RESPONSE OF SELECTED INDIANA HORSEWEED (*CONYZA CANADENSIS*) POPULATIONS TO GLYPHOSATE AND CLORANSULAM. Greg R. Kruger, Vince M. Davis, William G. Johnson, and Stephen C. Weller, Graduate Research Assistant, Graduate Research Assistant, Associate Professor, Department of Botany and Plant Pathology, Professor, Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN 47907.

Horseweed populations which are resistant to glyphosate and cloransulam or chlorimuron have been identified in Indiana. The purpose of this study was to characterize the response of glyphosate and ALS resistant horseweed populations to glyphosate and cloransulam. A greenhouse study was designed with a factorial arrangement with six rates of glyphosate (0, 0.21, 0.42, 0.84, 1.68, and 3.36 kg ae/ha) and six rates of cloransulam (0, 6, 12, 24, 48, and 96 g ai/ha) in all combinations for five different horseweed populations. The experiment was set up in a randomized complete block design with five replications in each of three runs. Plants were visually evaluated and harvested at 28 days after treatment. Data were analyzed using a modified version of Colby's method for joint activity analysis. The R:S ratios ranged from 2.5 to 8.1 based on the GR_{50} values in response to cloransulam applications. The R:S ratios ranged from 1.4 to 50.3 based on the GR_{50} values in response to glyphosate applications. Three of the populations tested were resistant to both glyphosate and cloransulam. The joint activity of the two herbicides for three tank-mixes were antagonistic. The two populations which had the lowest levels of resistance had one and two tank-mixes which had synergistic activity. All other populations and tank-mix combinations had an additive joint activity response. In order to effectively manage multiple resistant horseweed populations with postemergence herbicides in soybean, it is important to understand the characteristics of the individual population when producers try to control horseweed. For example, a producer trying to control a population with a low level of resistance to glyphosate should not cut the rate of glyphosate if cloransulam is added to the spray mix.

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