

EFFECTIVENESS OF PREEMERGENCE AND POSTEMERGENCE SOYBEAN HERBICIDES ON COMMON RAGWEED WITH RESISTANCE TO GLYPHOSATE AND ALS INHIBITORS.

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Field studies were conducted in 2008 at a site in southwest Ohio with a common ragweed population resistant to glyphosate and ALS inhibitors, with the objective of developing recommendations for control of this population in soybeans. Glyphosate-resistant soybeans were planted under no-tillage conditions on May 7. The experimental area was treated with glyphosate and 2,4-D ester 7 days prior to planting to control emerged weeds. In the postemergence (POST) study, POST herbicides were applied on June 11, with sequential POST application on July 2. Common ragweed plants were 10 to 20 cm tall at the time of the initial POST application. In the preemergence/postemergence (PRE/POST) study, PRE herbicides were applied on May 7, and POST herbicides were applied on June 24. Common ragweed plants were 5 to 18 cm tall at the time of POST application. In both studies, POST herbicides were applied with methylated seed oil (1% v/v) and ammonium sulfate (2% w/v) in a volume of 195 l/ha.

In the POST study, one or two applications of glyphosate alone or in combination with cloransulam did not control more than 38% of the common ragweed at the end of the season. Control exceeded 90% for several fomesafen-containing treatments 3 weeks after the initial POST treatment (WAT). However, control did not exceed 83% in late August, even with two POST herbicide applications, due to regrowth of plants injured by herbicide. A single application of fomesafen at the rate of 350 or 440 g/ha controlled 64 and 78% of the common ragweed in late August. The addition of glyphosate, cloransulam, or bentazon to 350 g/ha of fomesafen did not improve control, compared with fomesafen applied alone. Two POST applications, consisting of fomesafen at 350 g/ha followed by lactofen at 100 or 210 g/ha, controlled 65 and 80% of the common ragweed.

In the PRE/POST study, control of common ragweed at the time of the POST application ranged from 44% for metribuzin at 420 g/ha to 72% for the combination of fomesafen and s-metolachlor at 270 and 1180 g/ha. PRE treatments containing flumioxazin at 71 g/ha controlled 56 to 61% of the common ragweed. POST application of fomesafen at 350 g/ha controlled 98% of the common ragweed 8 WAT, averaged over the five PRE treatments. Control with fomesafen was not affected by the addition of glyphosate or bentazon. The combination of glyphosate and cloransulam at 1680 and 18 g/ha controlled 34% of the common ragweed 8 WAT, averaged over PRE treatment.

Single or multiple applications of POST herbicides did not adequately control this multiple-resistant common ragweed population in the absence of PRE herbicides. PRE herbicides only partially controlled this common ragweed population, but this resulted in an increase in POST herbicide (fomesafen) effectiveness. It is possible that these results are indicative of a low level of resistance to PPO inhibitors in this population. Resistance may be manifested as reduced control of larger plants, and those not affected by previous application of PRE herbicide, which could explain the differences in control between these two studies.