2008 Dry Bulb Onion Weed Control Studies

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Summary: Lambsquarter was the dominant weed in Trial No. 1. Nortron as a preemergence material did not effectively control this weed. Also, preemergence applications of Nortron more than 16 oz/A reduced onion yield. Preemergence applications of low rates of Goal Tender were safe at 0.5 to 1.0 oz/A, however better weed control was obtained at the 1.0 to 2.0 oz/A rates. In Trial No. 2 we evaluated rates and timing of Outlook for nutsedge control. Applications of Outlook at either the 1st or 2nd true leaf stage in combination with the acid fertilizer 7-7-0-7, as a nutsedge burn down material, effectively controlled nutsedge for two months and allowed the onions time to outgrow the nutsedge.

Methods: ***Trial No. 1:*** Trial was conducted in cooperation with Marvin Borzini, grower and Bob Riddle, with Integrated Pest Control Service in San Ardo. Each plot was one 40-inch bed wide by 20 feet long and replicated four times in a randomized complete block design. The trial was seeded to the variety 'Sedona' on March 13 and the post plant preemergence applications were made on March 17; the first irrigation was applied on March 18. The first true leaf applications were made on April 17 (30 days after planting). The soil at the site was Docas silty clay loam. ***Trial No. 2:*** Trial was conducted in cooperation with James Guidici of C&G farms and Sergio Casillas of Integrated Crop Management. The soil type at the site was Pico fine sandy loam in San Ardo. Each plot was one 40-inch bed wide by 30 feet long and replicated four times in a randomized complete block design. The field was planted to a proprietary dehydration variety on March 10. The first true leaf applications were made on April 10 (irrigated on April 12) and the second true leaf on April 21 (irrigated on April 22***)***. ***Details for both trials:*** All materials were applied with a CO2 backpack sprayer with two passes of a one nozzle wand with an 8008E tip at 30 psi applying the equivalent of 72 gallons per acre.

Results: ***Trial No. 1:*** The main weed at this site was lambsquarter. The first weed evaluation on April 8 measured weed control provided by the preemergence materials (the post emergence treatments had been applied). Dacthal controlled 28 percent of the weeds and the higher rates of Nortron controlled 31-37% (Table 1). Weed control by the preemergence applications of Goal Tender depended on the rate with the 0.5 oz rate controlling 37% and the 2.0 oz rate controlling 90%. The second weed evaluation date on April 28 measure the impact of the post emergence applications and on this day that standard weed control treatment of Dacthal followed by Goal Tender controlled 98% of the weeds (Table 2). Nortron at 16 and 32 oz/A followed by Goal Tender at 6.0 oz/A post emergence controlled 98% of the weeds. Nortron at 16 and 32 oz/A followed by Norton at 16 oz/A post emergence controlled 44 and 66% of the weeds, respectively. Goal Tender as a preemergence application at 0.5, 1.0 and 2.0 oz/A controlled 76, 85 and 95% of the weeds respectively. Nortron alone as a preemergence at 16, 24 and 32 oz/A controlled 53, 51 and 55% of the weeds. The untreated plots took the equivalent of 329 hours per acre to weed. The standard, Dacthal followed by Goal Tender took 1.6 hours/A to weed. The next lowest weeding time treatments included Goal Tender preplant at 2.0 oz/A, Nortron at 16 oz/A followed by Goal Tender and Nortron at 32 oz/A followed by Goal Tender. The untreated plots had the equivalent of 104,960 marketable bulbs/A (Table 3). Other treatments that yielded well included Dacthal followed by Goal Tender, Goal Tender preemergence at 0.5 and 1.0 oz/A and all preemergence applications of Nortron at 16 oz/A treatments. Higher rates of Nortron reduced the yield of marketable onions.

Trial No. 2: This trial was conducted in a field with an extremely high nutsedge population. Early applications of the acid fertilizer 7-7-0-7 in combination with 7.0 or 14.0 oz/A of Outlook provided the better nutsedge control for two months after application than applications made at the 2nd true leaf stage (Table 4). By July 29 the level of control provided by Outlook was wearing off and the nutsedge was resprouting and all applications were declined in efficacy. One treatment included Goal Tender at the first true leaf stage and this treatment also provided excellent weed control but was the most phytotoxic treatment on most evaluation dates (Table 5). The stand of onions in this trial was impacted by the high nutsedge population and the yield evaluations are a bit difficult to interpret. In general it appears that the 1st true leaf applications of Outlook at 14.0 oz/A had lower yield than the 7.0 followed by 7.0 oz/A treatment. The dramatic result in this trial was that the untreated plots had essentially no marketable yield. The variety used in this trial was less vigorous than varieties used for fresh market and the regrowth of nutsedge was higher in the part of the field with this variety than in an adjacent planting of a fresh market type.

