MID-FLOWERING APPLICATION OF PGR-IV TO ENHANCE COTTON MATURITY AND YIELD J.T. Cothren Texas Agricultural Experiment Station College Station, TX J.A. Landivar Texas Agricultural Experiment Station Corpus Christi, TX D.M. Oosterhuis Arkansas Agricultural Experiment Station Fayetteville, AR

Abstract

The growth regulator PGR-IV has been reported to exhibit numerous physiological responses in cotton including enhanced root growth, nutrient uptake, yields, and to ameliorate certain metabolic stresses. The compound can be applied beginning with infurrow treatments at planting and continuing throughout the season as foliar treatments. Although much work has focused on early vegetative and flowering applications, little has been done on mid- and late-season treatments.

Studies were conducted at four locations (College Station and Corpus Christi, Texas, and Fayetteville and Marianna, Arkansas) to determine the benefits of mid- to late-seasons application of PGR-IV. In 1994, fruit was selectively handremoved from the three middle fruiting nodes at three weeks after first flower to simulate damage from insect pests. A PGR-IV application at 4 oz/A to these plots significantly improved yields relative to the "damaged" plots that were not treated with PGR-IV, but was not different from the untreated, "nondamaged" control. In another location in Arkansas, 4 oz/A of PGR-IV applied at 3 weeks after first flower gave a numerical increase of 9.8% in yield and showed marked visual enhancement of maturity.

In 1995, small replicated trials in Arkansas gave numerical, but non-significant, increases in yield with a late season application of 4 oz/A PGR-IV at 3 weeks after first flower. Bolls randomly sampled from the plots in Marianna showed greater starch accumulation in PGR-IVtreated plots compared to the untreated control using a modified starch/iodine test.

In Corpus Christi, Texas, addition of PGR-IV significantly reduced internode length and plant height compared to the untreated control. An additional application of 4 oz/A of PGR-IV at 3 weeks after bloom tended to further reduce internode length and plant height compared to the untreated control. Plant mapping of these plots suggested higher fruit retention on fruiting branches 11-15. Earlier maturity was also indicated as 88.6% of PGR-IV-treated cotton was harvested at first pick compared to 83.4% for the untreated control. Yields were not affected by PGR-treatment.

At College Station, TX a trend for increased yield was observed for 2 oz/A of PGR-IV applied at pinhead square, early bloom, and early bloom + 2 weeks. Single and multiple applications of either 2 or 4 oz/A of PGR-IV at early bloom (EB) + 2 weeks, EB + 4 weeks, and EB + 6, or combinations thereof, did not affect lint yield.

The studies indicate that mid- and late-flowering applications of PGR-IV to enhance maturity and yield have some merit, but further studies are needed.

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