

EVALUATING SUMMER SQUASH FOR *PHYTOPHTHORA* TOLERANCE

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OBJECTIVE:

To determine field tolerance to *Phytophthora capsaci* of 12 summer squash lines.

SUMMARY:

Statistical difference in plant survival was observed between the 12 entries. PI 615115 and PI 357955 had 100% survival. Top performers should be subjected to further evaluation for *Phytophthora* tolerance. If they continue to exhibit tolerance they provide the opportunity to initiate a breeding program to develop *Phytophthora capsaci* resistant commercial varieties.

METHODS:

Fertilizer: Prior to planting, 0-0-60, 21-0-0, and Solubor was applied at a rate of 200, 150, and 5 pounds/acre, respectively. After planting, nutrients were supplied through the drip system using 4-0-8-2(Ca) at a rate of 1 pound nitrogen/a/day. Application began 10 June and ended 17 July, 2002.

Herbicide: Prior to planting, 2 pints/a Curbit 3E was applied between the plastic.

Planting: The planting site has a known history of *Phytophthora*, and has been planted to squash for the past four years. Each selection was direct seeded in raised, plastic-mulched beds, 6" high and 24" wide. Beds were on 5.5' centers, in row spacing was 18" (5280 plants/a). Seeds were planted on 28 May, 2002. The trial was planted and analyzed as a completely randomized design with four replications, ten plants/replication.

Evaluation: Evaluation was done on 10 and 17 July, 2002. Each plot was rated for number of surviving plants. Only readings from 10 July were used for analysis. Later readings were complicated from a Squash Vine Borer infestation.

RESULTS:

All PI numbers were selected from previous field evaluations grown at the same location. 'Tigress' was selected as a known susceptible control. Differences in survivability were noted among the 12 entries (Table 1). Only entries PI 508467 and PI 508469 had significantly less survival rate than the top performers. PI 615115 and PI 357955 had 100% survival. However, this was not statistically different than the known susceptible cultivar, Tigress. This is the fourth year PI 615115 has been amongst the leaders and it is the third year of good performance for PI 357955.

Tigress is known to be susceptible from previous trials. Tigress survival in 2002 may be due to specific environmental conditions of 2002 and the peculiarities of *Phytophthora* infection. Only survivability ratings taken on 10 July were used for analysis. This was to remove possible confusion with vine death due to Squash Vine Borer infestations.

Top performers come from several locations and represent a wide variety of summer squash phenotypes. Many are not immediately useful as commercial varieties, but they do represent a broad base from which to begin a breeding program to develop tolerant commercial lines.

Table 1. Plant survival of 12 summer squash varieties grown in *Phytophthora capsaci* infested soil at the Southwest Michigan Research and Extension Center. Survivability was rated on 10 July, 2002.

Plant ID#	Live Plants (%)	Origin
615115	100	United States
357955	100	Macedonia
177376	97	Turkey
615105	97	United States
135394	95	Afghanistan
176534	95	Turkey
512817	92	Spain
227237	92	Iran
261780	86	France
Tigress	85	commercial control
508467	79	South Korea
508469	63	South Korea
LSD _{0.05} =		17

Plant ID# = USDA identification number used by the USDA Plant Introduction Station at Ames, Iowa.