Figure 1. Trial No. 1
Untreated on left
Nortron 32oz/A applied preplant on right
Goal Tender 2.0 oz/A preplant on left
Nortron 16.0 pre + 16.0 post on right

Figure 2. Trial No. 2
7-7-0-7 + Outlook at 7.0 oz/A 1st leaf left
7-7-0-7 + Outlook at 7.0 oz/A 2nd leaf right
Overview of trial showing impact of treatments

Table1. Trial No. 1: Weed count and phytotoxicity rating on April 8. Upper number in each cell is percent control and lower number is weed count (3 ft^2).

Treatment	Rate	Chenos	Night shade	Sowthistle	Pig weed	Groundsel	Malva	Total Weeds	Phyto[1]
Untreated	----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		79.0	8.3	2.5	2.3	0.3	0.3	72.8	
Dacthal 6F Pre + Goal Tender 4F Post	1.33 gals 6.0 oz	26.7	44.4	22.2	100.0	66.7	0.0	28.2	0.0
		45.7	5.7	3.7	0.0	0.3	1.7	57.0	
Goal Tender 4F Pre	0.5 oz	37.5	23.4	50.0	100.0	100.0	66.7	37.8	0.7
		36.3	9.0	1.7	0.0	0.0	0.3	47.3	
Goal Tender 4F Pre	1.0 oz	54.6	67.5	94.4	100.0	100.0	66.7	61.6	1.0
		22.7	3.7	0.3	0.0	0.0	0.3	27.0	
Goal Tender 4F Pre	2.0 oz	86.3	100.0	100.0	100.0	100.0	100.0	90.9	1.3
		6.3	0.0	0.0	0.0	0.0	0.0	6.3	
Nortron 4SC Pre	16 oz	35.8	19.4	50.0	66.7	100.0	100.0	33.3	0.0
		41.3	8.0	1.7	0.3	0.0	0.0	51.3	
Nortron 4SC Pre	24 oz	33.8	5.6	55.6	100.0	100.0	66.7	31.2	0.0
		37.0	10.3	2.0	0.0	0.0	0.7	50.0	
Nortron 4SC Pre	32 oz	39.4	57.1	55.6	100.0	100.0	100.0	37.6	0.0
		49.0	4.7	3.3	0.0	0.0	0.0	57.0	
Nortron 4SC Pre + Nortron 4SC Post	16 oz 16 oz	26.5	36.1	16.7	100.0	100.0	33.3	24.4	0.0
		52.3	7.3	5.0	0.0	0.0	0.7	65.3	
Nortron 4SC Pre + Nortron 4SC Post	32 oz 16 oz	23.9	55.2	38.9	100.0	100.0	100.0	36.5	0.0
		34.7	4.7	2.3	0.0	0.0	0.0	41.7	
Nortron 4SC Pre + Goal Tender 4F Post	16 oz 6.0 oz	8.2	57.9	27.8	100.0	100.0	100.0	7.9	0.0
		67.3	4.3	3.7	0.0	0.0	0.0	75.3	
Nortron 4SC Pre + Goal Tender 4F Post	32 oz 6.0 oz	28.4	48.8	38.9	100.0	100.0	66.7	29.3	0.0
		34.7	5.7	2.3	0.0	0.0	0.7	43.3	
Pr>F % control		0.0515	0.001	0.0256	<0.0001	<0.0001	0.006	0.0071	----
LSD 0.05 % control		42.851	38.155	52.964	28.222	28.222	58.953	37.206	----
Pr>F weed count		0.0238	0.0066	0.2137	0.0054	0.4767	0.0247	0.0032	0.4767
LSD 0.05 weed count		34.155	4.914	NS	1.34	NS	0.8802	33.842	1.4

1 – Scale: 0 = no crop damage to 10 = crop dead

Table 2. Trial No. 1: Weed count rate and time of weeding evaluation on April 28. Upper number in each cell is percent control and lower number is weed count (3 ft^2).

