

# Evaluation of Preemergence and Postemergence Herbicides for Sweet Corn Weed Control

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## **Abstract**

*Callisto at 0.24 lb AI/A applied PREE gave a similar level of control of prostrate pigweed as did Dual Magnum, Outlook, and Prowl. POST applications of Callisto at 0.188 lb AI/A were equivalent to the higher rate of 0.24 lb AI/A. Callisto, Distinct, and Clarity provided excellent POST control of pigweed. Callisto applied POST was the same as PREE followed by POST sequentially. Aim provided marginally acceptable control of pigweed.*

## **Introduction**

Sweet corn production acreage in Arizona is very limited but it is typically grown for the direct marketing outlets targeting the summer holidays. Sweet corn is grown very quickly in less than 80 days from first water to harvest. The major cost is to control weeds as the ears develop. Weeds generally are not a problem with timely cultivations. However, if weeds are anticipated in a new field or weeds have a history of severely infesting fields, herbicides are an option to control weeds. Relatively new herbicides such as Callisto\* (mesotrione), Aim\* (carfentrazone), and Distinct\* (diflufenzopyr plus dicamba), and improved products such as Dual Magnum\* (s-metolachlor) and Outlook\* (dimethenamid-p) offer preemergence (PREE) and postemergence (POST) weed control programs. This field experiment was conducted to evaluate and compare the efficacy of corn herbicides in irrigated desert growing conditions.

## **Materials and Methods**

A small plot field experiment was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Sweet corn cv. Sugar Ace was planted on 25 March 2002 in a single seedline on 40-inch raised and shaped beds. Plots consisted of two beds measuring 30 ft long and each treatment was replicated four times in a randomized complete block design. All herbicides were applied using a backpack CO<sub>2</sub> sprayer equipped with a hand-held boom consisting of four flat fan 8002 nozzles spaced 20 inches apart. The herbicides were applied in 30 gpa water at 30 psi. The preemergence (PREE) herbicide treatments were applied on 27 March when the air temperature was 64°F, the sky was clear, and there was a very slight breeze at less than 3 mph. The soil was dry and the temperature at a depth of 2-in was 58°F. The field was furrow irrigated and the top of beds were completely wetted immediately after applications to activate the herbicides and to germinate the crop. The postemergence (POST) herbicide treatments were applied on 12 April when the air temperature was 88°F, the sky was clear, and there was a very slight breeze at less than 3 mph. The sweet corn was at the 4-leaf stage of growth, prostrate pigweed (*Amaranthus blitoides*), the dominant weed in the site, was at the cotyledon to 4-leaf stage of growth and few barnyardgrass (*Echinochloa crus-galli*) plants that were present were at the 4-leaf stage of growth. All POST herbicide treatments included an adjuvant, Latron CS-7 at 0.25% v/v. Crop injury and weed control visual ratings were done approximately two weeks after each application.

## Results and Discussion

PREE herbicides did not cause sweet corn injury during the crop establishment period (Table). Callisto at 0.24 lb AI/A was superior to the lower rate to control prostrate pigweed. Prowl, Outlook, and Dual Magnum were similar and gave acceptable prostrate pigweed control. Pigweed control declined to less than acceptable levels 1 month following all of PREE herbicide applications. All POST herbicide treatments of Callisto gave near complete control of pigweed. A single POST application of Callisto at 0.188 lb AI/A was comparable to a PREE plus a POST application and both of these treatments were superior to a single PREE application. Clarity and Distinct applied POST gave very good pigweed control. Aim gave slightly less than acceptable control of pigweed. Clarity, Aim, and Distinct typically control only broadleaved weeds and appeared to offer a reduction of grasses that were a limited population in the test site.

Table. Evaluation of sweet corn herbicides applied preemergence and postemergence

Treatment	Rate (lb AI/A)	Timing	Corn injury (%)		Weed Control (%)		
			16 DAT-1	12 DAT-2	AMABL 16 DAT-1	AMABL 12 DAT-2	GRASS 12 DAT-2
Untreated check			0	0	0	0	0
Callisto	0.188	PREE	0	3	81	73	97
Callisto	0.24	PREE	0	0	90	76	95
Callisto	0.188	POST	-	3	-	99	95
Callisto	0.24	POST	-	5	-	99	96
Callisto + Callisto	0.188 + 0.188	PREE + POST	0	0	84	99	96
Callisto + Callisto	0.188 + 0.188	PREE + POST	0	0	89	99	98
Dual Magnum	0.75	PREE	0	5	89	75	96
Outlook	0.75	PREE	0	3	85	73	81
Prowl	0.75	PREE	0	2	93	84	97
Distinct	0.075 + 0.188	POST	-	3	-	97	91
Clarity	0.63	POST	-	5	-	97	95
Aim	0.008	POST	-	3	-	80	88
LSD (p=0.05)					8.2	8.3	10.7

PREE applications on 27 March 2002 and POST applications on 12 April.

AMABL = *Amaranthus blitoides* (prostrate pigweed), GRASS = *Echinochloa* sp. and *Leptochloa* sp.