

FIELD RESPONSE OF SIX OHIO COMMON LAMBSQUARTERS POPULATIONS TO GLYPHOSATE. Jeffrey B. Taylor and Brad A. Miller, Technology Development Representatives, Monsanto Company, St. Louis, MO 63167, and Mark M. Loux and Jeff M. Stachler, Professor and Program Specialist, Dept. of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

Field studies were conducted in glyphosate-resistant soybeans at six locations across Ohio in 2005 by Monsanto and The Ohio State University to determine the response to glyphosate of six common lambsquarters biotypes that had exhibited variable response to glyphosate in greenhouse studies (reported in a separate abstract). Glyphosate treatments were applied to large plots with commercial application equipment. Although herbicide treatments were not replicated, individual common lambsquarters plants were marked before treatment in 5 to 6 random areas within each plot in order to evaluate control and plant survival after treatment. Postemergence treatments included glyphosate (Roundup WeatherMAX[®]) at 0.84 kg ae/ha, 0.84 kg/ha with an additional 0.25% (v/v) nonionic surfactant, and 1.68 kg/ha. All treatments were applied with 2% (w/v) ammonium sulfate when lambsquarters plants were 8 to 20 cm tall. Plots were retreated with glyphosate (Roundup WeatherMAX[®]) at 0.84 kg/ha for the 1.68 kg/ha rate, and at 1.68 kg/ha for the 0.84 kg/ha rate approximately 21 days after the initial treatment. Treatments were visually evaluated for control approximately 21 days after treatment (DAT), 21 to 31 days after retreatment, and just prior to soybean harvest. The injury to marked common lambsquarters plants was evaluated at these same intervals using the following scale: 1 - plant death; 2 - plants injured but no regrowth evident; and 3 - plants injured but showing regrowth.

The addition of nonionic surfactant to glyphosate (Roundup WeatherMAX[®]) did not appear to improve control, and results are discussed here for the 0.84 and 1.68 kg/ha rates without additional surfactant. Control of common lambsquarters approximately 21 days after the first application ranged from 85% to 99% for 0.84 kg/ha, and 94% to 99% for 1.68 kg/ha, among all locations. At this evaluation, 0 to 18% of marked plants received a score of 3, or showed signs of regrowth for the 0.84 kg/ha rate, and four of the six locations had at least one marked plant receiving this score. Among the six locations, none of the marked plants received a score of 3 at the 1.68 kg/ha rate. Control of lambsquarters 21 to 31 days after retreatment ranged from 95 to 99% for 0.84 kg/ha and 97 to 99% for 1.68 kg/ha. Only one of the six locations had any marked plants showing signs of regrowth at the 0.84 kg/ha rate, and only 2% of marked plants were in this category for this rate. None of the marked plants showed signs of regrowth at the 1.68 kg/ha rate. Similar results occurred for evaluations at the time of soybean harvest.

While plants of these common lambsquarters biotypes survived glyphosate applications in the greenhouse, this did not occur at five of six field locations by the end of the season. Results showed that all six biotypes were controlled with two applications of a labeled rate of glyphosate (Roundup WeatherMAX[®]) under field conditions in 2005. Plants marked prior to treatment were able to survive two glyphosate applications at only one location. Reduced control of individual plants can be caused by several different factors, including environmental conditions, and this may be one reason for infrequent survival of plants in these studies.