

2011 Carrot Weed Control Trial

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Objective: To evaluate the safety and weed control of various weed control materials on carrots

Summary: This trial indicated that a broad range of herbicide combinations gave good weed control and acceptable carrot root yield. Outlook at both rates and Dual Magnum at 1.2 lbs a.i./A preemergent had greater phytotoxicity and lower yields. Of particular interest in the preemergent applications were Norton, Prowl H2O and Caparol in addition to the standard Lorox. Post emergent application that looked interesting included Nortron, Goal Tender and possibly Dual Magnum. Dual Magnum is registered for preemergent use and this trial indicates that care needs to be taken selecting rates on lighter soils with this material.

Methods: The trial was conducted in cooperation with a commercial grower and carrot production company in San Ardo. The trial was established on March 30. The variety of carrots was Maverick and the soil type at the site was Metz complex (loamy sand surface texture, with stones). Each plot was 20feet long by one 40-inch wide bed and was replicated three times in a randomized complete block design. The preemergence applications were applied immediately following planting on March 30 (Table 1); the remainder of the field was sprayed commercially on March 31 and irrigated the same day. Post emergence applications when the plants were 3 inches tall were made on May 6. All treatments were applied with a CO₂ backpack sprayer applying the equivalent of 56 GPA with two passes of a one nozzle boom with an 8008EVS nozzle at 30 psi.

Results: The weed evaluation on May 2 measured the impact of the preemergent applications, and all treatments significantly reduced the number of weeds over the untreated control (Table 2). There was good weed pressure at the site and there were some minor differences detected between the materials in this evaluation: Dual Magnum was weaker on the clover species while Caparol and Lorox provided the best weed control. Prowl H2O, Caparol and Lorox had no detectable phytotoxicity on this date, and Nortron had minor levels of phytotoxicity. Outlook and Dual Magnum had unacceptable levels of phytotoxicity.

The June 7 evaluation date measured the impact of the preemergent application followed by the post emergent application. All treatments greatly reduced weed pressure and weeding time relative to the untreated control (Table 3). The preemergent applications of Outlook and Dual Magnum continued to impact the plants and had high phytotoxicity ratings, although Dual Magnum at 0.6 lbs a.i./A was safer than the 1.3 lbs a.i./A treatment.

On the first root biomass evaluation, both preemergent applications of Outlook and Dual Magnum reduced root biomass. Nortron fb Outlook also reduced root biomass. All other treatments were not statistically lower than the untreated check. At harvest, Outlook and Dual Magnum at 1.2 lbs a.i./A had statistically lower yield than the highest yielding treatments, Nortron fb Norton and Lorox fb Lorox.

Table 1. Treatments, rates and application timing

| No. | Treatment | lbs a.i./A | Material/A | Application Timing |
|------------|--|-------------------|----------------------|---------------------------|
| 1 | Untreated | --- | | --- |
| 2 | Lorox 50WP fb ¹ Lorox 50WP | 0.75 0.75 | 1.5 lb 1.5 lb | Postplant PRE 3" tall |
| 3 | Nortron 4 SC fb Nortron 4 SC | 1.125 1.5 | 36 fl oz 48 fl oz | Postplant PRE 3" tall |
| 4 | Nortron 4 SC fb Nortron 4 SC | 1.5 1.5 | 48 fl oz 48 fl oz | Postplant PRE 3" tall |
| 5 | Nortron 4 SC fb Dual Magnum 7.62 | 1.5 0.6 | 48 fl oz 10.7 oz | Postplant PRE 3" tall |
| 6 | Nortron 4 SC fb Outlook 6 L | 1.5 0.42 | 48 fl oz 9 fl oz | Postplant PRE 3" tall |
| 7 | Nortron 4 SC fb GoalTender 4F | 1.5 0.125 | 48 fl oz 4 fl oz | Postplant PRE 3" tall |
| 8 | Nortron 4 SC fb Lorox 50 WP | 1.5 0.75 | 48 fl oz 1.5 lb | Postplant PRE 3" tall |
| 9 | Outlook 6 L fb Lorox 50 WP | 0.42 0.75 | 9 fl oz 1.5 lb | Postplant PRE 3" tall |
| 10 | Outlook 6 L fb Lorox 50 WP | 0.56 0.75 | 12 fl oz 1.5 lb | Postplant PRE 3" tall |
| 11 | Dual Magnum 7.62 fb Lorox 50 WP | 0.6 0.75 | 10.7 oz 1.5 lbs | Postplant PRE 3" tall |
| 12 | Dual Magnum 7.62 fb Lorox 50 WP | 1.3 0.75 | 21.1 oz 1.5 lbs | Postplant PRE 3" tall |
| 13 | Caparol 4L fb Lorox 50 WP | 2.0 0.75 | 64 oz 1.5 lbs | Postplant PRE 3" tall |
| 14 | Prowl H2O 3.8 fb Lorox 50 WP | 0.95 0.75 | 32 oz 1.5 lbs | Postplant PRE 3" tall |

1 – fb = followed by

Table 2. Weed counts (12 ft²) and phytotoxicity rating on May 2.

