

Experimental fungicide compared to a fungicide registered for managing powdery mildew of winter squash, 2005.

The objective of this study was to evaluate a new chemical from Valent Biosciences, Inc. as compared to a current standard for the control of powdery mildew in butternut squash. A field experiment was conducted at the Long Island Horticultural Research and Extension Center on Haven loam soil. The field was plowed on 13 Apr and fertilizer (N-P-K 10-10-10) at 1000 lb/A was broadcast and incorporated on 10 May. Three rows of black plastic mulch 30 in. apart were laid on 11 May. Dutch white clover was broadcast-seeded between plastic strips as a living mulch to control weeds. The insecticide Asana XL EC (9.6 fl oz/A) was applied for cucumber beetles on 15 Jul and 12 Aug. During the season weeds were controlled with one application of Roundup Weathermax (32 fl oz/A), hand weeding, and mowing down the clover before the squash vines grew together. To manage Phytophthora blight (*Phytophthora capsici*) and downy mildew (*Pseudoperonospora cubensis*), Phostrol 6.69 EC (5 pt/A) was applied on 5 Aug, and Acrobat 50 WP (6.4 oz/A) was applied on 23 Jul, 12 Aug, 28 Aug, and 17 Sep. Downy mildew was also managed by applying Previcur Flex 66 F (1.2 pt/A) on 19 Aug and 10 Sep. These fungicides were selected because they were not expected to affect powdery mildew. Plots were three 12-ft rows spaced 68-in apart. Each row consisted of 3 plants each spaced 24 in. apart, 10 ft was left unplanted between plots. A randomized complete block design with four replications was used. Average monthly high and low temperatures (°F) were 81/61 in Jun, 84/67 in Jul, 85/69 in Aug, 79/62 in Sep, and 63/51 in Oct. Rainfall (in.) was 1.20, 1.36, 1.48, 3.46, and 20.32 for these months, respectively. All treatments were started on 28 Jul after the IPM threshold of one leaf of 50 old leaves examined with powdery mildew symptoms (Plant Dis. 80:910-916) was reached in 2 of 4 plots scouted. Treatments were applied weekly on 28 Jul, and 4, 11, 18, and 25 Aug with a tractor-mounted boom sprayer equipped with D5-25 hollow cone nozzles spaced 17 in. apart that delivered 85 gal/A at 100 psi. Upper and lower surfaces were examined weekly for powdery mildew beginning on 20 Jul when fruit were starting to enlarge. Initially, 50 older leaves were examined in select plots. All plots were examined beginning on 3 Aug. The examined leaves were selected from the oldest third of the foliage based on leaf appearance and position in the canopy. As disease progressed, the number of leaves examined was reduced to as few as 10 based on the incidence of affected leaves in a plot. Mid-aged and young leaves were also examined beginning on 16 Aug. Powdery mildew colonies were counted; severity was assessed when colonies could not be counted accurately because they had coalesced and/or were too numerous. Average severity for the entire canopy was calculated from the individual leaf assessments. A square root transformation was used when needed prior to analysis to achieve homogeneity of variance. Severity data for 16 Aug and AUDPC were also analyzed without one plot of V-10118 (6.24 fl oz) because the data collected on 16 Aug from this plot were substantially higher than other plots of this treatment. Canopy condition including defoliation was assessed on 24 Aug.

Powdery mildew was first observed on 20 Jul at an extremely low level (2 older leaves out of 200 examined). Symptoms were found in half of the plots on 26 Jul, thus fungicide treatments were started 2 days later. V-10118 provided effective control of powdery mildew that was similar to that obtained with the DMI fungicide Procure. There was a trend of lower severity with the higher rate of V-10118, but these treatments did not differ significantly, even when the full data set was analyzed including the plot with values that were outliers. No phytotoxicity was observed.

Treatment and rate/A ^y	Foliar powdery mildew disease severity (%) ^z						Defoliation
	Upper surface			Lower surface			
	16-Aug	22-Aug	AUDPC	16-Aug	22-Aug	AUDPC	
Treatment and rate/A ^y	16-Aug	22-Aug	AUDPC	16-Aug	22-Aug	AUDPC	24-Aug
Nontreated	20.9 a ^x	17.3 a	203.8 a	18.6 a	22.4 a	202.6 a	36.3 a
Procure 50 WP 6.4 oz	0.2 b	0.5 b	3.2 b	0.9 b	3.8 b	19.9 b	12.5 b
V-10118 6.24 fl oz	0.5 b	0.2 b	2.3 b	1.1 b	3.0 b	19.1 b	21.3 b
V-10118 9.37 fl oz	0.0 b	0.0 b	0.1 b	0.1 b	2.4 b	7.8 b	11.3 b
Treatment <i>P</i> -value	0.0001	0.0001	0.0001	0.0017	0.0001	0.0004	0.0072

^z Exact colony counts were made when possible and severity was estimated using the conversion factor of 30 colonies/leaf = 1%. Severity data is for all leaves on 16 Aug and mid-aged and young leaves only on 22 Aug.

^y Rate of formulated product/A. All treatments were initiated on an IPM schedule with threshold of 1 affected leaf out of 50 older leaves. Application dates were 28 Jul, and 4, 11, 18, and 25 Aug.

^x Numbers in each column followed by the same letter are not statistically different from each other according to Fisher's Protected LSD ($P=0.05$).