Broadleaf Weed Control in Onion

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An experiment was conducted at the Carrington Research Extension Center to evaluate broadleaf weed control in onion. 'Teton' onion was seeded May 2, 2003, in 3-inch paired rows on 18-inch centers at 167,000 seeds/A. The experimental design was a randomized complete block design with four replicates. Pre-emergence herbicide treatments PRE1 and PRE2 were applied May 7 (53° F air, 45° F soil, 76 % RH, 5 mph wind, and 0% clouds) and May 14 (47° F air, 47° F soil, 93 % RH, 0 mph wind, and 0% clouds), respectively, through XR 8003 flat fan nozzles delivering 20 gpa at 22 psi. Post-emergence herbicide treatments to flag leaf (POST 0) and 3-leaf (POST 3) onion were applied May 27 (59° F air, 64° F soil, 81% RH, 10 mph wind, and 100% clouds) and June 25 (55° F air, 59° F soil, 89% RH, 11 mph wind, and 40% clouds), respectively, through XR 8003 flat fan nozzles delivering 20 gpa at 22 psi. Bromoxynil and oxyfluorfen were applied to 1-leaf (POST 1) and 2-leaf (POST 2 and 2a) onion June 11 (64° F air, 61° F soil, 80% RH, 11 mph wind, and 80% clouds), June 18 (69° F air, 67° F soil, 48% RH, 7 mph wind, and 0% clouds), and June 19 (65° F air, 68° F soil, 62% RH, 8 mph wind, and 20% clouds) through XR 11006 flat fan nozzles delivering 40 gpa at 30 psi. Due to excellent weed control in the treated plots, a second application of bromoxynil + oxyfluorfen 0.375 + 0.125 lb/A was not applied at the 5-leaf stage. Best management practices were used for fertility and disease, insect, and grass control. All herbicide treatments were applied with a CO_2 hand-boom sprayer. The onions were harvested September 25.

When evaluated July 30, a PRE 1 application of Nortron at 48 oz/A was the only herbicide treatment that did not provided greater than 90 percent redroot pigweed and common lambsquarters control (Table 1). PRE 1 applications of Valor at 1.5 and 3 oz/A and Nortron at 96 oz/A caused significant crop injury and a reduction in the number of harvested bulbs and yield (Tables 1 and 2). Buctril applied PRE 2 at 16 oz/A and Buctril + Goal applied POST 1 at 24 + 0.8 oz/A caused crop injury but there was no reduction in yield. An application of Buctril + Goal POST 1 at 12 + 4 oz/A did not cause any significant crop injury. There was no benefit of applying Buctril and Goal separately (POST 2 and 2a) when compared to a tank mix application POST 2 (Trt No. 10 and 11 vs. 14).

Prowl POST 1 and 3 at 24 oz/A / Buctril + Goal POST 2 at 24 + 8 oz/A, June 24.

Untreated check, June 24.

Table 1. Onion tolerance and weed control.

No.	Treatment	Timing	Rate	Onion Crop Injury 6/16	Onion Stand Reduction 7/30	Onion Growth Reduction 7/30	Weed control Redroot 6/16	Weed control Redroot 7/30	Weed control Pigweed Common Lambsquarters 6/16	Weed control Pigweed Common Lambsquarters 7/30
			oz/A	%						
1	Dacthal	PRE 1	160	0	0	0	95	99	94	100
	Buctril+Goal	POST 2	24+8							
	Prowl	POST 3	24							
2	Valor	PRE 1	1.5	24	8	4	98	99	98	95
3	Valor	PRE 1	3	38	34	4	100	97	100	98
4	Prowl	PRE 1	24	3	0	0	93	91	86	83
	Valor	POST 2	1.5							
5	Nortron	PRE 1	48	5	0	5	93	59	73	33
6	Nortron	PRE 1	96	14	31	18	98	96	92	92
7	Nortron	PRE 1 & POST 3	48 & 64	4	8	4	93	100	73	100
	Buctril+Goal	POST 2	24+8							
8	Prowl	POST 0 & 3	24	3	0	0	100	100	96	100
	Buctril+Goal	POST 1	12+4							
9	Prowl	POST 0 & 3	24	3	0	0	100	99	99	100
	Buctril / Goal	POST 2 / 2a	24 / 8							
10	Prowl	POST 0 & 3	24	1	5	5	100	100	95	100
	Goal / Buctril	POST 2 / 2a	8 / 24							
11	Buctril	PRE 2	16	21	0	0	100	96	100	100
	Prowl	POST 0 & 3	16 & 24							
	Buctril+Goal	POST 2	24+8							
12	Prowl	POST 0 & 3	24	20	0	0	100	100	100	100
	Buctril+Goal	POST 1	24+8							
13	Prowl	POST 0 & 3	24	1	0	0	99	100	95	100
	Buctril+Goal	POST 2	24+8							
14	Prowl	POST 0	24	1	0	0	99	100	97	100
	Buctril+Goal	POST 2	24+8							
	Dual Magnum	POST 3	16							
15	Prowl	POST 0	24	3	0	0	100	99	98	100
	Buctril+Goal	POST 2	24+8							
	Outlook	POST 3	16							
16	Prowl	POST 0	24	3	0	0	100	100	98	100
	Buctril+Goal	POST 2	24+8							
	Authority	POST 3	3							
17	Prowl	POST 0	24	4	0	0	99	92	96	95
	Authority	POST 3	3							
18	Handweed check			0	0	0	100	100	100	100
19	Untreated check			0	8	28	0	0	0	0
	LSD (0.05)			6	15	11	6	12	7	9

