THE CONTROL OF ANNUAL GRASSES IN SEEDLING SUGAR BEETS WITH POSTEMERGENCE HERBICIDES

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Purpose

To evaluate Poast, Prism, and Assure II herbicides with X-77 or MorAct surfactants for seedling sugar beets tolerance and control of green foxtail (Setaria viridis) and barnyardgrass (Echinochlva crus-galli) species of annual grasses.

Procedures

Sugar beet variety MonoHy WS-PM9 and seed of barnyardgrass and green foxtail was planted on June 14. Sugar beet seed was planted in the sugar beet row using an Ezee flow granular insecticide applicator. Grass seed was dropped through a tube, falling in a 1-inch wide band over the top of the planted sugar beet seed. The trial area was watered by furrow irrigation the same day of planting to furnish soil moisture for seed germination, seedling emergence, and growth.

Stephens winter wheat had been the previous crop grown during 1994. Bronate herbicide had been applied at the rate of 1 quart per acre to control weeds in the wheat. No other herbicides were applied to the trial area before the herbicides in this trial were applied to the sugar beets. Following wheat harvest the straw stubble was shredded with a flail beater and the field disked and irrigated. In October the field was mold-board plowed and bedded. Fertilizer applied was 100 lbs/ac of phosphate and 200 lbs/ac of nitrogen. The phosphate and 60 lbs/ac of nitrogen were broadcast applied before plowing. The remainder of the nitrogen was sidedressed when the sugar beets had six to eight leaves. Temik at 2.0 lb ai/ac was sidedressed with the nitrogen.

The herbicide treatments were applied on July 10 to sugar beets with six leaves. Air temperature was 78°F, and wind was calm.

Herbicide treatments were applied using a single bicycle wheel plot sprayer. Four Teejet fan nozzles size 6502 were mounted 22 inches apart on the spray boom so a single nozzle was centered over each row of the 4 row plots. Spray pressure was 42 psi, and water as the herbicide carrier was applied at a volume of 19.5 gal/ac. Each treatment was replicated three times and placed at random in blocks using a complete block experimental design. Barnyardgrass and green foxtail plants had four to five leaves with one to three tillers and dense populations of both species (15 plants/sq ft)

when the herbicides were applied. All plants were growing vigorously. The treatments were evaluated on July 24 for crop injury and percent grass control.

Results

Crop injury and percent grass control was evaluated 14 days after herbicide application. Treatments resulting in complete weed control were Assure II at 0.15 lb ai/ac with both surfactants, Prism at the 0.094 lb ai/ac with crop-oil-concentrate, and Prism at 0.125 lb ai/ac with both surfactants. Poast at 0.28 lb ai/ac with both surfactants also controlled 100 percent of both grass species.

Crop-oil-concentrate (MorAct) was generally better than X-77 as a surfactant for all herbicides. This effect was measurable with the lower rates of Assure II and Prism. It was not measurable with the higher rates of herbicides. Sugar beets were tolerant to all herbicides and rates evaluated. Grass control persisted until August 15 at which time the trial was terminated. Reoccurrence of grass populations after herbicide application was probably prevented by competition because of a fall stand of rapidly growing sugar beet plants.

Table 1. Crop injury ratings and percent weed control from herbicides applied postemergence to sugar beets for control of barnyardgrass and green foxtail. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

					Percent weed control					
		Crop injury			Barnyardgrass			Green foxtail		
Herbicides	Rate	1	2	3	1	2	3	1	2	3
	lb ai/ac	—% —			— % —					
Assure II + X-77	0.075 + 0.25%	0	0	0	95	95	95	90	92	90
Assure II + MorAct	0.075 + 1%	0	0	0	98	99	100	95	98	98
Assure II + X-77	0.15 + 0.25%	0	0	0	100	100	100	100	100	100
Assure II + MorAct	0.15 + 1%	0	0	0	100	100	100	100	100	100
Prism + X-77	0.094 + 0.25%	0	0	0	95	98	98	95	98	98
Prism + MorAct	0.094 + 1%	0	0	0	100	100	100	100	100	100
Prism + X-77	0.125 + 0.25%	0	0	0	100	100	100	100	100	100
Prism + MorAct	0.125 + 1%	0	0	0	100	100	100	100	100	100
Poast + X-77	0.28 + 0.25%	0	0	0	100	100	100	100	100	100
Poast + MorAct	0.28 + 1%	0	0	0	100	100	100	100	100	100
Untreated check	–	0	0	0	0	0	0	0	0	0

Evaluated July 24.

Ratings: 0 = no herbicide effect. 100 = all plants killed.