nitrogen   | NAWF   | Percent Open | Length (in) | Yield (lbs/A) |
|------------|--------|--------------|-------------|---------------|
| 40 lb N/A  | 3.5 b  | 51.0 a       | 1.158 ab    | 1071 b        |
| 80 lb N/A  | 3.7 a  | 47.5 b       | 1.161 a     | 1092 ab       |
| 120 lb N/A | 3.7 ab | 47.8 b       | 1.152 b     | 1113 a        |
| Mean       | 3.6    | 48.8         | 1.158       | 1092          |
| LSD 0.05   | 0.22   | 2.80         | 0.008       | 30.49         |
| C.V. %     | 14.35  | 13.70        | 1.44        | 7.37          |