

CHARACTERIZATION OF THREE HORSEWEED (*CONYZA CANADENSIS*) POPULATIONS WITH DIFFERENT ALS MUTATIONS. Greg R. Kruger, Vince M. Davis, Patrick J. Tranel, Stephen C. Weller, and William G. Johnson, Graduate Research Assistant, Graduate Research Assistant, Department of Botany and Plant Pathology, Purdue University, Associate Professor, Department of Crop Sciences, University of Illinois, Urbana, IL 61801, Professor, Department of Horticulture and Landscape Architecture, Associate Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907.

Glyphosate resistant horseweed was first found in Indiana in 2002. Since then it has been identified in numerous counties. To control glyphosate resistant horseweed with postemergence herbicides in soybean, the addition of an ALS inhibitor is commonly recommended. However, over 30 counties in Indiana have been documented to have ALS resistant horseweed populations. Three different mutations in the ALS enzyme have been confirmed to cause resistance to ALS inhibitors in Indiana horseweed populations. The purpose of this study was to determine the influence of the mutation on horseweed tolerance to cloransulam. The frequency of resistance within each populations was determined by spraying 100 plants of four populations with 8.8 g ai/ha of cloransulam. The frequency of resistant plants in the each of the three resistant populations varied from 85 to 98% while all of the susceptible plants sprayed were dead at 28 DAT. A dose response study was conducted using the same four populations. Data were analyzed using non-linear log-logistic modeling in R. The two populations which had mutations at the 197 position exhibited a higher level of resistance (GR<sub>50</sub> values: 10.3 and 13.9 g ai/ha) to cloransulam than the population which had a mutation at the 376 position (6.6 g ai/ha). The susceptible population had a GR<sub>50</sub> value of 0.2 g ai/ha. The population with the mutation at the 376 position still had an R:S ratio of 33 while the two populations with the mutation at the 197 position had R:S ratios of 52 and 70, respectively.