Treatment	Rate	Chenos	Night shade	Sowthistle	Pig weed	Groundsel	Malva	Total Weeds	Weed time Hrs/A
Untreated	----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	329.8
		94.3	6.0	5.0	1.0	1.3	0.3	107.8	
Dacthal 6F Pre + Goal Tender 4F Post	1.33 gals 6.0 oz	98.2	100.0	100.0	100.0	100.0	100.0	98.5	1.6
		1.8	0.0	0.0	0.0	0.0	0.0	1.8	
Goal Tender 4F Pre	0.5 oz	73.6	100.0	100.0	100.0	100.0	100.0	76.9	45.2
		25.8	0.0	0.0	0.0	0.0	0.0	25.8	
Goal Tender 4F Pre	1.0 oz	83.0	100.0	100.0	100.0	100.0	100.0	85.3	27.5
		16.0	0.0	0.0	0.0	0.0	0.0	16.0	
Goal Tender 4F Pre	2.0 oz	94.5	100.0	100.0	100.0	100.0	100.0	95.2	10.4
		5.3	0.0	0.0	0.0	0.0	0.0	5.3	
Nortron 4SC Pre	16 oz	52.6	83.3	72.2	100.0	37.5	75.0	53.9	127.0
		46.3	1.3	1.5	0.0	1.3	0.3	50.5	
Nortron 4SC Pre	24 oz	49.4	78.1	51.4	100.0	93.8	100.0	51.7	88.8
		51.8	1.3	2.3	0.0	0.3	0.0	55.5	
Nortron 4SC Pre	32 oz	55.7	71.9	55.6	91.7	68.8	75.0	55.7	77.7
		47.0	1.8	2.0	0.3	0.5	0.3	51.8	
Nortron 4SC Pre + Nortron 4SC Post	16 oz 16 oz	41.0	76.0	23.6	100.0	93.8	100.0	44.0	125.3
		56.3	1.5	4.0	0.0	0.3	0.0	62.0	
Nortron 4SC Pre + Nortron 4SC Post	32 oz 16 oz	64.0	90.6	55.6	75.0	100.0	75.0	66.8	64.6
		30.5	0.5	2.0	0.3	0.0	0.3	33.5	
Nortron 4SC Pre + Goal Tender 4F Post	16 oz 6.0 oz	98.1	100.0	100.0	100.0	100.0	100.0	98.5	8.6
		1.5	0.0	0.0	0.0	0.0	0.0	1.5	
Nortron 4SC Pre + Goal Tender 4F Post	32 oz 6.0 oz	98.7	100.0	100.0	100.0	100.0	100.0	98.9	10.6
		1.0	0.0	0.0	0.0	0.0	0.0	1.0	
Pr>F % control		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	----
LSD 0.05 % control		20.074	12.702	19.612	22.084	28.361	35.6	16.971	----
Pr>F weed count		<0.0001	<0.0001	<0.0001	0.1256	0.0241	0.724	<0.0001	<0.0001
LSD 0.05 weed count		24.637	1.097	1.5577	NS	0.8765	NS	23.759	77.7

Table 3. Trial No. 1: Yield evaluations on September 19.

Treatment	Rate	Marketable			Culls			Total		
		1000's/A	T/A	Mean lbs	1000's/A	T/A	Mean lbs	1000's/A	T/A	Mean lbs
Untreated	----	104.96	43.33	0.82	6.53	1.38	0.36	111.50	44.72	0.80
Dacthal 6F Pre + Goal Tender 4F Post	1.3 gals 6.0 oz	105.37	43.24	0.82	8.16	1.18	0.25	113.54	44.43	0.78
Goal Tender 4F Pre	0.5 oz	110.27	46.82	0.84	4.90	2.08	0.77	115.17	48.90	0.84
Goal Tender 4F Pre	1.0 oz	102.10	43.31	0.85	9.39	2.53	0.53	111.50	45.84	0.82
Goal Tender 4F Pre	2.0 oz	90.26	42.24	0.94	7.76	2.26	0.59	98.02	44.51	0.91
Nortron 4SC Pre	16 oz	102.51	43.55	0.85	6.53	1.83	0.39	109.04	45.37	0.84
Nortron 4SC Pre	24 oz	96.38	42.94	0.90	14.70	3.04	0.41	111.09	45.98	0.83
Nortron 4SC Pre	32 oz	73.10	38.26	1.04	14.29	2.49	0.38	87.40	4075	0.93
Nortron 4SC Pre + Nortron 4SC Post	16 oz 16 oz	100.88	46.16	0.91	3.67	1.14	0.57	104.55	47.31	0.91
Nortron 4SC Pre + Nortron 4SC Post	32 oz 16 oz	77.19	36.53	0.96	12.25	1.87	0.29	89.44	38.41	0.88
Nortron 4SC Pre + Goal Tender 4F Post	16 oz 6.0 oz	105.77	44.65	0.85	6.12	2.53	0.86	111.50	47.19	0.85
Nortron 4SC Pre + Goal Tender 4F Post	32 oz 6.0 oz	92.71	41.77	0.91	4.49	0.87	0.67	97.20	42.65	0.88
Pr>F		<0.0001	0.0100	0.0094	0.0022	0.5200	0.1200	0.0016	0.0402	0.2543
LSD 0.05		12.73	4.97	0.11	5.66	NS	NS	14.34	5.66	NS

Table 4. Trial No. 2: Nutsedge rating[1] on six dates.

