

DIFFERENTIAL EXPRESSION OF GLYPHOSATE RESISTANCE DURING GIANT RAGWEED (*AMBROSIA TRIFIDA* L.) DEVELOPMENT. Renae R. Robertson, Burkhard Schulz, and Stephen C. Weller, Graduate Research Assistant, Assistant Professor, Professor, Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN 47907.

Giant ragweed (*Ambrosia trifida* L.) persists in disturbed areas and is a major weed problem in Midwestern US croplands where glyphosate is often used for its control. Glyphosate is the most widely used herbicide worldwide and kills weeds by inhibiting EPSP synthase, the key enzyme of the shikimate pathway. Repeated use of glyphosate in agronomic crop fields has selected for glyphosate resistant (R) giant ragweed plants in Indiana. This study investigated response of R populations compared to susceptible (S) populations of giant ragweed at various stages of plant development in greenhouse and field studies. R and S populations were treated at 5 different growth stages (1, 2, 3, 4, and 5 nodes). Each class was sprayed with glyphosate at 1x (0.7 kg/ha), 2X and 4X field rates and then evaluated for injury and plant biomass. We observed resistance in R populations compared to S populations at all plant sizes. Resistance was most pronounced at the 1X rate, but was observed at all rates in R populations. R plants showed initial injury at all glyphosate concentrations and developmental stages with onset of initial injury being faster in R populations than in S populations. However, R populations did not die and showed re-growth of new tissue at all rates while S populations ceased growth and died.