

INVESTIGATING THE HERITABILITY OF VARIABLE GLYPHOSATE-RESISTANCE LEVELS IN HORSEWEED (*CONYZA CANADENSIS*). Vince M. Davis, Greg R. Kruger, Stephen C. Weller, and William G. Johnson, Graduate Research Assistant, Graduate Research Assistant, Department of Botany and Plant Pathology, Professor, Department of Horticulture and Landscape Architecture, and Associate Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907.

Glyphosate-resistant horseweed (*Conyza canadensis*) biotypes have been reported in 15 states in the U.S., as well as reports in Brazil and China. Horseweed is a common and problematic weed in the Eastern cornbelt and glyphosate-resistant populations are particularly troublesome in no-till glyphosate-resistant cropping systems. Populations from several states have demonstrated variable levels of glyphosate tolerance in dose-response experiments. Different field populations collected with-in Indiana have also demonstrated resistance ranging from 4 to 110 fold resistance compared to susceptible field populations. However, little information is known about the inheritance of variable levels of glyphosate tolerance in horseweed. The objective of this experiment is to determine if variable levels of glyphosate resistance in field populations of horseweed are passed to first generation progeny. Initial glyphosate screens of 1.68 kg ae/ha were conducted on 85 horseweed populations comprised of 40 mother plants as a composite population. Resistant survivors that demonstrated varying levels of glyphosate tolerance were selected and allowed to self-pollinate. Seeds from individual plants were collected and grown in the greenhouse. Glyphosate dose response experiments were conducted on the field populations and the progeny of the selfed individual plants. The experiments were randomized complete block designs with nine glyphosate rates and 10 horseweed populations replicated four times. The correlation between glyphosate tolerance levels of mother plants to respective progeny was poor for growth parameters and visual control; however, the ranking of glyphosate tolerance in the mother plants corresponded well with progeny survival at the 1.68 kg ae/ha rate. Mother plants with a “high” level of resistance had progeny survival of 92%, while a population with a “low” level of resistance had progeny survival of 25% at the 1.68 kg ae/ha rate.