

2005 Dry Bulb Onion Weed Control Studies

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Objective: To evaluate various postemergence and layby weed control materials on weed control and yield of dry bulb onions

Summary: There was substantial weed pressure in trial 1. Preemergence applications alone (Dacthal, low rates of Chateau and Goal Tender) reduced weeds by 80% while combinations of preemergence plus postemergence applications reduced weeds generally by 95%. Ultra low rates of Chateau continued to look promising in terms of safety and weed control. We did not see a yield advantage of applications of Goal Tender over Goal 2XL this year as we have seen in the previous two years. There was a trend that indicated that at equivalent rates, applications made at the 1st true leaf had improved weed control over applications made at the 2nd true leaf stage as well as reductions in the time required per acre to weed. Layby applications of Dual Magnum and Outlook improved control of nutsedge. A commercial application of Chateau at the second true leaf stage appeared to reduce the yield of onions as compared to the standard application of 1 pt/A of Goal 2XL. Flumioxazin (same active ingredient as Chateau) impregnated on fertilizer and applied at the 2nd true leaf reduced the stand of onions in trial 1 but not trial 3.

Methods: *Trial No. 1:* The plot was conducted in collaboration with Jerry Rava and Bob Martin, Growers, and Chris Headley of Western Farm Service on the Maggio Ranch Block south of King City. Post plant preemergence applications were made on March 29, 2005. First true leaf applications were made on April 22 and second true leaf applications were made on April 29. All plots were weeded on May 3 and layby applications made (4th true leaf stage). All application were made with a CO₂ backpack sprayer using two passes of a one nozzle wand with an 8008E tip pressurized at 30 psi applying 72 gallons per acre of water. Harvest was conducted on September 29 by harvesting all bulbs in an 8 foot long strip from the middle of each plot. Each plot was one 40-inch bed wide by 20 feet long and replicated four times in a randomized complete block design. *Trial No. 2:* The plot was conducted in collaboration with Bob Martin, Growers, and Paul Anthony of ICMCI on the Doud Ranch off Spreckles Rd. in King City. Postemergence (2nd true leaf) applications were made with a commercial rig to eight beds on one side of the field on May 4, 2005. The rig applied one ounce of Chateau (0.063 lb a.i./A) with 0.25% X-77 spreader sticker. This treatment was compared with the grower standard of 1.0 pint/A of Goal 2XL. No weed evaluations were conducted, but harvest evaluations were conducted on September 29 by harvesting 10 foot strips (5 reps) from the Chateau and Goal 2XL treated areas. *Trial No. 3:* The plot was conducted in collaboration with Bob Martin, Growers, and Paul Anthony of ICMCI on the Doud Ranch off Spreckles Rd. in King City. A postemergence (2nd true leaf) application of 0.13 lb a.i./A flumioxazin impregnated on 20-20-20 fertilizer at the rate of 260 lbs/A was made to a ten beds by 200 feet area on May 4. No weed evaluations were conducted, but harvest evaluations were conducted on September 29 by harvesting 10 foot strips (5 reps) from the flumioxazin on fertilizer and adjacent Goal 2XL treated areas (1.0 pint/A) on September 29.

Results: *Trial No. 1.* There was substantial weed pressure at this site because it had been abandoned for a number of years. The untreated control had 81.8 weeds per 20 ft² at the post 2nd true leaf evaluation date (Table 1). Dacthal alone reduced the number of weeds to 19.3, Chateau at 0.004 lb a.i./A to 14.8 and Goal Tender alone (applied at the first true

leaf stage) to 14.3 weeds per 20 ft². All combinations of Dacthal plus Goal 2XL or Goal Tender generally reduced numbers of weeds to less than 5.0 per 20 ft². In situations where the number of weeds was higher it was due to the spotty nature of the shepherd's purse population and the weakness of Goal on this weed. Matran was weak on other weeds as well and had 50 weeds 20 ft². At the post 4th true leaf evaluation, the layby applications of flumioxazin on fertilizer, Dual Magnum and Outlook gave improved weed control over most of the treatments that did not receive layby applications (Table 2). Dual Magnum and Outlook had zero nutsedge. The nutsedge population was spotty in the plots which made obtaining statistical differences among the plots difficult, but the Dual Magnum and Outlook treatments look promising for control of this weed. The yield of the onions was high this year (Table 3). There was no difference in the yield between Goal Tender and Goal 2XL when applied at the 1st true leaf stage as was seen in 2003 and 2004. The biggest impact on yield was observed in the flumioxazin on fertilizer which reduced the number of plants per acre. All other treatments had equivalent yields. **Trial No. 2.** Chateau reduced the tonnage and mean bulb weight in comparison with Goal 2XL (Table 4). In addition, we did not rate weeds in the plot, but observationally, there was more malva in the Chateau treatment. **Trial No. 3.** No observations were made on weed control. There was not reduction in bulbs per acre in the flumioxazin treatment in this trial as was observed in Trial No. 1.

