

INDIANA GLYPHOSATE-RESISTANT HORSEWEED (*CONYZA CANADENSIS*) SURVEY: CURRENT STATUS. Vince M. Davis*, William G. Johnson, and Kevin D. Gibson, Graduate Research Assistant, Assistant Professor, and Assistant Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907.

Understanding the geographic distribution and frequency of glyphosate resistant horseweed (GRH) in Indiana has been a concern to soybean producers for the last couple of years. The objective of this project was to develop a field survey system in which both geographic distribution and frequency of occurrence could be determined for horseweed escapes in soybean fields. Counties were selected for sampling based upon a point system for determining which counties had the highest priority. The point system was designed to place highest priority on counties with confirmed or suspected glyphosate-resistance and counties which had a high percentage of cropland in conservation tillage systems.

Survey sites within a county were randomly pre-selected using maps developed from digital aerial raster imagery (orthophotos) developed by the United States Geological Service and Natural Resources Conservation Service and the Cropland Data Layer program conducted by the National Agricultural Statistical Service. Orthophotos and Cropland Data Layers were compiled by the Purdue Center for Advanced Application in Geographic Information Systems. Maps were developed in the ArcView GIS 3.2 software program. Survey sites were selected in areas where land use was primarily devoted to corn production for the 2003 and soybean production for 2004 surveys. The coordinates for the randomly selected soybean fields were downloaded to a GPS unit and a driving route was developed to facilitate efficient travel time between survey sites. A form was used at each survey site to gather information including presence and abundance of weed escapes that protruded the soybean canopy and type of field tillage system estimated by the status of crop residues present. If horseweed escapes were present at the survey site seed heads from forty plants were sampled. Since soybean was our primary crop of concern, if a pre-selected point did not fall directly in a soybean field, it was moved to the next soybean field on the driving route. The random survey system was supplemented by taking up to one additional sample between pre-selected points from soybean fields in which horseweed was clearly visible from the road. The supplemental sample points were included as a means of identifying potential problem fields within a geographic range in which horseweed was not readily observed in pre-selected survey sites. Supplemental survey sites were not included in frequency analysis

In the fall of 2003, 792 sites were surveyed for the presence of horseweed in Indiana. Most of the survey locations were in southeast Indiana where the first populations of glyphosate-resistant horseweed were discovered. 388 horseweed samples were collected and 116 demonstrated less than 60% visual control at 21 days after the initial 1.7 kg ae/ha glyphosate screen. In the fall of 2004, 324 sites were surveyed. The geographical area sampled in 2004 was a one to two county wide band surrounding the southeastern region sampled in 2003. The counties extend east from Tippecanoe to Jay County on the eastern state line and extending south from Tippecanoe to Warrick on the southern state line in the southwestern region of the state. Of 2004 sites, 62 HW samples were collected for later herbicide screening and evaluation.