

**Assessment of resistance to powdery mildew race 1 and race 2 in cantaloupe cultivars, 2015.**

The objective was to determine whether resistance to powdery mildew Race 1 and Race 2, which has been bred into most commercial resistant cantaloupe cultivars, was continuing to provide suppression of the pathogen. Excellent control has been obtained in previous experiments conducted at this location. However, in 2014 when an evaluation of resistant cultivars was not conducted, powdery mildew was observed to be severe by the start of harvest in a cultural practice experiment. The resistant cultivars in that experiment, Athena and Sugar Cube, were compared in 2015 to Superstar, the standard susceptible cultivar used in previous evaluations. A field experiment was conducted at the Long Island Horticultural Research and Extension Center (LHREC) in Riverhead on Haven loam soil. Beds were formed with drip tape and covered with black plastic mulch on 10 Jun. A randomized complete block design with four replications was used. Plots were three adjacent rows each with four plants spaced 24 in. apart. Rows were spaced 68 in. apart. To separate plots and provide a source of inoculum, two plants of a powdery mildew-susceptible zucchini squash cultivar (Spineless Beauty) were planted between each plot in each row. Upper and lower leaf surfaces were assessed for powdery mildew on 15 Jul; 4, 10, and 17 Aug; and 4 Sep. Powdery mildew colonies were counted; severity was estimated when colonies had coalesced or were too numerous to count. Colony counts were converted to severity values using the conversion factor of 10 colonies/leaf = 1% severity. Average severity for the entire canopy was calculated from the individual leaf assessments. Area Under Disease Progress Curve (AUDPC) values were calculated from 4 Aug through 17 Aug and also through 4 Sep. To determine which pathogen races were present, powdery mildew differentials were grown in a section of the field adjacent to the plots with the melon cultivars. The same procedures were used to grow these plants and assess powdery mildew. Average monthly high and low temperatures (°F) were 77/61 in Jun, 83/68 in Jul, 84/67 in Aug, and 81/63 in Sep. Rainfall (in.) was 5.02, 1.24, 2.14, and 2.84 for these months, respectively.

One powdery mildew lesion was observed on 15 Jul in one plot of susceptible cultivar Superstar. Symptoms were first observed the previous week on the zucchini separator plants which had begun to produce marketable-sized fruit. The same Superstar plot was the only one with symptoms on 4 Aug. Severity remained low through 17 Aug for all cultivars; however, Superstar had numerically more severe powdery mildew and was the only cultivar with symptoms in all plots. There were also no significant differences among the resistant and susceptible cultivars on 4 Sep when powdery mildew was moderately severe in all cultivars, and first fruit were ripe. Athena and Sugar Cube exhibited excellent suppression of powdery mildew when compared to Superstar in similar experiments conducted in 2011, 2012, and 2013. In the planting of the powdery mildew differentials, the susceptible differential variety (Hales Best Jumbo) was affected first with a single lesion found on 8 Jul. Severity remained low until 17 Aug. Symptoms were found on 10 Aug on the differential with resistance to race 1 (PMR-45), 17 Aug on the differential with resistance to races 1 and 2 (PMR-5), and 4 Sep on the differential with resistance to races 1, 2, and 3 (MR-1). These results confirm presence of *Podosphaera xanthii* strain(s) able to overcome resistance to races 1 and 2, which accounts for powdery mildew becoming severe on the resistant cultivars.

Cultivar	Powdery mildew severity (%) <sup>*</sup>							
	Upper leaf surface				Lower leaf surface			
	17 Aug	4 Sep	AUDPC 1 <sup>**</sup>	AUDPC 2 <sup>**</sup>	17 Aug	4 Sep	AUDPC 1	AUDPC 2
Athena	0.00	32.3	0.03	291	0.00	21.5	0.03	193
Sugar Cube	0.00	23.4	0.03	211	0.00	18.1	0.03	163
Superstar	3.90	21.7	14.83	245	4.98	34.3	19.90	373
<i>P-value (treatment)</i>	0.067	0.612	0.059	0.705	0.062	0.310	0.045	0.092

<sup>\*</sup> There were no significant differences for any powdery mildew severity assessments according to Tukey's HSD, *P*=0.05.

<sup>\*\*</sup> AUDPC values were calculated for severity from 4 Aug through 17 Aug for AUDPC 1 and through 4 Sep for AUDPC 2.