New Postemergence Herbicides Evaluation in Cantaloupes

K. Umeda and N. Lund

Abstract

Halosulfuron applied POST with an adjuvant and ammonium sulfate was effective against lambsquarters and nutsedge. Rimsulfuron, flumetsulam, and thifensulfuron were effective against the pigweeds and purslane with minimal activity against lambsquarters. Halosulfuron and rimsulfuron were safe on melons and flumetsulam and thifensulfuron were marginally safe on cantaloupes. The combinations of these products may offer broader spectrum weed control.

Introduction

There are currently no postemergence herbicides available for broadleaved weed control in desert melon production systems. An herbicide screening project was initiated in 1999 and three herbicides were identified as demonstrating satisfactory cantaloupe and watermelon crop safety and efficacy against a limited weed spectrum. Rimsulfuron (Shadeout® and Matrix®) currently registered for use in tomatoes and potatoes demonstrated safety on cantaloupe at up to 0.014 lb AI/A. Flumetsulam (Broadstrike®) is used in soybeans and showed melon safety at 0.015 lb AI/A. Thifensulfuron (Harmony® and Pinnacle®) is registered for use in soybeans and wheat was safe and effective at less than 0.004 lb AI/A. Halosulfuron (Permit®, Manage®, Sandea proposed for melons) is used in corn and turf with recent registrations obtained for squash and cucumber groupings of cucurbits. A development program is in the process of defining the specific use patterns for halosulfuron on melon crops. Halosulfuron is especially effective against purple nutsedge with very good safety in cantaloupes and watermelons. The objectives of this experiment were to 1) evaluate and determine the efficacy and safety of halosulfuron on cantaloupes with the use of adjuvants methylated seed oil combined with ammonium sulfate, 2) confirm the safety of a narrowed rate range for rimsulfuron, flumetsulam, and thifensulfuron, and 3) evaluate the efficacy of a narrowed rate range for rimsulfuron, flumetsulam, and thifensulfuron on a broader spectrum of weeds.

Materials and Methods

A small plot field experiment was established at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Cantaloupe cv. Topmark was planted on 17 April 2000 in a single seedline on every other row of 40-inch shaped beds and furrow irrigated. Plots consisted of a single bed measuring 50 ft long and each treatment was replicated four times. Postemergence herbicide treatments were applied on 09 May. All treatments were applied using a backpack CO_2 sprayer equipped with a hand-held boom consisting of four 8002 flat fan nozzle tips spaced 20 in apart. All treatments were applied in 25 gpa water pressurized to 30 psi. Halosulfuron treatments included methylated seed oil at 1.0% v/v and Embrace (ammonium sulfate) at 5% v/v. Rimsulfuron, flumetsulam, and thifensulfuron treatments included non-ionic surfactant Latron CS-7 0.25% v/v. Cantaloupes were at the 3-leaf stage of growth when treatments were applied. Weeds present were tumble pigweed (*Amaranthus albus*) at 5 to 6 leaf stage, Palmer amaranth (*A. palmeri*) at 5-9 leaf

This is a part of the University of Arizona College of Agriculture 2001 Vegetable Report, index at:
http://ag.arizona.edu/pubs/crops/az1252/

stage, prostrate pigweed (*A. blitoides*) at 6 to 7 leaf stage, narrowleaf lambsquarters (*Chenopodium dessicatum*) at 5 to 8 leaf stage, purslane (*Portulaca oleracea*) at 3 to 6 in diameter, Wright's groundcherry (*Physalis wrightii*) at 1 to 3 in height, and purple nutsedge (*Cyperus rotundus*) at 6 to 8 leaf stage. At the time of applications, the temperature was 92F with only a very slight breeze at less than 3 mph. Crop injury and weed control was evaluated visually following applications at 9 and 43 days after treatment (DAT).

