

COTTON CULTIVAR PERFORMANCE UNDER MULTIPLE PLANT GROWTH REGULATOR REGIMES**Tom Barber****University of Arkansas Division of Agriculture****Little Rock, AR****Darrin Dodds****Mississippi State University****Mississippi State, MS****Christopher L. Main****University of Tennessee****Jackson, TN****Abstract**

Research was conducted in Arkansas and Tennessee focusing on plant growth regulator response of four new varieties from Bayer Crop Science: ST4288 B2RF, ST5288 B2RF, ST5458 B2RF and FM1740 B2RF. Treatments included Stance plant growth regulator applied: 3oz/A at pinhead square; 2oz/A at matchhead square followed by 3oz/A at flowering; 2oz/A pinhead followed by 3oz/A matchhead followed by 4oz/A bloom, with all treatments compared to an untreated check. These treatments represented a single, low rate multiple and high rate multiple plant growth regulator regime respectively. A separate study was conducted in Arkansas and Mississippi looking at plant growth regulator response to experimental cotton lines that represent the class of 2010 from Delta and Pine Land Company. Treatments in this study consisted of ten experimental cotton cultivars and two plant growth regulator regimes; a high rate single application (16oz/A Mepex at bloom followed by 16oz/A as needed); and an aggressive multiple application (8oz/A Mepex at matchhead followed by 8oz/A Mepex 14DAT followed by 16 oz/A Mepex mid bloom). Both studies were arranged in a split plot design with main plots represented by variety and sub plots by plant growth regulator treatments. All trials were irrigated. Analysis of the Bayer Crop Science varieties indicated a variety by growth regulator application interaction. Initial results indicate that these varieties do respond differently based on rates and timings of Stance plant growth regulator. Varieties ST4288 B2RF and FM1740 B2RF responded well to the Stance treatments and season long growth was significantly reduced with both multiple rate application methods. Single rates of Stance at 3oz/A at pinhead controlled growth early but not season long for any variety. Cutout was reached 7 to 10 days earlier where multiple applications were made. ST5288 B2RF was the only variety where total nodes were affected by the more aggressive treatment. Lint yields of ST4288 B2RF and FM 1740B2RF were reduced when early applications of Stance 3oz/A were made at pinhead square stage, while matchhead application timings of 2oz/A Stance did not reduce yield. This suggests that applications prior to the matchhead square stage should be avoided. No differences in lint yield with were observed with ST5288 B2RF and ST5458 B2RF; however, a more aggressive multiple application of Stance was necessary to control growth of these varieties season long under irrigated conditions. Analysis of Deltapine's experimental variety lines did not result in a variety by plant growth regulator treatment interaction. Therefore results were focused on main effects of variety and plant growth regulator regime. Mepex 8oz/A at matchhead square followed by Mepex 8oz/A 14DAT and 16oz/A mid bloom resulted in significantly shorter plants at harvest by approximately 10 inches across varieties, when compared to the single rate Mepex 16 oz/A application applied at bloom. Total node number was also significantly reduced on average with the aggressive treatment. The single high rate applications produced 20 total nodes on average while the aggressive multiple rate strategy produced only 17 total nodes at maturity. Varieties under the multiple aggressive strategy reached cutout approximately 7 to 10 days prior to the same variety under the single high rate scenarios. Results of the two studies indicate that varieties may respond differently depending environment and inherent varietal characteristics. The only applications that resulted in lint yield reduction were made at the pinhead square growth stage. Cotton growth was controlled best by making lower rate applications at or around the matchhead square stage. More research is needed, however it appears that low multiple applications starting around the matchhead square stage or high single rate applications at bloom will appropriately manage growth without reducing lint yield or causing pre-mature cutout.