## COTTON RESPONSE TO SIMULATED DRIFT RATES OF DICAMBA, GLUFOSINATE, AND 2-4,D

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## <u>Abstract</u>

Development and utilization of dicamba, glufosinate, and 2,4-D resistant crop cultivars potentially will have a significant influence on weed control in the southern United States. However, off-site movement to adjacent non-tolerant crops is a concern in many areas of eastern North Carolina, especially where cotton is grown. Cotton, peanut, soybean, tobacco, and many vegetable crops not resistant to these herbicides are often grown in close proximity to one another, and practitioners will need to consider potential adverse effects on non-resistant crops when these herbicides are used. Research was conducted to simulate drift rates of glufosinate, dicamba and 2,4-D to evaluate injury and effects on cotton yield and quality.

Experiments were conducted at two locations (Lewiston-Woodville and Rocky Mount) during the 2009 and 2010 growing season. Glyphosate-resistant cotton cultivars were DP0912 (year or location) and DP0920 (year or location) were grown under recommended cultural practices until early to mid-June when treatments were applied. Dicamba and 2,4-D rates were 1/2, 1/8, 1/32, 1/128, and 1/512 the recommended rate of 8 and 16 ounces per acre, respectively. Glufosinate rates were 1/2, 1/4, 1/8, 1/16, and 1/32 the recommended rate of 29 ounces per acre. Plots were two rows by 30 feet with treatments arranged in a randomized complete block design with four replications and were applied with a  $CO_2$ -pressurized backpack sprayer calibrated to deliver 15 gallons per acre. Photographs were taken along with visual injury symptoms 7 and 14 days after treatment on a scale of 0 (no injury) to 100 (plant death). Following defoliation, five plants from each plot were mapped to compare differences in fruit arrangement. Cotton yield was also determined.

The highest rate of all herbicides reduced cotton yield at one or both locations each year except in the case of dicamba in 2009. Cotton was more sensitive to 2,4-D than to the other herbicides, and this demonstrated in yield loss from all rates at one or both locations during each year with the exception of the two lowest rates only causing a yield reduction during 2010. Results from these experiments will be used to emphasize the need for diligence in application of these herbicides in close proximity to adjacent crops that are susceptible as well as the need to clean sprayers completely before spraying sensitive crops. Although yield and injury were negatively correlated for all herbicides, variation in yield response limits ability to use foliar injury during the first few weeks after application as a predictor of cotton yield loss.