

THE EFFECT OF GLYPHOSATE PLUS DICAMBA DRIFT RATES ON COMMERCIAL PROCESSING TOMATOES. Greg R. Kruger, William G. Johnson, and Stephen C. Weller, Graduate Research Assistant, Associate Professor, Department of Botany and Plant Pathology, Professor, Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN 47907.

Commercial processing tomatoes are grown on 3,250 ha in Indiana and have been shown to be sensitive to both glyphosate and dicamba, so issues concerning potential drift of these herbicides are a serious concern for growers. The objective of this study was to evaluate the effect on processing tomatoes of simulated drift of glyphosate and dicamba tank-mixtures. The study was conducted in West Lafayette, IN in 2008 in two independent experiments. Experiments were established in a randomized complete block design with four replications with herbicides applied approximately two weeks after transplanting. Treatments based on a use rate of 0.64 kg ae/ha of glyphosate and 0.56 kg ae/ha of dicamba respectively, were 0, 0.006, 0.021, or 0.064 kg ae/ha (0, 1/100th, 1/30th, and 1/10th of normal use rate) of glyphosate or 0, 0.006, 0.019, 0.056 kg ae/ha (0, 1/100th, 1/30th, and 1/10th of normal use rate) of dicamba. Additionally, tank-mixture treatments of 0.006 + 0.006, 0.021 + 0.019, 0.064 + 0.056 kg ae/ha of glyphosate + kg ae/ha dicamba (1/100th + 1/100th, 1/30th + 1/30th, and 1/10th + 1/10th of normal use rates of glyphosate and dicamba), respectively, were included. Treatments were applied with a backpack sprayer delivering 140 l/ha at 117.2 kPa of pressure. Spray solutions contained 2.8 kg/ha of AMS and 0.25% v/v NIS and the herbicide(s). Injury was rated two and five weeks after application for visual injury on a scale of 0 to 100 with 100 representing dead plants. No yield was obtained since experiments were established late in the summer. Data were analyzed using Colby's analysis to determine additive or synergistic effects of tank-mixtures and data were pooled across experiments. Tomatoes were severely injured by all three rates of glyphosate and all three rates of dicamba when applied alone, but injury was greater when the two herbicides were mixed. An additive response was observed for 1/30th + 1/30th glyphosate + dicamba tank-mixtures at two weeks after treatment and all three tank mixes at five weeks after treatment. A synergistic response was observed for the 1/100th + 1/100th and 1/10th + 1/10th glyphosate + dicamba tank-mixtures at two weeks after treatment. These results suggest that drift of tank mixtures of glyphosate and dicamba onto commercial processing tomatoes will likely show an additive response.