

ASSESSING LONG-TERM VIABILITY OF GLYPHOSATE-RESISTANT TECHNOLOGY AS A FOUNDATION FOR CROPPING SYSTEMS - ON-FARM COMPARISONS OF WEED MANAGEMENT PROGRAM EFFICACY. Robert G. Wilson, William G. Johnson, Stephen C. Weller, Micheal D. K. Owen, David R. Shaw, John W. Wilcut, Bryan G. Young, Professor, Department of Agronomy & Horticulture, University of Nebraska, Scottsbluff, NE 69361, Professors, Crop Sciences, Purdue University, West Lafayette, IN 47907, Professor, Department of Agronomy, Iowa State University, Ames, IA 50011, Department of Plant & Soil Sciences, Mississippi State University, Mississippi State, MS 39762, Professor, Department of Crop Sciences, North Carolina State University, Raleigh, NC 27695, Department of Agriculture, Southern Illinois University, Carbondale, IL 62901.

Weed scientists from Illinois, Indiana, Iowa, Nebraska, North Carolina, and Mississippi conducted similar studies from 2006 to 2007 at 156 on-farm sites to determine the viability of various crop management strategies for the preservation of glyphosate programs as an effective tool for weed control. On-farm sites were divided into seven cropping systems: continuous glyphosate-resistant (GR) corn, soybean, or cotton, GR soybean followed by GR corn, GR soybean followed by non GR corn, GR cotton followed by GR soybeans, and GR soybean followed by a non GR crop. In the spring of 2006, growers selected fields that had previously been in a GR cropping system for a minimum of 3 yr to enroll in the project. The field was divided into two sections with each section approximately 8 ha in size. On the grower side of the field the farmer continued with his established glyphosate based weed management program. In the second half of the field the weed control program was managed by the university weed scientist with the goal of expanding the weed management program to include herbicides with several modes of action. In both the grower and university sections of the field, 20 0.5 m² observation points were established in a W pattern across the field. Each point was mapped using a GPS positioning instrument so each observation point could be examined throughout the growing season and in following years. Weed populations were observed at four times during the growing season: in early spring before crop planting, after crop emergence but before the first POST treatment, 2 wk following the last POST treatment, and before crop harvest in the fall. When averaged within the different cropping systems initial weed populations in the grower and university sections of the field were similar. In both 2006 and 2007 weed populations recorded after crop emergence were greater in continuous GR corn and least in a GR soybean followed by GR corn rotation. Implementing a POST weed control program in all cropping systems effectively reduced weed density. Members of the *Amaranthus* and *Setaria* genuses were two of the more prevalent weeds observed at study sites 2 wk following the last POST treatment and their density varied with cropping systems.