

PREEMERGENCE AND POSTEMERGENCE HERBICIDES FOR WEED CONTROL IN FIELD CORN

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Introduction

Weed control is important in field corn production to reduce competition to the crop and reduce the production of weed seeds for future crops. This trial evaluated preemergence and postemergence herbicides for weed control and crop tolerance in furrow-irrigated field corn.

Methods

A trial was conducted at the Malheur Experiment Station comparing registered and experimental herbicides for weed control and crop safety in field corn. The soil was a Nyssa silt loam with pH 7.6 and 1.4 percent organic matter. The field was fertilized with 125 lb N/acre, 10 lb Zn/acre, 2 lb B/acre, and 6 lb Mg/acre as a preplant, sidedressed application. Novartis variety 'NK N3030Bt' field corn was planted with a John Deere model 71 Flexi Planter on May 2. Seed spacing was one seed every 7 inches on 30-inch rows. Plots were 10 ft (four rows) wide by 30 ft long and replicated three times in a randomized complete block design. Herbicide treatments were applied with a CO₂-pressurized backpack sprayer delivering 20 gal/acre at 30 psi. Percent corn injury and percent weed control were evaluated throughout the growing season. Corn yield was determined October 5 by harvesting ears from the two center rows of each plot. On November 14 harvested ears were threshed and dry weight of the grain recorded. Grain yields were adjusted to 12 percent moisture.

Treatments included an Aventis numbered product in two formulations, AE F130360 WG70 and AE F130360 WG62. AE F130360 WG70 was evaluated alone with methylated seed oil (MSO) and in combination with Clarity. AE F130360 WG70 was applied with Balance and Atrazine as a preemergence treatment. AE130360 WG62 was entered alone with crop oil concentrate(COC), nonionic surfactant (NIS), or MSO and in a tank mixture with Clarity. Balance, premerge, was also applied to an AE130360 WG62 treatment. DuPont's experimental DPX 79406 was entered alone with COC and tank-mixed with Clarity. Other treatments included Basis, Basis plus Clarity, Basis Gold, Accent, Accent plus Clarity, and Accent Gold. All treatments except AE F130360 WG62 with MSO had 32 percent nitrogen added at 2 qt/acre. Preemergence applications of Balance were made May 2 and early postemergence treatments made May 24 when the corn was 5 inches tall. Regular postemergence treatments were made June 1 to 7-inch corn

Results

On May 31, AE130360 WG70 (0.875 oz ai/acre) plus MSO and AE130360 WG62 (0.775)oz ai/acre plus NIS had the highest injury (8 percent) and was significantly higher than Accent, Basis, Basis Gold, DPX 79406, Accent Gold, Balance plus AE130360 WG62, and Balance and Atrazine plus 130360 WG70 (Table 1). On June 23, treatments with Balance preemerge followed by postemergence applications had the highest amount of injury. Balance plus AE 130360 WG62 had significantly higher injury (12 percent) than all other treatments.

On June 23, all treatments gave good redroot pigweed control (94-98 percent) except Accent Gold (68 percent). Balance plus Atrazine preemerge followed by AE 130360 WG70 and Basis Gold alone provided significantly better common lambsquarter control than Accent, Accent plus Clarity, DPX 79406, Accent Gold, and DPX 79406 plus Clarity. All treatments provided excellent shepardspurse control (90-98 percent) except Accent plus Clarity (84 percent). AE 130360 WG62 plus COC and Basis plus Clarity provided significantly less green foxtail control than most other treatments. All treatments gave excellent wild oat control except Basis plus Clarity, which appeared weak (82 percent).

All treatments increased yield significantly over the untreated check. Balance preemerge followed by AE 130360 WG62, or Balance plus Atrazine and AE130360 WG70 were among the lowest yielding treatments, suggesting the injury recorded June 23 had a lasting effect.

Table 1. Weed control and corn yield with preemergence and postemergence treatments in field corn, Malheur Experiment Station, Oregon State University, Ontario, OR, 2000.

Treatment*	Rate oz ai/acre	Timing†	Corn injury		Weed control‡					Corn yield§ bu/acre
			5-31 -----%-----	6-23	Pig weed	Lambs quarters	Shepards purse -----%-----	Green foxtail	Wild oats	
AE 130360 WG70 + MSO + 32%N	0.875	EPOST	8	0	94	88	93	92	97	187
Accent + COC + 32%N	0.5	EPOST	0	0	98	30	92	93	97	173
AE 130360 WG62 + MSO + 32%N	0.775	EPOST	5	2	95	95	98	93	98	188
AE 130360 WG62 + MSO	0.775	EPOST	5	0	95	87	98	83	95	183
AE 130360 WG62 + NIS + 32%N	0.775	EPOST	8	0	95	92	98	89	97	184
AE130360 WG62 + COC + 32%N	0.775	EPOST	3	0	98	78	93	77	94	185
Balance+Atrazine AE 130360 WG70 + MSO + 32%N	1.125 + 16 0.875	PRE POST	0	7	98	97	98	98	98	175
Balance AE130360 WG62 + MSO + 32%N	1.125 0.775	PRE POST	2	12	95	89	98	92	98	169
AE 130360 WG70 + Clarity + MSO + 32%N	0.875 + 2.0	EPOST	3	0	94	93	96	91	97	180
AE 130360 WG62 + Clarity + MSO + 32%N	0.775 + 2.0	EPOST	3	0	97	96	98	93	97	182
Accent + Clarity + COC + 32%N	0.5+2.0	EPOST	3	0	94	73	84	88	92	187
Basis Gold + COC + 32%N	12.5	EPOST	2	0	98	98	98	94	98	191
Accent Gold + COC + 32%N	2.43	EPOST	2	0	68	73	98	92	93	190
Basis + COC + 32%N	0.25	EPOST	0	0	95	75	98	88	89	177
Basis + Clarity + COC + 32%N	0.25 + 2.0	EPOST	3	3	97	93	98	75	82	187
DPX 79406 + COC + 32%N	0.375	EPOST	0	0	98	23	97	94	97	185
DPX 79406 +Clarity + COC + 32%N	0.375 + 2.0	EPOST	3	0	95	71	90	88	93	183
Untreated			0	0	0	0	0	0	0	147
LSD (0.05)			6	3	21	23	9	9	9	13

*MSO and COC were applied at 1.5 pt/acre and NIS at 0.5 percent v/v. The 32 percent N was applied at 2 qt/acre.

†Preemergence applications were made May 2, early-post treatments May 24, and late-post June 7.

‡Weed control evaluations were made June 23.

§Corn was harvested October 5 and grain was adjusted to 12 percent moisture.