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Efficacy of Vivando for managing powdery mildew in cucurbit crops, 2011.

A field experiment was conducted at the Long Island Horticultural Research and Extension Center on Haven loam soil. The field was plowed on 2 May and tilled on 7 Jun. Controlled release fertilizer (19-10-9) at 525 lb/A was broadcast and incorporated on 5 Jun. Beds were formed with drip tape and covered with black plastic mulch on 6 Jun. A waterwheel transplanter was used to make planting holes in the beds for planting in the mulch and to apply starter fertilizer plus insecticide on 22 Jun. Three seeds were placed by hand into each of the holes on 23 Jun. After seedlings were established they were thinned to one plant per hole. All plants in some holes were damaged by herbicide; these were re-seeded on 11 Jul. Weeds were controlled between the rows of mulch by applying a tank mix of Strategy (3.0 pt/A) and Sandea (0.5 oz/A) on 22 Jun, which was followed by 0.4 in rain, and by hand weeding. Cucumber beetles were managed with Admire Pro (7.5 - 10.0 fl oz/treated A) applied with the transplanter. No fungicides were applied to control powdery mildew. The following fungicides were applied to preventively manage downy mildew (Pseudoperonospora cubensis) and Phytophthora blight (Phytophthora capsici): Presidio (3.5 oz/A) on 28 Jul and 14 Sep; ProPhyt (3 qt/A) on 6 Aug; Curzate (3.2 oz/A) on 26 Aug and 14 Sep; and Ranman 400 SC (2.75 fl oz/A) on 20 Aug and 1 Sep. A randomized complete block design with four replications was used. Treatments were three Vivando applications; none, low and high rates. Plots were three adjacent rows each 22 ft long and separated by 19 ft within the row. Plots were divided into three sections with butternut squash in the north section, acorn squash in the center and muskmelon in the south section. Each section had 12 plants spaced 2 ft apart. Rows were spaced 68 in. apart. Treatment applications were made weekly using a tractor-mounted boom sprayer equipped with twinjet (TJ60-11004VS) nozzles spaced 17-in. apart that delivered 54 gal/A at 100 psi. Severity of powdery mildew was assessed on upper and lower leaf surfaces on 26 Aug, 2 Sep, and 14 Sep. Initially 5 leaves were selected in each section from the oldest part of the foliage based on leaf physiological appearance and position in the canopy. On 14 Sep, when symptoms had become more widespread on plants, mid-aged and young leaves were assessed. Powdery mildew colonies were counted; severity was assessed by visual estimation of percent leaf area infected 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. Area Under the Disease Progress Curve (AUDPC) was calculated by trapezoidal integration for severity from 26 Aug through 14 Sep. Yield was not assessed. Average monthly high and low temperatures (°F) were 79/61 in Jun, 87/68 in Jul, 82/66 in Aug, and 76/63 in Sep. Rainfall (inches) was 6.1, 2.35, 10.61, and 6.88 for these months, respectively. There was a hurricane and several atypical intensive rain events during the 2011 growing season on Long Island.

Powdery mildew was first detected on 22 Aug. Vivando applied beginning after disease detection effectively controlled powdery mildew in all three cucurbit crop types. There were no significant differences between the two rates tested. At the 14 Sep assessment, the lowest rate of Vivando was providing 100% and 93% control on upper and lower leaf surfaces, respectively, in muskmelon, 94% and 83% control in butternut squash, and 81% and 55% control in acorn squash. No symptoms of phytotoxicity were observed.

		Powdery mildew severity (%) ^z					
Cucurbit crop type (cultivar)		Upper leaf surface			Lower leaf surface		
	Fungicide treatment ^y	26 Aug	14 Sep ^x	AUDPC	26 Aug	14 Sep	AUDPC
Muskmelon (Ambrosia)							
	Untreated control	0.0	26.6 a	159.8 a	0	34.1 a	204.8 a
	Vivando (30.7 fl oz/A)	0.0	0.1 b	0.8 b	0	0.2 b	0.9 b
	Vivando (15.4 fl oz/A)	0.0	0.0 b	0.0 b	0	2.4 b	14.1 b
	<i>P</i> -value (treatment)	0.4219	0.1113	0.0113	0.0000	0.0007	0.0007
Butternut Squash (Butterboy)							
	Untreated control	0.0	33.7 a	218.1 a	1.4	39.9 a	310.3 a
	Vivando (30.7 fl oz/A)	0.1	7.6 b	45.6 b	1.5	15.1 ab	110.8 b
	Vivando (15.4 fl oz/A)	0.0	2.1 b	12.6 b	0.4	6.7 b	46.3 b
	<i>P</i> -value (treatment)	0.5083	0.0092	0.0132	0.4887	0.0188	0.0113
Acorn Squash (Heart of Gold)							
	Untreated control	0.5	11.2 a	72.8 a	3.4	13.0 a	118.7 a
	Vivando (30.7 fl oz/A)	0.2	2.3 b	14.5 b	1.7	5.6 b	53.7 b
	Vivando (15.4 fl oz/A)	0.0	2.1 b	12.8 b	0.6	6.1 b	47.4 b
	<i>P</i> -value (treatment)	0.3145	0.0009	0.0003	0.2196	0.0006	0.0012

^z Exact colony counts were made when possible and severity was estimated using the conversion factor of 30 colonies/leaf = 1% severity.

^y Rate of formulated product/A. Applications were made on 25 Aug and 1 Sep.

^x Numbers for each cucurbit crop type in each column with a letter in common or no letter are not significantly different according to Tukey's HSD (P = 0.05).