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Table 1. Trial 1. Post 2nd true leaf application evaluation: Weed (no./20 ft²), phytotoxicity and time of weed time evaluations on May 3, 2005

Treatment	a.i./A lbs	Application ¹	Chenopod	Nutsedge	Shepherds Purse	Night shade	Knot weed	Malva	Other weeds	Total weeds	Phyto ¹	Time to weed Hrs/A
Untreated	----	----	39.5	1.0	13.5	5.8	3.8	2.0	4.0	81.8	0.0	20.7
Dacthal W 75	8.0	Pre	0.0	3.5	10.8	0.0	0.0	2.0	3.0	19.3	0.0	5.8
Chateau 51 WD	0.004	Pre	4.0	1.5	0.3	0.5	2.8	1.3	3.0	14.8	0.0	4.3
Chateau 51 WD	0.008	Pre	0.5	4.0	0.3	0.0	1.8	0.0	0.5	7.3	0.0	3.3
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 1 t. leaf	0.0	1.3	0.0	0.0	0.0	0.0	0.5	1.8	2.8	2.4
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 2 t. leaf	0.3	2.0	3.5	0.0	0.0	0.0	0.5	6.3	1.8	3.3
Dacthal W 75 + Goal 2XL	8.0 + 0.25	Pre Post 2 t. leaf	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	2.0	3.0
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 1 t. leaf	0.0	2.8	0.8	0.0	0.0	0.0	0.0	3.5	2.5	2.4
Goal Tender 4F	0.125	Post 1 t. leaf	7.8	1.8	0.3	0.0	3.8	0.0	0.8	14.3	2.3	5.4
Dacthal W 75 + Goal Tender 4F	8.0 + 0.188	Pre Post 1 t. leaf	0.0	1.5	1.0	0.0	0.0	0.0	1.0	3.5	3.0	2.5
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 2 t. leaf	0.3	1.8	5.8	0.0	0.3	0.0	2.0	10.0	1.3	4.1
Dacthal W 75 + Goal Tender 4F	8.0 + 0.25	Pre Post 2 t. leaf	1.5	0.5	15.0	0.0	0.5	0.0	1.5	19.5	1.3	2.6
Matran	20%	Post 2 t. leaf	19.5	0.0	11.5	11.0	2.0	0.0	6.0	50.0	0.5	14.3
Dacthal W 75 + Goal 2XL + flumioxazin ²	8.0 + 0.25 + 0.063	Pre Post 2 t. leaf Post 4 t. leaf	0.3	0.8	1.5	0.0	0.0	0.0	0.8	3.3	2.8	3.3
Dacthal W 75 + Goal 2XL + Dual Magnum 7.63	8.0 + 0.25 + 1.5	Pre Post 2 t. leaf Post 4 t. leaf	0.0	1.8	0.8	0.0	0.0	0.0	0.0	2.5	3.5	3.2
Dacthal W 75 + Goal 2XL + Outlook 6	8.0 + 0.25 + 0.66	Pre Post 2 t. leaf Post 4 t. leaf	0.3	1.3	1.8	0.3	0.0	0.0	0.3	3.8	2.8	2.9
LSD (0.05)	----	----	8.7	2.6	6.5	6.2	1.7	1.0	3.7	13.0	0.6	3.0

1 - Scale: 0 = no damage to 10 = crop dead; 2 - impregnated on fertilizer (0.125 lb a.i./250 lbs fertilizer)

Table 2. Trial 1. Post 4th true leaf application evaluation: Weed (no./20 ft²) on June 17, 2005

