



A COMPARISON IN COTTON OF MEPIQUAT CHLORIDE ACTIVITY WITH AND WITHOUT CYCLANILIDE ADDITION

by Rob Millings, Craig Bednarz, Glen Ritchie, Cory Mills, Jared Whitaker

OBJECTIVE

The objective was to compare the effects of Mepiquat Chloride + Cyclanilide with Mepiquat Chloride in controlling height, maturity, quality, and yield.

INTRODUCTION

Controlling height and maturity plays a direct correlation in cotton (*Gossypium hirsutum* L.) yield and quality. Over the past decade Mepiquat Chloride (MC) has become the standard in growth regulation in cotton production. MC reduces the synthesis of a plant hormone, gibberellic acid, that is responsible for cell expansion. Therefore by reducing gibberellic acid (GA), then the plant's height can be reduced.

The addition of cyclanilide with MC has shown a synergistic effect in affecting plant hormones and development in cotton. This is the result of cyclanilide influencing another plant hormone known as auxin. This hormone plays a direct relationship with GA. The cyclanilide in Reign (Trade Name: MC + cyclanilide) manipulates auxin by preventing its mode of action. Without auxin the GA produced by the plant cannot be utilized by the plant and prevents partial height development.

METHODS & MATERIALS

The experiment was laid out in a randomized split plot design with applications of 2.0, 2.5, 3.0 oz. of MC + cyclanilide and applicable MC applications as well as the untreated. An irrigation variable was included however was negated by substantial rainfall during the summer. Rows were laid out on 36 inch centers with an average of 3.2 plants per row foot. Watermarks were set at depths of 8, 16, and 24 inches in all applications and irrigations were applied to maintain soil water potential between 0 and -40cbar. Weekly nodes counts and height measurements were taken along with record development along with weekly nodes above first square and nodes above white flower counts to measure plant maturity.

The cotton was planted on April 18, 2005 at the Stripling Irrigation Park in Camilla, Georgia and fully emerged around 12 – 14 DAP. Applications of the treatments were made 39, 57, and 95 DAP. The MC treatment were applied in 8.0, 12.0, and 16.0 oz. applications, respectively on the given time intervals. The second location was in Tifton, Georgia and was planted on May 11, 2005.

Amount of Mepiquat Chloride as a.i. and % per treatment

Treatments (oz.)	Reign 2.0	Reign 2.5	Reign 3.0	MC 8.0
% of MC	8.4	8.4	8.4	4.2
Amount MC per app. (oz)	.17	.21	.25	.34



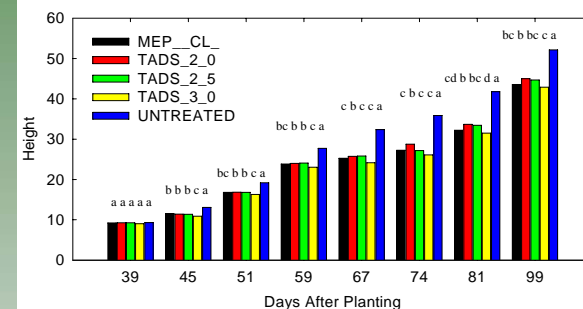
RESULTS



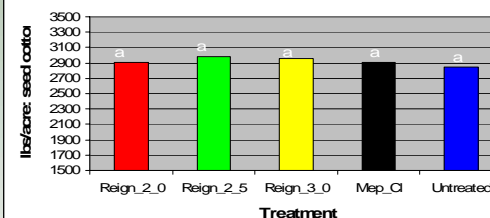
• Dark green foliage is the result of compressed leaf area index.

The combination of mepiquat chloride and cyclanilide resulted in similar control of growth and maturity with the 2.5 oz. applications as compared with the mepiquat alone. The 2.0 oz. application did not maintain the same level of control on height and did not increase maturity to the same extent as compared with the MC treatment. The 3.0 oz. application produced a slightly shorter plant as compared with the MC treatment.

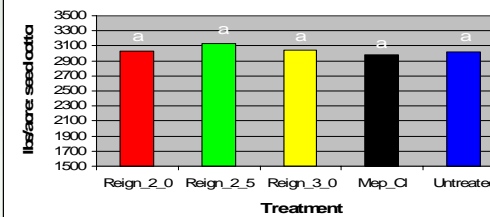
CURRENT DATA 2005



Yield: Two Locations - Irrigated



Yield: Two Locations - Dryland



CONCLUSION

This comparative study between mepiquat chloride + cyclanilide and mepiquat chloride determined the importance of rate on the regulation of growth on cotton. The final outcome is that the mepiquat chloride + cyclanilide treatments, given the correct rate, is comparable with mepiquat chloride alone, and does offer effective control of height and maturity.

ACKNOWLEDGEMENTS

This project was funded by grant from Bayer Cropscience, and special thanks to the staff of Stripling Irrigation Research Park.

Produced in the apical meristem



AUXIN

Causes cell elongation



CYCLANILIDE: manipulates the activity of auxin as it moves to the roots.

In elongating internodes, auxin maintains the level of bioactive GA1, by promoting GA1 biosynthesis & by inhibiting GA1 deactivation (J.J. Ross 2003)



Since the cyclanilide has inhibited the mode of action of auxin, the GA's produced by the plant cannot be bioactivated. The GA's in the plant have no effect on internode elongation.

