## NON-2,4-D TOLERANT COTTON RESPONSE TO DRIFT AND TANK CONTAMINATION

M. R. Manuchehri P. A. Dotray Texas Tech University Lubbock, TX T. S. Morris J. W. Keeling Texas A&M AgriLife Research Lubbock, TX P. A. Baumann G. D. Morgan Texas A&M AgriLife Extension Service College Station, TX

## <u>Abstract</u>

Drift and spray tank contamination of 2,4-D in cotton is a major concern in Texas as grain crops and pastureland are also produced in the state. Drift and tank contamination risk will likely increase with the introduction of new transgenic, 2,4-D tolerant cotton, which is scheduled to be available to growers as early as 2016. Growers are aware of the risk of physical drift and improper tank-clean out procedures, but the extreme sensitivity of cotton that is not tolerant to 2,4-D must be properly documented in order to illustrate this concern. In 2012, three studies were conducted to examine the effects of 2,4-D simulated drift and tank contamination in non-2,4-D tolerant cotton in Lubbock and College Station, TX. In the simulated drift studies, cotton plants were sprayed with two rates of 2,4-D amine (0.06 and 1.2 oz/A) at six different growth stages (4 leaf, 9 leaf, first bloom, first bloom+2 weeks, first bloom+4 weeks, and first bloom+6 weeks). The first bloom stage was not included at the Lubbock location. In the tank contamination study, cotton plants were sprayed with five rates of Enlist Duo™ (0.000626, 0.00626, 0.0626, 0.626, 6.26 oz/A) at two growth stages (nine leaf and first bloom). The above rates are similar to tank contamination of Enlist Duo<sup>TM</sup> solution at concentrations of 0.0008, 0.008, 0.08, 0.8, and 8%, respectively. Visual injury was recorded at 14, 21, and 28 days after treatment (DAT). For the simulated drift studies at both locations, injury 28 DAT decreased as cotton plants matured with the exception of nine leaf cotton in Lubbock. In College Station, there were no differences in injury among the 0.06 and 1.2 oz/A rates for all application stages; however, as rate increased from 0.06 to 1.2 oz/A in Lubbock, injury increased by 65 and 41% for four and nine leaf cotton, respectively. There were no yield differences in Lubbock or College Station for cotton sprayed at 0.06 oz/A, regardless of cotton stage. In Lubbock, applications of 1.2 oz/A decreased yields compared to the nontreated control for four leaf, nine leaf, and two weeks after first bloom cotton by 38, 63, and 25%, respectively. In College Station, applications of 1.2 oz/A decreased yields compared to the nontreated control for four leaf, nine leaf, and first bloom cotton by 76, 65, and 57%, respectively. For the tank contamination study in Lubbock, no visual injury was detected for nine leaf cotton when concentrations of 0.0008 and 0.008% of Enlist Duo<sup>TM</sup> were present in spray solution; however, injury increased to 29, 59, and 76% when concentrations of 0.08, 0.8, and 8% were present, respectively. For first bloom cotton, injury was similar (4%) for concentrations of 0.0008, 0.008, and 0.08%, but injury increased to 24 and 58% for concentrations of 0.8 and 8%, respectively. These studies confirm the extreme sensitivity of cotton to 2,4-D and that visual injury is influenced by rate and growth stage. Lint yields from these trials also suggest that the relationship between injury and yield is complex as visual injury does not always translate into a yield loss.