Treatment	a.i./A lbs	Application ¹	Purselane	Chenopod	Nutsedge	Other weeds	Total weeds
Untreated	----	----	2.0	2.3	2.3	1.0	7.5
Dacthal W 75	8.0	Pre	1.5	1.8	3.8	1.3	8.3
Chateau 51 WD	0.004	Pre	0.8	1.3	2.8	3.0	7.8
Chateau 51 WD	0.008	Pre	1.5	0.5	3.5	1.8	7.3
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 1 t. leaf	0.5	1.5	2.8	0.5	5.3
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 2 t. leaf	0.0	1.3	3.3	0.5	5.0
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 1 t. leaf	0.3	2.3	3.8	1.5	7.8
Goal Tender 4F	0.125	Post 1 t. leaf	0.5	1.0	1.0	2.3	4.8
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 2 t. leaf	1.0	1.8	0.5	1.0	4.3
Dacthal W 75 + Goal 2XL + flumioxazin ¹	8.0 + 0.25 + 0.063	Pre Post 2 t. leaf Post 4 t. leaf	0.0	0.0	0.8	0.0	0.8
Dacthal W 75 + Goal 2XL + Dual Magnum 7.63	8.0 + 0.25 + 1.5	Pre Post 2 t. leaf Post 4 t. leaf	0.0	0.0	0.0	0.0	0.0
Dacthal W 75 + Goal 2XL + Outlook 6	8.0 + 0.25 + 0.66	Pre Post 2 t. leaf Post 4 t. leaf	0.0	0.0	0.0	0.0	0.0
LSD (0.05)	----	----	1.7	ns	3.4	1.5	4.7

1 – impregnated on fertilizer (0.125 lb a.i./250 lbs fertilizer)

Table 3. Trial 1. Yield evaluation on September 29.

Treatment	a.i./A lbs	Application ¹	Yield Tons/A	Yield Bulbs/A	Mean Bulb wt (lbs)
Untreated	----	----	64.3	139,804	0.92
Dacthal W 75	8.0	Pre	64.3	139,804	0.92
Chateau 51 WD	0.004	Pre	63.9	138,169	0.92
Chateau 51 WD	0.008	Pre	63.4	134,898	0.94
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 1 t. leaf	60.6	134,081	0.90
Dacthal W 75 + Goal 2XL	8.0 + 0.125	Pre Post 2 t. leaf	62.7	131,628	0.95
Dacthal W 75 + Goal 2XL	8.0 + 0.25	Pre Post 2 t. leaf	62.5	132,445	0.95
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 1 t. leaf	61.3	130,810	0.95
Goal Tender 4F	0.125	Post 1 t. leaf	64.1	139,395	0.92
Dacthal W 75 + Goal Tender 4F	8.0 + 0.188	Pre Post 1 t. leaf	64.2	140,075	0.94
Dacthal W 75 + Goal Tender 4F	8.0 + 0.125	Pre Post 2 t. leaf	62.9	130,402	0.97
Dacthal W 75 + Goal Tender 4F	8.0 + 0.25	Pre Post 2 t. leaf	63.7	137,895	0.92
Matran	20%	Post 2 t. leaf	63.0	134,625	0.92
Dacthal W 75 + Goal 2XL + flumioxazin ¹	8.0 + 0.25 + 0.063	Pre Post 2 t. leaf Post 4 t. leaf	60.6	121,408	1.01
Dacthal W 75 + Goal 2XL + Dual Magnum 7.63	8.0 + 0.25 + 1.5	Pre Post 2 t. leaf Post 4 t. leaf	60.0	129,584	0.93
Dacthal W 75 + Goal 2XL + Outlook 6	8.0 + 0.25 + 0.66	Pre Post 2 t. leaf Post 4 t. leaf	59.1	132,037	0.90
LSD (0.05)	----	----	NS	10,350	NS

1 – Impregnated on fertilizer (0.125 lb a.i./250 lbs fertilizer)

Table 4: Yield of onions in trials 2 and 3 on September 29.

Treatments	Lbs active ingredient/A	Material/A	Mean Wt (Tons/A)	Mean # Bulbs/Acre	Mean Bulb Wt (lbs)
<i>Trial No. 2</i>					
Goal 2XL	0.25	1.0 pint	55.6	141,287	0.788
Chateau X-77	0.063 0.25% v/v	1.0 oz	50.2	134,484	0.748
<i>LSD ($\alpha=0.05$)</i>			3.2	<i>NS</i>	<i>0.036</i>
<i>Trial No. 3</i>					
Goal 2XL	0.25	1.0 pint	53.7	132,914	0.81
Flumioxazin on fertilizer (0.125 lb a.i./250 lbs fertilizer)	0.13	260 lbs	51.9	139,194	0.75
<i>LSD ($\alpha=0.05$)</i>			<i>NS</i>	<i>NS</i>	<i>0.04</i>