

# Ohio Vegetable & Small Fruit Research & Development Program

## Final Report

2020

**Project Title:** Management of Plectosporium Blight of Pumpkins

**Principle Investigator(s):** Sally A. Miller

**Phone Number:** 330-263-3678

**Fax:** 330-263-3841

**E-mail:** [miller.769@osu.edu](mailto:miller.769@osu.edu)

**Cooperating Institution:** The Ohio State University CFAES Wooster Campus,  
Department of Plant Pathology

**Mailing Address:** 1680 Madison Ave., Wooster, OH 44691

**Other Key Personnel:** Amilcar Vargas, Josh Amrhein, The Ohio State University CFAES Wooster Campus; Matt Hofelich, OSU NCARS

**Why was this project funded?** Plectosporium blight has become a serious disease of pumpkins in Ohio and other states, and research on this topic was suggested by OVSFRDP member(s) in 2018. The disease must be managed using cultural practices like crop rotation, as well as fungicides. However, there is very little information available on the relative efficacy of fungicides labeled for use on pumpkins against Plectosporium blight. We conducted a similar OVSFRDP-funded trial in 2019, but disease pressure was low and the study was repeated in 2020.

**Project outline:** We established a field trial on the OSU Wooster campus (Snyder Farm) with a pumpkin variety shown in a 2018 OVSFRDP-sponsored trial to be susceptible to Plectosporium blight. Treatments were arranged in a randomized complete block design with four replications. The trial was inoculated with the pathogen (*Plectosporium tabacinum*) to insure even distribution of the disease. The following fungicides were evaluated: Aprovia Top (difenoconazole + solatenol), Dexter Max (azoxystrobin + mancozeb), Dexter XCEL (azoxystrobin + mancozeb + tebuconazole), Flint Extra (trifloxystrobin), Inspire Super (cyprodinil + difenoconazole), Mural (azoxystrobin + benzofindiflupyr), Quadris Top (azoxystrobin + difenoconazole), Quadris Flowable (azoxystrobin), Tepera (fluoxastrobin), Tepera Plus (bifenthrin + fluoxastrobin), and TopGuard (azoxystrobin + flutriafol). Water-treated plots served as a non-treated control. Foliage was evaluated weekly after symptoms appeared for disease severity, and pumpkin fruits were assessed for disease at harvest.

**Take-home messages:** None of the fungicides tested reduced *Plectosporium* blight in this study under moderate to high disease pressure. In the 2019 trial, under lower disease pressure, Quadris Top significantly reduced *Plectosporium* blight on pumpkin handles compared to the non-treated control, and the fungicide program containing Topsin M increased marketable yield. Adequate fungicide coverage can be difficult to obtain in pumpkins, and therefore increasing coverage of fungicides with systemic activity may improve disease suppression.

**Impacts:** This research has shown that the recommended, labeled fungicides for *Plectosporium* management are ineffective under moderate to high disease pressure. Growers should focus on cultural practices, including crop rotation and sanitation, to keep inoculum levels and disease pressure low, as well as improving coverage of applied fungicides.

### **What was discovered?**

- *Plectosporium* blight severity was low to moderate on foliage in this trial, reaching 23.8% on pumpkin leaf petioles in the non-treated control by 9 Sep.
- None of the fungicides tested significantly reduced disease severity on petioles at the final rating or throughout the rating period (AUDPC) compared to the non-treated control.
- The incidence of *Plectosporium* blight on pumpkin fruit was high, reaching 65.9% at harvest in the non-treated control. None of the fungicides tested significantly reduced *Plectosporium* blight on pumpkin fruit compared to the non-treated control.
- Bacterial spot (*Xanthomonas cucurbitae*) entered the trial naturally, causing lesions on 11.5 – 37.9% of the fruit and contributing to the low percentage of marketable fruit, but there were no significant differences between treated and non-treated pumpkins.

Treatment, rate (application timing) <sup>z</sup>	Plectosporium blight		Total yield (t/A)	Fruit w/ Plectosporium blight (%) <sup>w</sup>	Marketable fruit (%) <sup>w</sup>
	(%) <sup>y</sup>	AUDPC <sup>yx</sup>			
Aprovia Top, 13.5 fl oz/A (1-8)	17.5	412.4	27.8	80.0	12.5
Dexter MAX, 3.2 lb/A (1-8)	17.5	452.9	25.0	58.8	14.7
Dexter XCEL, 72 fl oz/A (1-8)	19.5	427.0	25.0	68.7	21.0
Flint Extra, 3.8 fl oz/A (1-8)	19.3	473.6	26.1	68.5	14.7
Inspire Super, 20 fl oz/A (1-8)	19.5	452.1	28.6	60.3	20.3
Mural, 6.96 oz/A (1-8)	23.0	516.8	31.0	77.6	10.2
Quadris Top, 14 fl oz/A (1-8)	18.3	446.3	29.2	62.9	22.9
Quadris Flowable, 15.5 fl oz/A (1-8)	24.0	516.1	27.6	60.6	19.6
Tepera, 12.6 fl oz/A (1-8)	15.5	370.9	26.3	71.8	10.5
Tepera Plus, 15.4 fl oz/A (1-8)	20.5	486.6	28.6	67.8	18.3
TopGuard EQ 8 fl oz/A (1-8)	16.0	386.0	28.6	73.3	17.5
Microthiol Disperss, 4 lb/A (1,3,5,7)					
Topsin M WSB, 3.2 oz/A (1,3,5,7)	10.8	291.0	25.9	64.5	12.5
Procure 480 SC, 8 fl oz/A (2,4,6,8)					
Manzate Pro-Stick, 3 lb/A (2,4,6,8)					
Non-treated	23.8	568.5	25.9	65.9	22.7
P-value	0.2646	0.3396	0.7273	0.3197	0.3352

<sup>z</sup> Application dates: 1= 15 Jul; 2= 21 Jul; 3= 30 Jul; 4= 7 Aug; 5= 17 Aug; 6= 27 Aug; 7= 4 Sep; 8= 11 Sep.

<sup>y</sup> Final disease rating on 9 Sep. Plectosporium blight ratings and area under the disease progress curve (AUDPC) values were based on the percent foliar disease on leaf petioles.

<sup>x</sup> AUDPC was calculated according to the formula:  $\sum[(x_i+x_{i-1})/2](t_i-t_{i-1})$  where  $x_i$  is the rating at each evaluation time and  $(t_i-t_{i-1})$  is the time between evaluations.

<sup>w</sup> Based on t/A values.