

Sweet Corn Herbicide Weed Control Study

K. Umeda

Abstract

*The soil applied herbicides EPTC plus safener (Eradicane7), metolachlor (Dual7), dimethenamid (Frontier7), pendimethalin (Prowl7), and fluthiamide/metribuzin (Axiom7) applied at planting time all provided very good weed control of pigweeds (*Amaranthus* spp.), grasses, and puncturevine (*Tribulus terrestris*). Most of the soil applied followed by POST combination treatments gave very good control (>90%) of lambsquarters (*Chenopodium* spp.), pigweeds, and groundcherry (*Physalis wrightii*). POST treatments bentazon (Basagran7), dicamba (Clarity7), and diflufenzopyr plus dicamba (Distinct7) applied alone were not as effective as combinations with soil applied herbicides.*

Introduction

Sweet corn that is grown in the low desert regions of Arizona is commonly planted and grown without the use of herbicides because of the fast growing season. Mechanical cultivation often suffices to reduce most of the competitive weed problems. In some situations where weeds may be expected to be overwhelming or when cultivation does not eliminate difficult to control weeds in the seed row, the use of herbicides may be necessary. Most herbicides are registered for use on field corn but not sweet corn because of varying degrees of varietal susceptibility to herbicides. Eradicane, Dual, Frontier, Prowl, and Basagran are labeled for use in sweet corn. Dicamba (varying formulations including Banvel7, Clarity, and Distinct) is not labeled for sweet corn but the newly introduced formulations may have potential for safe use in sweet corn. Axiom is a new chemistry that is pre-mixed with metribuzin to cover a broader spectrum of weeds in field corn. This study was conducted to evaluate the currently available herbicides and the potentially available new herbicides for use in sweet corn when applied alone or in combinations for broad spectrum weed control.

Materials and Methods

A small plot field test was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. The test was set up as a randomized complete block design with three replicates and each plot consisted of two 40-inch beds measuring 30 ft in length. The field was prepared with typical tillage operations and laser-leveled to facilitate furrow irrigation. The beds were listed and cultipacked then preplant incorporated (PPI) treatments were applied. All herbicides were applied with a hand-held boom having four flat fan 8002 nozzle tips spaced 20-inches apart and delivered 18 gpa water pressurized with CO₂ backpack sprayer at 40 psi. The PPI treatments were applied on 14 April 1998 when the soil was dry and air temperature was 64 and clear. Within one hour of applications, a Asidewinder@power incorporator-bed shaper was used to mechanically incorporate the PPI herbicides. After bed shaping, sweet corn cv. Sugar Ace was planted in a single row on each bed. Preemergence (PREE) herbicides were applied on the following day (15 Apr) when the sky was 50% overcast, air temperature at 50°F, and a slight breeze at less than 5 mph. Immediately after the PREE herbicide treatment applications, water was applied until the beds were completely wetted across the top surface to activate the PREE herbicide

This is a part of the University of Arizona College of Agriculture 1999 Vegetable Report, index at <http://ag.arizona.edu/pubs/crops/az1143/>

treatments. POST herbicide treatments were applied on 11 May when the sweet corn was at the 6-7 leaf stage of growth. Adjuvants were added to all POST treatments. A crop oil concentrate at 1 qt/A was added to Basagran and a non-ionic surfactant at 0.25% v/v was added to Clarity and Distinct treatments. Predominant weeds were *Amaranthus* spp. (pigweeds) at the 6-10 leaf stage and *Chenopodium album* (common lambsquarters) at the 2-leaf stage of growth. The weather was clear with a very slight breeze and air temperature was 86°F. Visual weed control observations were taken at intervals after the soil applied application and POST applications.

Results and Discussion

The soil applied herbicides at planting time all provided very good weed control of pigweeds, grasses, and puncturevine at better than 93% (Table 1). There were no significant differences in the performance of PPI compared to PREE treatments of Dual and Frontier in this test.

Most of the soil applied followed by POST combination treatments gave very good control (>90%) of lambsquarters, pigweeds, and groundcherry (Table 2). POST treatments applied alone were not as effective as combinations with soil applied herbicides. Basagran marginally controlled tumble pigweed and groundcherry while providing good control of lambsquarters and prostrate pigweed. Clarity and Distinct were also marginally effective against tumble pigweed and did not adequately control lambsquarters. Both appeared to be effective in controlling prostrate pigweed and groundcherry.

All of the PPI, PREE, and POST treatments applied alone or in combinations were safe on the sweet corn in this test. No crop stand reduction, chlorosis, or vigor reduction could be observed for any treatment.

