

SQUASH (*Cucurbita pepo*)

Phytophthora crown rot and fruit rot; *Phytophthora capsici*

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SENSITIVITY OF CUCURBITA PEPO EXPERIMENTALS AND VARIETIES TO PHYTOPHTHORA CROWN ROT AND FRUIT ROT, 1995: 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 and 10:147). Sensitivity was determined in an infested field of Haven loam/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 and Phytophthora blight of pepper had occurred in 1994. On 27 Jun 95, 1000 lb/A of 10-10-10 fertilizer was broadcast and incorporated. The experiment was conducted twice. Seed were planted on 7 and 27-28 Jun for the two plantings. Seedlings were grown in a greenhouse, then acclimated to outdoor conditions for several days before transplanting on 28 Jun and 20 Jul. The two plantings were 31 ft apart. The field had a slight slope. There were four replications in a randomized block design. Replication one for both plantings was in the highest part of the field. Each plot contained seven plants spaced 24 in. apart in a line. The spacing between rows was 68 in. There were only four plants of SSXP287 in each plot in planting two because of poor germination. Supersett was included as a known susceptible variety for comparison. Average monthly high and low temperatures (F) and total rainfall (in.) were 80, 57, and 2.52 in Jun; 86, 65, and 1.52 in Jul; 86, 62, and 0.7 in Aug; 76, 56, and 4.43 in Sep; and 70, 49, and 6.35 in Oct, respectively. The first planting was irrigated (approx. 1.0 in.) seven times on 28+30 Jun; 3, 7, 14, 24, 25, 27 (approx. 0.5 in.) and 31 Jul; and 3, 9, and 10 Aug. In an effort to promote disease development, the field was irrigated excessively on 16 Jul (approx. 2.0 in.), 2 days after a standard irrigation, and on 2 Aug (approx. 1.5 in.). The second planting was irrigated (approx. 1.0 in.) seven times on 20, 24, and 31 Jul; 4, 9, 15, and 30 Aug; and 9 Sep. The field was irrigated excessively on 17 Aug (approx. 2.0 in.), on 22 and 23 Aug (approx. 2.5 in. on each date), and on 4 Sep (approx. 1.5 in.) to promote disease development. In the second experiment, weeds were controlled by applying Curbit EC at 1 qt/treated A in a 12-in. band over the row on 21 Jul, mechanically cultivating and hand-weeding. Cucumber beetles and aphids were managed by applying the following insecticides: Metasystox R (1 qt/A) on 12 Jul and 8 Aug, Asana (9.6 oz/A) on 21 Jul, and Lannate LV (3 pt/A) on 28 Jul. Bravo Ultrex (1.4 lb/A) was applied on 29 Jul to suppress powdery mildew. Plants and fruit were examined periodically for symptoms of fruit and crown rot. Marketable-sized fruit were removed when plants were examined. The assessment dates were 26 Jul; and 1, 7, 14, and 21 Aug for the first experiment and 21 and 28 Aug; and 7, 14, and 27 Sep for the second experiment.

Phytophthora did not cause fruit rot or crown rot in the first planting, despite the amount of irrigation provided. Pythium was observed on a few fruit. In the second planting, Phytophthora fruit rot was observed first on 21 Aug, 4 days after the field was irrigated excessively. Symptoms occurred in only five plots: one plot each of Genie, SSXP210, SSXP287, SSXP288, and Zucchini Elite. Incidence was higher on 28 Aug following excessive irrigation on 22 and 23 Aug. Symptoms were not observed on any plants of HMX1708, Jason, or SSXP210 on 28 Aug. Affected fruit often were found on plants that otherwise appeared healthy. For example, fruit with Phytophthora were observed on 49 plants while only six plants had symptoms of crown rot on 28 Aug. Supersett was very susceptible to Phytophthora. In addition to the high percentage of fruit that developed symptoms during Sep, many plants died because of crown rot. On 14 Sep, 46% of Supersett plants were dead because of crown rot while 0-22% of plants of other entries in this experiment had died. This variety also was shown to be very susceptible in previous experiments (B&C Tests 9:26 and 10:147). The type of stem symptom on the other entries often was necrosis of the growing tip, which sometimes progressed such that the entire plant collapsed and died. Aladdin had the lowest percentage of fruit with symptoms during this experiment. This variety also performed well in 1994 (B&C Tests 10:147). However, 50% of Aladdin plants developed crown rot. In comparison with Aladdin, significantly fewer SSXP210 plants developed stem symptoms whereas the percentage of fruit with symptoms was significantly higher. SSXP210 had a relatively low incidence of fruit rot in 1994. HMX1708 was the overall best entry with a relatively low incidence of fruit rot, late onset of symptoms, and a low incidence of stem symptoms. This experimental also performed well in 1993 (B&C Tests 9:26). Results generally were as expected based on previous results from greenhouse seedling tests and/or pedigree information, except that SSXP286 was very susceptible and SSXP285 was resistant to crown rot in seedling trials.

Variety or experimental	Fruit with Phytophthora fruit rot (%)			First week fruit rot was seen	Plants with stem symptoms (%)
	Aug	Sep	Total		
Aladdin (middle eastern type)	4.7	23.4 a *	14.6	2.2 a	50.6 bcd
HMX1708 (grey zucchini)	0.0	33.5 ab	15.3	3.8 c	12.5 ab
Jason (stripped zucchini)	0.0	42.1 ab	16.0	3.5 c	48.3 abcd
SSXP286 (grey zucchini)	2.5	45.2 abc	18.0	3.0 abc	41.1 abcd
SSXP287 (zucchini)	14.3	29.9 ab	18.9	2.5 a	62.5 cd
SSXP210 (grey zucchini)	1.0	52.8 bc	24.2	3.0 abc	4.2 a
Genie (zucchini)	14.8	52.4 bc	24.2	2.5 a	25.0 abc
SSXP285 (stripped zucchini)	12.3	71.1 cd	30.7	2.8 ab	73.2 d
Zucchini Elite (zucchini)	18.0	71.1 cd	33.4	2.5 a	50.0 bcd
SSXP288 (grey zucchini)	14.4	52.8 cd	34.9	3.0 abc	36.1 abcd
Supersett (yellow crookneck squash)	11.2	81.8 d	35.8	2.5 a	75.0 d
P-value	0.2775	0.0034	0.1235	0.0787	0.0542

* Means followed by the same letter in a column are not significantly different according to Fisher's protected LSD.