SQUASH (*Cucurbita pepo*)
Phytophthora crown rot and fruit rot; *Phytophthora capsici*

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SENSITIVITY OF *CUCURBITA PEPO* BREEDING LINES AND VARIETIES TO PHYTOPHTHORA CROWN ROT AND FRUIT ROT, 1994: The objectives of this experiment were to identify potential sources of resistance and to evaluate material previously screened for sensitivity to *Phytophthora capsici* in FL and in NY (Biological and Cultural Tests 9:26). Sensitivity was determined in an infested field of Riverhead sandy loam, a well-drained soil, at the Long Island Horticultural Research Laboratory in Riverhead, NY. Phytophthora fruit rot had developed on pumpkin in this field in 1991, 1992, and 1993. Disease pressure was severe in 1992 and 1993. On 23 May 94, 1000 lb/A of 10-10-10 fertilizer was broadcast and incorporated. Weeds were controlled by applying Command 4EC at 8 oz/treated A in a 12-in. band over the row on 21 Jun, mechanically cultivating and hand-weeding. Cucumber beetles and aphids were managed by applying Metasystox-R 2SC (1.5 pt/A) on 29 Jul. Bravo 720 (2 pt/A) and Bayleton 50DF (4 oz/A) were applied on 29 Jul and 12 Aug to suppress powdery mildew. Average monthly high and low temperatures (F) and total rainfall (in.) were 88, 67, and 0.7 in Jul; 81.5, 60.5, and 7.26 in Aug; and 75.5, 55.5, and 3.76 in Sep, respectively. The field was irrigated (1.0 in.) 5 times on 13-14 Jul; 19-20 Jul; 25-27 Jul; 1-2 Aug; and 9-10 Aug (more than one day was required to cover the field). There were two experiments, each with four replications, in a randomized block design. The experiments were located at opposite ends of a 500-ft field in areas considered to have relatively 'high' and 'low' disease pressure based on incidence of pumpkins with Phytophthora fruit rot in 1992 and 1993. The 'high' disease pressure area of the field had a slightly lower elevation and the soil tended to drain more slowly after rain than the 'low' disease pressure area. Twenty-day-old seedlings were transplanted into plots on 13 Jul. Each plot contained 4 plants spaced 30 in. apart in a line. There were two plots per row with a 36 in. gap between plots within rows. The spacing between rows was 68 in. Replications 1 and 2 were separated by a 23-ft gap from replications 3 and 4. The susceptible variety Supersett was included for comparison. There were not enough plants of SSXP 211 for it to be included in both experiments. Plants and fruit were examined periodically for symptoms. Fruit were removed when they exceeded marketable size. The percentage of fruit per plant with symptoms of Phytophthora fruit rot and the percentage of plants per plot with symptoms were calculated for individual assessment dates and for the entire period of disease development (27 Aug - 6 Sep).

Plants in the field appeared healthy until after 4 days of rain (a total of 3.48 in. fell on 14, 15, 20, and 22 Aug). Symptoms of Phytophthora fruit rot were observed on all experimental lines and varieties on 27 Aug. Supersett appeared to be substantially more susceptible than the other entries; however, detecting this statistically was hampered because there was considerable variation in disease occurrence among replications within the two areas of the field. In the 'low' disease pressure area, Phytophthora fruit rot did not develop during the entire experiment in replication 1 while all entries in replication 4 had affected fruit on 27 Aug. Although Supersett was infected in replication 3, the other entries remained asymptomatic. In addition to fruit symptoms, many Supersett plants died prematurely, apparently because of Phytophthora crown rot. Aladdin had the fewest plants with Phytophthora fruit rot and the lowest percentage of affected fruit/plant in both experimental areas. SSXP 210 was evaluated previously in FL: it was resistant to root and crown rot in seedling tests. HMX 1708 was evaluated in NY in 1993: it had the lowest incidence of fruit rot .

	Plants with Phytophthora (%) [1]			Fruit/plant with Phytophthora (%) [1]		
	92-93 Disease pressure [2]			92-93 Disease pressure [2]		
Variety or breeding line	'low'	'high'	All	'low'	'high'	All
Aladdin (middle eastern type)	31 a [3]	31	31	13 a	31	23
SSXP 210 (middle eastern type)	17 a	75	50	8 a	75	46
SSXP 211 (middle eastern type)	--	50	50	--	50	50
HMX 1708 (middle eastern type)	50 ab	62	58	50 ab	62	58
Supersett (yellow crookneck squash)	92 b	100	96	66 b	89	79
P-value	.0166	.1044	.0589	.0518	.1270	.1551

1 Mean percentage of plants/plot with Phytophthora fruit rot and mean percentage of affected fruit/plant were calculated for fruit examined between 27 Aug and 6 Sep, when conditions were favorable for disease development, on 4 plants in each of 4 replications in each disease pressure area. These calculations do not include fruit that rotted for other reasons, plants that did not have fruit during this period, and replication 1 in the 'low' disease pressure area where Phytophthora fruit rot did not develop.

2 Disease pressure was classified as relatively 'high' and 'low' in the two experimental areas based on incidence of pumpkins with Phytophthora fruit rot in 1992 and 1993.

3 Means followed by the same letter in a column are not significantly different according to Fisher's protected LSD (P = 0.05).