Treatment
a.i. lbs/A

Night
shades
Cheno-pods
Clovers
Love grass
Henbit
London
rocket
Other
weeds
Total
weeds
Phyto¹

Untreated

4.7
8.3
7.7
1.3
0.0
0.0
2.7
26.0
0.0

Lorox 50WP
fb Lorox 50WP
0.75
0.75

0.0
0.0
0.0
0.0
0.0
0.0

0.0
0.3
0.0

Nortron 4 SC
fb Nortron 4 SC
1.125
1.5

2.0
0.7
1.0
0.0
0.0
0.0
0.7
4.3
1.5

Nortron 4 SC
fb Nortron 4 SC
1.5
1.5

0.7
0.3
0.0
0.0
0.0
0.0
0.0
1.0
0.5

Nortron 4 SC
fb Dual Magnum 7.62
1.5
0.6

0.0
0.3
0.0
0.0

0.0
0.0
0.0
0.3
1.0

Nortron 4 SC
fb Outlook 6 L
1.5
0.42

0.0
0.0
0.7
0.0
0.0
0.0
0.0
0.7
1.5

Nortron 4 SC
fb GoalTender 4F
1.5
0.125

0.0
0.0
1.0
0.0
0.0
0.0
0.0
1.0
1.5

Nortron 4 SC
fb Lorox 50 WP
1.5
0.75

0.3
0.3

0.3
0.0
0.3
1.0
0.3
2.7
1.5

Outlook 6 L
fb Lorox 50 WP
0.42
0.75

1.0
0.7
0.7
0.0
0.0
0.0
0.0
2.3
5.3

Outlook 6 L
fb Lorox 50 WP
0.56
0.75

0.3
0.3
0.0
0.0
0.0
0.0
0.3
1.0
7.3

Dual Magnum 7.62
fb Lorox 50 WP
0.6
0.75

0.0
2.0
2.3
0.0
0.0
0.0
0.3
4.7
3.7

Dual Magnum 7.62
fb Lorox 50 WP
1.3
0.75

0.3
0.0
0.3
0.0
0.0
0.0
0.0
0.7
5.5

Caparol 4L
fb Lorox 50 WP
2.0
0.75

0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.3
0.0

Prowl H2O 3.8
fb Lorox 50 WP

0.95
0.75

0.7
0.0
0.7
0.0
0.0
0.0
0.0
0.3
1.7
0.0

Pr>Treat

<0.001
<0.001
0.013
NA
NA
NA
0.001
<0.001
<0.001

Pr>Block

0.513
0.881
0.335
NA
NA
NA
0.644
0.752
0.058

LSD (0.05)

1.4
1.3
3.5

NA
 NA
 NA
 1.0
 4.8
 1.8

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

Table 3. Weed counts (12 ft²), phytotoxicity rating and time of weeding on June 7.

| Treatment | a.i. lbs/A | Night shades | Cheno-pods | Clovers | Other weeds | Total weeds | Weed time hrs/A | Phyto ¹ |
|--|--------------|--------------|------------|---------|-------------|-------------|-----------------|--------------------|
| Untreated | --- | 11.0 | 13.0 | 8.3 | 2.3 | 34.7 | 38.3 | 0.0 |
| Lorox 50WP fb Lorox 50WP | 0.75 0.75 | 0.0 | 0.3 | 0.0 | 0.3 | 0.7 | 1.7 | 0.0 |
| Nortron 4 SC fb Nortron 4 SC | 1.125 1.5 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 1.5 | 1.0 |
| Nortron 4 SC fb Nortron 4 SC | 1.5 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.3 |
| Nortron 4 SC fb Dual Magnum 7.62 | 1.5 0.6 | 0.0 | 0.3 | 0.0 | 0.3 | 0.7 | 2.0 | 0.7 |
| Nortron 4 SC fb Outlook 6 L | 1.5 0.42 | 0.0 | 0.3 | 0.0 | 0.3 | 1.0 | 2.1 | 3.7 |
| Nortron 4 SC fb GoalTende | 1.5 0.125 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 0.3 |

