Crop Rotation and Tillage System Influence Late-Season Incidence of Giant Ragweed and Horseweed in Indiana Soybean

Jeff Barnes, Post Doctoral Research Associate, Bill Johnson, Assistant Professor, and Kevin Gibson, Assistant Professor, Department of Botany and Plant Pathology, and Steve Weller, Professor, Department of Horticulture and Landscape Architecture, Purdue University, W. Lafayette, IN 47907-2054

Corresponding author: Bill Johnson. wgjohnso@purdue.edu


Many crop advisors and farmers have expressed concern regarding the performance of glyphosate-based weed management practices on horseweed (Conyza Canadensis) and giant ragweed (Ambrosia trifida) control (Fig. 1). Corresponding increases in conservation tillage and utilization glyphosate-resistant soybean throughout the 1990s make it difficult to access impact either is having on glyphosate effectiveness. The objective of this survey was to determine the relationship between crop rotation, tillage system, and prevalence of horseweed and giant ragweed in Indiana soybean fields.

Fig. 1. Soybean field in Indiana with horseweed protruding through the canopy.

Field surveys of 389 soybean fields in 15 counties were conducted in September and October 2003. Survey sites were randomly selected from NASS Cropland Data Layer and USGS digitized aerial imagery. The number of sites in each county was based upon a target of one field per every 3500 acres of cropland (Fig. 2). Weed species protruding above the soybean canopy, tillage system, and previous crop were recorded in each field. Tillage systems were defined as no-till (greater than 30% residue coverage), mulch-till (tilled with greater than 30% residue coverage), reduced-till (tilled with 15 to 30% residue coverage), and conventional tillage (tilled with less than 15% residue coverage) (1). Southeastern Indiana (232 fields) was sampled more intensively than northern Indiana (157 fields) due to widespread reports of horseweed escapes following glyphosate.