

CARROT (*Daucus carota* ‘Cupar’)
Alternaria leaf blight; *Alternaria dauci*
Powdery mildew; *Erysiphe heraclei*

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Evaluating conventional fungicides for the control of Alternaria leaf blight of carrot, 2023.

This trial was established in sandy soil at a grower-cooperator’s field in Oceana County, MI. Carrot (‘Cupar’) seed was sown 16-in apart in three row beds on 1 May. Each treatment plot included three 20-ft long rows with a 3-ft buffer between treatment plots. Four replicates were established for each of the 11 treatments and the untreated control, arranged in a randomized complete block design. Insecticide and fertilizer were applied by the grower cooperater according to commercial production standards. The trial was initiated on 13 Jul prior to foliar blight symptom development. Applications were made with a backpack sprayer calibrated to 35 PSI with three XR8003 flat-fan nozzles spaced 18-in apart, delivering 50 gallons per acre. Application dates were 13 and 24 Jul; 3, 16 and 24 Aug; 5, 14 and 26 Sep. Visual assessment of the foliar blight severity was made using a 0 to 100% scale, where 0 = 0% foliar blight and 100 = 100% foliar blight. Ratings were taken on 16 and 24 Aug; 5, 14, and 25 Sep; and 3 Oct. Individual ratings of foliar blight were used to calculate the area under disease progress curve values. On 3 Oct, the carrots were harvested from 5-ft of the center row of each plot and the carrots were topped and weighed. Data were analyzed using an analysis of variance (ANOVA) with means separation performed using Fisher’s protected least significant difference (LSD) using the statistical software RStudio V 4.1.1.

There was a high level of Alternaria leaf blight in this trial, with disease severity reaching 83% by the end of the trial (25 Sep). Powdery mildew was observed on the carrot petioles and foliage for the untreated control and the Bravo WeatherStik treatment at the last assessment date (data not shown). There were no significant yield differences between the treatments and the untreated control. All treatments had significantly less diseased foliage compared to the untreated control at each assessment date and according to the AUDPC data. On 24 Aug, 5, and 25 Sep, all fungicide treatments had a similar level of diseased foliage. On 14 Sep, Miravis Prime alternated with Bravo WeatherStik, Luna Flex alternated with Bravo WeatherStik, Luna Sensation alternated with Bravo WeatherStik, and Elisys alternated with Bravo WeatherStik were more effective than Omega SC alternated with Bravo WeatherStik. On the final rating date, Miravis Prime alternated with Bravo WeatherStik was more effective than Bravo WeatherStik, Cabrio EG alternated with Bravo WeatherStik, Cevya SC alternated with Bravo WeatherStik, and Omega alternated with Bravo WeatherStik. According to the AUDPC data, Miravis Prime alternated with Bravo WeatherStik, Luna Flex alternated with Bravo WeatherStik, Luna Sensation alternated with Bravo WeatherStik, Elisys alternated with Bravo WeatherStik. Merivon SC alternated with Bravo WeatherStik and Inspire Super SC alternated with Bravo WeatherStik were more effective than Omega SC alternated with Bravo WeatherStik. Phytotoxicity was not observed in any of the treatments.

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| Treatment ^y and rate/A, application schedule, applied at 7-10-day intervals | Yield (lb) ^x | Foliar Blight Severity (%) ^z | | | | | AUDPC ^w |
|---|-------------------------|---|--------|--------|--------|---------|--------------------|
| | | 24 Aug | 5 Sep | 14 Sep | 25 Sep | 3 Oct | |
| Untreated | 16.2 a | 11.3 a ^v | 21.8 a | 67.5 a | 87.5 a | 83.8 a | 2174.6 a |
| Miravis Prime SC 6.8 fl oz apps B,D,F,H -alt- ^u Bravo WS ^t 32 fl oz apps A,C,E,G | 21.2 a | 1.8 b | 2.8 b | 2.0 c | 4.3 b | 3.5 e | 122.5 c |
| Luna Flex SC 12 fl oz apps C,E -alt- Bravo WS 32 fl oz apps A,B,D,F,G,H | 20.6 a | 2.0 b | 2.0 b | 2.5 c | 6.8 b | 4.3 de | 148.1 c |
| Luna Sensation SC 5 fl oz apps B,D,F,H -alt- Bravo WS 32 fl oz apps A,C,E,G | 20.2 a | 2.8 b | 3.5 b | 2.5 c | 5.0 b | 4.3 de | 151.6 c |
| Elisys SC 7 fl oz apps C,E,G -alt- Bravo WS 32 fl oz apps A,B,D,F,H | 19.6 a | 2.8 b | 3.5 b | 2.0 c | 5.0 b | 5.0 de | 152.6 c |
| Merivon SC 5.5 fl oz apps C,E,G -alt- Bravo WS 32 fl oz apps A,B,D,F,H | 18.4 a | 2.0 b | 3.0 b | 3.5 bc | 5.0 b | 6.3 de | 159.5 c |
| Inspire Super SC 16 fl oz apps B,D,F,H -alt- Bravo WS 32 fl oz apps A,C,E,G | 19.1 a | 2.8 b | 4.5 b | 3.3 bc | 5.0 b | 6.0 de | 178.1 c |
| Switch WG 14 oz apps B,D,F,H -alt- Bravo WS 32 fl oz apps A,C,E,G | 20.0 a | 2.3 b | 4.0 b | 4.3 bc | 7.0 b | 7.5 c-e | 204.4 bc |
| Bravo WS 32 fl oz apps A-H | 17.4 a | 4.3 b | 4.3 b | 3.5 bc | 5.0 b | 12.8 bc | 223.4 bc |
| Cabrio EG 12 oz apps B,D,F,H -alt- Bravo WS 32 fl oz apps A,C,E,G | 19.1 a | 2.3 b | 5.0 b | 4.0 bc | 7.3 b | 10.0 cd | 224.3 bc |
| Cevya SC 5 fl oz apps C,E,G -alt- Bravo WS 32 fl oz apps A,B,D,F,H | 23.3 a | 3.0 b | 5.5 b | 4.8 bc | 6.3 b | 10.0 cd | 231.4 bc |
| Omega SC 32 fl oz apps B,D,F,H -alt- Bravo WS 32 fl oz apps A,C,E,G | 19.1 a | 4.3 b | 5.5 b | 8.8 b | 7.5 b | 18.0 b | 329.1 b |
| <i>P-value</i> | n.s. | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | < 0.001 |

^z: Based on a visual estimation of the foliage diseased (%)

^y: apps = applications. Application dates: A=13 Jul, B=24 Jul, C=3 Aug, D=16 Aug, E=24 Aug, F=5 Sep, G=14 Sep, H=25 Sep

^x: Data from single 5-ft row of carrots harvested from each experimental plot on 3 Oct

^w: AUDPC = Area Under Disease Progress Curve

^v: Columns with letters in common are not statistically different from each other (LSD t-test; $P=0.05$)

^u: -alt- = alternate

^t: Bravo WS = Bravo WeatherStik SC