Table 2. Onion yield.

Trt no.	Treatment	Timing	Rate	Days to 1/2 down	Yield <2.25"	2.25-3"	3-4"	4-4.5"	>4.5"	Total	Culls	# of bulbs
			oz/A	days	cwt/acre							1000's/A
1	Dacthal	PRE 1	160	128	2.5	93.2	686.8	76.2	10.7	869.4	13.4	122.5
	Buctril+Goal	POST 2	24+8									
	Prowl	POST 3	24									
2	Valor	PRE 1	1.5	134	2.7	48.3	374.8	139.3	19.1	584.2	9.5	76.2
3	Valor	PRE 1	3	-	0.0	17.2	243.7	99.8	29.0	389.8	24.7	46.3
4	Prowl	PRE 1	24	130	4.8	82.4	603.5	47.4	13.6	751.6	7.0	107.1
	Valor	POST 2	1.5									
5	Nortron	PRE 1	48	133	25.9	144.7	232.3	5.4	0.0	408.4	7.7	93.9
6	Nortron	PRE 1	96	-	10.4	39.0	267.7	81.4	5.9	404.5	39.7	75.3
7	Nortron	PRE 1 & POST 3	48 & 64	128	10.0	73.3	552.0	56.9	7.9	700.1	9.5	104.4
	Buctril+Goal	POST 2	24+8									
8	Prowl	POST 0 & 3	24	126	4.1	66.2	768.0	42.9	6.4	887.5	8.8	120.7
	Buctril+Goal	POST 1	12+4									
9	Prowl	POST 0 & 3	24	126	4.9	43.2	769.6	99.2	0.0	916.9	6.4	99.8
	Buctril / Goal	POST 2 / 2a	24 / 8									
10	Prowl	POST 0 & 3	24	128	5.9	64.2	692.9	72.8	22.2	858.0	14.1	114.3
	Goal / Buctril	POST 2 / 2a	8 / 24									
11	Buctril	PRE 2	16	129	2.9	73.1	726.9	77.6	14.3	894.8	1.4	119.8
	Prowl	POST 0 & 3	16 & 24									
	Buctril+Goal	POST 2	24+8									
12	Prowl	POST 0 & 3	24	127	6.8	86.0	675.9	51.7	6.1	826.5	4.5	118.0
	Buctril+Goal	POST 1	24+8									
13	Prowl	POST 0 & 3	24	128	2.7	80.5	768.4	33.1	0.0	884.8	10.2	126.1
	Buctril+Goal	POST 2	24+8									
14	Prowl	POST 0	24	126	0.7	102.3	645.5	70.3	0.0	818.8	12.0	114.4
	Buctril+Goal	POST 2	24+8									
	Dual Magnum	POST 3	16									
15	Prowl	POST 0	24	128	4.8	80.3	731.0	37.7	0.0	853.7	3.4	119.3
	Buctril+Goal	POST 2	24+8									
	Outlook	POST 3	16									
16	Prowl	POST 0	24	127	5.0	70.8	705.1	41.1	0.0	822.0	14.2	119.3
	Buctril+Goal	POST 2	24+8									
	Authority	POST 3	3									
17	Prowl	POST 0	24	128	8.2	132.3	556.8	42.4	0.0	739.6	3.2	118.9
	Authority	POST 3	3									
18	Handweed check			127	3.2	69.7	588.3	69.9	20.0	751.0	11.6	106.6
19	Untreated check			126	25.6	155.0	94.4	0.0	0.0	275.0	2.5	77.1
	LSD (0.05)			4	8.0	66.6	155.6	61.7	22.4	144.6	20.4	23.8