| | | | | | | | | |
|---|--------------|--------|--------|-----|--------|--------|--------|--------|
| r 4F | | | | | | | | |
| Nortron 4 SC fb Lorox 50 WP | 1.5 0.75 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.9 | 0.7 |
| Outlook 6 L fb Lorox 50 WP | 0.42 0.75 | 1.0 | 1.3 | 1.7 | 0.3 | 4.3 | 2.6 | 7.0 |
| Outlook 6 L fb Lorox 50 WP | 0.56 0.75 | 0.7 | 2.0 | 0.0 | 0.3 | 3.0 | 2.2 | 7.3 |
| Dual Magnum 7.62 fb Lorox 50 WP | 0.6 0.75 | 0.7 | 0.7 | 0.0 | 0.0 | 1.3 | 2.2 | 3.0 |
| Dual Magnum 7.62 fb Lorox 50 WP | 1.3 0.75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 6.7 |
| Caparol 4L fb Lorox 50 WP | 2.0 0.75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 1.0 |
| Prowl H2O 3.8 fb Lorox 50 WP | 0.95 0.75 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.3 |
| | Pr>Treat | <0.001 | <0.001 | NA | <0.001 | <0.001 | <0.001 | <0.001 |
| | Pr>Block | 0.772 | 0.772 | NA | 0.150 | 0.692 | 0.463 | 0.010 |
| | LSD (0.05) | 3.6 | 3.7 | NA | 0.8 | 10.4 | 10.7 | 1.9 |

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

Table 4. Mid-season biomass on June 27 and harvest evaluations on August 11.

| Treatment | a.i. lbs/A | Mean root weight | Roots | Mean root weight | Roots |
|---------------------------|------------|------------------|-----------|------------------|--------|
| | | grams | tons/A | grams | tons/A |
| | | June 27 | August 11 | | |
| Untreated | --- | 21.5 | 14.3 | 45.2 | 38.0 |
| Lorox 50WP | 0.75 | 26.2 | 12.2 | 70.1 | 39.0 |
| Lorox 50WP | 0.75 | | | | |
| Nortron 4 SC | 1.125 | 29.4 | 13.1 | 87.8 | 40.1 |
| Nortron 4 SC ¹ | 1.5 | | | | |
| Nortron 4 SC | 1.5 | 18.5 | 12.9 | 59.9 | 35.6 |
| Nortron 4 SC ¹ | 1.5 | | | | |
| Nortron 4 SC | 1.5 | 16.5 | 13.6 | 70.5 | 35.7 |
| Dual Magnum 7.62 | 0.6 | | | | |
| Nortron 4 SC | 1.5 | 26.4 | 8.1 | 63.9 | 33.4 |
| Outlook 6 L ¹ | 0.42 | | | | |
| Nortron 4 SC | 1.5 | 17.0 | 13.7 | 49.0 | 35.7 |
| GoalTender 4F | 0.125 | | | | |
| Nortron 4 SC | 1.5 | 17.2 | 14.1 | 78.3 | 36.1 |
| Lorox 50 WP | 0.75 | | | | |
| Outlook 6 L | 0.42 | 8.0 | 4.9 | 62.3 | 28.1 |
| Lorox 50 WP | 0.75 | | | | |
| Outlook 6 L | 0.56 | 7.6 | 3.5 | 62.5 | 19.8 |
| Lorox 50 WP | 0.75 | | | | |
| Dual Magnum 7.62 | 0.6 | 10.7 | 8.6 | 51.1 | 34.4 |
| Lorox 50 WP | 0.75 | | | | |
| Dual Magnum 7.62 | 1.3 | 7.4 | 3.4 | 63.5 | 27.5 |
| Lorox 50 WP | 0.75 | | | | |
| Caparol 4L | 2.0 | 20.6 | 12.6 | 64.1 | 36.1 |
| Lorox 50 WP | 0.75 | | | | |
| Prowl H2O 3.8 | 0.95 | 18.5 | 13.4 | 57.0 | 38.6 |
| Lorox 50 WP | 0.75 | | | | |
| | Pr>Treat | 0.046 | <0.001 | 0.809 | 0.014 |
| | Pr>Block | 0.157 | 0.174 | 0.285 | 0.167 |
| | LSD (0.05) | 13.8 | 3.8 | NS | 9.7 |

Carrots treatments on May 6 showing the impact of the preemergent treatments



Untreated



Lorox 1.5 lb (0.75 lb ai/A)



Nortron 48 fl oz (1.5 lb ai/A)



Outlook 9 fl oz (0.42 lb ai/A)



Dual Magnum 10.7 fl oz (0.6 lb ai/A)



Caparol 64 fl oz (2.0 lb ai/A)



Prowl H2O 32 fl oz (0.95 lb ai/A)

Carrots treatments on June 7 showing the impact of the pre and post emergent treatments



Untreated (note weeds pulled From the plot)



Lorox fb Lorox



Nortron fb Nortron



Leaf distortion in Nortron plots



Dual (0.6 lb ai/A) fb Lorox



Outlook (0.4 lb ai/A) fb Lorox



Nortron fb Goal Tender



Caparol fb Lorox



Prowl fb Lorox



Nortron fb Dual Magnum