Weed Control and Fertility

Postemergence Control of Dudaim Melon in Cotton

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Summary

Dudaim melon seedlings were effectively controlled by an early postemergence application of Cotoran applied over the top of DPL 70 seedling cotton. Some stunting of cotton occurred, but recovery was rapid. Directed postemergence treatments of Cotoran and several other postemergence herbicides in combination with MSMA, on cotton 6-11 inches tall, also gave indications of dudaim seedling control and cotton selectivity.

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The dudaim melon (Cucumis melo L. var. dudaim Naudin) has been recognized as a dangerous weed in California for more than ten years. Common names are Queen Anne's Pocket Melon and Pomegranate Melon. It was discovered in the Yuma Valley in 1982. By 1983, 300 acres of cotton were infested. Dudaim is an annual, reproducing from seeds and is in the cucurbit family with vining foliage resembling cantaloupe and cucumbers. The fruit of dudaim is oblong, approximately 1 1/2" by 1 inch in size, mottled, green striped when immature, turning bright yellow at maturity with smooth skin.

An eradication program instituted by the Arizona Commission of Agriculture and Horticulture prompted selective chemical control studies in cotton. A herbicide trial was established on DPL 70 emerged cotton & weedy dudaim melons in the 2 true leaf stage on 4/12/84. Plot size was 80' by 4-40" cotton rows with 4 replications. A knapsacks sprayer using 40 gallons of water per acre with 40 psi inch of pressure was used at 3 mph. A 10" band using 8002 nozzles was sprayed over the top of the cotton. The number of dudaim melons per plot was counted on 5/4/84. Table 1 summarizes the treatments, average number of melons, % control, and % stunt. In addition to an untreated check a hand-hoed check was included. In the hand-hoed check all of the melons observed in the 10" band straddling the planted cotton row were removed. The hand-hoed check required the equivalent of 1.4 hrs/acre to remove weeds. It is interesting to note that all of the herbicide treatments had fewer melons than the hand-hoed check. The small dudaims were very difficult to identify in the cotton seed row. All of the herbicide treatments caused some temporary cotton stunting. Cotoran and Cotoran + DSMA controlled dudaim most effectively, but caused the most stunting and leaf discoloration. No yield data was obtained, but the cotton had recovered from the stunting by 5/14/84. Cotoran was the best candidate herbicide to control dudaims in this trial.

A second application of herbicide was made to the area on 5/14/84. Plots previously treated were split into subplots with four replications. Table 2 displays plots and subplots. The herbicide (Premerge 3) was applied to an area not previously treated. Most of the candidate herbicides were applied as directed spray at this time. Only Cotoran was applied as an over-the-top

treatment. All treatments had surfactant added. All but the over-the-top Cotoran included MSMA at the rate of 2 lbs/acre. The directed spray was applied using 50 gallons of water per acre on a 10" band on each side of the seed row. Approximately the bottom 1/3 of the 6"-11" cotton was sprayed. This gave good coverage of small dudaims in the seed row.

Evaluations were made on 5/23/84, 6/11/84 and 8/7/84. Results were not consistent enough to draw firm conclusions. Some observations were made. All treatments temporarily stunted cotton. Leaf symptoms of chlorosis were most severe with over-the-top Cotoran. By August 7 Cotoran, Bladex and Lorox directed sprays were most successful in preventing vining melons. Previous research at the Cotton Research Center, Phoenix, indicated no yield reduction occurred from these herbicides applied in a similar manner. (Arle, Hamilton, 1976, Weed Science 24:166-169) Morning glory, also present in the test, was not effectively controlled by Cotoran. Cotoran, Bladex and Lorox all appear to show potential for controlling the dudaim melon. Cotoran was tested by more application methods because it can be applied over the top of cotton and was efficacious for dudaim melon control -- Cotoran is the most promising treatment. Dudaim melon can be quite effectively controlled by using multiple cultivations at proper times, coupled with timely use of some of the herbicides tested. Additional trials to test rates of herbicides vs. cotton stunting would be in order.

Table 1. Postemergence Dudaim Melon Control in Cotton - Applied 4/12/84

Treatment or Herbicide	Lb/A A.I.	Surfactant %	5/4/84 Average # Dudaim Plants /Plot 1/	5/4/84 Average % Control	5/4/84 Average % Cotton Stunt
1 DSMA	2	.25	20 a	67	2
2 MSMA	2	.25	20 a	67	11
3 DSMA	4	.25	27 ab	56	10
4 Cotoran	2	.50	1 a	98	20
5 Cotoran+ DSMA	2 2	.50	4 a	93	16
6 Check Hand Hoed			47 ab	24	0
7 Check			62 b		0

1/ Numbers followed by the same letter are not significantly different at the .05 level of probability.

Table 2. Dudaim Control in Cotton with Postemergence Herbicides Applied 5/14/84

				------5/23/84------		---6/11/84----	8/7/84
Main Treatment 4/12/84	Subplot Treatment 5/14	#S/ Acre	App. Method 1/	Leaf Burn Cotton Av. %	Dudaim Seed-ling Control %	Old Dudaim Control %	Cotton % Stunt	# Vining Dudaim /Plot Avg.
DSMA	A-Bladex	.60	DP	29	98	25	10	1.50
"	B-Goal	.50	DP	24	75	33	10	3.25
MSMA	C-Karmex	.40	DP	40	100	50	15	.75
"	D-Caparol	.60	DP	43	100	58	16	.50
DSMA	E-Cotoran	2.00	OP	83	100	48	21	2.00
"	F-Cotoran	2.00	DP	38	100	38	8	.00
Cotoran	G-Check			1	85	88	6	1.00
"	H-Cotoran	2.00	DP	14	100	98	9	.00
Cotoran+	I-Bladex	.60	DP	33	100	95	6	.00
DSMA "	J-Karmex	.40	DP	48	100	100	15	.75
Check	K-Cotoran	2.00	OP	78	100	85	24	1.00
Hoed"	L-Cotoran	2.00	DP	16	100	85	6	.00
Check	M-Lorox	.75	DP	13	100	50	1	.00
"	N-Check			0	0	0	0	2.00
None	Premerge	2.25	DP	16	100	0	16	.50

1/ DP = Directed Postemergence Spray
OP = Over-the-top Postemergence Spray