

WEED CONTROL IN SWEET CORN

Charles E. Stanger and Joey Ishida
Malheur Experiment Station
Oregon State University
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Purpose

Several herbicides were applied at various rates alone and in tank-mix combinations as preplant incorporated and postemergence applications to evaluate Jubilee of sweet corn herbicide tolerance and control of common problem weed species in corn production.

Procedures

Herbicides evaluated in the trial included Dual II, Frontier, Axiom, and Axiom tank-mixed with Atrazine or Bladex applied as preplant incorporated applications. Herbicides applied postemergence to both corn and weeds included Peak, Tough, and Basagran. Tough was evaluated as wettable powder and emulsifiable formulations. Postemergence tank-mix combinations included Peak/Atrazine and Tough/Basagran. Crop oil concentrate (MorAct) was added to Peak, Tough/Basagran, and Basagran herbicides.

The trial site for this study had been planted to Stephens winter wheat in October 1993. Following wheat harvest in August of 1994, the straw was shredded with a flail chopper and the field double disked and furrow irrigated. In October, before mold-board plowing, 100 lb/ac of phosphate and 60 lb/ac of nitrogen were applied broadcast. After plowing, the soil was tilled, bedded, and left to overwinter. Soil texture was silt loam with 1.3 percent organic and a pH of 7.2.

On May 9, 1995, the beds were harrowed using a spike-tooth bed harrow. The preplant herbicides were applied and incorporated in the top 2 inches of soil using the spike-toothed bed harrow. Jubilee variety of sweet corn was planted with a John Deere flexi planter. The trial area was furrow irrigated after planting to furnish moisture for seed germination and seedling emergence. Air temperature was 68°F; soil temperature at 4-inch depth was 58°F; wind was calm, and skies overcast when herbicides were applied.

The postemergence herbicide treatments were applied on May 29. Corn plants were 4 inches tall and had 4 to 6 leaves. Emerged weed species included lambsquarters, redroot pigweed, hairy nightshade, kochia, and barnyardgrass. Broadleaf weeds ranged from plants with cotyledon leaves to plants one-inch tall and one-inch rosettes. Barnyardgrass plants had 1 to 3 leaves. When postemergence herbicides were

applied, the wind was calm, air temperature 72°F, soil temperature 62°F at 4-inch depth; skies were clear, and the soil moist on the surface.

The herbicides in both the preplant incorporated and the postemergence treatments were applied with a single bicycle wheel experimental plot sprayer. Individual plots were 4-rows wide and 25 feet long. Distance between rows was 22-inches. Each treatment was replicated 3 times using a randomized strip-type experimental plot design. The spray boom covered 4 rows with a spray nozzle centered over each plot row. Teejet fan nozzles size 6502 were used. Spray pressure was 42 psi, and water was applied at a volume of 20 gallons per acre.

Results

Jubilee sweet corn was tolerant to all the preplant incorporated herbicides and to the postemergence applied Basagran and wettable powder formulation of Tough. Jubilee corn was not as tolerant to the 0.94 lb ai/ac emulsifiable concentrate formulation of Tough which caused some temporary yellowing of the corn leaves. Corn was less tolerant to Peak which caused severe leaf chlorosis and some stunting of growth to the corn plants. The symptoms occurred within 3 days after herbicide application and persisted for 10 to 14 days before the corn resumed normal growth. The herbicidal activity of Peak increased when the rate of crop oil concentrate increased from 1 to 2 pints. The best treatments for broadleaf weed control included Frontier, Axiom, and the tank-mixes of Axiom with Atrazine or Bladex. Axiom alone did not completely control hairy nightshade. Tough, Tough plus Basagran, and Basagran plus a crop oil concentrate controlled most broadleaf weeds. The preplant incorporated herbicides controlled barnyardgrass, but barnyardgrass was not controlled by the herbicides applied postemergence.

