CUCUMBER (*Cucumis sativus* ‘Straight-Eight’) M.R. Uebbing and M.K. Hausbeck

Downy mildew, *Pseudoperonospora cubensis*  Michigan State University

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**Evaluation of single product treatments for control of downy mildew on pickling cucumbers, 2021.**

This trial was conducted at the Michigan State University Plant Pathology Farm in Lansing, MI in a field previously planted to cucumber. Pre-plant fertilizer (urea 100 lb/A, potash 180 lb/A, sulfur 25 lb/A, boron 20 lb/A) was applied on 20 May. The field was prepared by plowing on 5 May and discing 17 and 20 May. Raised beds were formed, plastic was laid, and drip tape established for irrigation on 25 May. Weeds were controlled via mechanical cultivation and hand weeding. Cucumber ‘Straight-Eight’ seeds were planted from seed by hand on 30 Jul and spaced 12 in. apart in rows that were spaced on 6-ft centers. Treatments were arranged in a completely randomized block design with four replicates. Each treatment replicate consisted of a single 20-ft row plot with a 5-ft buffer between treatments within a row. The trial was fertilized throughout the growing season with weekly applications of 28% nitrogen via drip tape at 1 gal/A. Insects were controlled with an application of Admire Pro (10.5 fl oz/A) through drip tape on 13 Aug and non-target diseases (Alternaria Leaf Spot/Blight and Powdery Mildew) were controlled with applications of Quadris (15.5 fl oz/A) and Quintec (6 fl oz/A) on 25 Aug and 1 Sep. Weekly spray treatments were applied on 6, 13, 20, and 26 Aug, 3 and 10 Sep.

Over the course of the study, foliar disease progressed from 18.8% to 87.5% for the untreated control plants. Orondis Opti SC was the most effective treatment with <1% foliar infection on the last rating date (16 Sep), significantly lower than all the other treatments (p < 0.05). Previcur Flex was the next most effective treatment, with 37.8% foliar infection, significantly lower than all other treatments besides Orondis Opti. Ranman, Elumin, Omega, Zampro, and Gavel were the next most effective products with 44.5%, 45.0%, 48.8%, 50.0%, and 50.0% foliar infection on the last rating date (16 Sep), respectively. Cabrio, Forum, and Presidio were the least effective treatments according to foliar infection. Cabrio EG and Forum SC did not differ significantly from the untreated control (p<0.05) and Presidio was not significantly different from Forum. The AUDPC data indicated that Orondis Opti, Previcur Flex, Ranman, and Omega were the most effective products for controlling downy mildew in 2021. Cabrio, Forum, and Presidio were the least effective products according to AUDPC data.

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| Treatment and rate/A,  applied at 7 day intervals | Foliar Infection (%)Z | | | | | | | | | | | | AUDPCy | |
| 23 Aug | | 30 Aug | | 3 Sep | | 8 Sep | | 13 Sep | | 16 Sep | |
| Untreated control | 18.8 | ax | 57.5 | a | 77.5 | a | 82.5 | a | 87.5 | a | 87.5 | a | 1624.4 | a |
| Orondis Opti 2.5 pt | 0.0 | c | 0.0 | e | 0.0 | e | 0.0 | h | 0.5 | g | 0.75 | g | 3.1 | g |
| Previcur Flex 1.2 pt | 1.3 | c | 22.5 | cd | 13.8 | d | 32.5 | g | 36.3 | f | 37.8 | f | 554.1 | f |
| Ranman 2.75 fl oz | 3.0 | c | 17.5 | d | 13.8 | d | 35.0 | g | 42.5 | ef | 44.5 | e | 580.4 | f |
| Omega 24 fl oz | 0.0 | c | 23.8 | cd | 10.0 | de | 38.8 | gf | 45.5 | e | 48.8 | e | 624.5 | ef |
| Zampro 14 fl oz | 3.8 | bc | 27.5 | c | 27.5 | c | 42.5 | gf | 48.8 | e | 50.0 | e | 770.6 | de |
| Elumin 8 fl oz | 7.5 | bc | 35.0 | b | 27.5 | c | 40.0 | gf | 43.8 | e | 45.0 | e | 785.0 | d |
| Gavel 2 lb | 3.5 | c | 36.3 | b | 28.8 | c | 43.8 | efg | 48.8 | e | 50.0 | e | 829.8 | d |
| Koverall 3 lb | 5.0 | bc | 35.0 | b | 30.0 | c | 51.3 | def | 57.5 | d | 58.8 | d | 919.4 | cd |
| Zing! 36 fl oz | 4.0 | bc | 40.0 | b | 37.5 | c | 53.8 | de | 58.8 | d | 61.3 | d | 998.4 | c |
| Bravo WeatherStik WP 2 pt | 3.3 | c | 37.5 | b | 37.5 | c | 61.3 | cd | 66.3 | c | 67.5 | c | 1058.9 | c |
| Presidio 4 fl oz | 13.0 | ab | 52.5 | a | 61.3 | b | 68.8 | bc | 73.8 | b | 78.8 | b | 1366.8 | b |
| Forum 6 fl oz | 10.0 | abc | 52.5 | a | 63.8 | b | 75.0 | ab | 81.3 | a | 82.5 | ab | 1434.4 | b |
| Cabrio 12 oz | 11.8 | ab | 55.0 | a | 70.0 | ab | 76.3 | ab | 82.5 | a | 86.3 | a | 1499.3 | ab |

zBased on visual assessment foliage diseased.

yArea Under the Disease Progress Curve.

xColumn means with a letter in common are not statistically different at p = 0.05 according to Tukey’s multiple-range test using ANOVA, SAS.