LARGE-SCALE EVALUATION OF ENLIST ONE OFF-TARGET MOVEMENT: A THREE-YEAR SUMMARY N. Godara J.K. Norsworthy G.L. Priess L. Piveta M. Houston L.T. Barber T.R. Butts University of Arkansas System Division of Agriculture, Favetteville, AR

Abstract

Enlist[®] cotton technology allows producers to make over-the-top applications of 2,4-D choline, glyphosate, and glufosinate. With the increased adoption of Enlist[®] cotton, concerns regarding off-target movement of 2,4-D choline injuring adjacent susceptible cotton also increased. Field experiments were conducted to evaluate the mechanisms associated with off-target movement of commercial application of Enlist One to sensitive cotton at the Marianna, AR in 2018 and at Keiser, AR in 2019, 2020, and 2021. A XtendFlex® cotton cultivar, DP1518 B2FX, was planted in a 10-acre field as a bioindicator (2,4-D susceptible), and a one-acre area in the center of the field was treated with Enlist One (2,4-D choline) at 1 qt/A + Liberty (glufosinate). Before commercial herbicide application, buckets were placed over marked susceptible plants in 25 feet increments in downwind direction transects to the edge of the field and removed at 30 minutes after application. High-Q environmental air samplers calibrated to 6.5 feet³ minute⁻¹ were placed in the center of the treated area and 5 feet outside the treated area in all four directions of the field at 30 minutes after application. Sampling media consisted of filter papers and PUFs were replaced in air samplers every 24 hours after application up to 72 hours and utilized to estimate the Enlist One air concentration. XtendFlex® cotton was also planted in pots in the greenhouse when cotton was planted in the field and placed in the center of the treated area following 30 minutes after application and replaced after 24 hours up to 72 hours. No cotton injury was observed in upwind directions. Cotton plants covered with buckets in the downwind direction up to 30 minutes after application exhibited no symptoms of Enlist One damage regardless of distance and year when evaluated at 28 days after treatment (DAT). However, uncovered plants in downwind direction were injured 10 to 75% at 25 feet from the treated area at 28 DAT. Enlist One did volatilize from the treated area at a rate of 3.32 to 4.33 ng m⁻³ day⁻¹ at 24 hours after application; however, minimal injury was observed to the potted plants at 28 DAT except 2020. Overall, damage from the offtarget movement of Enlist One is most likely the result of physical drift and poses little risk for injury to Enlist One susceptible cotton cultivars by volatilization.