

2019 Onion Weed Control Trial

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Summary: Bicyclopyrone was evaluated for pre and post emergent weed control efficacy and safety in dry bulb onion production. At 0.045 lb a.i./A applied post plant preemergence it reduced the number of weeds over the untreated control, but was not as effective as the standard preemergence, Dacthal. Bicyclopyrone did not effectively control weeds as a post emergent application (groundsel plants were yellowed but not killed -see Photo). Bicyclopyrone did not affect the yield of onions. Post emergence applications of Caparol 4L (prometryn) and Linex 4L (linuron) were also tested at 0.5 lb a.i./A at the 2nd, 3rd and 4-5th true leaf stage. Both materials applied at the 2nd true leaf stage had significant phytotoxicity. Applications at the 3rd and 4th true leaf stage were less injurious. No yield reduction was measured in the Caparol and Linex treatments, but there is a trend indicating the 2nd true leaf applications were lower than applications later in the crop cycle.

Methods: The trial was conducted with a cooperating grower in a commercial onion field north of King City. The onion variety Ridgeline was seeded in 10 seedlines on an 80-inch bed on March 15 on a site with Metz fine sandy loam soil. Each plot was half of a bed (40 inches wide) by 10 feet long. Treatments were applied on the following dates: Post plant preemergence - March 15; post planting - 2nd true leaf: April 26; 3rd true leaf: May 9; and 4-5 true leaf: May 17. The experiment was a randomized complete block design with 4 replications. Treatments were applied with a CO₂ backpack sprayer with one pass of a one-tip wand with an 8008EVS nozzle pressurized at 30 psi applying 41 GPA. See tables for dates of phytotoxicity ratings, weed counts and weeding time evaluations. Harvest evaluation was carried out on August 22 (160 days after planting) by harvesting all plants in each plot, trimming off the tops and roots and counting and weighing the bulbs.

Results: Data in Table 1 was collected on April 26 and only reflects the impact of preemergent herbicide treatments. Bicyclopyrone at 0.045 lb a.i./A had significantly fewer weeds than the untreated control; Dacthal had the lowest number of weeds of all the preemergent treatments. Data in Table 2 was collected on May 1 reflects the preemergence and post emergence treatments applied at the 2nd true leaf stage. Post plant preemergence application of bicyclopyrone at 0.045 lb a.i./A reduced the number of weeds relative to the untreated control. All Dacthal treatments had significantly fewer weeds than bicyclopyrone at 0.045 lb a.i./A. Dacthal plus the post emergent application of Goal and Buctril eliminated all weeds and had the lowest weeding time. None of the treatments had significant phytotoxicity on this evaluation date. Data in Table 3 was collected on May 17 and reflects the preemergence and post emergence treatments applied at the 2nd and 3rd true leaf stages. All treatments had been hand weeded on May 1, so the remaining weeds were those missed by the weeding operation or were newly emerged. Preemergent applications of bicyclopyrone had the highest number of weeds. All Dacthal treatments had fewer weed weeds. Dacthal plus the post emergent application of Goal and Buctril eliminated all weeds. Dacthal plus the post emergent applications of Caparol and Linex at the 2nd and 3rd leaf stage also had few weeds. Caparol and Linex applied at the 2nd true leaf stage had significantly higher phytotoxicity ratings on May 9 and 17. There were no significant differences in yield among the treatments (Table 4).



Trial site.



Post emergent symptoms of bicyclopyrone on groundsel

Table 1. Weed evaluations on April 26 (no. weeds per 33.3ft²)

Herbicides	Rates (lb ai/A)	Application timing	Cheno- pods	Groundsel	Night- shade	Purse- lane	Malva	Shepherd's Purse	Sow Thistle	Total weeds
Bicyclopyrone 200 SL	0.033	PRE	9.0	2.5	3.8	3.3	0.3	1.3	0.5	21.0
Bicyclopyrone 200 SL	0.045	PRE	9.5	1.5	3.8	0.8	0.3	0.8	0.0	17.5
Bicyclopyrone 200 SL Goal Tender + Buctril 4E	0.033 0.125 + 0.36	PRE 2 lf stage	13.5	4.8	5.8	1.3	0.0	0.5	0.5	26.5
Dacthal Goal Tender + Buctril 4E	6 0.125 + 0.36	PRE 2 lf stage	0.0	4.8	0.0	0.0	0.0	0.0	0.0	4.8
Untreated Check	---	---	17.8	3.3	4.3	1.8	0.0	1.8	0.3	31.5
		Pr>F treat	0.0298	0.6282	0.1089	0.0710	0.6114	0.0219	0.3036	0.0089
		LSD _{0.05}	10.3	ns	ns	ns	ns	1.0	ns	13.3

Table 2. Weed counts (no. per 33.3ft²), phytotoxicity ratings and weeding time evaluations on May 1

