

Performance of Postemergence Herbicides for Cantaloupe Weed Control

Kai Umeda and N. Lund

Abstract

Halosulfuron applied alone gave marginal to good control of common lambsquarters and common purslane, respectively, but did not provide control of the pigweeds. Acceptable control of 85% of the limited population of purple nutsedge was observed. Rimsulfuron applied alone gave good control of the pigweeds, lambsquarters, purslane, and marginal control of nutsedge. Weed control was effective until the late season evaluation at 9 WAT. The combination of halosulfuron and rimsulfuron gave similar results of the rimsulfuron applied alone, however, nutsedge control was not evaluated due to insufficient populations. Halosulfuron treated melons showed the least injury among all of the herbicide treatments applied alone. Rimsulfuron caused marginally unacceptable injury at 18% compared to flumetsulam, thifensulfuron, MKH-6561, and flufenacet which caused unacceptable injury ranging from 20 to 68%.

Introduction

Preliminary herbicide screening tests determined that few new products demonstrated effective weed control with some degree of melon crop safety. Halosulfuron is currently in the development process to eventually gain registration for use in melons. It has demonstrated efficacy against purple nutsedge when applied postemergence (POST), however, halosulfuron has also demonstrated limited activity against other common weeds that occur in melons such as the pigweeds. The objectives of this study were to evaluate 1) in secondary field testing, the products that initially indicated potential safety and efficacy in the preliminary testing, and 2) consider enhancing and broadening the spectrum of halosulfuron by combining herbicides applied as a tank-mix.

Materials and Methods

A small plot field experiment was conducted at the University of Arizona Maricopa Agricultural Center, Maricopa, AZ. Cantaloupe cv. Topmark was planted in a single row into every third 40 inch raised bed on 10 April 2001. Individual plots consisted of one row measuring 30 ft long. Each herbicide treatment was replicated four times. The treatments were applied using a CO₂ backpack sprayer equipped with a hand-held boom consisting of four 8004 flat fan nozzle tips spaced 20 inches apart. The sprays were pressurized to 40 psi and all treatments included Latron CS-7 at 0.25% v/v. The POST applications were made on 23 May when the cantaloupe plants ranged in size from 4 to 7 true leaves. The weeds present were common purslane (*Portulaca oleracea*) at 6 to 12 inch stem length, common lambsquarters (*Chenopodium album*) at 4 inch height, prostrate pigweed (*Amaranthus blitoides*) at 4 to 6 inch stem length, Palmer amaranth (*A. palmeri*) at 4 to 6 inch height, and grasses (*Leptochloa* spp) at 4 to 8 inch height. The weather at the time of applications was clear sky with minimal wind at 5 mph and air temperature at 92°F. Visual observations for weed control efficacy and crop safety were made at intervals after application.

Results and Discussion

On 19 June, at approximately 4 weeks after treatment (WAT), halosulfuron treated melons showed the least injury among all of the herbicide treatments applied alone (Table). Rimsulfuron caused marginally unacceptable injury at 18% compared to flumetsulam, thifensulfuron, MKH-6561, and flufenacet which caused unacceptable injury ranging from 20 to 68%. The combination of halosulfuron and rimsulfuron caused an acceptable degree of melon injury that was intermediate between each herbicide applied alone.

Most of the treatments alone or in combinations did not adequately control grass weeds at less than 84%. Halosulfuron applied alone gave marginal to good control of common lambsquarters and common purslane, respectively, but did not provide control of the pigweeds. Acceptable control of the limited population of purple nutsedge was observed. Rimsulfuron applied alone gave good control of the pigweeds, lambsquarters, purslane, and marginal control of nutsedge. Weed control was effective until the late season evaluation at 9 WAT. The combination of halosulfuron and rimsulfuron gave similar results of the rimsulfuron applied alone and nutsedge control was not evaluated due to insufficient populations. Conclusive results regarding the advantage of combining the two products to improve and broaden the weed spectrum was not obtained.

Thifensulfuron gave excellent control of the all of the broadleaved weeds while severely injuring the melons. MKH-6561 gave good control of the pigweeds and lambsquarters but was less effective against purslane and nutsedge. Flufenacet gave acceptable control of the more difficult to control tumble pigweed and purslane while causing marginally unacceptable crop injury. The combination of halosulfuron with flufenacet and thifensulfuron caused severe melon injury while giving acceptable weed control.

References

- Umeda, K., D. MacNeil, N. Lund, and D. Roberts. 2000. Herbicide screen for melons. In D.N. Byrne and P. Baciewicz, (eds.), 2000 Vegetable Report, College of Agriculture and Life Sciences, The University of Arizona, Tucson, AZ. AZ1177, August 2000.
- Umeda, K. and N. Lund. 2001. New postemergence herbicides evaluation in cantaloupes. In D.N. Byrne and P. Baciewicz, (eds.), 2001 Vegetable Report, College of Agriculture and Life Sciences, The University of Arizona, Tucson, AZ. AZ1252, August 2001.

Table. Postemergence herbicide performance in cantaloupe.

Treatment	Rate (lb AI/A)	Melon Injury		Weed Control								
		19 Jun	Grasses	AMABL		AMAAL		CHEAL		POROL		CYPRO
		%		19 Jun	24 Jul	19 Jun	24 Jul	19 Jun	24 Jul	19 Jun	24 Jul	24 Jul
				%								
Untreated check		0	0	0	0	0	0	0	0	0	0	0
Halosulfuron	0.047	5	20	50	77	45	77	84	80	88	93	85
Rimsulfuron	0.02	18	82	95	95	95	95	82	85	80	90	83
Flumetsulam	0.01	36	39	73	85	83	85	75	82	89	90	0
Thifensulfuron	0.002	47	42	95	95	95	95	93	88	93	96	0
Halosulfuron + Rimsulfuron	0.047 + 0.02	11	84	91	93	94	93	89	85	91	95	
Halosulfuron + Flufenacet	0.047 + 0.01	33	60	76	85	86	88	89	59	89	95	83
Halosulfuron + Thifensulfuron	0.047 + 0.002	47	82	95	98	95	98	95	95	95	98	
MKH-6561	0.008	68	80	95	93	95	93	87	88	77	73	73
Flufenacet	0.5	20	80	69	77	88	85	73	83	85	90	0
		17.1	38.3	18.5	8.2	17.1	14.3	16.4	31.1	11.4	7.1	5.8

Treatments applied 23 May 2001.

All treatments included Latron CS-7 at 0.25% v/v.

Grasses included *E. crus-galli* and *Leptochloa* spp., AMABL = *Amaranthus blitoides* (prostrate pigweed),

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

POROL = *Portulaca oleracea* (purslane), CYPRO = *Cyperus rotundus* (purple nutsedge)