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PURDUE EXTENSION WEED SCIENCE

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Weed Science Surveys III: The Perception of Glyphosate-Resistance

Surveys are also useful tools to investigate popular opinion. In 2003, Bill Johnson and Kevin Gibson sent out 3000 surveys to investigate the level of concern growers of corn and soybean had in regards to the development of glyphosate-resistance and what management techniques were being used to stop or slow the development of glyphosate-resistant weeds in Indiana. Of the 3000 surveys sent out, 612 were returned. The majority of growers surveyed responded that the development of glyphosate-resistant weeds was of high to moderate concern to them at 36% and 46%, respectively, when averaged across farm size[1]. However, 19% responded that the development of glyphosate-resistance was of low or no importance. When farm size was broken down from 500 acres or less to greater than 2000 acres the percent or responses indicating that weed resistance to glyphosate was of high concern increased from 34% to 40%. This may suggest that larger growers may be more aware of the impacts and costs of dealing with resistance to herbicides. Like the medical field and the use of antibiotics, agriculture has been dealing with the development of resistance to insecticides, fungicides, and herbicides for many years. The development of resistance is not new to growers, the opinion that until it happens on your field it is of low importance exists. It has been also argued that the development of glyphosate-resistant weeds is unlikely to decrease the value of glyphosate greatly, resistance has developed to other families of herbicides and yet their value was retained, for example atrazine. In actuality, it might be said that it was the development of the Roundup Ready® system that had a greater impact on the value of other herbicide's than the development of resistance in those modes of action.

Herbicide resistance is a product of natural selection or induced selection. Natural mutations or variability in a plant's genetics can allow resistance to occur. These can occur with or without the use of a herbicide. It is the continual use of the same mode of action that applies the selection pressure to give the resistant plants the competitive advantage over the susceptible wild type. When growers were asked what factors contributed to the development of resistant weeds, the responses were grouped into four categories, repeated use of same mode of action, poor application technique or timing, unique weed characteristics, and changes in tillage practices. When averaged over farm size, 58% responded that it was the repeated use of the same mode of action of a herbicide. Poor application technique was indicated by 33% of the growers[1]. Although the development of glyphosate resistance was something of expressed concern, the question was raised what growers would be willing to do to prevent or slow the development of herbicides resistance on their fields.

Four options were provided; scout for weeds, use soil-applied herbicides, use 2,4-D or dicamba with glyphosate applications, or to use postermergence tank mixes. The results of the responses are in table 1. Twenty seven percent of the survey growers responded that they already used tank mixes in postemergent applications, 53% responded that they would be

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willing to start tank mixing something with glyphosate[1]. Almost half of the responders (42%) selected that they already used a soil-applied residual herbicide, 45% stated that they would be willing to start using one. No grower responding in the survey selected that they would not be willing to use soil-applied residual herbicides; however, 14% averaged over farm size were not sure.

Table 1. Willingness of growers to adopt practices to prevent or slow the development of glyphosate resistance in thier fields.

Practice	Already do	Yes	Not sure	No
Scpit for weeds	54	38	5	3
Use soil-applied herbicides	42	45	14	0
Use 2,4-D or dicamba with glyphosate in burn-down programs	32	36	20	13
Use postemergence tank mixes	27	53	15	5

Adapted from Glyphosate-Resistant Weeds and Resistance Management Strategies: An Indiana Grower Perspective. Adapted from Weed Technology 20:768-772

1. Johnson, W.G. and K.D. Gibson. 2006. Glyphosate-Resistant Weeds and Resistance Management Strategies: An Indiana Grower Perspective. Weed Technol. 20:768-772.