Making mepiquat chloride application decisions

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Mepiquat chloride is mobile in the plant, and its activity is observed in the decrease of internodal length, slightly reduced leaf area and higher concentration of chlorophyll in the leaf area (Figure 1). Well timed applications can be beneficial in controlling excessive vegetative growth and aiding indeterminate varieties to successfully move into a fruiting mode without introducing a photosynthesis limiting stress.

General applications of 0.3–0.6 litres per hectare of mepiquat chloride applied near the time of early flowering, and eliminating early season water stress, results in

FIGURE 1: Leaf area and internode length reduction as related to mepiquat chloride concentraton

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a yield increase estimated to be about 20 per cent.

Mepiquat chloride response from 0.6 litres per hectare applied at early flowering is related to maximum internode distance in Figure 2. Similar results have been observed in many regions of the world, and also reported at the 2004 US Beltwide Conference.

If maximum internode distance near the time of first flower is less than about 6.9 cm, an assessable response to mepiquat chloride is not expected. As this distance increases, the probability of a positive yield benefit from the application of mepiquat chloride increases.

Modest rates of mepiquat chloride (or higher rates if growth rates are high) can help the transition of indeterminate varieties into fruiting. Growth limiting concentrations of mepiquat chloride will be diluted within a few weeks. As this occurs, the plant should have sufficient boll load to ultimately regulate growth. Good boll set with sustained vegetative growth is a formula for higher potential yield as long as growth is controlled to accommodate the season. Monitoring of height, internode length and fruit retention will assist in managing the crop.

The use of early multiple applications of mepiquat chloride to control vegetative growth and promote fruiting has been used in shorter season areas to decrease plant height but not the number of fruiting branches and potential fruiting sites.

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MONITORING VEGETATIVE GROWTH

Deltapine's 'Benchmark' program is an invaluable tool to help monitor vegetative growth, particularly in relation to early and multiple applications of mepiquat chloride. As mepiquat chloride is applied to a crop and the concentration in the plant approaches 10 ppm, plant cell expansion is reduced.

Benchmark indicates the quantity of mepiquat chloride in both ppm and millilitres per hectare required to reach 10 ppm — and so reduce cell expansion, regulate vegetative growth and promote progression to fruiting phases. Figure 3 demonstrates that sustained vegetative growth during early fruit set is critical to avoid early cut-out.

Deltapine Technical Services plant map data suggests that Bollgard II varieties will require mepiquat chloride applications less frequently due to the propensity for higher earlier boll retention. Mepiquat chloride application decisions should include:

- Evaluation of sustained growth as physiological measurements and counts;
- Potential for sustained growth based on soil moisture and nutrient status; and,
- Crop maturity compared to where it should be for the calendar date or length of the remaining anticipated growing season.

For more information on Benchmark or to obtain Dr Tom Kerby's publication 'Management Considerations for Deltapine Bollgard II Varieties in Australia' contact Deltapine on Freecall 1800 006 088. www.deltapine.com.au

FIGURE 2: Expected response from mepiquat chloride application as related to maximum internode distance near the time of first flower

FIGURE 3: Sustained vegetative growth as related to boll load and rate of leaf area expansion from node 10 until near the time of cutout