## POSTEMERGENCE TOLERANCE OF COTTON TECHNOLOGIES TO AUXIN HERBICIDES

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## <u>Abstract</u>

Enlist cotton was released for planting on limited acres in 2016 whereas Bollgard II XtendFlex cotton was released for planting in 2015. However, up until recently, no label was issued for in-crop use of dicamba or 2.4-D in these crop technologies. With these new technologies coming to market, there are questions regarding the tolerance of these crops (traits) to a wide assortment of postemergence-applied auxin herbicides. To provide insight into this, tests were conducted in 2016 at the Lon Mann Cotton Research Station near Marianna, AR and the Rohwer Research Station near Rohwer, Arkansas, to determine whether these new cotton technologies possess tolerance to other auxin herbicides following an over-the-top application. This experiment was conducted using Enlist, Bollgard II XtendFlex, and Glytol/LibertyLink cotton varieties and was arranged using a split-split-plot design. Treatments consisted of a single postemergence application at a 1x and 1/16x rate to 7-leaf cotton, approximately one month after planting. Treatments were applied to the center two rows of four-row plots at 40 PSI using a TTI 110015 nozzle on a 19-inch spacing at the rate of 12 gallons per acre with a tractor-mounted sprayer. Percent crop injury relative to the nontreated was recorded at 3, 7, 14, and 21 days after application (DAA) on a scale of 0-100, with 0 being no visible injury and 100 being complete plant death. At 21 DAA, aboveground biomass was collected from a 3.3 ft of row from each cultivar in each treatment, dried, and recorded as a percent of the corresponding nontreated check. The 14 and 21 DAA ratings provided the greatest differences in injury across treatments and traits. No injury was observed when 2,4-D was applied to Enlist cotton, but the XtendFlex and Glytol/LibertyLink varieties exhibited injury greater than 90% at both ratings when applied at a 1X rate. The Enlist also exhibited tolerance to a 1X rate of Starane Ultra (fluroxypyr) and Grandstand (triclopyr) whereas the other two varieties were sensitive to these herbicides. The 1/16x treatments resulted in a general reduction of injury, consistent with a reduced rate. Overall, biomass data followed similar trends to the injury ratings for most herbicides. Based on this research, the application of triclopyr or floroxypyr, at either rate, did not show significant injury to the Enlist cultivar, but significant injury was observed to the other cultivars. Additionally, the misuse of synthetic auxin herbicides on nontolerant cultivars could cause severe injury or plant death.