

MANAGING GLYPHOSATE-RESISTANT HORSEWEED WITH POSTEMERGENCE APPLICATIONS OF GLYPHOSATE AND 2,4-D. Greg R. Kruger, Vince M. Davis, Stephen C. Weller, and William G. Johnson, Graduate Research Assistant, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47904, Assistant Professor, Department of Crop Sciences, University of Illinois, Urbana, IL 61801, Professor, Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN 47904, Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47904.

A natural-emerging glyphosate-resistant horseweed population was identified at the Southeastern Purdue Agricultural Center. The purpose of this study was to characterize the response of glyphosate and 2,4-D treatments on a glyphosate-resistant horseweed population. A field study was designed with a factorial arrangement with six rates of glyphosate (0, 0.14, 0.28, 0.56, 1.12, and 2.24 kg ae/ha) and six rates of 2,4-D amine (0, 0.07, 0.14, 0.28, 0.56, and 1.12 kg ae/ha) in all combinations for four different horseweed sizes (0 to 7, 7 to 15, 15 to 30, and greater than 30 cm tall plants). The experiment was set up in a randomized complete block design with four replications in both 2008 and 2009. Plants were visually evaluated and harvested at 28 days after treatment. Neither 2.24 kg/ha of glyphosate nor 1.12 kg/ha of 2,4-D alone provided complete control of the horseweed population. Plants greater than 15 cm tall at the time of application were more tolerant to the herbicide treatments than plants less than 15 cm tall. However, tank mixtures on horseweed plants less than 15 cm tall were 2.5 times more likely to be antagonistic than synergistic while tank mixtures on horseweed plants greater than 15 cm tall were four times more likely to be synergistic than antagonistic. Tank mixtures had a predominantly additive response regardless of plant size. Tank mixtures of glyphosate plus at least 560 g/ha of 2,4-D provided greater than 80% of glyphosate-resistant horseweed.