CUCUMBER (*Cucumis sativus* 'Vlaspik')
Downy mildew; *Pseudoperonospora cubensis*

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Evaluation of single fungicide products for control of downy mildew of cucumber, 2018.

This trial was established at the Michigan State University Plant Pathology Farm in Lansing, MI, in a field of Capac loam soil previously planted to soybean. Roundup PowerMax 1 qt/A was applied for weed control prior to planting. Soil was prepared by plowing and disking, forming raised beds, and covering them with black plastic. Drip tape was established for irrigating the plot. Cucumber 'Vlaspik' seeds were planted on 20 Jul into the raised beds. Treatment rows were spaced 5.5 ft apart and plants were spaced 12 in. within the row. Treatments were arranged in a completely randomized block design with four replicates. Each treatment replicate consisted of a single row 20-ft plot with a 3-ft buffer between treatments within the row. The trial was fertilized throughout the growing season with weekly applications of 20-20-20 via drip tape at 2.5 lb/A. One application of Admire Pro 8 fl oz/A was applied via drip irrigation 4 weeks after planting for insect control. The plots were hand weeded. Foliar spray treatments were applied on 10, 16, 23 and 30 Aug and 7, 15, and 22 Sep using a CO_2 backpack sprayer and a broadcast boom equipped with three XR8003 flat-fan nozzles spaced 18 in. apart, calibrated at 50 psi and delivering 50 gal/A. Foliar infection was visually estimated using a 0 to 100% scale on 29 Aug; 3, 6, 16, 24 and 27 Sep. Marketable fruit were harvested from the entire 20-ft plot on 10, 14, 19 and 26 Sep and weighed. Data were analyzed using an analysis of variance (ANOVA), with means separation performed using Fisher's protected least significant difference (LSD).

Downy mildew was first reported in Ingham County on 15 Aug in cucumber research plots on the Michigan State University Plant Pathology Farm. AUDPC data indicate that only four fungicides limited foliar blight compared to the control and included Previcur Flex, Ranman, Zampro, and Omega. However, applications of Bravo WeatherStik, Gavel, Orondis Opti, and Elumin reduced foliar blighting compared to the control on each foliar assessment date. The highest yields resulted from treatments of Previcur Flex, Ranman, or Zampro and were 3 to 4 times that of the control. Other treatments that increased yields compared to the control included Bravo WeatherStik, Koverall, Gavel, Tanos, Omega, and Orondis Opti.

Treatment and rate/A, applied	Foliar blight (%)[z]							Total yield
at 7-day intervals	8/29	9/3	9/6	9/16	9/24	9/27	AUDPC[y]	(lb)
Untreated control	7.0 a[x]	9.8 a	25.0 a	85.0 a	85.0 ab	88.8 a	2012.5 a	15.3 ef
Bravo WeatherStik SC 2 pt	1.3 e-h	2.8 d-f	18.8 b	75.0 de	43.8 c	68.8 b	1094.3 ab	40.6 b
Koverall DG 2 lb	0.8 f-h	1.5 ef	18.8 b	81.3 a-c	78.8 b	71.3 b	1197.4 a	36.6 bc
Cueva SC 2 qt	2.5 d-h	2.8 d-f	18.8 b	83.8 ab	80.0 b	82.5 a	1301.6 a	17.4 d-f
Cabrio EG 12 oz	3.5 b-f	5.0 b-d	25.0 a	85.0 a	80.0 b	82.5 a	1336.8 a	14.3 f
Presidio SC 0.25 pt	3.0 c-g	7.5 ab	25.0 a	85.0 a	88.8 a	88.8 a	1393.0 a	23.2 d-f
Previcur Flex SL 1.2 pt	0.8 f-h	0.8 ef	1.5 g	23.8 j	22.5 g	42.5 f	642.5 bc	56.0 a
Ranman SC 2.75 fl oz	0.5 gh	0.8 ef	5.0 fg	30.0 i	26.3 fg	50.0 ef	444.6 c	57.7 a
Zampro SC 14 fl oz	1.0 f-h	0.0 f	15.0 cd	66.3 g	35.0 de	57.5 de	760.6 bc	53.9 a
Gavel 75DF 2 lb	0.5 gh	0.0 f	16.3 bc	72.5 ef	40.0 cd	66.3 bc	945.0 ab	35.2 bc
Tanos DF 0.25 lb	5.0 a-d	6.0 bc	8.8 e	80.0 bc	83.8 ab	82.5 a	1164.6 ab	27.7 cd
Curzate 60DF 5 oz	4.0 b-e	3.8 c-e	4.5 fg	78.8 cd	80.0 b	82.5 a	1181.6 a	26.7 c-e
Omega 500F 1 pt	0.0 h	0.0 f	12.5 d	35.0 h	31.3 ef	53.8 de	727.0 bc	38.0 bc
Revus SC 8 fl oz	5.8 a-c	6.8 a-c	22.5 a	83.8 ab	81.3 b	86.3 a	1161.9 ab	16.4 d-f
Forum SC 6 fl oz	6.3 ab	7.5 ab	23.8 a	85.0 a	83.8 ab	86.3 a	1370.1 a	19.2 d-f
Orondis Opti SC 40 fl oz	0.0 h	0.0 f	15.0 cd	33.8 hi	26.3 fg	53.8 de	785.0 a-c	39.8 b
Elumin SC 8 fl oz	0.8 f-h	0.8 ef	7.0 ef	68.8 fg	38.8 cd	60.0 cd	797.5 ab	55.0 a
Priaxor Xemium SC 8 fl oz	7.0 a	6.8 a-c	25.0 a	85.0 a	85.0 ab	87.5 a	1273.7 a	13.9 f

[z]Based on a visual estimation of the percentage of foliage diseased.
[y]Area under the disease progress curve.
[x]Column means with a letter in common are not significantly different (LSD t-Test; *P*=0.05).