SURVEY OF HERBICIDE-RESISTANT WEEDS IN MICHIGAN CHRISTMAS TREE PLANTATIONS. Steven A. Gower, Robert J. Richardson, and Bernard H. Zandstra, Academic Specialist, Diagnostic Services, Research Associate and Professor, Department of Horticulture, Michigan State University, East Lansing, MI 48824.

Michigan is one of the largest producers of Christmas trees in the country, ranked in the top three in trees harvested and acres in production. Christmas tree growers use herbicides as part of an effective and economical weed management program. A few herbicides have been used extensively and exclusively for weed control in Michigan. Growers are concerned with the possibility of weed shifts and herbicide resistance.

In response, a survey has been initiated in Michigan Christmas tree plantations to (1) identify and document weeds species in the top five-producing counties, (2) collect mature seeds from these weeds, and (3) determine whether these species are resistant to several common Christmas tree herbicides.

To date, several independent greenhouse experiments have been conducted to evaluate herbicide resistance in common ragweed, horseweed, and velvetleaf. Herbicides used in these experiments include atrazine, chlorimuron, cloransulam-methyl, glyphosate, imazamox, oxyfluorfen, and simazine. Known susceptible control populations were included with each experiment.

Common ragweed plants survived foliar-applied cloransulam-methyl and imazamox at 35 and 88 g ai ha^{-1}, respectively. Horseweed plants survived soil-applied simazine at 4.4 and 13 kg ai ha^{-1} and foliar-applied atrazine at 2.2 and 6.7 kg ai ha^{-1}. Additional horseweed populations survived foliar-applied atrazine at 6.7 kg ai ha^{-1}, chlorimuron at 18 g ai ha^{-1}, and cloransulam-methyl at 35 g ai ha^{-1}. At least one horseweed population demonstrated resistance to both triazine and acetolactate synthase (ALS)-inhibiting herbicides, which to our knowledge would be the first report in the United States. Results from experiments to date indicate ALS resistance in one common ragweed population, triazine resistance in four populations, and triazine and ALS resistance in at least one horseweed population collected from Michigan Christmas tree plantations.