

Preemergence and Postemergence Herbicide Combinations for Weed Control in Melons

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Abstract

Sandea at 0.05 lb ai/A tank-mixed with Matrix at 0.02 lb ai/A and applied POST following Prefar applied preemergence on cantaloupes gave very good control of pigweeds, lambsquarters, purple nutsedge, and junglerice. Melon injury was just acceptable at 15%. The tank-mix treatment applied POST was similarly effective on the pigweeds, lambsquarters, and nutsedge but grass weed control decreased slightly and melon injury increased when following preemergence herbicide treatments of Dual Magnum, Outlook, or Chateau. Single or multiple POST applications of Sandea alone were not effective against pigweeds.

Introduction

The introduction of halosulfuron (Sandea*) for weed control in melons was primarily targeted for purple nutsedge control. In desert melon production, several grass and broadleaved weeds are significant problems since herbicide registrations are very limited. Sandea has demonstrated variable results on other broadleaved weeds and *Amaranthus* species (pigweeds) have been among those showing good results for some species and lesser efficacy against others. Rimsulfuron (Matrix*) has been combined with Sandea in prior field experiments in efforts to broaden the range of weeds controlled for both herbicides. Preemergence herbicides for grass weeds and small-seeded broadleaved weeds being explored for potential use in new crops include *s*-metolachlor (Dual Magnum*) and dimethenamid-*p* (Outlook*). Flumioxazin (Chateau*), a relatively new herbicide is being investigated for potential new uses in various crops. Clethodim (Select*) was included to evaluate the feasibility of using only postemergence herbicides for a weed control program in melons.

Materials and Methods

A small plot field experiment was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Cantaloupe cv. Mission was planted on 28 April 2003 on every other raised and shaped 40-inch bed such that the single seedlines were 80-inches apart. The melons were furrow irrigated with water running in every other furrow as opposed to every furrow to prevent salt buildup in the seedline of the beds. Each plot consisted of one 40-inch bed measuring 50 ft in length. Herbicide treatments were replicated three times in a randomized complete block design. All herbicide applications were made using a backpack CO₂ sprayer equipped with a hand-held boom consisting of two flat fan 8002 nozzles spaced 20-in apart. Treatments were applied in water at 30 gpa at 45 psi. Preemergence herbicide applications were made one day after planting on 29 April. At the time of applications, the weather was clear with a slight wind, the air temperature was 85EF, and the dry soil surface was 88EF. Furrow irrigation was applied immediately after applications and beds were sub-irrigated to wet the soil surface across the bed top to activate the herbicides. The first postemergence (POST1) herbicide applications were made on 20 May when the cantaloupe was at the 2 leaf stage of growth. Junglerice was at the 4 to 6 leaf stage of growth, prostrate pigweed was at the 4 leaf stage and with several branches, Palmer amaranth was 6 to 8 leaf, common lambsquarters ranged from cotyledon to 6 leaf, and purple nutsedge was 4 to 6 leaf. Weather data was not collected at the time of application; however, the high temperature for the day was

86EF. The second postemergence (POST2) herbicide applications were made on 29 May when the cantaloupe was at the 5 leaf stage of growth. The temperature at the time applications was 100EF, clear sky, and there was a very slight breeze. Junglerice was tillering, prostrate pigweed had several branches measuring 2 to 3 inches, Palmer amaranth was 3 inches tall and showed herbicide injury from the previous POST1 application, common lambsquarters was 6 leaf, and purple nutsedge was 6 leaf and also showed injury. All POST herbicide treatments included an adjuvant, Latron CS-7 at 0.25% v/v. Cantaloupe injury and weed control were rated at various intervals after herbicide applications.

Results and Discussion

A standard preemergence application of Prefar gave excellent junglerice control at better than 97% regardless of a sequential POST application of Sandea alone or Sandea tank-mixed with Matrix. Sandea applied alone after Prefar did not adequately control pigweeds (<85%) compared to better than 94% when Matrix was added as a tank-mix. The tank-mix combination also gave 93 to 95% control of prostrate and tumble pigweeds and Palmer amaranth when following preemergence applications of Dual Magnum, Outlook, and Chateau. Sequential applications of Sandea POST with Select did not give acceptable junglerice control compared to preemergence herbicides, Dual Magnum, Outlook, or Prefar. All Sandea treatments gave very good control of common lambsquarters and purple nutsedge.

Cantaloupe injury was observed for all Sandea treatments. The injury was acceptable at less than 15% except when Dual Magnum, Outlook, and Chateau were applied preemergence and then followed by the tank-mix combination of Sandea plus Matrix.

Sandea alone applied POST was relatively weak in providing better than acceptable control of three pigweeds in the field trial. Purple nutsedge and common lambsquarters control was very good with Sandea applications. Sandea following Prefar controlled common lambsquarters, purple nutsedge, and junglerice. Complete weed control of all weeds present including the three pigweeds, junglerice, purple nutsedge, common lambsquarters was accomplished when Matrix was added to Sandea in a tank-mix. Cantaloupe injury was at a tolerable level at 15% when the near complete weed control was observed. Grass weed control was slightly less with Dual Magnum, Outlook, Chateau, and Select compared to the standard preemergence application of Prefar.

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Table. Preemergence and postemergence herbicide combinations for melon weed control.

Treatment	Rate lb ai/A	Timing	Melon injury %	Weed control					
				ECHCO	AMABL	AMAPA	AMAAL	CHEAL	CYPRO
Untreated check			0	0	0	0	0	0	0
Prefar + Sanda	6.0 + 0.05	PREE POST1	8	97	82	83	82	95	90
Prefar + Sanda + Matrix	6.0 + 0.05 + 0.02	PREE POST1 POST1	15	99	97	94	96	96	93
Dual Magnum + Sanda + Matrix	0.25 + 0.05 + 0.02	PREE POST1 POST1	20	92	95	93	95	93	87
Outlook + Sanda + Matrix	0.25 + 0.05 + 0.02	PREE POST1 POST1	20	85	95	95	95	93	93
Chateau + Sanda + Matrix	0.05 + 0.05 + 0.02	PREE POST1 POST1	18	78	95	95	95	95	92
Sanda + Sanda + Select	0.05 + 0.03 + 0.188	POST1 POST2 POST2	13	60	88	85	83	92	93
Sanda + Sanda + Select	0.05 + 0.05 + 0.188	POST1 POST2 POST2	10	67	85	87	83	95	93
LSD (P=0.05)			5.6	7.8	2.2	5.1	4.3	3.5	5.6

PREE applications on 29 Apr 2003, POST1 applications on 20 May, and POST2 applications on 29 May.

Crop injury and weed control rated on 13 Jun at 2 weeks after last applications.

ECHCO = *Echinochloa colona* (junglerice), AMABL = *Amaranthus blitoides* (prostrate pigweed), AMAPA = *A. palmeri* (Palmer amaranth), AMAAL = *A. albus* (tumble pigweed), CHEAL = *Chenopodium album* (common lambsquarters), CYPRO = *Cyperus rotundus* (purple nutsedge)