

Evaluation of fungicides for management of downy mildew on cucumber, fall 2010.

On 10 Sep 2010, plots were established at the University of Florida's Gulf Coast Research and Education Center in Balm, FL to assess the effect of several fungicides on the severity of downy mildew on butternut squash. Plots consisted of 27 ft-long bed sections along 300 ft-long, raised beds with 5 ft center-to-center bed spacing. Beds were covered with black virtually impermeable mulch and irrigated with a drip system. Seeds were sown at 12-in spacing along beds skipping a 3-ft alley between plots and every third bed as a buffer. Fungicide treatments were applied on 13 Oct, 21 Oct, 28 Oct, and 5 Nov (corresponding with applications 1 to 4 below) with a CO₂ back pack sprayer calibrated to deliver 60 gal/A at 40 psi. Treatments, including a non-treated control, were arranged in a randomized complete block design with each treatment repeated four times. Plots were monitored regularly for downy mildew and rated on 22 Oct, 29 Oct, and 5 Nov after disease reached acceptable levels across the trial. The yield was assessed from a single harvest of plots on 9 Nov. Alternating applications of Procure 480SC (8 fl oz/A) and Quintec (6 fl oz/A) were included as general maintenance sprays (not shown in treatment list) to minimize the impact of powdery mildew.

Cucumber plants applied with V-10208 had the lowest disease severity on 22 Oct. Except K-phite, the other treatments significantly reduced downy mildew based on disease severity on 29 Oct. Five treatments had the lowest level of the final disease severity: GWN-9941-GWN-9823, Ranman-GWN-9941-GWN-4700-Presidio-Dithane, Previcur Flex-Bravo WeatherStik, Presidio-Bravo WeatherStik, and Presidio-Penncozeb. Of the five treatments, GWN-9941-GWN-9823 exhibited the lowest area under the disease progress curves (AUDPC) and significantly reduced disease epidemics by 72.1% in comparison to the non-treated control. Except K-phite, Prestine-Bravo WeatherStik, and Forum-Bravo WeatherStik, the other treatments significantly reduced AUDPC in comparison to the non-treated control. Although most fungicide treatments significantly lowered the final disease severity and disease epidemics compared to the non-treated control, only GWN-9941-GWN-9823, Ranman-Bravo WeatherStik, and Presidio-Bravo WeatherStik significantly increased the yield.

Treatment, rate/A (application) ^z	Disease severity (%) ^y				Yield (lb/plot)
	22 Oct	29 Oct	5 Nov	AUDPC ^x	
Non-treated Control.....	9.13 a ^w	43.8 a	62.5 a	557 a	62.8 def
GWN-9941, 2 pt (1,3); Gavel 75DF, 2 lb (2,4).....	9.13 a	28.0 bcd	32.8 cde	343 b-e	75.1 a-e
GWN-9941, 2 pt (1,3); GWN-9823, 0.45 lb (2,4).....	5.25 a-d	7.88 g	23.3 e	155 h	97.8 ab
GWN-9941, 2 pt (1,3); GWN-4700, 4 fl oz (2,4); GWN-9939, 5.5 fl oz (2,4).....	5.63 a-d	20.9 c-f	37.5 bcd	297 c-f	57.5 def
Ranman, 2.5 fl oz (1,4); GWN-9941, 1.5 pt (2); GWN-4700, 4 fl oz (2); Presidio 4SC, 4 fl oz (3); Dithane, 2 lb (3).....	6.75 abc	23.3 b-e	23.3 e	268 d-g	74.9 a-f
BAS 651, 14 oz (1-4); Silwet L-77, 0.05% (1-4).....	5.63 a-d	32.8 b	43.8 bc	402 bc	54.3 ef
V-10208, 8 fl oz (1-4).....	2.25 d	10.3 fg	25.6 de	169 gh	82.0 a-d
Catamaran, 4 pt (1-4).....	4.88 bcd	18.5 d-g	32.8 cde	261 e-h	81.1 a-d
Bravo WeatherStik 6SC, 2 pt (1-4).....	4.88 bcd	32.8 b	37.5 bcd	378 bc	63.9 def
Ranman, 2.75 fl oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4)....	6.75 abc	20.9 c-f	23.3 e	251 e-h	93.6 abc
Prestine 38WG, 18.5 oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4).....	3.38 cd	30.4 bc	50.0 ab	399 bc	65.1 def
Curzate 60DF, 3.2 oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4)	3.75 bcd	11.4 fg	28.0 de	191 fgh	69.3 c-f
Previcur Flex, 1.2 pt (1-4); Bravo WeatherStik 6SC, 2 pt (1-4)	7.88 ab	13.8 efg	23.3 e	205 fgh	76.6 a-e
Revus 2.08SC, 4 fl oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4)	3.00 cd	32.8 b	37.5 bcd	371 bcd	72.2 c-f
Presidio 4SC, 4 fl oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4)	4.13 bcd	11.4 fg	23.3 e	175 gh	99.6 a
Forum, 6 oz (2,4); Bravo WeatherStik 6SC, 2 pt (1-4).....	5.63 a-d	32.8 b	50.0 ab	424 b	70.1 c-f
K-phite, 1 qt (2,4).....	7.88 ab	50.0 a	62.5 a	596 a	50.3 f
Presidio 4SC, 4 fl oz (2,4); Penncozeb 75DF, 2 lb (1-4).....	5.63 a-d	11.4 fg	23.3 e	181 gh	73.5 b-f
<i>P > F</i>	0.0433	< 0.0001	< 0.0001	< 0.0001	0.0052

^z Listed treatment rates are on a per acre basis unless noted otherwise.

^y The severity of downy mildew was assessed as the percentage of canopy affected. The Horsfall-Barratt scale was used for all ratings, but values were converted to mid-percentages prior to statistical analyses.

^x Area under the disease progress curves (AUDPC) was calculated using the formula: $\Sigma[(x_i + x_{i-1})/2](t_i - t_{i-1})$ where x_i is the rating at each evaluation time and $(t_i - t_{i-1})$ is the time between evaluations.

^w Values followed by the same letter are not statistically significant ($P = 0.05$) according to Fisher's LSD test.