

GIANT RAGWEED BIOTYPES WITH RESISTANCE TO GLYPHOSATE AND ALS INHIBITORS. Mark M. Loux and Jeff M. Stachler, Professor and Extension Program Specialist, Department of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

Field research was conducted in 2007 with giant ragweed biotypes from Licking and Pickaway Co, OH, which were suspected of having resistance to both glyphosate and ALS-inhibiting herbicides. Objectives of the research were to characterize the response of biotypes to PRE and POST applications of ALS inhibitors, glyphosate, and PPO inhibitors, and determine the role of alternatives to glyphosate for POST control in glyphosate-resistant soybeans. The response of individual plants and overall control were measured 21 DAT and in October. In a characterization study at Pickaway Co., ALS inhibitors controlled less than 50% of the giant ragweed when applied PRE or POST, and POST application of glyphosate at rates up to 1.7 kg ae/ha controlled less than 60% of the giant ragweed. Individual plant survival at 21 DAT ranged from 79 to 91% for POST application of ALS inhibitors, and 78 to 93% for glyphosate. A mixture of cloransulam and glyphosate did not improve control, compared with application of either alone. At the end of the season, survival of individual plants exceeded 62% for these same treatments, even where glyphosate was applied again three weeks after the initial postemergence treatment. Most effective control of giant ragweed resulted from POST application of fomesafen, which controlled 88 and 100% of the ragweed 21 DAT at rates of 0.34 and 0.67 kg/ha, respectively, and killed 75 and 96% of individual plants.

An additional study was conducted at both locations to determine the most effective POST strategies for control of giant ragweed with multiple resistance. Treatments included glyphosate, fomesafen, lactofen, and cloransulam applied alone and in various combinations, and glyphosate was applied again to one-half of each plot 21 days after the initial POST treatment. At Pickaway Co., survival of individual plants at the end of the season ranged from 62 to 80% where glyphosate or cloransulam was applied alone or in combination initially, and followed with a later application of glyphosate. Application of fomesafen with methylated seed oil and ammonium sulfate resulted in 17 to 23% survival of individual plants, but fomesafen applied with glyphosate and ammonium sulfate (no methylated seed oil) resulted in 50 to 75% survival. Overall control did not exceed 71% for any treatment at 21 days after the initial POST application, or at the end of the season.

At the Licking Co. site, resistance to glyphosate and ALS inhibitors appeared to be of lower level and more variable throughout the study area, compared with Pickaway Co. Survival of individual plants at the end of the season ranged from 67 to 80% where glyphosate or cloransulam was applied initially, and followed with a later application of glyphosate. Survival decreased to 23 to 57% where cloransulam and glyphosate were applied in combination. Overall control at the end of the season did not exceed 79%, with the exception of the initial application of a combination of cloransulam and methylated seed oil plus either fomesafen or lactofen. These treatments, when followed by application of glyphosate three weeks later, controlled 96 and 89% of the ragweed, respectively, but this decreased to 60 and 37% without the later glyphosate application.

These results confirm the presence in Ohio of giant ragweed biotypes with multiple herbicide resistance, to glyphosate and ALS inhibitors. The glyphosate resistance appears to be present at a higher level compared with the biotypes in our 2006 field studies. Fomesafen and lactofen can be important components of POST herbicide programs to control multiple-resistant giant ragweed, but additional research is needed to determine specifically how they should be managed in these programs.