## EFFECT OF SEED TREATMET, INSECT INFESTATION, AND PESTICIDE PROGRAM ON COTTON GROWTH AND YIELD Darrin M. Dodds Angus L. Catchot Mississippi State University Mississippi State, MS Jeff Gore Don Cook Kevin Ford

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## <u>Abstract</u>

Seed treatments have become increasingly common in cotton production over the past decade. However, it is not uncommon for growers in the Mid-South to treat cotton with a foliar insecticide for thrips control even when a seed treatment has been used. In addition, in an effort to increase efficiency, growers will often tank-mix a foliar insecticide for thrips control with a broad spectrum non-selective herbicide such as glyphosate as well as a residual herbicide such as s-metolachlor. However, given the widespread infestation of glyphosate-resistant Palmer amaranth in the Mid-South, growers have been forced to utilize herbicides other than glyphosate for weed control. Utilization of glufosinate for Palmer amaranth control has increased substantially over the past two years. As such, 'PHY 375 WRF' cotton was planted on 21% of the total acreage in the Mid-South in 2011 due in part to variety performance as well as the added benefit of being able to broadcast apply glufosinate postemergence. However, no data exists on the effect of glufosinate application to Widestrke<sup>TM</sup> cotton when tank-mixed with insecticides and residual herbicides. Therefore, the objective of this research was to evaluate the interaction between variety, seed treatment (and subsequent thrip infestation), and pesticide program on cotton growth, development, and yield.

This study was conducted in 2011 at the R.R. Foil Plant Science Research Center near Starkville, MS. 'PHY 375 WRF' and 'FM 1773 LLB2' cotton were planted on 05 May 2011. Plots were two-97 cm wide rows by 12.2 meters in length. Seed treatments applied to each variety included: trifloxystrobin + triadimenol + metalaxyl (Trilex Advanced) at 14 g ai /45 kg seed and trifloxystrobin + triadimenol + metalaxyl (Trilex Advanced) at 14 g ai /45 kg seed and trifloxystrobin + triadimenol + metalaxyl (Trilex Advanced) at 14 g ai /45 kg seed + Imidacloprid (Gaucho 600F) at 227 g ai/45 kg seed. The following pesticides were applied on 02 June 2011 to each variety and seed treatment combination: dicrotophos (Bidrin 8) at 22 g ai/ha; glufosinate (Ignite 280 SL) at 594 g ai/ha; s-metolachlor (Dual Magnum) at 1419 g ai/ha; dicrotophos + glufosinate; dicrotophos + s-metolachlor; glufosinate + s-metolachlor. Pesticides were applied with a tractor-mounted compressed-air sprayer using hollow cone spray tips. Five plants per plot were harvested immediately prior to pesticide application and thrip counts were made from these plants. Plant heights, total nodes, thrips injury, and yield data were collected. Data was subjected to analysis of variance using the PROC Mixed procedure in SAS 9.2 and means were separated using Fisher's Protected LSD at p = 0.05.

Regardless of variety, cotton seed treated with Trilex Advanced only had an average 2.7 times more immature thrips per five plants that seed treated with Gaucho + Trilex Advanced. Treating 'PHY 375 WRF' with any pesticide significantly reduced plant height three weeks after treatment. However, pesticide application did not reduce plant height of 'FM 1773 LLB2' three weeks after treatment. Untreated plants from both varieties had an average of two more nodes than plants treated with Ignite + Dual Magnum or Bidrin three weeks after treatment. Pesticide application had no effect on end of season plant height of 'FM 1773 LLB2'; however application of Ignite + Bidrin and Ignite + Dual Magnum significantly reduced the number of total nodes of 'PHY 375 WRF' at the end of the season. Pooled over seed treatment and pesticide program, 'PHY 375 WRF' yielded significantly more than 'FM 1773 LLB2'. In addition, cotton seed treated with Gaucho + Trilex Advanced yielded significantly higher than cotton seed treated with Trilex Advanced only.

In conclusion, it is very difficult to completely quantify the effects of complex biological interactions on cotton growth, development, and yield. In general, tank-mixing pesticides can have a negative impact on plant height during and at the end of the growing season. In addition, cotton yields can be reduced following tank-mix application of multiple pesticides. Additional research is needed to further quantify the effective variety, seed treatment, and pesticide program on cotton growth, development, and yield.