

# Ohio Vegetable and Small Fruit Research and Development Program Grant - 2008

**Final Report: January, 2009**

**Project Title:** Field Evaluation of Microdochium-Resistant Pumpkins – Year 3

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**Summary of Material Benefits to the Ohio Fruit and Vegetable Industry Deriving from this Project:**

Microdochium Blight (also known as Plectosporium Blight or ‘White Speck’) is an extremely destructive disease of pumpkin. In recent years Microdochium Blight has become common and destructive throughout Ohio. The fungus initially causes superficial lesions on leaf veins, then quickly spreads to leaf blades, petioles, stems and developing fruit. It defoliates the plants and causes cracking and death of infected stems. Even a low incidence of the disease can have substantial economic impact, because fruit are scarred and unmarketable. Control at this time requires both long rotations and additional fungicide sprays in the spring before normal spray schedules would start in late July. Both of these practices increase production costs for Ohio growers. The best control for this disease would be the use of pumpkin varieties with high levels of resistance. No such commercial pumpkin varieties are known to exist now. In earlier work funded by OVSFRDP, efforts have been made to identify and field-test sources of resistance to this disease. Beginning in 2004 and continuing through 2007, we have evaluated varieties of pumpkin (*Cucurbita pepo* and *Cucurbita moschata*) for resistance to Microdochium Blight. During this time it was found that *C. moschata* and interspecific hybrids of *C. pepo* and *C. moschata* were resistant to the disease. This was confirmed in field trials in 2006 and 2007.

**2008 Field Trial: Methods and Results:**

In 2008 we conducted a field trial which included thirteen interspecific hybrids provided by Dr. Ted Superak, Harris-Moran Seed Co., to confirm levels of resistance in these hybrids and to determine if resistant hybrids with ‘Jack O’Lantern’-type characteristics could be found. Several additional varieties of known disease resistance (identified in previous work) were also included in the trial. Plots were established at the Western Agricultural Research Station, South Charleston, Ohio on June 16, 2008. Disease ratings were made on September 16, 2008, however, due to the relatively dry conditions during much of the 2008 growing season, virtually no symptoms developed and disease ratings overall were very low (Table 1). The susceptible varieties Temnozolena, Hokore, and Yellow Oval had the highest disease severity ratings, but average disease severity ratings for petioles in these varieties were only 17, 14, and 10%, respectively. All *C. moschata* varieties and all *C. pepo* x *C. moschata* hybrids had average petiole disease ratings of less than 1%. Results indicate the importance of rainfall for development of Microdochium Blight and for successful field assessment of disease resistance.

**Presentation of Results.** A presentation on research progress was given August 21, 2008 to approximately 45 individuals at the 2008 Pumpkin Field Day at the OARDC Western Branch Research Station, South Charleston, Ohio.

Table 1. Disease severity ratings (percent of plant surface area with lesions) for pumpkins (*Cucurbita pepo*, *C. moschata*, or *C. pepo* x *C. moschata* hybrids, Western Agricultural Research Station, South Charleston, Ohio, 2008.

16 Sep 2008

Cultivar or Experimental Designation	Species or Hybrid	PI #	Green-house Reaction <sup>z</sup>	Percent Petiole area with Lesions <sup>y</sup>	Percent Leaf area with Lesions <sup>y</sup>
Temnozolena	<i>C. pepo</i>	357938	S	17.3 a <sup>y</sup>	6.2 a <sup>y</sup>
Hokore	<i>C. pepo</i>	482591	S	13.7 a	6.8 a
Yellow Oval	<i>C. pepo</i>	267663	S	10.2 ab	2.9 b
Omaha Pumpkin	<i>C. pepo</i>	302418	S	3.0 bc	1.5 b
Stocna	<i>C. pepo</i>	379323	S	2.3 bc	1.8 b
Little Gem	<i>C. pepo</i>	299575	S	1.2 c	0.1 b
Hybrid 8 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.3 c	0.4 b
Hybrid 5 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.3 c	0.3 b
TGR 27C	<i>C. moschata</i>	482489	R	0.4 c	0.0 b
TGR 1340	<i>C. moschata</i>	482538	R	0.4 c	0.2 b
Hybrid 1 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.3 c	0.2 b
<i>C. moschata</i> #1 <sup>u</sup>	<i>C. moschata</i>	N/A <sup>w</sup>	R	0.2 c	0.0 b
Hybrid 10 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.1 c	0.0 b
Hybrid 2 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.1 c	0.0 b
Pro Gold 510 <sup>x</sup>	<i>C. pepo</i>	N/A <sup>w</sup>	S	0.0 c	0.0 b
Hybrid 3 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.0 c	0.0 b
Hybrid 11 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.0 c	0.0 b
Kadu (1)	<i>C. moschata</i>	163228	R	0.0 c	0.0 b
Hybrid 4 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	R	0.0 c	0.0 b
5055	<i>C. pepo</i>	135394	MR	0.0 c	0.0 b
Hybrid 7 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.0 c	0.0 b
Hybrid 9 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.0 c	0.0 b
<i>C. moschata</i> #2 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	R	0.0 c	0.8 b
Hybrid 6 <sup>u</sup>	<i>C. pepo</i> x <i>C. moschata</i>	N/A <sup>w</sup>	NT	0.0 c	0.0 b

<sup>z</sup>Disease reaction previously determined on 3-week old seedlings in the greenhouse (S=Susceptible; R=Resistant; MR=Moderately Resistant, NT=Not Tested).

<sup>y</sup>Disease severity was assessed by estimating the percent of petiole or leaf surface with white speck lesions within a 5 ft diameter circle in each plot.

<sup>x</sup>Pro Gold 510 used as a standard commercial check.-

<sup>w</sup>N/A = Not Applicable.

~~(Not available)??~~

<sup>v</sup>Column numbers followed by the same letter are not significantly different at  $P=0.05$  as determined by Fisher's protected LSD.

<sup>u</sup> Experimental lines ~~were~~ provided by Dr. Ted Superak, Harris Moran Seed Company.