Treatment	Material /A	Timing	April 25	April 29	May 8	May 14	June 5	July 29
7-7-0-7 Outlook 7-7-0-7 Outlook	60 gal 7 oz 30 gal 7 oz	1st true leaf 1st true leaf 2nd true leaf 2nd true leaf	7.0	7.5	7.0	6.6	7.8	4.5
7-7-0-7 Outlook 7-7-0-7	60 gal 14 oz 30 gal	1st true leaf 1st true leaf 2nd true leaf	8.0	8.5	8.5	8.3	9.1	5.0
7-7-0-7 Outlook	60 gal 7 oz	2nd true leaf 2nd true leaf	3.7	6.2	4.7	5.0	4.2	3.8
7-7-0-7 Outlook	60 gal 14 oz	2nd true leaf 2nd true leaf	5.0	6.5	5.5	5.0	6.5	3.5
7-7-0-7 Outlook Goal Tender	60 gal 14 oz 8 oz	1st true leaf 1st true leaf 1st true leaf	7.8	8.2	8.7	8.0	8.3	5.8
Untreated	----	----	0.0	0.0	0.0	0.0	0.0	0.0
Pr>F			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
LSD 0.05			1.5	0.7	1.3	1.3	1.6	1.6

1 – Rating: 0 = no weed control to 10 = total weed control

Table 5. Trial No. 2: Phytotoxicity ratings[1] on six dates.

Treatment	Material /A	Timing	April 25	April 29	May 8	May 14	June 5	July 29
7-7-0-7 Outlook 7-7-0-7 Outlook	60 gal 7 oz 30 gal 7 oz	1st true leaf 1st true leaf 2nd true leaf 2nd true leaf	3.2	2.7	1.2	2.0	1.5	3.0
7-7-0-7 Outlook 7-7-0-7	60 gal 14 oz 30 gal	1st true leaf 1st true leaf 2nd true leaf	3.7	3.7	3.0	3.5	4.2	2.8
7-7-0-7 Outlook	60 gal 7 oz	2nd true leaf 2nd true leaf	2.5	2.0	1.0	1.5	2.0	2.3
7-7-0-7 Outlook	60 gal 14 oz	2nd true leaf 2nd true leaf	3.2	2.0	0.7	1.7	1.7	2.5
7-7-0-7 Outlook Goal Tender	60 gal 14 oz 8 oz	1st true leaf 1st true leaf 1st true leaf	4.2	4.2	3.0	4.2	3.5	4.0
Untreated	----	----	0.0	0.0	0.0	0.0	0.0	0.0
Pr>F for Nutsedge / Phyto			<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0009
LSD for Nutsedge / Phyto			0.6	1.1	0.6	1.2	1.5	1.4

1 – Scale: 0 = no crop damage to 10 = crop dead

Table 6. Trial No. 2: Yield evaluation on September 19.

Treatment	Material per A	Timing	Marketable			Culls			Total		
			1000's/A	T/A	Mean lbs	1000's/A	T/A	Mean lbs	1000's/A	T/A	Mean lbs
7-7-0-7 Outlook 7-7-0-7 Outlook	60 gal 7 oz 30 gal 7 oz	1st true leaf 1st true leaf 2nd true leaf 2nd true leaf	128.7	14.4	0.22	10.8	0.1	0.04	139.5	14.6	0.21
7-7-0-7 Outlook 7-7-0-7	60 gal 14 oz 30 gal	1st true leaf 1st true leaf 2nd true leaf	84.9	11.2	0.28	9.1	0.3	0.05	94.0	11.6	0.26
7-7-0-7 Outlook	60 gal 7 oz	2nd true leaf 2nd true leaf	110.1	9.4	0.17	36.8	0.8	0.05	147.0	10.3	0.15
7-7-0-7 Outlook	60 gal 14 oz	2nd true leaf 2nd true leaf	143.1	16.2	0.23	18.6	0.5	0.05	161.8	16.7	0.21
7-7-0-7 Outlook Goal Tender	60 gal 14 oz 8 oz	1st true leaf 1st true leaf 1st true leaf	102.5	11.8	0.23	14.1	0.4	0.05	116.6	12.1	0.21
Untreated	----	----	0.0	0.0	0.0	1.0	0.1	0.01	1.0	0.1	0.01
Pr>F			<0.0001	<0.0001	<0.0001	0.0870	0.0488	0.0228	<0.0001	<0.0001	<0.0001
LSD 0.05			33.0	3.5	0.06	23.7	0.5	0.03	48.7	3.5	0.06