Results and Discussion

At 9 DAT, halosulfuron at 0.032 and 0.047 lb AI/A gave marginal control of narrowleaf lambsquarters and purple nutsedge at 81 to 87% . As the season progressed, complete control of nutsedge was achieved at 43 DAT. Lambsquarters control was marginally acceptable at 76 to 83%. The pigweeds and purslane were not adequately controlled at less than 73%. There was no activity on Wright's groundcherry. The use of adjuvants demonstrated that halosulfuron was equally effective at 0.032 lb AI/A as the higher rate of 0.047 lb AI/A which did not expand the weed control spectrum or improve efficacy against weeds that were controlled. A combination of methylated seed oil and ammonium sulfate was used added and melon crop safety was minimal at less than 5%.

Rimsulfuron at 0.02 lb AI/A was efficacious against the pigweeds and purslane at better than 86% at 9 and 43 DAT. There was slight reduction in groundcherry at 75% but minimal activity against lambsquarters and nutsedge. Rimsulfuron was safe when applied POST on cantaloupes.

Flumetsulam at 0.02 lb AI/A and thifensulfuron at 0.002 lb AI/A were effective against the pigweeds. Flumetsulam was less efficacious against tumble pigweed, lambsquarters, purslane, groundcherry, and nutsedge. Thifensulfuron showed good efficacy against purslane at 0.004 lb AI/A, but little activity against nutsedge. Flumetsulam and thifensulfuron were marginally safe on melons at 9 DAT but the vines vigor improved and crop injury appeared minimal at 43 DAT.

Rimsulfuron, flumetsulam, and thifensulfuron were effective against the pigweeds and purslane with minimal activity against lambsquarters. Halosulfuron was effective against lambsquarters and nutsedge. Combinations of the products may offer a broader spectrum of weed control. Additive or synergistic effects resulting from combinations may have the potential to offer more complete or improved weed control in melons.

Table. New Postemergence Herbicides Evaluation in Cantaloupes

Treatment	Rate	Crop Injury	Weed control at 9 days after treatment (%)						
	(lb AI/A)	(%)	AMAAL	AMAPA	AMABL	CHEPR	POROL	PHYWR	CYPRO
Untreated check		0	0	0	0	0	0	0	0
Halosulfuron	0.032	0	0	0	0	87	0	0	85
Halosulfuron	0.047	2	0	0	0	81	6	0	83
Rimsulfuron	0.01	0	19	28	19	13	13	0	80
Rimsulfuron	0.02	2	81	81	86	13	31	0	0
Flumetsulam	0.01	14	84	61	84	38	75	0	52
Flumetsulam	0.02	15	88	88	88	60	64	0	28
Thifensulfuron	0.002	21	93	94	92	66	74	0	17
Thifensulfuron	0.004	23	93	93	93	58	81	0	38
LSD (p=0.05)		7.1	19.6	29.9	18.8	38.1	29.7	0	55.7

Treatment	Rate	Crop Injury	Weed control at 43 days after treatment (%)						
	(lb AI/A)	(%)	AMAAL	AMAPA	AMABL	CHEPR	POROL	PHYWR	CYPRO
Untreated check		0	0	0	0	0	0	0	0
Halosulfuron	0.032	3	38	43	73	83	13	0	99
Halosulfuron	0.047	5	44	48	73	76	13	0	99
Rimsulfuron	0.01	4	85	69	89	25	48	48	0
Rimsulfuron	0.02	8	86	94	91	0	86	75	0
Flumetsulam	0.01	2	63	71	75	49	30	13	0
Flumetsulam	0.02	3	74	97	85	64	56	30	0
Thifensulfuron	0.002	2	89	96	92	54	64	0	0
Thifensulfuron	0.004	2	96	96	97	0	96	0	0
LSD (p=0.05)		5.6	25.7	33.5	11.1	29.5	38.9	31.8	0

Treatments applied 09 May 2000
Halosulfuron treatments included methylated seed oil at 1.0% v/v and Embrace (ammonium sulfate) at 5% v/v. Latron CS-7 at 0.25% v/v added to all other treatments.
AMAAL = tumble pigweed (*Amaranthus albus*), AMAPA = Palmer amaranth (*A. palmeri*), AMABL = prostrate pigweed (*A. blitoides*), CHEPR = narrowleaf lambsquarters (*Chenopodium dessicatum*), POROL = purslane (*Portulaca oleracea*), PHYWR = Wright's groundcherry (*Physalis wrightii*), CYPRO = purple nutsedge (*Cyperus rotundus*)