Herbicides	Rates (lb ai/A)	Application timing	Cheno- pods	Groundsel	Night- shade	Purse- lane	Other weeds	Total weeds	Phyto	Weed time hrs_A
Bicyclopyrone 200 SL	0.033	PRE	3.5	1.8	1.3	1.0	0.3	7.8	0.0	13.7
Bicyclopyrone 200 SL	0.045	PRE	4.0	1.0	0.5	0.3	1.0	6.8	0.0	11.8
Bicyclopyrone 200 SL Goal Tender + Buctril 4E	0.033 0.125 + 0.36	PRE 2 lf stage	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.4
Bicyclopyrone 200 SL	0.033	2 lf stage	5.8	1.3	1.8	0.3	0.8	9.8	0.0	21.7
Dacthal Caparol 4L	6 0.5	PRE 2 lf stage	0.3	1.5	0.0	0.0	0.0	1.8	1.0	4.6
Dacthal Caparol 4L	6 0.5	PRE 3 lf stage	0.0	1.3	0.5	0.0	0.0	1.8	0.0	4.0
Dacthal Caparol 4L	6 0.5	PRE 4-5 lf stage	0.0	1.5	0.0	0.0	0.5	2.0	0.0	4.7
Dacthal Linex 4L	6 0.5	PRE 2 lf stage	0.0	1.3	0.0	0.0	0.0	1.3	0.8	3.1
Dacthal Linex 4L	6 0.5	PRE 3 lf stage	0.0	2.3	0.8	0.0	0.0	3.0	0.0	6.1
Dacthal Linex 4L	6 0.5	PRE 4-5 lf stage	0.0	1.3	1.3	0.0	0.0	2.5	0.0	5.2
Dacthal Goal Tender + Buctril 2E	6 0.125 + 0.36	PRE 2-3 lf stage	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3
Untreated Check	---	---	6.3	0.8	1.5	1.0	1.3	10.8	0.0	25.6
		Pr>F treat	0.0000	0.0704	0.0350	0.0907	0.0010	0.0000	0.0000	0.0000
		LSD _{0.05}	2.2	ns	1.3	0.7	0.7	3.2	1.4	7.5

Table 3. Weed counts (no. per 33.3ft²) on May 17 and phytotoxicity ratings on May 9 and 17

Herbicides	Rates (lb ai/A)	Application timing	Cheno- pods	Groundsel	Night- shade	Purse- lane	Other weeds	Total weeds	Phyto May 9	Phyto May 17
Bicyclopyrone 200 SL	0.033	PRE	1.5	0.0	1.5	1.5	0.0	4.5	0.0	0.0
Bicyclopyrone 200 SL	0.045	PRE	0.5	1.3	0.5	0.8	0.3	3.3	0.5	0.3
Bicyclopyrone 200 SL Goal Tender + Buctril 4E	0.033 0.125 + 0.36	PRE 2 lf stage	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.0
Bicyclopyrone 200 SL	0.033	2 lf stage	0.0	0.0	0.8	0.5	0.5	1.8	0.0	0.0
Dacthal Caparol 4L	6 0.5	PRE 2 lf stage	0.0	0.0	0.3	0.0	0.0	0.3	2.0	1.8
Dacthal Caparol 4L	6 0.5	PRE 3 lf stage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Dacthal Caparol 4L	6 0.5	PRE 4-5 lf stage	0.0	0.3	1.5	0.0	0.0	1.8	0.0	0.0
Dacthal Linex 4L	6 0.5	PRE 2 lf stage	0.0	0.5	0.0	0.0	0.0	0.5	1.8	1.5
Dacthal Linex 4L	6 0.5	PRE 3 lf stage	0.0	0.3	0.0	0.0	0.0	0.3	0.0	1.0
Dacthal Linex 4L	6 0.5	PRE 4-5 lf stage	0.0	0.3	4.0	0.0	0.3	4.5	0.0	0.0
Dacthal Goal Tender + Buctril 2E	6 0.125 + 0.36	PRE 2-3 lf stage	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Untreated Check	---	---	1.0	0.5	1.5	1.5	0.5	5.0	0.0	0.0
		Pr>F treat	0.0696	0.2671	0.0376	0.0016	0.2753	0.0006	0.0000	0.0000
		LSD _{0.05}	ns	ns	2.3	0.9	ns	2.8	0.9	1.1

Table 4. Harvest evaluation on August 22

Herbicides	Rates (lb ai/A)	Application timing	Mean head lbs	Tons/A	Heads/acre
Bicyclopyrone 200 SL	0.033	PRE	0.7	35.5	108,483
Bicyclopyrone 200 SL	0.045	PRE	0.7	42.2	113,384
Bicyclopyrone 200 SL Goal Tender + Buctril 4E	0.033 0.125 + 0.36	PRE 2 lf stage	0.8	38.9	101,948
Bicyclopyrone 200 SL	0.033	2 lf stage	0.7	41.9	113,057
Dacthal Caparol 4L	6 0.5	PRE 2 lf stage	0.8	35.6	89,858
Dacthal Caparol 4L	6 0.5	PRE 3 lf stage	0.8	39.1	101,948
Dacthal Caparol 4L	6 0.5	PRE 4-5 lf stage	0.7	40.5	110,770
Dacthal Linex 4L	6 0.5	PRE 2 lf stage	0.7	38.5	106,849
Dacthal Linex 4L	6 0.5	PRE 3 lf stage	0.8	39.1	99,987
Dacthal Linex 4L	6 0.5	PRE 4-5 lf stage	0.7	40.4	108,809
Dacthal Goal Tender + Buctril 2E	6 0.125 + 0.36	PRE 2-3 lf stage	0.8	37.6	93,452
Untreated Check	---	---	0.8	39.7	104,562
		Pr>F treat	0.1453	0.4282	0.3874
		LSD _{0.05}	ns	ns	ns