Table 1. Early evaluations (June 5) for crop injury and percent weed control from herbicides applied preplant incorporated and postemergence to Jubilee sweet corn. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Herbicides	Rate	Applied	Percent weed control																	
			Crop injury			Lambsquarters			Pigweed			H. nightshade			Kochia			Barnyardgrass		
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
	lb ai/ac		— % —			%														
Dual II + Peak + COC	2 + 0.018 + 1 pt	ppi + post	20	30	20	80	98	95	80	99	95	95	99	92	90	85	85	98	95	95
Dual II	2	ppi	0	0	0	99	96	98	99	95	98	99	93	95	95	90	95	100	98	98
Frontier	1.5	ppi	0	0	0	100	99	100	100	100	100	100	99	100	100	98	100	100	100	100
Axiom	0.68	ppi	0	0	0	98	98	98	95	95	98	95	90	80	95	95	98	100	100	100
Axiom	0.72	ppi	0	0	0	100	100	100	100	100	100	93	95	90	99	98	98	100	100	100
Axiom	0.77	ppi	5	0	0	100	100	100	100	98	98	100	95	90	100	100	100	100	100	100
Axiom + Atrazine	0.72 + 1.4	ppi	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Axiom + Bladex	0.72 + 2.25	ppi	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Peak + Atrazine + COC	0.018 + 0.05 + 1 pt	post	20	30	30	100	100	100	100	100	100	80	85	80	100	100	100	45	60	50
Peak + COC	0.018 + 1 pt	post	25	25	25	85	90	85	100	100	100	80	80	75	80	85	85	0	0	0
Peak + COC	0.018 + 2 pt	post	35	35	35	98	98	98	98	98	100	85	90	90	95	98	95	0	0	0
Tough (ec)	0.47	post	0	0	0	100	100	100	100	100	100	98	98	95	100	100	100	0	0	0
Tough (ec)	0.94	post	15	15	15	100	100	100	100	100	99	100	100	99	100	100	100	0	0	0
Tough (wp)	0.47	post	0	0	0	95	98	98	95	98	98	95	98	98	95	98	95	0	0	0
Tough (wp)	0.94	post	0	0	0	100	100	100	100	100	100	100	100	100	99	100	98	0	0	0
Tough + Basagran + COC	0.47 + 0.5 + 1 pt	post	15	15	10	100	100	100	100	100	100	100	100	100	100	100	100	0	0	0
Basagran + COC	1.0 + 1 pt	post	0	0	0	100	100	100	100	100	100	100	100	100	100	98	100	0	0	0
Untreated Check	—	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Evaluated June 5, 1995. Corn about 10-12 inches tall in checks.

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

COC = MorAct

Postemergence treatments applied on May 29.

Table 2. Second evaluations (June 22) for crop injury and percent weed control from herbicides applied to Jubilee sweet corn as preplant incorporated and postemergence applications. Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Herbicides	Rate lb ai/ac	Applied	Percent weed control																	
			Crop injury			Lambsquarters			Pigweed			H. nightshade			Kochia			Barnyardgrass		
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3			
Dual II + Peak + COC	2 + 0.018 + 1 pt	ppi + post	5	10	10	85	85	85	90	95	95	70	85	85	80	85	85	90	95	95
Dual II	2.0	ppi	0	0	0	95	95	95	98	98	98	83	85	90	90	95	90	98	95	95
Frontier	1.5	ppi	0	0	0	98	98	98	99	99	99	99	99	99	95	95	95	98	98	98
Axiom	0.68	ppi	0	0	0	93	95	93	95	98	98	83	85	70	90	90	88	95	95	92
Axiom	0.72	ppi	0	0	0	98	93	98	99	99	99	80	85	80	95	90	95	100	98	98
Axiom	0.77	ppi	0	0	0	99	99	99	98	95	98	95	90	80	93	95	95	95	98	98
Axiom + Atrazine	0.72 + 1.4	ppi	0	0	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Axiom + Bladex	0.72 + 2.25	ppi	0	0	0	100	100	100	100	100	99	100	100	99	100	100	100	100	100	100
Peak + Atrazine + COC	0.018 + 0.05 + 1 pt	post	15	5	5	100	100	100	100	100	100	90	85	90	95	98	95	25	35	35
Peak + COC	0.018 + 1 pt	post	15	10	15	100	100	98	100	100	98	80	85	80	90	95	90	0	0	0
Peak + COC	0.018 + 2 pt	post	15	15	15	100	100	100	100	100	100	90	95	80	95	95	95	0	0	0
Tough (ec)	0.47	post	0	0	0	99	98	100	100	98	99	100	100	95	99	95	99	35	40	30
Tough (ec)	0.94	post	5	5	0	100	100	100	100	100	100	98	98	100	100	100	100	50	60	60
Tough (wp)	0.47	post	0	0	0	95	95	95	95	95	95	98	98	90	90	95	90	50	40	45
Tough (wp)	0.94	post	0	0	0	100	100	100	100	100	100	99	100	100	100	98	100	55	45	55
Tough + Basagran + COC	0.47 + 0.5 + 1 pt	post	0	5	10	100	100	100	100	95	100	100	100	99	100	100	100	30	25	30
Basagran + COC	1.0 + 1 pt	post	0	0	0	100	100	100	100	98	98	100	99	99	100	98	98	0	0	0
Untreated Check	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Evaluated June 22, 1995. Corn 24 inches tall in checks.

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

COC = MorAct

Postemergence treatments applied on May 29.