

**Powdery mildew resistant zucchini summer squash cultivar evaluation, 2006.**

The objective of this study was to evaluate eight green zucchini cultivars, two grey zucchini cultivars (Amatista and Topazio), and one golden yellow cultivar (Sebring Premium) with resistance to powdery mildew by comparing them to a susceptible cultivar that is an industry standard (Zucchini Elite). Romulus PM is open-pollinated. One cultivar (Lynx) is not marketed as having resistance but performed well when evaluated in a previous experiment in terms of both disease severity and yield, producing fruit with very good horticultural characteristics. Most cultivars evaluated also have resistance to several viruses. A field experiment was conducted at the Long Island Horticultural Research and Extension Center in Riverhead on Haven loam soil. All squash seed was planted on 7 Jun in the greenhouse and transplanted into black plastic mulch on 19 Jun. During the season weeds were controlled with one application of Select 2 EC (8 fl oz/A) on 31 Jul, hand weeding, and mowing between the rows of black plastic mulch. Water was provided as needed through drip irrigation lines placed beneath the mulch. Additional fertilizer (N-P-K 34-0-0) at 29.4 lb/A was injected through the drip irrigation system on 12 and 28 Jul, and on 10 and 17 Aug. No fungicides were applied specifically for powdery mildew; however, copper fungicides applied for control of bacterial leaf spot (*Xanthomonas campestris* p.v. *cucurbitae*) would have also provided some suppression of powdery mildew on upper leaf surfaces. Champion WP (2 lb/A) was applied on 29 Jul; Cuprofix Disperss (2.5 lb/A) was applied on 12 Jul, and 5, 13, and 23 Aug; and Kocide 2000 (1.5 lb/A) was applied on 31 Aug. The following fungicides were applied preventively for downy mildew (*Pseudoperonospora cubensis*) and Phytophthora blight (*Phytophthora capsici*): Acrobat 50 WP (6.4 oz/A) on 12 Jul, Previcur Flex 6 F (1.2 pt/A) on 29 Jul, Ranman 200 SC (2.75 fl oz/A) on 23 Aug, and Tanos 50 WG (8 oz/A) on 31 Aug. Neither disease developed before the end of this experiment. Plots were one 20-ft row each with a plant spacing of 24-in. One zucchini plant of a susceptible cultivar (Zucchini Elite) was planted between each plot to increase powdery mildew 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, one day before fruit were harvested for the second time. Ten old and 10 mid-aged leaves were selected on 26 Jul and on 9 Aug in each plot based on leaf physiological appearance and position in the canopy. On 15 Aug, 10 mid-aged leaves were assessed. Powdery mildew colonies (spots) were counted; severity was assessed by visual estimation of percent leaf area affected 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. These canopy severity values were used to calculate area under disease progress curves (AUDPC) to obtain a measure of severity over the entire assessment period. Squash fruit were harvested and weighed a total of eight times on 24 and 27 Jul; and on 4, 7, 11, 14, 18, and 24 Aug. Fruit were separated into marketable and unmarketable grades based on length and blemishes from disease (bacterial leaf spot) and insect feeding. Weight and length of marketable fruit were measured. A square root transformation was used when needed prior to analysis to achieve homogeneity of variance.

All cultivars tested that are marketed with claims for resistance to powdery mildew exhibited at least 72% control on lower leaf surfaces, where symptoms were most severe, relative to Zucchini Elite based on AUDPC values. The table contains the eight standard green zucchini squash cultivars listed in order based on AUDPC values, followed by the golden yellow cultivar, the two grey zucchinis, then the standard cultivar included for comparison. Lynx did not exhibit resistance in this study as it had in a previous experiment conducted in upstate NY. On upper leaf surfaces, control over the entire assessment period was at least 47% for most cultivars, however AUDPC values for Felix and Topazio were not significantly different from Zucchini Elite. Sebring Premium produced the greatest number and weight of marketable fruit. Total number of fruit produced was also high for the two grey zucchinis. Romulus PM had the lowest yield. Fruit production was affected by poor weed control; therefore, yield data should not be considered an indication of yielding ability but rather should be considered relative yield values.

Cultivar	Powdery mildew severity (%)*						Yield		
	Upper leaf surface			Lower leaf surface			Marketable Fruit/Plant		Fruit weight (lb)
	26-Jul	9-Aug	AUDPC	26-Jul	9-Aug	AUDPC	Total number	Total weight (lb)	
Romulus PM (SQ 807)...	0.0 b**	0.7	2 cd	0.0 c	0.0 c	5 d	0.8 d	0.7 d	0.8 a
Judgement .....	0.0 b	0.0	5 d	0.0 c	0.0 c	8 d	2.2 abc	1.2 bc	0.6 bcd
Wildcat .....	0.1 b	3.1	8 cd	0.5 c	0.0 c	30 cd	2.4 abc	1.3 b	0.5 bcd
Justice III .....	0.0 b	0.3	15 cd	0.1 c	1.8 c	32 cd	2.1 bc	1.2 bc	0.5 bcd
Envy .....	0.1 b	0.0	23 cd	0.0 c	2.5 c	36 cd	1.6 c	0.9 bcd	0.5 bcd
Payroll .....	0.2 b	0.7	24 cd	0.6 c	2.5 c	53 cd	2.6 ab	1.1 bc	0.5 cd
Felix (HMX 1712) .....	0.1 b	0.0	34 bc	0.3 c	3.1 c	56 cd	2.3 abc	1.2 bc	0.5 bcd
Lynx .....	2.3 a	0.5	72 a	5.7 a	31.1 a	482 a	2.1 bc	0.9 cd	0.4 d
Sebring Premium .....	0.3 b	0.8	13 cd	0.2 c	1.3 c	27 cd	3.1 a	2.0 a	0.6 abc
Amatista .....	0.1 b	0.0	10 cd	0.4 c	0.0 c	42 cd	2.0 bc	0.9 bcd	0.4 d
Topazio .....	0.1 b	1.1	32 bcd	0.8 bc	5.3 c	101 c	2.5 ab	1.0 bcd	0.4 d
Zucchini Elite (std).....	1.3 a	3.8	63 ab	3.6 ab	22.8 b	357 b	2.2 abc	1.0 bcd	0.7 ab
<i>P</i> -value	0.0007	0.0592	0.0022	0.0008	0.0001	0.0001	0.0003	0.0006	0.0085

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

Severity data is for old leaves on 26 Jul and on mid-aged leaves on 9 Aug.

\*\* Numbers in each column with a letter in common are not significantly different according to Fisher's Protected LSD (*P* = 0.05).