

# VOLUNTEER POTATO CONTROL IN ONIONS

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## Introduction

Many producers raise onions in rotation with potatoes. Volunteer potatoes are extremely competitive with onions and are not effectively controlled with herbicides currently registered for use on onions. Volunteer potatoes can serve as an inoculum source for late blight, verticillium wilt, viruses, and nematodes. Starane, a new herbicide registered for volunteer-potato control in wheat and corn, may effectively control volunteer potatoes in onions. A trial was conducted to evaluate Starane alone and in combinations with other herbicides for volunteer-potato control and onion tolerance.

## Procedures

A trial was established at the Malheur Experiment Station to evaluate Starane, Buctril, Goal, and Nortron for volunteer-potato control in onions. Potatoes were planted four days before onion seeding. Shepody potato tubers were cut and planted 4-in deep in the center two rows of each plot, with a spacing of one seed every 3 ft. Onions (cv. Viper, Asgrow) were planted at a 4-in spacing in double-rows on 22-in beds April 13. Plots were 4-rows wide by 30-ft long. Lorsban was applied on a 6-in band over each row at 3.7 oz/1000 ft of row. Onions were sidedressed with 166 lb N/acre as Urea on June 9.

Herbicide treatments were applied with a CO<sub>2</sub>-pressurized backpack sprayer calibrated to deliver 20 gpa at 30 psi. Herbicides were applied on May 18, May 28, and June 24. At the first application, onions had 1-2 true leaves. At the second application onions had 2 true leaves, and the last application was to 5-leaf onions. A severe hail storm on July 4 defoliated all the onions. Insecticides and fungicides were applied for thrip and powdery mildew control. Herbicide applications began late because of inclement weather and the trial was not taken to yield because of failure to control common lambsquarters. Prior to destroying the trial, potato tubers were harvested from three plants in each plot on July 29 to determine the effect of the herbicide treatments on tuber production. Tubers were refrigerated and evaluated for sprouting March 2, 1999.

## Results and Discussion

Following the first herbicide application, onion injury was greatest with treatments containing Goal and the higher rates of Starane (0.25 lb ai/acre)(Table 1). Goal continued cause some of the greatest onion injury especially within a few days after treatments were applied. Applying Starane (0.5 lb ai/acre) in June resulted in 58 percent injury to the onions. Treatments containing Goal were the fastest acting on volunteer potatoes burning back the foliage, but the foliage rapidly regrew following each treatment. Starane treatments caused stunting and yellowing of potatoes and symptoms were more persistent through the entire season. Starane applied early and as a sequential treatment reduced tuber yield, tuber number, and the average weight of each tuber. Buctril plus Goal also reduced tuber yield, number, and weight per tuber. Later applications of Starane at the lower rates (0.125 and 0.25 lb ai/acre) had little impact on volunteer potato tuber production. However, at the highest rate (0.5 lb ai/acre), Starane at the May 28 and June 24 application timings reduced the average weight of the potato tubers.

Evaluations of tuber sprouting revealed that some of the Starane treatments that reduced tuber number also reduced the percentage of those tubers that produced sprouts (Table 2). Starane treatments applied June 24 had minimal impact on tuber number or size, but they eliminated sprouting in the tubers that were produced.

## Conclusions

Onions appear to be more tolerant to the earlier applications of Starane and volunteer potato control also appears to be greatest when Starane is applied early in the season. Although Starane did not eliminate potato plants completely, it has the potential to reduce volunteer potato competition with onions and also to reduce tuber production. The small tubers resulting from Starane treatment would be less likely to survive and result in a volunteer potato problem in subsequent crops. Also the ability of tubers to produce sprouts may be inhibited by Starane applications.

Table 1. Onion injury and volunteer potato control with postemergence herbicide treatments, Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Treatment	Rate	Timing†	Onion injury				Volunteer potato control				Tuber production per plant‡		
			5-28	6-8	6-23	7-1	5-28	6-8	6-23	7-1	Weight	Number	Weight/tuber
	lb ai/acre		-----%				-----%				g	no.	g
Starane	0.063	1,2,3	15	13	8	20	46	59	58	51	70	4	21
Starane	0.125	1,2,3	15	16	10	23	51	65	66	55	38	2	26
Starane + Buctril	0.25 + 0.15	1	23	16	13	20	51	70	65	63	8	1	5
Buctril	0.15	1,2,3	8	3	0	8	36	43	38	39	324	7	45
Buctril + Goal	0.15 + 0.05	1,2,3	21	10	0	38	84	85	58	63	46	4	13
Buctril + Nortron	0.15 + 0.25	1,2,3	5	5	0	14	40	44	39	45	248	6	45
Buctril + Goal + Nortron	0.15 + 0.05 + 0.25	1,2,3	19	19	1	34	84	84	54	64	79	6	14
Starane + Buctril	0.125 + 0.15	1,2,3	14	13	4	35	55	68	56	58	32	6	5
Starane + Goal	0.125 + 0.05	1,2,3	18	14	6	36	54	76	59	68	19	2	9
Starane + Nortron	0.125 + 0.25	1,2,3	16	20	13	21	41	61	71	66	25	2	15
Starane	0.125	2	8	6	1	11	40	45	42	39	293	7	47
Starane	0.25	2	9	10	0	9	39	48	50	44	238	6	42
Starane	0.5	2	9	8	2	8	36	48	63	55	89	6	17
Starane	0.25	3	9	5	0	44	44	43	39	54	262	8	34
Starane	0.5	3	9	5	0	58	38	41	36	58	217	7	30
Untreated	-	-	0	0	0	0	0	0	0	0	298	7	42
LSD (0.05)			6	7	4	9	7	6	10	9	77	3	11

†Treatments were applied at the first, second, or third application timing or all three. For treatments applied only one time, Buctril (0.15 lb ai/acre) was applied at the other two application times. Treatments were applied on May 18 (1), May 28 (2), and June 24 (3).

‡Tubers were harvested from three plants in each plot on July 29.

Table 2. Volunteer potato sprouting after cold storage in response to postemergence herbicide treatments, Malheur Experiment Station, Oregon State University, Ontario, OR, 1998.

Treatment	Rate lb ai/acre	Timing <sup>†</sup>	Tuber per plant <sup>‡</sup>		
			Total -----No.-----	Sprouting	Sprouting %
Starane	0.063	1,2,3	4	0	0
Starane	0.125	1,2,3	2	0	0
Starane + Buctril	0.25 + 0.15	1	1	0	4
Buctril	0.15	1,2,3	8	5	57
Buctril + Goal	0.15 + 0.05	1,2,3	4	1	34
Buctril + Nortron	0.15 + 0.25	1,2,3	7	4	59
Buctril + Goal + Nortron	0.15 + 0.05 + 0.25	1,2,3	5	2	37
Starane + Buctril	0.125 + 0.15	1,2,3	6	1	9
Starane + Goal	0.125 + 0.05	1,2,3	2	1	26
Starane + Nortron	0.125 + 0.25	1,2,3	2	0	8
Starane	0.125	2	6	4	54
Starane	0.25	2	6	3	60
Starane	0.5	2	5	1	33
Starane	0.25	3	8	0	0
Starane	0.5	3	8	0	0
Untreated	-	-	8	4	54
LSD (0.05)			3	2	29

<sup>†</sup>Treatments were applied at the first, second, or third application timing or all three. For treatments applied only one time, Buctril (0.15 lb ai/acre) was applied at the other two application times. Treatments were applied on May 18 (1), May 28 (2), and June 24 (3).

<sup>‡</sup>Tubers were evaluated for sprouting March 2, 1999.