

GLYPHOSATE-RESISTANT HORSEWEED SEEDBANK FLUCTUATIONS UNDER VARIOUS NO-TILL WEED MANAGEMENT SYSTEMS. Greg R. Kruger, Vince M. Davis, and William G. Johnson, Graduate Student, Research Associate, and Associate Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907.

Glyphosate resistance in horseweed is becoming more prevalent in the eastern cornbelt. The biological implications of horseweed populations containing both glyphosate resistant (GR), and glyphosate susceptible (GS) biotypes are unknown. This lack of knowledge makes the development of integrated weed management (IWM) strategies aimed at reducing the presence of GR biotypes in the local weed flora more difficult. The objective of this study was to determine the annual and sub-annual persistence of viable horseweed seed in the soil seedbank in a mixed GR and GS horseweed population under various management systems. A split-plot field study was established in a no-tillage field with crop rotation (soybean-corn or soybean-soybean) as the main plots and management systems as sub plots. In 2003, the study was established in a field that contained a moderate infestation of GR horseweed (approximately 1 plant m⁻²). The management systems were evaluated by monitoring in-field seed producing adult horseweed densities and sub-annual viable seedbank densities. Seedbank densities were determined from soil samples collected in the spring prior to germination, summer prior to seed rain, and fall following seed rain. Crop rotation did not influence plant or seedbank density. Viable horseweed seed declined rapidly in the soil with an average of 76% for all treatments in the first ten months prior to new seedrain. While persistence of total horseweed seedbank densities seemed minimal, persistence of GR biotypes was similar to GS biotypes. Therefore, to reduce the presence of GR horseweed biotypes in a local no-tillage weed flora, IWM strategies should be developed to reduce total horseweed populations based on the knowledge that seed for GR biotypes no less persistent than GS biotypes.