

PROTOX-INHIBITING HERBICIDE PERSISTENCE AND PLACEMENT AFFECTS CONTROL OF COMMON WATERHEMP. Dana B. Harder, Kelly A. Nelson, and Reid J. Smeda, Undergraduate Assistant, Assistant Professor, and Associate Professor, Department of Agronomy, University of Missouri, Novelty, MO 63460.

A field in northeast Missouri had a population of common waterhemp (*Amaranthus rudis* Sauer.) with confirmed resistance to protox-inhibiting herbicides in 2002. Preemergence protox-inhibiting herbicide treatments controlled common waterhemp up to four weeks after treatment. Greenhouse research was initiated to evaluate herbicide persistence and placement on the control of protox-inhibiting herbicide resistant common waterhemp.

Prottox-resistant common waterhemp seed was collected and planted into containers with herbicide treated soil at two week intervals and rated four weeks after each planting date. A preemergence application of isoxaflutole 70 g ai ha⁻¹, sulfentrazone at 240 g ai ha⁻¹, atrazine at 1680 g ai ha⁻¹, fomesafen at 330 g ai ha⁻¹, and flumioxazin 72 g ai ha⁻¹ visibly controlled common waterhemp greater than 85%. In addition, control of common waterhemp was greater than 80% for waterhemp sown two weeks after herbicide application for all treatments except flumioxazin. Isoxaflutole, sulfentrazone, fomesafen, flumioxazin, lactofen at 220 g ai ha⁻¹, acifluorfen at 420 g ai ha⁻¹, and imazethapyr at 70 g ai ha⁻¹ controlled common waterhemp 64, 44, 40, 33, 19, 15, and 0%, respectively, at the six week after application planting date.

Soil only, foliar only, and soil plus foliar applications were evaluated to determine the impact of herbicide placement on resistant common waterhemp control. The soil plus foliar placement of flumioxazin at 72 g ha⁻¹, fomesafen at 330 g ha⁻¹, acifluorfen at 420 g ha⁻¹, and lactofen at 220 g ha⁻¹ controlled common waterhemp 32, 24, 17, and 8%, respectively, 21 days after treatment (DAT). The foliar only placement of flumioxazin, fomesafen, acifluorfen, and lactofen controlled common waterhemp 15, 13, 13, and 13%, respectively, 21 DAT. The soil only placement did not control common waterhemp. Common waterhemp control was affected by herbicide placement and was ranked: soil plus foliar > foliar > soil.