

Evaluation of downy mildew resistance in experimental hybrids of cucumber, 2012.

A field experiment was conducted at the Long Island Horticultural Research and Extension Center in Riverhead, NY, on Haven loam soil. Fertilizer (N-P-K, 10-10-10) at 1000 lb/A (100 lb/A of nitrogen) was broadcast over the bed area and incorporated on 15 Jun. Beds were formed with drip tape and covered with black plastic mulch on 18 Jun. A waterwheel transplanter was used to make planting holes in the beds and apply starter fertilizer (20-20-20 Nutri-Leaf) plus insecticide on 18 Jun. Seeds were sown on 29 May in the greenhouse. Seedlings were transplanted by hand into the holes in the beds on 21 Jun. During the season, water was provided as needed via drip irrigation lines. Weeds were controlled between mulched rows by applying a tank mix of Strategy (3 pt/A), Sandea (0.5 oz/A), and Scythe (1.3 fl oz/gal spray mix) on 19 Jun, and by hand weeding. Plots were single 18-ft rows with 12 plants at 18-in. spacing. Rows were 68 in. apart. The plots were 9 ft apart within the row initially until plants began to vine. Vines were moved as needed to maintain plot separation. A randomized complete block design with four replications was used. Downy mildew severity was assessed on 24 Jul, 6 Aug, and 14 Aug by estimating incidence of symptomatic leaves in each plot and rating severity on nine representative affected leaves. Incidence and average severity for symptomatic leaves were used to estimate canopy severity. Fruit of marketable size were harvested on 18 Jul, 25 Jul, 8 Aug, and 16 Aug. Area Under Disease Progress Curve (AUDPC) values were calculated from 24 Jul through 14 Aug. Average monthly high and low temperatures (°F) were 78/61 in Jun, 85/68 in Jul, and 83/67 in Aug. Rainfall (inches) was 5.44, 4.35, and 3.24 for these months, respectively.

Downy mildew developed naturally in this experiment. Symptoms were first seen on 18 Jul. Infection likely occurred on 3-4 Jul when there was a low to moderate risk predicted for the area by the Cucurbit Downy Mildew *ipm*PIPE forecasting system. The experimental hybrids, reputed to contain a new source of resistance to downy mildew, were not able to effectively suppress the strain of *Pseudoperonospora cubensis* present. They did have numerically lower canopy severity values than Straight Eight, a cultivar with no known genes for resistance, for all parameters. With the exception of 14 Aug, these values were also numerically lower than those for Speedway, a cultivar bred to be resistant to pathogen strains present before 2004. Straight Eight produced fewer fruit than all other entries.

Cultivar or experimental	Canopy severity (%) *				Severity on affected leaves (%) *			Yield (# fruit/plant) *	
	24 Jul	6 Aug	14 Aug	AUDPC **	24 Jul	6 Aug	14 Aug	Marketable	Total
SVR 3462.....	0.2	46.4	36.9	632.5	1.5	58.5	52.4 b	3.0 a	10.4 a
SVR 4719.....	10.3	38.7	39.0	623.8	13.4	54.3	47.8 b	2.8 a	9.7 a
Speedway.....	15.7	53.2	32.2	781.2	26.4	56.7	45.9 b	3.5 a	11.6 a
Straight Eight.....	18.7	47.3	50.3	816.5	29.7	56.8	77.5 a	1.2 b	4.8 b
<i>P-value (treatment)</i>	0.4181	0.1568	0.4216	0.1466	0.1880	0.8519	0.0098	0.0065	0.0006

* Numbers in each column followed by the same or no letter are not significantly different from each other (Tukey's HSD, *P*=0.05).

** AUDPC values were square root transformed before analysis. Table contains de-transformed values.