Evaluation of Postemergence Herbicides for Melon Weed Control

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Abstract

Bentazon (Basagran®) at 0.5 to 2.0 lb a.i./A, halosulfuron (Permit®) at 0.025 to 0.10 lb a.i./A, and pyridate (Lentagran®) at 0.25 to 1.5 lb a.i./A were applied postemergence on cantaloupe and watermelon. Bentazon was marginally safe on cantaloupes and controlled purslane and pigweeds. Morningglory and Wright's groundcherry were not effectively controlled by bentazon. Bentazon appeared to be less injurious to watermelons relative to cantaloupes. Halosulfuron was safe on both cantaloupes and watermelons (<15% injury). Halosulfuron at greater than 0.05 lb/A was effective in controlling only Hyssop spurge and London rocket. In one test, halosulfuron gave acceptable control (85%) of morningglory. Purslane and groundcherry were not controlled by halosulfuron. Pyridate was not safe on cantaloupes causing severe crop stand reduction. Pyridate was safer on watermelons and caused marginally acceptable injury, however, weed control was not effective against groundcherry, spurge or London rocket. Pyridate appeared to give acceptable control of morningglory in one test.

Introduction

Melon production in the desert southwest begins with planting the spring crop in January to March and ends with harvesting the fall crop in November. Spring cantaloupes and watermelons may be planted by direct seeding or transplanting under furrow irrigation with or without plastic mulch or irrigated with subsurface drip systems. A banded application of preemergence herbicide and several cultivations provide marginal weed control until the vines begin to spread on typical 80-inch beds. Fall melons may be directly seeded into pre-irrigated mulched beds or sprinkler irrigation may be used to germinate the crop. Following emergence of the crop in the early spring or early fall, hand-hoeing is the only effective method to eliminate hard to control weeds in the seed row. Several field tests were conducted in Central Arizona to evaluate postemergence herbicides for potential use in melon weed control.

Materials and Methods

A total of five small plot field tests were conducted in cantaloupes (3) and watermelons (2) at four different locations - the University of Arizona Maricopa Agricultural Center, Maricopa, AZ and commercial grower fields in Tolleson, Goodyear, and Scottsdale, AZ. Plots were single rows of melons planted on 80-inch beds and treatments were replicated three or four times. All postemergence treatments were applied with a CO_2 backpack sprayer equipped with a hand-held boom with one or two flat fan nozzle tips directed over the seed row. All treatments were applied in water delivered at a range of 25 to 38 gpa at 45 psi. An adjuvant, Agridex was added to all treatments at 1.0% v/v. At Maricopa on 06 May 1996, cantaloupes were at the 2-leaf stage of growth while pigweeds (*Amaranthus* sp.) and purslane (*Portulaca oleracea*) were at the 3- to 4-leaf growth stage. At Goodyear on 22 Apr 1996 at about one week after removal of plastic tunnel covering, cantaloupes were at the 6-leaf stage and puncturevine (*Tribulus terrestris*) and purslane were dominant

weeds having runners measuring 6-inches. At Scottsdale on 24 Jul 1996, cantaloupes were at the cotyledon to 1-leaf growth stage and morninglories (*Ipomoea* sp.) were at the cotyledon to 2-leaf stage. The watermelon tests at Tolleson were initiated on 28 Mar and 01 Apr 1996 within one week after the plastic tunnel covering was removed. The watermelons ranged in size from 4- to 8-leaves with a runner initiating. The weeds present included groundcherry (*Physalis wrightii*), spurge (*Euphorbia hyssopifolia*), London rocket (*Sisymbrium irio*), and sowthistle (*Sonchus oleracea*). Weed control and crop injury were evaluated with visual observations at intervals after treatments were applied.

Results and Discussion

Bentazon at 0.50 lb AI/A caused marginally acceptable injury on cantaloupes (Table 1). Ratings at 12 days after treatment (DAT) on watermelons showed that bentazon was relatively safe at as high as 2.0 lb AI/A (Table 2). Bentazon at 0.50 lb AI/A controlled purslane and pigweeds but higher rates were required to control morninglory and groundcherry (Table 5). Spurge, sowthistle, puncturevine, and London rocket were not controlled by bentazon.

