IMIDAZOLINONE-RESISTANT SUNFLOWER AND SUBSEQUENT CROP EVALUATIONS

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The objective of the study was to evaluate the crop tolerance of imidazolinone-resistant sunflower and the subsequent crop response to imazamox and imazamox + imazapyr. The study was conducted at the NDSU Carrington Research Extension Center on a loam soil with a 7.2 pH and 3.7 percent organic matter. Imidazolinone resistant sunflower 'Mycogen 81359 CL' was planted May 30, 2002, in 30-inch rows at 16,500 seeds/A. Individual plots were 45 ft by 40 ft and arranged in a randomized complete block design with three replications. Imazamox and imazamox +imazapyr were applied at a 1X and 2X rate with a CO_2 pressurized hand-held plot sprayer delivering 10 gal/A at 20 psi through XR80015 flat fan nozzles on June 27 with 65º F, 82% RH, 30% cloud cover, 8 mph wind, and 78º F soil temperature to V3 sunflower. The 1X and 2X rates of imazamox were 0.0312 and 0.0625 lb ai/A. The 1X and 2X rates for imazamox +imazapyr were 0.022 + 0.01 and 0.044 + 0.2 lb ai/A. A nonionic surfactant 'Preference' and 28% UAN liquid fertilizer were applied with each herbicide treatment at 0.25% v/v and 1% v/v, respectively. The sunflowers were cultivated to control a low population of grass and broadleaf weeds in the untreated check plots. The sunflowers were harvested on October 21. To evaluate the subsequent crop response to imazamox and imazamox + imazapyr, each main plot was split into 15 ft. by 40 ft. subplots and planted to barley 'Drummond', hard red spring wheat (HRSW) 'Russ', and corn 'DKL 35-51 RR/YG' in the spring of 2003. The barley and HRSW were seeded on April 28 in 6-inch rows at 1.2 million PLS/A. The corn was planted May 13 in 30-inch rows at 25,000 seeds/A. The barley, HRSW, and corn were harvested August 8, August 12, and October 13, respectively.

Imazamox and imazamox +imazapyr did not visually injure the sunflowers when evaluated for overall crop injury, chlorosis, and height reduction 14 and 31 days after application (data not shown). Seed yields for the 1X applications of imazamox and imazamox +imazapyr were 2239 and 2261 lbs./A, respectively. The 2X application rate for each treatment reduced seed yields by 16 percent when compared to the 1X application rate. The seed yield for the untreated check was 1716 lbs./A. The seed yield LSD (p=0.05) was 225 lbs./A. The herbicide treatments did not affect sunflower test weights, with a mean test weight of 30 lbs./bu. The herbicide treatments did not cause any noticeable crop injury to the barley, HRSW, or corn planted the subsequent year (data not shown). The herbicide treatments also did not cause a reduction in grain yield or test weight for the subsequent crops. The mean grain yield and test weight were 64.1 bu/A and 47.0 lbs./bu, respectively for barley and 57.5 bu/A and 63.4 lbs./bu for HRSW. The mean corn yield was 103.5 bu/A.

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