

RESPONSE OF SELECTED SOUTHERN ILLINOIS HORSEWEED POPULATIONS TO BURNDOWN HERBICIDES WITH DIFFERENT MODES OF ACTION. Brock S. Waggoner, Bryan G. Young, Julie M. Young, and Joseph L. Matthews, Undergraduate Research Assistant, Professor, and Researchers, Department of Plant, Soil and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901.

In the fall of 2006, horseweed suspected to be resistant to glyphosate was collected from two commercial crop production fields near Murphysboro, Illinois. In field research studies conducted previously at the sites during the summer of 2006, horseweed was not completely controlled by glyphosate, 2,4-D or cloransulam. Thus, greenhouse studies were conducted to determine the response of the horseweed populations to glyphosate, cloransulam, 2,4-D, and paraquat. Seven rates of each herbicide ranging from 1/27 to 27 times the labeled use rate were applied when horseweed were 5 to 8 cm in diameter. In addition to the suspected glyphosate-resistant populations (denoted as Fager and Alstat), two populations susceptible to glyphosate (BRC and HRC) were evaluated. Dry weight data collected at 21 days after treatment was analyzed using linear regression as well as the R software package *drc* to calculate ED<sub>50</sub> values.

The suspected glyphosate-resistant populations were 21 to 48 times less sensitive to glyphosate compared with the susceptible populations. There was no difference in sensitivity to glyphosate between the two suspected resistant populations. The Fager population was two times less sensitive to 2,4-D than the BRC population. There was no difference between populations in response to cloransulam. The ED<sub>50</sub> for cloransulam was less than the lowest rate evaluated (0.65 g ai/ha). Paraquat completely controlled all populations of horseweed at the lowest rate evaluated (21 g ai/ha). Future research is justified to further characterize the reduced sensitivity of the Fager horseweed population to 2,4-D with a more refined rate structure and potentially including dicamba as another synthetic auxin herbicide.