#### THE TRANSITION FROM BGRR TO B2RF VARIETIES AND ITS IMPACT ON COTTON MANAGEMENT IN THE SOUTHEAST: RESEARCH AND OBSERVATIONS IN 2009 Guy Collins

Guy Collins University of Georgia Tifton, GA Jared Whitaker University of Georgia Statesboro, GA Keith Edmisten Bill Foote James Lanier Seth Holt North Carolina State University Raleigh, NC

#### <u>Abstract</u>

In 2009, DP 555 BGRR<sup>®</sup> was planted to over 82% of the cotton acres in Georgia, largely due to its yield potential and consistent performance over the past several years. This particular variety will only be available on a limited basis in 2010, and will not be available thereafter. Therefore, Georgia cotton growers will be planting a larger proportion of their acres to newer varieties in 2010. This transition will potentially be accompanied by changes in management practices for these newer varieties, including growth management and defoliation practices.

# **Introduction**

DP 555 BGRR<sup>®</sup> contains the RR technology, allowing growers to apply glyphosate up to the 4-leaf stage. Glyphosate applied beyond this growth stage may result in some mild fruit abortion in some environments. Some of the newer varieties contain the B2RF technology which allows growers to apply glyphosate at any growth stage while avoiding the potential for glyphosate-induced fruit abortion. Some observed characteristics of B2RF varieties include the potential for improved fruit retention on lower nodes in some situations, resulting in more compact fruiting and thus slightly earlier maturity. The potential for improved fruit retention on lower nodes in B2RF varieties, perhaps requiring less aggressive PGR rates or application strategies, and could also influence defoliation timing. Experiments were conducted in 2009 near Midville, Georgia and at an on-farm location in Onslow County, North Carolina. The objectives of these experiments were to investigate the potential interactions of varieties (and associated technologies) with PGR application strategies and rates, and defoliation timing, with regard to fruit distribution, maturity, and lint yield of cotton.

# **Methods**

The PGR experiment was conducted at both locations and consisted of a factorial arrangement of four varieties: two BGRR varieties {one earlier-maturing (DP 445 BGRR<sup>®</sup>), and the other later-maturing (DP 555 BGRR<sup>®</sup>)}, two B2RF varieties {one earlier-maturing (DP 0924 B2RF<sup>®</sup>), and the other later-maturing (DP 0949 B2RF<sup>®</sup>)}, and four mepiquat chloride (MC) application strategies. Each of the four MC strategies consisted of an application at the 7-to 8-leaf stage followed by (fb) another application at the early bloom stage. These strategies include nothing, 0.022 lbs a.i./A fb 0.022 lbs/A, 0.022 lbs/A fb 0.044 lbs/A, and 0.044 lbs/A fb 0.044 lbs/A. The defoliation experiment was only conducted in NC, and consisted of a factorial arrangement of three defoliation timings (30, 60, and 90 percent open bolls) and two varieties (DP 0924 B2RF<sup>®</sup> and DP 445 BGRR<sup>®</sup>). Treatments were arranged in a splitblock design containing four replications. Data were subjected to analysis of variance using SAS version 9.2 and means were separated using Fisher's Protected LSD at p<0.05.

# **Results**

In the PGR experiment, MC significantly affected nodes above white flower, plant height, percent open bolls, and some plant mapping parameters, but had no effect on lint yield. In Georgia, variety significantly affected percent open bolls and lint yield, and in North Carolina, variety significantly affected some plant mapping parameters.

There were very few interactions between variety and MC strategy for most growth, maturity, and yield parameters, suggesting that all varieties respond similarly to a particular MC treatment, and that rates may not need to be adjusted for B2RF varieties. However, this experiment was conducted in environments with sufficient and consistent rainfall. Therefore, variety response to MC may be different if similar experiments were conducted in drier conditions. Further investigation of the potential variety by MC interactions in drier environmental conditions is warranted, before sound recommendations can be made. In the defoliation experiment, defoliation timing significantly affected percent open bolls at 1<sup>st</sup> harvest, percent defoliation at 1<sup>st</sup> harvest, percent regrowth at 1<sup>st</sup> harvest, lint yield at 1<sup>st</sup> harvest, and total lint yield. There was no variety by defoliation timing interaction, nor was there a variety main effect, on these parameters. This indicates that varieties respond similarly to defoliation timings for these parameters. Lint yield at 1<sup>st</sup> harvest was highest when defoliation was initiated at 60 percent open bolls, across varieties. However, when cotton was defoliated at 30 percent open bolls, lint yield at 2<sup>nd</sup> harvest was higher for DP 445 BGRR<sup>®</sup> than for DP 0924 B2RF<sup>®</sup>. Additionally, percent 1<sup>st</sup> harvest yield was slightly higher for DP 0924 B2RF than DP 445 BGRR when defoliation was initiated at 30 percent open bolls. Although there was a difference in percent 1<sup>st</sup> harvest yields for these varieties defoliated early, the optimal defoliation timing in terms of 1<sup>st</sup> harvest yield, was not different for these varieties. These data suggests that varieties respond similarly to defoliation at 60 percent open bolls or beyond. Further investigation of potential variety by defoliation timing interactions in different environments is warranted, before sound recommendations can be made.