Halosulfuron at all rates tested caused less than 15% injury on both cantaloupes and watermelons (Table 3). Halosulfuron only controlled London rocket and spurge. In one test, morningglory was marginally controlle.

Pyridate was marginally safe on watermelons at as high as 1.5 lb AI/A but cantaloupes were not tolerant and crop stand was severely reduced (Table 4). Pyridate did not provide adequate control of several weeds and only gave acceptable control of morningglory in one test.

In limited testing, bentazon was safer on watermelons than cantaloupes. Purslane and pigweeds were effectively controlled but higher rates were required to give marginal control of morningglory and groundcherry. Halosulfuron was safe on both cantaloupes and watermelons. Control with halosulfuron was observed on London rocket, spurge, and morningglory. Pyridate marginally injured watermelons and caused stand reduction on cantaloupes while only controlling only morningglory in one test.

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Table 1. Bentazon Injury on Cantaloupe

Rate (lb AI/A)	Goodyear 7 DAT	Goodyear 21 DAT	Scottsdale 7DAT	Maricopa 14DAT
	%			
Untreated	0	0	0	0
0.50	17	12	-	16
0.75	-	-	-	25
1.0	23	15	27	19

Table 2. Bentazon Injury on Watermelons

Rate (lb AI/A)	Tolleson A 12 DAT	Tolleson A 21 DAT	Tolleson B 17 DAT
	%		
Untreated	0	0	0
0.50	0	3.3	-
0.75	1.7	12	-
1.0	3.3	12	18
1.5	3.3	13	-
2.0	6.7	12	-

Table 3. Halosulfuron Injury on Melons

Rate (lb AI/A)	Watermelon Tolleson 17 DAT	Cantaloupe Goodyear 7 DAT	Cantaloupe Goodyear 21 DAT	Cantaloupe Scottsdale 7 DAT
	%			
Untreated	0	0	0	0
0.025	10	0	7	8
0.05	10	2	8	15
0.075	12	-	-	-
0.10	13	8	13	12

Table 4. Pyridate Injury on Melons

Rate (lb AI/A)	Watermelon Tolleson 17 DAT	Cantaloupe Scottsdale 7 DAT
	%	
Untreated	0	0
0.25	5	-
0.50	12	90
1.0	15	94
1.5	18	99

Table 5. Herbicide Efficacy Against Melon Weeds

Bentazon Rates for Weed Control Efficacy in Melons

	lb AI/A
POROL	0.50
AMARA	0.50
IPOHE	1.0
PHYWR	2.0
EPHHS	>2.0
SONOL	>2.0
TRBTE	>2.0
SSYIR	>2.0

Halosulfuron Rates for Weed Control Efficacy in Melons

	lb AI/A
SSYIR	0.05
IPOHE	0.05
EPHHS	0.075
PHYWR	>0.10
POROL	>0.10
TRBTE	>0.10
CYPRO	>0.10
SONOL	>0.10

Pyridate Rates for Weed Control Efficacy in Melons

	lb AI/A
IPOHE	0.50
EPHHS	>3.0
PHYWR	>3.0
SONOL	>3.0
SSYIR	>3.0

POROL = common purslane (*Portulaca oleracea*)
AMARA = pigweed species (*Amaranthus sp.*)
IPOHE = ivyleaf morningglory (*Ipomoea hederacea*)
PHYWR = Wright's groundcherry (*Physalis wrightii*)
EPHHS = hyssop spurge (*Euphorbia hyssopifolia*)
SONOL = sowthistle (*Sonchus oleracea*)
TRBTE = puncturevine (*Tribulus terrestris*)
SSYIR = London rocket (*Sisymbrium irio*)
CYPRO = purple nutsedge (*Cyperus rotundus*)