

PREPLANT HERBICIDES FOR CONTROL OF HERBICIDE-RESISTANT HORSEWEED IN SOYBEAN. Geoffrey D. Trainer\*, Mark M. Loux, S. Kent Harrison, and Anthony F. Dobbels, Graduate Research Assistant, Associate Professors, and Research Associate, Department of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

In recent years, producers in Ohio have with increasing frequency been unable to control horseweed with glyphosate or ALS-inhibiting herbicides. Field studies were conducted in glyphosate-tolerant soybeans in the fall and spring of 2001/2002 at one location, and in 2002/2003 at three sites throughout Ohio. The horseweed population at the 2001/2002 site was characterized as ALS-resistant in greenhouse research, and populations at two of the 2002/2003 sites were characterized as glyphosate-resistant. The objectives of these studies were to determine: a) the effectiveness of soybean herbicides applied in the fall and spring for residual control of horseweed, and b) the effectiveness of preplant soybean herbicides for the control of emerged horseweed.

In the residual study, various herbicides were applied with 2,4-D ester in early November or early April, when horseweed seedlings were less than 10 cm in diameter and prior to stem elongation. When applied in the fall of 2001, imazaquin, sulfentrazone, metribuzin, flumioxazin, and flumetsulam were the most effective treatments in late May of 2002, but they only controlled 73 to 80% of the ALS-resistant horseweed. Chlorimuron plus sulfentrazone, flumioxazin, flumetsulam, cloransulam, and sulfentrazone controlled 80 to 100% of the non-resistant horseweed in late May of 2003 when applied the previous fall. Early-spring applications of these herbicides were more effective for residual control of horseweed, controlling 83 to 98% of the horseweed in late May of 2002, and 87 to 100% in 2003. Horseweed population densities ranged from 13 to 78 plants/m<sup>2</sup> for fall treatments and 0 to 44 plants/m<sup>2</sup> for spring treatments in 2002. In 2003, population densities ranged from 0 to 24 plants/m<sup>2</sup> for fall treatments and 0 to 4 plants/m<sup>2</sup> for spring treatments.

In a second study, herbicides were applied in early May when the horseweed plants were 7 to 15 cm tall. Combinations of glyphosate, chlorimuron, and sulfentrazone or glyphosate, 2,4-D, chlorimuron, and sulfentrazone were the only treatments that controlled 100% of the horseweed at all sites 28 DAT. Treatments that controlled at least 90% of the horseweed at all sites included glyphosate plus 2,4-D applied alone or in combination with metribuzin or flumioxazin, and a combination of metribuzin, glufosinate, and 2,4-D. Glyphosate controlled 90 to 97% of the ALS-resistant and non-resistant horseweed but not more than 68% of the glyphosate-resistant horseweed. However, combinations of several other herbicides with glyphosate generally resulted in greater than 90% control of glyphosate-resistant horseweed.