

**NOVEL FORMULATION OF MEPIQUAT CHLORIDE – 90WDG****O. J. Turner****Joseph Hickey****Arysta LifeScience North America, LLC****Abstract**

Mepiquat chloride has been a mainstay in cotton production practices for nearly 30 years. The products used during this time period have traditionally been formulated as a 4.2% water based product manufactured and sold by a number of companies. Arysta LifeScience has participated in this market with our PIX®, PIX® PLUS®, and Mepichlor® branded products (all 4.2%).

**Introduction**

Arysta LifeScience North America has a patented method of manufacturing mepiquat chloride technical ingredient as well as dry, high purity end use formulations that will change the way growers and applicators view this active ingredient. Arysta formulators have developed a fast dispersing 90WDG (90% ai Water Dispersible Granule) product that will reduce grower shipping, storage, and warehousing. The new 90WDG product will also greatly reduce container disposal and associated triple rinsing time and labor. Containers will be reduced approximately 90% to cover the same acreage at the same rates. This new formulation was thoroughly tested across the Cotton Belt over the last three years. Trials based across the Cotton Belt gathered wide ranging data in varied weather, as 2008 and 2009 brought some of the greatest in-season variations in recent memory.

**Methods**

The protocol was consistent across the years and at all locations. The MEPRT program was used at all sites to ensure all application rates would be made according to the plant's needs rather than a subjective rating. A consistent mepiquat chloride plant tissue concentration of 17 ppm is judged as the optimum concentration for continued growth and maximum fruit retention during the fruiting phase of cotton production. Height, main stem nodes (MSN), and population ratings were taken just prior to 4 specific application timings: MHS, MHS+9 days, MHS+18 days, and MHS+27 days. This information was fed into MEPRT for both dry and liquid formulations which provided the rate for each application timing to adjust the plant to the 17 ppm concentration.

While the university testing was ongoing, a group of crop consultants and applicator tests were running in-field, small acre commercial type applications concurrently that showed the new dry 90WDG to be equal to the long running 4.2% mepiquat chloride liquid formulations in height control with no change in the yield characteristics of mepiquat chloride. This also allowed for testing the mixability, tank mix capability, and use under true field conditions under widely variable conditions.

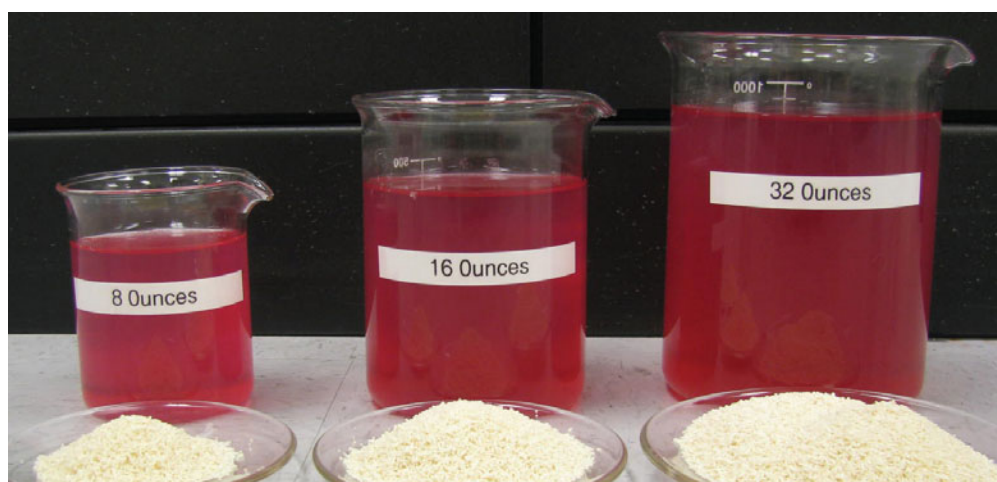
**Results**

In three years of testing, there has been no significant difference in height control, number of nodes produced or yield when comparing the commonly used 4.2% formulations and 90WDG formulations at the same ai rate per acre. New model sprayer applicators in the cotton industry are now covering large acre areas from 500 to 1500 acres. An example of the input volume of product for a common tank size would be: 500 gallon sprayer set to apply 2 gallons per acre would cover 250 acres. A prescribed 16 oz. rate of the current 4.2% product would require 31.25 gallons of product (Figure 1). The same active ingredient applied using the 90WDG product will be 12 pounds. In comparison, the 31.25 gallons weighs 265.6 pounds, now replaced with only 12 pounds of product. This succinctly shows the container disposal savings, triple rinse time, as well as grower storage and measuring time required. A simple conversion chart will be supplied with every case and container.



**Figure 1. 2.5 Gallons (256 oz) vs. 420 grams of the new 90WDG formulation to show the volume of product equivalent of each formulation type.**

Common use rates range from 32 to 8 ounces per acre. With the new 90WDG formulation, this much more efficient formulation calls for only grams of product per acre. Growers will now be able to carry a day's needs in the cab of a pickup. In general terms, a grower applying 32 oz of the 4.2% product would now apply on 42 grams per acre of the 90WDG. Figure 2 shows the equivalent amounts of liquid 4.2% mepiquat chloride and 90WDG.



**Figure 2. Equivalent amounts of liquid 4.2% mepiquat chloride and 90WDG.**

#### **Normal Versus Wet Year**

A comparison of mepiquat chloride formulations at the University of Georgia shows a good example of the normal progression of cotton plant nodal development and corresponding Ht/Node Ratio. The years of comparison trials and studies show the 90WDG to be equal to the commercial 4.2% liquid mepiquat formulations in height control and normal nodal development, even in the extreme weather conditions of the past several years. No significant differences were found in these comparisons of mepiquat formulations in height control, nodal development, or yield. These 2009 Georgia data were chosen to show the mepiquat affect during the extremely wet 2009 growing season, where mepiquat products have their toughest challenge.

Arysta LifeScience plans to launch the new 90WDG formulation in 2010, as EPA registration is expected in the first quarter of 2010.

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