MUSKMELON (*Cucumis melo*)
Powdery mildew; *Podosphaera xanthii*

M. T. McGrath[1], S. R. Menasha[2] and L.K. Hunsberger[1]
Dept of Plant Pathology & Plant-Microbe Biology,
Cornell Univ[1], and Cornell Coop Ext[2], LIHREC,
3059 Sound Avenue, Riverhead, NY 11901

Powdery mildew resistant muskmelon cultivar evaluation, 2011.

The objectives of this study, which is part of a multi-year cultivar evaluation project, were 1) to continue to monitor adaptation in the pathogen that has been reducing the effectiveness of powdery mildew resistance and 2) to determine whether cultivars with resistance to pathogen races 1 and 2 are better protected against powdery mildew than cultivars with resistance to just pathogen race 1. A field experiment was conducted at the Long Island Horticultural Research and Extension Center in Riverhead on Haven loam soil. Controlled release fertilizer (N-P-K, 19-10-9) at 525 lb/A (100 lb/A of nitrogen) was broadcast and incorporated on 31 May. Beds were formed with drip tape and covered with black plastic mulch on 1 Jun. A waterwheel transplanter was used to make planting holes in the beds and apply starter fertilizer plus insecticide on 7 Jun. Seeds were sown on 31 May in the greenhouse. Seedlings were transplanted by hand into beds covered with black plastic mulch on 10 Jun. During the season, water was provided as needed via drip irrigation lines. Weeds were managed by mowing and hand weeding. Cucumber beetles were managed with Admire Pro (7.5 – 10 fl oz/treated A) applied with the transplanter on 7 Jun and Asana XL (9.6 fl oz/A) applied to foliage on 2 Jul. No fungicides were applied to control powdery mildew. The following fungicides were applied preventively for downy mildew (*Pseudoperonospora cubensis*) and Phytophthora blight (*Phytophthora capsici*): ProPhyt (4 pt/A) on 6 Aug; Ranman 400 SC (2.75 fl oz/A) on 18 Aug and 2 Sep; and Curzate (3.2 oz/A) on 26 Aug. Plots were three adjacent rows each with four plants spaced 24 in. apart. Rows were spaced 68 in. apart. Two plants of Multipik, a powdery mildew-susceptible summer squash cultivar, were planted between each plot in each row to separate plots and provide a source of inoculum. A randomized complete block design with four replications was used. Upper and lower leaf surfaces were assessed for powdery mildew on 14 and 21 Jul and on 3, 10 and 17 Aug. 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 30 colonies/leaf = 1% severity. Average severity for the entire canopy was calculated from the individual leaf assessments. Area under disease progress curve (AUDPC) was calculated based on the five weekly disease severity ratings. Average monthly high and low temperatures (°F) were 79/61 in Jun, 87/68 in Jul, and 82/66 in Aug. Rainfall (inches) was 6.1, 2.35, and 10.61 for these months, respectively. There was a hurricane and several atypical intensive rain events during the 2011 growing season on Long Island.

Symptoms of powdery mildew were first found on 14 Jul. Only 1 spot was found on 2 of the 120 leaves examined. Severity remained low until 10 Aug in the susceptible cultivar and through 17 Aug, the last assessment date, for all plots of the resistant cultivars except one plot of Eclipse. Fruit ripened and were at full slip stage by 26 Aug. All three resistant cultivars provided a very good level of suppression of powdery mildew. Thus there was no evidence from this experiment of a new pathogen race being present. These and other cultivars with resistance to races 1 and 2 were similarly effective in previous evaluations at this location in 2008 and 2009. In contrast, powdery mildew was more severe on these cultivars in a similar experiment in 2010, suggesting a new race was present. However, symptoms were also more severe that year on Superstar, the susceptible cultivar included for comparison, indicating highly favorable conditions for powdery mildew. If a new race was present in 2010 on Long Island, there was no evidence from the annual cultivar evaluation that it had returned in 2011.

	Powdery mildew severity (%) [z]					
	Upper leaf surface			Lower leaf surface		
Cultivar (resistance) [y]	10 Aug [x]	17 Aug	AUDPC	10 Aug	17 Aug	AUDPC
Athena (R1, 2)……...	0.0 b	0.2 b	0.7 b	0.0 b	0.0 b	0.0 b
Wrangler (R1, 2)……	0.0 b	0.0 b	0.7 b	0.0 b	0.0 b	3.1 b
Eclipse (R1)……...	0.0 b	3.3 b	11.7 b	0.4 b	5.5 b	22.2 b
Superstar (S)……..	5.6 a	37.5 a	171.1 a	7.8 a	35.3 a	185.5 a
P-value (treatment)	<0.0001	0.0055	0.0007	<0.0001	0.0052	0.0003

[z] Exact colony counts were made when possible and severity was estimated using the conversion factor of 30 colonies/leaf = 1% severity. Area Under Disease Progress Curve (AUDPC) was calculated from 14 Jul through 17 Aug.

[y] R1 indicates resistance to Race 1; R1,2 = resistance to Race 1 and 2; S = susceptible to powdery mildew.

[x] Numbers in each column followed by the same letter are not significantly different from each other according to Tukey's HSD (P=0.05).