

Evaluation of powdery mildew resistant muskmelon and specialty melon cultivars, 2007.

The objective of this study was to evaluate some of the new cultivars of muskmelon and of specialty melon types that were released recently with resistance to powdery mildew. They were compared to Athena, a resistant cultivar that is grown commonly, and to Superstar, a standard cultivar lacking genetic resistance. A field experiment was conducted at the Long Island Horticultural Research and Extension Center in Riverhead on Haven loam soil. Seeds were sown on 31 May in the greenhouse. Seedlings were transplanted into beds covered with black plastic mulch on 11 Jun. Fertilizer (N-P-K 10-10-10) at 1000 lb/A was broadcast and incorporated on 11 May. Water was provided as needed through drip irrigation. During the season weeds were controlled with Strategy (2 pt/A) applied on 21 May and Roundup WeatherMax (22 oz/A) applied 29 Jun with a shielded sprayer to soil between plastic and by hand weeding. Cucumber beetles were managed with Admire 2F applied after transplanting as a soil drench around transplants (0.0007 fl oz/plant) on 18 Jun and with Asana XL (9.6 oz/A) applied to foliage on 16 Jul. No fungicides were applied specifically for powdery mildew. The following fungicides were applied preventively for downy mildew (*Pseudoperonospora cubensis*) and Phytophthora blight (*Phytophthora capsici*): Forum 4.16SC (6 oz/A) on 16 Jul, Ranman 400 SC (2.75 fl oz/A) on 12 Aug, Acrobat 50 WP (6.4 oz/A) on 19 Aug, and Previcur Flex 6 F (1.2 pt/A) on 29 Aug. Neither disease developed before the end of this experiment. Plots were three adjacent rows each with four plants spaced 24-in. apart. Rows were spaced 68-in. apart. A single plant of Multipik summer squash, a susceptible variety, was 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 surfaces of leaves were assessed for powdery mildew beginning on 26 Jul. Fifty old leaves were selected on 26 Jul in each plot in one replication based on leaf appearance and position in the canopy. On 14 Aug eight old and eight mid-aged leaves were assessed. Powdery mildew colonies (spots) were counted; severity was assessed by visual estimation of percentage leaf area affected when colonies could not be counted accurately because they had coalesced and/or were too numerous. Colony counts were converted to severity values using the conversion factor of 30 colonies/leaf = 1%. Average severity for the entire canopy was calculated from the individual leaf assessments. Powdery mildew control was calculated for upper and lower leaf surfaces using average canopy severity values for 14 Aug relative to the average value for Superstar. Melon fruit were harvested, weighed, and measured when they reached maturity. Harvesting was done on 9, 14, 17, 23, and 27 Aug. Fruit characteristics were also evaluated and rated on a scale of 1 to 9 with 1= poor and 9 = best. Fruit were also evaluated by four commercial growers. Average monthly high and low temperatures (°F) were 79/61 in Jun, 82/66 in Jul, and 82/65 in Aug. Rainfall (in.) was 3.37, 3.63, and 2.60 for these months, respectively.

Powdery mildew was first observed on 26 Jul at a very low level (1 spot in two plots). Severity increased greatly on the susceptible cultivar Superstar. All of the cultivars tested with powdery mildew resistance exhibited at least 48% suppression of mildew on upper leaf surfaces. Crème de Menthe was the only cultivar not significantly less severely affected by powdery mildew than Superstar on lower leaf surfaces. The specialty melons, most of which are not advertised as having resistance to both race 1 and 2, exhibited less suppression of powdery mildew than the muskmelons, which all have resistance to both races. Four of the six muskmelons exhibited a very high level of suppression (at least 99%). Strike and Goddess contain two different sources of resistance in contrast with Athena.

Cultivar (resistance) ^y	Powdery mildew severity (%) ^z		Marketable yield		Total yield	
	Upper leaf surface (14 Aug)	Lower leaf surface (14 Aug)	Number /plant	Weight (lb)/plant	Number/plant	Weight (lb)/plant
Goddess (PM 1,2)	0.000 d ^x	0.003 d	1.54 def	9.39 c	1.94 d	10.97 bc
Strike (PM 1,2)	0.001 d	0.002 d	2.19 cd	12.53 ab	2.63 cd	14.59 a
Wrangler (PM 1,2)	0.464 d	0.055 d	3.04 b	10.12 bc	3.19 bc	10.46 bcd
Maverick (PM 1,2)	12.063 c	1.305 cd	3.21 b	10.63 abc	3.77 b	12.01 ab
Lil' Loupe (PM 1,2)	16.622 bc	3.131 cd	5.46 a	9.49 c	6.06 a	10.19 bcd
Athena (PM 1,2)	13.023 c	4.196 cd	2.13 cd	10.51 bc	2.69 c	12.76 ab
Bolero (PM)	20.680 bc	5.616 cd	0.90 fg	6.29 d	1.13 e	7.92 de
Dorado (PM 1,2)	0.469 d	0.074 d	1.10 efg	5.03 d	1.17 e	5.23 ef
Vicar (PM 1)	19.951 bc	8.095 bc	1.75 de	5.19 d	2.81 c	9.04 cd
Crème de Menthe (PM) .	24.917 b	13.835 ab	0.63 g	4.20 d	0.69 e	4.46 f
Superstar (susceptible) ..	48.073 a	20.292 a	2.65 bc	13.60 a	2.98 c	14.61 a
<i>P</i> -value	< .0001	< .0001	< .0001	0.0001	< .0001	< .0001

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

^y Genetic resistance as specified in the catalogue. "PM 1, 2" indicates resistance to races 1 and 2. "PM" used when information on race not specified in the catalogue.

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