EVALUATION OF A NOVEL DRY MEPIQUAT FORMULATION TO CURRENT PRODUCTS Joe Townsend Townsend Agricultural Consulting, Inc. Lula, MS

<u>Abstract</u>

Mepiquat chloride is a standard use product in the Mississippi Delta for cotton plant growth control. In 2009 a new dry formulation of Mepiquat chloride was tested on the farm of Mr. Kenneth Cobb in Quitman County, Mississippi. Plots were 4 rows by 40 feet and replicated 6 times. Plant growth regulators were used beginning at the twelfth node and continued as needed. Treatments included Arysta MC Plus90WDG, Pix Plus, Mepex Ginout, Stance, Pentia, and Mepiquat Chloride (4.2%). Arysta MC Plus 90WDG is a patented 90% active ingredient dry formulation of mepiquat chloride set to launch in 2010.

Methods

The MEPRT program was used trying to maintain a 17 ppm concentration of mepiquat chloride in the plant tissue. A consistent Mepiquat chloride plant tissue concentration of 17 ppm has been shown as the optimum concentration for continued growth and maximum fruit retention during the fruiting phase of cotton production. Plant height and main stem nodes were counted on a 4-5 day schedule from the eighth node onward. This information was fed into the MEPRT program and rates given for each application. The goal was to adjust the plant tissue concentration of mepiquat chloride of all treatments to the 17 ppm every 8-10 days throughout the peak fruiting cycle (Table 1). Special thanks is given to Dr. Carlos Fernandez at Texas A&M University for his work to recalculate MEPRT to adjust for the 90WDG concentration change, as the original program designed by Dr. Juan Landivar of Texas A&M in 1978, was calibrated for the 4.2% standard mepiquat formulations of that time period.

Mepiquat Rates by Application Date	18-Jun	30-Jun	9-Jul
Control	Na	Na	Na
MC Plus 90WDG	14.6 gms	5.1 gms	6.5 gms
Pix Plus	10.5 ozs	3.7 ozs	14.7 ozs
Mepex Ginout	10.5 ozs	3.7 ozs	4.3 ozs
Stance	5.0 ozs	1.7 ozs	7.3 ozs
Pentia	4.5 ozs	1.6 ozs	6.7 ozs
Mepiquat Chloride	10.5 ozs	3.7 ozs	15.8 ozs

Table 1. Application dates and product rates applied in 2009.

Results

The 2009 growing season offered many challenges in plant growth regulator use due to the weather. June was very dry and hot, followed by extended rains in August and September. Three applications were made to the test. Two before the rains came to this Stoneville 5458 cotton. One week after the first Mepiquat applications were made the treatments began to separate, then continued this trend for the entire season.

On June 30, 2009, 12 days after the initial application, the untreated cotton was 29% taller than the MC Plus 90WDG, and 21% taller than the average of all treatments. Activity of the MC Plus 90WDG appeared to be greater than the other products, so lower a.i. rates could possibly be used.

The experimental MC *Plus*90WDG cotton had a yearend height of 34 inches, compared to 55 inches in the untreated cotton, and an average of the remainder of the treatments was 43.5 inches. Total main stem nodes produced was 22

for the MC *Plus 90*WDG, 27.5 for the untreated, and 24.5 for the remainder of the treatments (Figure 1). Mainstem nodes producing mature bolls was 6.24 for the untreated, 7.86 for the MC *Plus* 90WDG, and 7.73 for the average of the remainder of the treatments (Figure 2). Total bolls produced per plant were 7.4 for the check, 11.6 for the MC *Plus* 90WDG, and 10.0 for the remainder of the treatments (Figure 3).



Figure 1. Average nodes produced per plant over mepiquat treatments.



Figure 2. Average nodes producing mature bolls per plant over mepiquat treatments.



Figure 3. Average number of mature bolls per plant over mepiquat treatments.

At approximately 30% open bolls, the rains started and lasted for 7 weeks, with about 30 inches of rain being received. Handpicked samples showed a yield reduction of 50-60% due to seeds germinating in the open cotton, boll rot, and hard lock. For this reason, yields were not taken from the test. However, the information taken shows that MC Plus 90WDG gave shorter plants with more bolls. Plants had fewer main stem nodes, but more nodes producing harvestable bolls. It is quite possible that by using MC Plus 90WDG a cotton grower would use less Mepiquat a.i. to properly control plant size versus generic Mepiquat products available on the market today. The extremely low rates of the MC Plus 90WDG should reduce labor costs with close to 90% less material to store, haul, and mix. When the excessive rains came at defoliation timing the cotton treated with MC Plus 90WDG maintained its plant size, while the efficacy of the other treatments was reduced allowing late season vegetative growth.