

Evaluation of fungicides for management of downy mildew on squash, spring 2010.

On 21 Mar 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 8 ft-long bed sections along 300 ft-long, raised beds with 4 ft center-to-center bed spacing. Beds were covered with black virtually impermeable mulch and irrigated with a drip system. Seeds were sown at 30-in spacing along beds skipping a 6 ft alley between plots and every third bed as a buffer. Fungicide treatments were applied on 10 May, 17 May, 24 May, 1 Jun, 7 Jun, 16 Jun, and 22 Jun (corresponding with applications 1 to 7 below) with a CO₂ back pack sprayer calibrated to deliver 40 (app. 1), 60 (app. 2), and 100 gal/A (apps. 3–7) 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 19 May, 3 Jun, and 14 Jun after disease reached acceptable levels across the trial. Marketable yield was assessed from a single harvest of plots on 29 Jun. Alternating applications of Procure 480SC (4–8 fl oz/A) and Quintec (4–6 fl oz/A) were included as general maintenance sprays (not shown in treatment list) to minimize the impact of powdery mildew.

In comparison to the non-treated control, all treatments significantly reduced disease severity of downy mildew rated on 19 May, whereas no significant difference was observed in the final disease severity between treatments. Based on area under the disease progress curves (AUDPC), all treatments significantly lowered disease progress by 21.4–57.5% compared to the non-treated control. Of these treatments, BAS 651-Silwet L-77 had the lowest AUDPC value. No significant difference was observed in the marketable fruit yield between treatments, although the non-treated control had the lowest fruit number and weight.

Treatment, rate/A (application) ^z	Disease severity (%) ^y				Fruit yield		
	19 May	3 Jun	14 Jun	AUDPC ^x	No. Fruit	Weight (lbs/plot)	Fruit size (lbs/fruit)
Non-treated Control.....	43.8 a ^w	62.5 a	86.3	1615 a	32	32.8	1.08
BAS 651, 14 oz (1-7); Silwet L-77, 0.05% (1-7).....	1.50 e	18.5 e	79.1	687 f	40	51.5	1.30
GWN-9941, 2 pt (1,3,5,7); Nu-Film P, 2.05 fl oz (1,3,5,7); Gavel 75 DF, 2 lb (2,4,6).....	10.3 cde	50.0 abc	69.6	1110 b-e	39	48.8	1.28
GWN-9941, 2 pt (1,3,5,7); GWN-9823, 0.45 lb (2,4,6).....	7.88 de	62.5 a	72.0	1268 b	39	43.1	1.10
GWN-9941, 2 pt (1,3,5); GWN-4700, 4 oz (2,4,6); GWN-9939, 5.5 oz (2,4,6).....	7.88 de	56.3 ab	76.8	1212 bc	37	47.2	1.35
Ranman, 2.75 fl oz (1); GWN-9941, 1.5 pt (2,4); GWN-4700, 4 oz (2,4); Presidio 4SC, 4 oz (3,5); Penncozeb 75DF, 2 lb (3,5,7).....	13.8 cd	50.0 abc	67.3	1123 bcd	38	43.5	1.13
Ranman, 2.75 fl oz (1,3,5,7); Bravo WeatherStik 6SC, 2 pt (1-7).....	7.25 de	43.8 bcd	79.1	1058 b-e	36	42.9	1.23
Bravo WeatherStik 6SC, 2 pt (1-7).....	7.88 de	50.0 abc	76.8	1131 bcd	39	49.6	1.28
Pristine 38WG, 18.5 oz (1,3,5,7); Bravo WeatherStik 6SC, 2 pt (1-7).....	20.9 bc	32.8 de	81.5	1031 cde	37	48.3	1.33
Presidio 4SC, 4 oz (1,3,5,7); Penncozeb 75DF, 2 lb (1-7).....	5.63 de	37.5 cd	74.4	939 de	39	45.8	1.20
V-10208, 8 fl oz (1-7).....	28.0 b	50.0 abc	74.4	1269 b	39	48.0	1.28
Curzate 60DF, 3.2 oz (1,3,5,7); Bravo WeatherStik 6SC, 2 pt (1-7).....	7.88 de	50.0 abc	81.5	1157 bcd	34	42.2	1.23
Catamaran, 4 pt (1-7).....	5.63 de	37.5 cd	67.3	900 ef	33	41.7	1.25
Forum, 6 oz (1,3,5,7); Bravo WeatherStik 6SC, 2 pt (1-7).....	5.63 de	50.0 abc	74.4	1101 b-e	35	43.3	1.25
Revus, 4oz (1,3,5,7); Bravo WeatherStik 6SC, 2 pt (1-7).....	5.63 de	50.0 abc	83.9	1154 bcd	35	44.3	1.28
<i>P > F</i>	<0.0001	<0.0001	0.0589	<0.0001	0.8635	0.1275	0.7571

^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.