

Research report to the
Agricultural Research Foundation
and the
Oregon Processed Vegetable Commission
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Title: *Tolerance of Carrots and Parsnips to Dual Magnum and Outlook Herbicides*

Project Leader

Ed Peachey (contact), Horticulture Dept., 541-737-3152, peachey@hort.oregonstate.edu

Cooperator

Bob McReynolds, NWREC, Aurora

The objective of the study was to compare crop tolerance of carrots and parsnips to two soil and early postemergent herbicides. Dual Magnum (s-metolachlor) was recently registered for use on root crops, but provides poor control of hairy nightshade, and loses effectiveness if rainfall is excessive after application.

Methods. Two rows of carrots and two rows of parsnips were planted on May 1 in 6 ft beds with 18 inches between rows. Dual Magnum and Outlook (dimethenamid-p) herbicide rates for similar treatments (PES, EPOST, or PES + EPOST) were based on equivalent herbicide costs/acre. Herbicides were applied to 6 ft by 30 ft plots with each treatment replicated 4 times in a RCBD. Linuron (0.5 lbs ai/A) was applied EPOST on May 31 after the initial weed ratings to reduce competition with the crop, and plots were kept weed free thereafter with cultivation and hand hoeing. Carrots and parsnips were harvested on August 8 from 10 ft of the middle row of each plot.

Results. Carrots were much more tolerant than parsnips to both herbicides. Both carrots and parsnips suffered less injury from Dual Magnum than Outlook. Weed control was better with Outlook than Dual Magnum at cost-equivalent rates. Outlook caused unacceptable yield reductions in both carrots and parsnips. The split application of Dual Magnum (PES + EPOST) may have improved weed control slightly compared to PES only, but carrot yield was substantially reduced at the 2X rate (Tr. 6).

Table 1. Effect of Dual Magnum and Outlook on parsnip and carrot growth, yield and weed control, Corvallis, OR, 2006.

| Herbicide | Timing | Rate <i>lb ai/A</i> | Crop stand (10 DA ¹ EPOST) | | Phytotoxicity (1 WA ¹ EPOST) | | Stunting (1 WA EPOST) | | Weed control % | Crop yield | | | | |
|------------|-----------------------|------------------------|--|--------|--|--------------------------|--------------------------|------------|----------------------|-----------------------|------------|--------|-----|------|
| | | | Parsnip | Carrot | Parsnip | Carrot | Parsnip | Carrot | | Parsnip | | Carrot | | |
| | | | <i>% of check</i> | | <i>---- 0-10 ----</i> | <i>---- 0-100 % ----</i> | <i>#/10 ft of row</i> | <i>t/A</i> | | <i>#/10 ft of row</i> | <i>t/A</i> | | | |
| 1 | DualMag | PES | 0.64 | 58 | 103 | 0.5 | 0.0 | 18 | 20 | 79 | 37 | 2.8 | 79 | 12.9 |
| 2 | DualMag | PES | 1.28 | 58 | 102 | 1.0 | 0.0 | 43 | 30 | 83 | 38 | 2.8 | 73 | 11.1 |
| 3 | DualMag | EPOST | 1.28 | 79 | 104 | 1.3 | 0.3 | 13 | 18 | 13 | 46 | 3.2 | 65 | 11.4 |
| 4 | DualMag | EPOST | 2.56 | 97 | 78 | 3.5 | 1.3 | 36 | 40 | 25 | 17 | 0.6 | 61 | 7.7 |
| 5 | DualMag | PES + EPOST | 0.64 1.28 | 56 | 89 | 0.5 | 0.0 | 33 | 35 | 88 | 33 | 1.7 | 69 | 10.4 |
| 6 | DualMag | PES + EPOST | 1.28 2.56 | 33 | 69 | 1.8 | 1.5 | 60 | 40 | 89 | 15 | 0.5 | 60 | 6.2 |
| 7 | Outlook | PES | 0.38 | 55 | 50 | 0.5 | 0.0 | 43 | 73 | 95 | 40 | 3.2 | 34 | 3.9 |
| 8 | Outlook | PES | 0.75 | 14 | 13 | 0.5 | 0.7 | 88 | 89 | 98 | 6 | 0.7 | 10 | 1.5 |
| 9 | Outlook | EPOST | 0.75 | 62 | 101 | 1.5 | 0.8 | 8 | 29 | 13 | 37 | 1.8 | 64 | 5.0 |
| 10 | Outlook | EPOST | 1.5 | 101 | 82 | 1.8 | 0.0 | 15 | 33 | 20 | 32 | 1.3 | 41 | 3.3 |
| 11 | Outlook | PES + EPOST | 0.375 0.75 | 47 | 64 | 1.3 | 0.3 | 55 | 67 | 94 | 25 | 1.1 | 33 | 2.1 |
| 12 | Outlook | PES + EPOST | 0.75 1.5 | 5 0 | 5 0 | - - | - - | 93 | 98 | 100 | 0 | 0 | 0.5 | 0.1 |
| 15 | Linuron | POST | 0.5 | 100 | 100 | 0 | 0 | 0 | 0 | 18 | 61 | 4.6 | 68 | 12.1 |
| 16 | Hand weeded + linuron | | | 78 | 102 | 0 | 0 | 8 | 10 | 50 | 63 | 4.8 | 77 | 14.5 |
| LSD (0.05) | | | | 22 | 27 | 0.9 | 0.9 | 21 | 22 | 38 | 13 | 0.9 | 19 | 2.5 |

¹DA, days after; WA, weeks after.

Table 2. Herbicide application and soil data.

| | May 2 | May 29 |
|----------------------------|--|--|
| Application date | May 2 | May 29 |
| Application timing | Preemergence surface (PES) | Early postemergence (EPOST) |
| Crop stage | Planted May 1; 3/4 inch deep | Carrots and parsnips 1.5 - 2 leaf |
| Start/end time | 6-7 AM | 8-9:30 AM |
| Air temp/ soil surface | 45/50 ⁰ F | 60/67 ⁰ F |
| Relative humidity | 85% | 90% |
| Wind direction/velocity | N 1-3 | SW 0-1 |
| Cloud cover | 0 | 80 |
| Soil moisture | Dry | Very wet |
| Plant moisture | - | Wet |
| Sprayer/PSI | Backpack, 4-8002 nozzles, 30 PSI, 20 GPA | Backpack, 4-8002 nozzles, 30 PSI, 20 GPA |
| Soil inc. method/implement | Irrigation of 0.5 in | Rainfall on May 31, 2 days after application |
| Soil texture | | Silt loam |
| Soil pH | | 5.2 |
| CEC | | 29.3 meq/100g soil |
| OM | | 3.5% |