The PPI and PREE applied herbicides provided excellent weed control during the period to establish the sweet corn crop stand. A weed control program that includes a POST herbicide following either a PPI or PREE herbicide would offer near complete season-long weed control in sweet corn. Reliance on only a POST herbicide application without a soil applied herbicide would not provide adequate season-long weed control. Weed interference during sweet corn stand establishment could reduce the crop stand and vigor and delay crop maturity. PPI and PREE herbicide applications could be supplemented with frequent mechanical cultivations during the short growing season for sweet corn.

Table 1. Sweet corn herbicide weed control study. (Umeda)

Treatment	Rate lb AI/A	Timing	Corn Injury (%)	AMASP	Weed control (%)		
					Melon	Grass	TRBTE
Untreated check			0	0	0	0	0
Eradicane	4.0	PPI	0	99	98	99	99
Dual	1.5	PPI	0	98	91	99	99
Frontier	1.0	PPI	0	93	63	99	99
Dual	1.5	PREE	0	93	93	99	99
Prowl	1.0	PREE	0	96	90	99	99
Frontier	1.0	PREE	0	94	91	99	99
Axiom	0.6	PREE	0	94	93	99	99
LSD (p=0.05)			0	7.5	31.9	0	0

PPI = preplant incorporated applied 14 April 1998, PREE = preemergence applied 15 April

AMASP = *Amaranthus* spp. (pigweeds), Melon = volunteer watermelon,

Grass = *Echinochloa* spp. and *Leptochloa* spp., TRBTE = *Tribulus terrestris* (puncturevine)

Rating date 05 May 1998

Table 2. Sweet corn herbicide weed control study. (Umeda)

Treatment	Rate lb AI/A	Timing	Corn Injury (%)	Weed control (%)			
				CHEAL	AMAAL	AMABL	PHYWR
Untreated check			0	0	0	0	0
Basagran	1.0	POST	0	96	83	96	83
Clarity	0.25	POST	0	66	89	96	93
Distinct	0.18	POST	0	83	83	96	96
Eradicane + Basagran	4.0 + 1.0	PPI + POST	0	99	99	99	90
Dual + Basagran	1.5 + 1.0	PPI + POST	0	99	93	99	91
Frontier + Basagran	1.0 + 1.0	PPI + POST	0	99	99	95	99
Dual + Basagran	1.5 + 1.0	PREE + POST	0	99	83	98	86
Prowl + Basagran	1.0 + 1.0	PREE + POST	0	99	99	99	91
Frontier + Basagran	1.0 + 1.0	PREE + POST	0	99	99	99	96
Axiom + Basagran	0.6 + 1.0	PREE + POST	0	99	96	99	93
Eradicane + Clarity	4.0 + 0.25	PPI + POST	0	99	98	98	99
Dual + Clarity	1.5 + 0.25	PPI + POST	0	99	93	98	83
Frontier + Clarity	1.0 + 0.25	PPI + POST	0	99	98	99	98
Dual + Clarity	1.5 + 0.25	PREE + POST	0	99	91	96	93
Prowl + Clarity	1.0 + 0.25	PREE + POST	0	99	99	99	98
Frontier + Clarity	1.0 + 0.25	PREE + POST	0	99	94	98	91
Axiom + Clarity	0.6 + 0.25	PREE + POST	0	99	99	99	96
Eradicane + Distinct	4.0 + 0.18	PPI + POST	0	99	99	99	95
Dual + Distinct	1.5 + 0.18	PPI + POST	0	99	95	98	88
Frontier + Distinct	1.0 + 0.18	PPI + POST	0	99	99	99	96
Dual + Distinct	1.5 + 0.18	PREE + POST	0	99	93	96	93
Prowl + Distinct	1.0 + 0.18	PREE + POST	0	99	99	99	99
Frontier + Distinct	1.0 + 0.18	PREE + POST	0	99	99	99	99
Axiom + Distinct	0.55 + 0.18	PREE + POST	0	99	99	99	99
LSD (p=0.05)			0	19.7	19.3	5.6	14.1

PPI=preplant incorporated applied 14 April 1998, PREE=preemergence applied 15 Apr,
POST=postemergence applied 11 May

CHEAL = *Chenopodium album* (lambsquarters), AMAAL = *Amaranthus albus* (tumble pigweed),

AMABL = *A. blitoides* (prostrate pigweed), PHYWR = *Physalis wrightii* (groundcherry)

Rating date 06 July