

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

R. P. Mulrooney, E. G. Ernest, and W. E. Kee
Plant and Soil Science Dept, University of
Delaware, Newark, DE 19716-2170

Evaluation of fungicides for control of downy mildew on pickling cucumbers, 2007.

The experiment was conducted on a Pepperbox loamy-sand soil at the Carvel Research and Education Center near Georgetown, DE. The experiment was arranged as a randomized complete block design with four replications. Plots were 7.5 ft wide and 20 ft long. Cucumbers were direct seeded in rows spaced 30 - in. apart with 3-in. between plants within the row on 5 Aug. Fungicide applications were initiated on 14 Aug (first true leaf expanded) before any symptoms were seen on the plants, but present in an adjacent field. Downy mildew was observed at low incidence on 23 Aug. Subsequent applications were made on 23, 30 Aug and 10 Sep using a CO₂ pressurized backpack sprayer that delivered 30 gal/A at 52 psi. Applications were made with a broadcast boom equipped with 4 hollow cone nozzles (D4 disks, no. 45 cores) spaced 18 in. apart. Each plot was bordered by three untreated rows. Disease severity was measured on 9 Sep and at harvest on 17 Sep by estimating the percent of infected leaf area per plot. A 15 ft-long section of the middle row of each plot was hand harvested once on 17 Sep to simulate mechanical harvest which is the standard harvest method in the region. Cucumbers were graded according to size and quality. The weight of crooks and nubs (small and misshapen fruit) was subtracted from the total yield weight to obtain marketable yield. The average minimum and maximum temperatures during the trial were 64°F and 85°F respectively. The plot received a total 3.8 inches of rainfall, and supplemental overhead irrigation was provided as necessary.

Despite periods of hot, dry weather during the trial, downy mildew severity was very high by harvest and the yields of the untreated control plots reflected that. All of the fungicide programs except Bravo Weather Stik 6SC 3.0 pt provided significant control of downy mildew compared to the untreated control. All treatments except Phostrol and Bravo Weather Stik produced marketable yields greater than the untreated control. It was interesting to note that there was a significant difference in yield for Previcur Flex + Bravo alternated with Tanos plus Manzate depending on which fungicide pair was applied first. There were no symptoms of phytotoxicity for any treatment.

Treatment and rate/A	Marketable Yield (bu/A)*	Total Yield (bu/A)*	% Crooks & Nubs*	% Infected leaves**	
				9 Sep	17 Sep
Tanos 50 DF 8 oz + Manzate Prostick 75 DG 3.0 lbs alt. w/ Previcur Flex 6F 1.2 pts + Bravo Weather Stik 6SC 2.0 pt	177 a	268 a	36.1 ab	3.0 ab	18.8 ab
Previcur Flex 6F 1.2 pts + Bravo Weather Stik 6SC 2.0 pts alt. w/ Ranman 3.33 SC 2.75 fl oz + Bravo Weather Stik 6 SC 2.0 pt	158 ab	233 ab	31.2 a	1.7 ab	16.3 ab
Ranman 3.33 SC 2.75 fl oz + Manzate Prostick 75DF 3.0 lbs alt. w/ Bravo Weather Stik 6SC 3.0 pts	114 abc	219 ab	51.7 abc	10.0 cd	26.8 ab
Tanos 50 DF 8.0 oz + Manzate Prostick 75 DF 3.0 lb alt. w/ Curzate 70 DF 3.2 oz + Bravo Weather Stik 6 SC 1.5 pt	106 abc	192 abc	49.0 ab	0.5 a	21.3 ab
Previcur Flex 6F 1.2 pts + Bravo Weather Stik 6 SC 2.0 pts alt. w/ Tanos 50 DF 8.0 oz + Manzate Prostick 75DF 3.0 lb	75 bc	169 bc	58.1 bc	4.5 abc	31.3 bc
Phostrol 6.69L 4.0 pt + Bravo Weather Stik 6SC 2.0 pt	57 cd	117 cd	52.1 abc	7.5 bc	21.3 ab
Bravo Weather Stik 6SC 3.0 pt	51 cd	163 bc	70.5 c	13.7 d	41.3 c
Untreated control	3 d	70 d	97.5 d	22.5 e	75.0 d
LSD				5.9	12.6
p-value	0.0056	0.0023	0.0013	<0.0001	<0.0001

**Mean values within a column followed by the same letter are not significantly different according to Fisher's protected least significant difference (LSD) test.

*Mean values separated using multiple t-tests, means within the column followed by the same letter are not significantly different.