

**Evaluation of winter squash cultivars for resistance to *Phytophthora* root rot, 2015.**

This study was conducted at the Michigan State University Southwest Research and Extension Center located in Benton Harbor, MI. On 9 Jun, cultivars of acorn and spaghetti squash were direct-seeded into raised plant-beds covered with black polyethylene mulch and spaced on 5.5 ft centers. For each replicate there were 12 plants with a 10 ft non-planted buffer between replicates within the row. The trial was arranged in a completely randomized split plot design with four replicates per cultivar; pathogen infestation was the main plot, and cultivar was the sub-plot. A single drip tape (0.65 gpm/100 ft) provided irrigation. Insects were managed with one application of Admire Pro (10.5 fl oz/acre) through the drip lines and bacterial spot was managed with weekly Kocide 3000 applications (1.25 lb/acre) for three weeks post-emergence. On 9 Jul, the plants were inoculated with *P. capsici*-infested millet (100 g sterilized millet seeds, 72 ml distilled water, 0.08 g asparagine, 7 7-mm plugs of *P. capsici*) by making a depression in the soil 1 cm from the plant crown and inserting 1.5 g of millet. *P. capsici* isolates 14110 (A2 mating type, sensitive to mefenoxam, isolated from cucumber) and SP98 (A2 mating type, sensitive to mefenoxam, isolated from pumpkin) were used as inoculum and were mixed 1:1 immediately prior to inoculation. Wilted and dead plants were counted on 13, 17, 21, 24 Jul and 1, 11 Aug. On 27 Aug fruit were harvested from the center 10 plants in each row and weighed. Data were analyzed using analysis of variance (ANOVA) with mean separation performed with Fisher's protected least significant difference (LSD) using the statistical software SAS v9.3.

Disease pressure was severe for all of the inoculated acorn squash cultivars. On 17 Jul, 32.5 to 65% of the acorn squash plants across the cultivars exhibited root rot whereas <10% of the spaghetti squash plants were symptomatic. By 21 Aug, more than 80% of the acorn squash plants were wilted or dead. While the spaghetti squash cultivars Tivoli, Primavera, and Vegetable Spaghetti showed 27.5, 37.5, and 42.5% disease incidence, respectively. On 24 Jul there was 52 to 65% incidence of wilt and plant death for the spaghetti squash plants across the cultivars and 90 to 100% for the acorn squash cultivars. By the final rating on 11 Aug, there was at least 80% wilt or plant death for all inoculated squash cultivars; plants in the uninfested plot remained asymptomatic (*data not shown*). In the infested plot, yields for each of the three spaghetti squash cultivars were significantly higher than that for each of the acorn squash cultivars ( $P < 0.05$ ). When inoculated, the spaghetti squash cultivars produced 56 to 61 lb of fruit per row and the acorn squash cultivars produced <7 lb of fruit per row. The spaghetti and acorn squash cultivars in the uninfested plot produced 99 to 120 and 48 to 76 lb of fruit per row, respectively.

Cultivar and (squash type)	Disease incidence (% infected plants) <sup>z</sup>					Yield (lb/20 ft) <sup>y</sup>			
	13 Jul	17 Jul	21 Jul	24 Jul	11 Aug	Inoculated		Uninoculated	
Table Queen (acorn)	10.0 a <sup>x</sup>	65.0 a	97.5 a	100.0 a	100.0 a	0.0 c	48.6 e		
Taybelle (acorn)	10.0 a	52.5 ab	97.5 a	100.0 a	100.0 a	0.5 bc	76.5 bc		
Table Gold (acorn)	5.0 ab	47.5 ab	85.0 a	92.5 a	95.0 a	3.1 bc	55.2 de		
Autumn Delight (acorn)	0.0 b	42.5 ab	92.5 a	97.5 a	100.0 a	0.3 bc	68.1 cd		
Table Ace (acorn)	5.0 ab	32.5 bc	82.5 a	90.0 a	97.5 a	6.9 b	58.4 cde		
Tivoli (spaghetti)	0.0 b	10.0 cd	27.5 b	52.5 b	80.0 b	61.4 a	120.0 a		
Vegetable Spaghetti (spaghetti)	2.5 ab	5.0 d	42.5 b	65.0 b	80.0 b	56.1 a	99.9 ab		
Primavera (spaghetti)	0.0 b	2.5 d	37.5 b	52.5 b	82.5 b	57.8 a	116.5 a		

<sup>z</sup>Percentage data were transformed with arcsine of the square root prior to analysis of variance. Means shown are back-transformed means.

<sup>y</sup>Yield data were square root transformed prior to analysis of variance. Means shown are back-transformed means.

<sup>x</sup>Column means with a letter in common not significantly different (Fishers LSD;  $P=0.05$ ).