INFLUENCE OF RAGWEED BORER ON GLYPHOSATE EFFICACY IN COMMON RAGWEED.

Justin M. Pollard* and Reid J. Smeda, Graduate Research Assistant and Associate Professor, Division of Plant Sciences, University of Missouri, Columbia, MO 65211; Brent A. Sellers, Assistant Professor, Range Cattle Research and Education Center and Department of Agronomy, University of Florida-IFAS, Ona, FL 33865.

In 2004, a population of common ragweed was identified resistant to glyphosate in Missouri. Initial investigations revealed that several plants surviving glyphosate were infested with a stem-boring insect, commonly known as ragweed borer (*Epiblema strenuana*, Walker). Field experiments were initiated to evaluate whether or not the ragweed borer influenced common ragweed response to glyphosate. Two sites were evaluated in 2004 and 2005, with one site containing the confirmed glyphosate-resistant common ragweed population, and a second site containing a known glyphosate-susceptible population. The experimental design was a split-block, with blocks treated with either 0 or 0.028 kg ai/ha lambda-cyhalothrin. Sub-plot treatments included 0, 0.84 (1X) or 2.52 (3X) kg ae/ha glyphosate on either 12 or 24 cm common ragweed. Lambda-cyhalothrin was applied bi-weekly from early spring until 6 weeks after glyphosate application to minimize ragweed borer infestation. At least four replications were utilized at each site-year and as many as 10 common ragweed plants were flagged in each plot following herbicide application. Flagged common ragweed plants were harvested at ground level six weeks after treatment and dissected following harvest to evaluate ragweed borer infestation; plant dry weight was measured following 3 days at 35 C. Biomass data were converted to percent reduction in dry weight compared to the untreated control prior to ANOVA. Overall, there were no differences in percent reduction of common ragweed biomass between the insecticide treated block (ITB) and the non-insecticide treated block (NITB) at either site in both years. For susceptible common ragweed, percent biomass reduction varied only in response to plant height at treatment, with reductions of 99 and 98% for 12 cm glyphosate treated plants and 86 and 89% for 24 cm glyphosate treated plants in 2004 and 2005, respectively. For glyphosate-resistant common ragweed, percent biomass reduction varied with both plant height and glyphosate rate. In 2004, 12 cm treated plants were reduced 87 and 97% for 1X and 3X glyphosate rates, respectively, while 24 cm treated plants were reduced 64 and 89% for 1X and 3X rates, respectively. Percent ragweed borer infestation of the herbicide treated glyphosate-resistant common ragweed was 22 and 60% for the ITB and NITB, respectively, and plant survival was >80%. In 2005, percent biomass reduction for 12 cm treated plants was 75 and 90% for 1X and 3X glyphosate rates, respectively and plants treated at 24 cm exhibited 79 and 85% reductions for 1X and 3X rates, respectively. Percent ragweed borer infestation of the herbicide treated glyphosate-resistant common ragweed was 28 and 39% for the ITB and NITB, respectively, with both blocks exhibiting 72% survival. These outcomes provide evidence that response to glyphosate for the glyphosate-resistant common ragweed is influenced by glyphosate rate and the timing of applications; ragweed borer is not a significant factor influencing plant response.

2005 North Central Weed Science Society Proceedings 60:145.