



## Azoxystrobin sensitivity of *Rhizoctonia solani* isolates from Michigan sugar beet fields

Jaime F. Willbur<sup>1</sup>, Chris Bloomingdale<sup>1</sup>, Cameron Pincumbe<sup>1</sup>, Carly Hendershot<sup>1</sup>, Douglas H. Minier<sup>1</sup>, Linda E. Hanson<sup>2</sup>  
<sup>1</sup>Michigan State University; <sup>2</sup>United States Department of Agriculture—Agricultural Research Service

### Introduction

Rhizoctonia root and crown rot (RRCR) is caused by *Rhizoctonia solani* Kühn and continues to be a major pathogen of sugar beet. RRCR is managed in Michigan with Quadris (a.i. azoxystrobin, Syngenta) that is widely applied in-furrow at planting or banded at the 6-8 leaf stage. Azoxystrobin is a quinone outside inhibitor (QoI) which targets a single site to inhibit fungal respiration. This inhibition method has a high risk for developing fungicide resistance.

**Objective: Determine azoxystrobin sensitivity of *Rhizoctonia solani* isolates from Michigan**

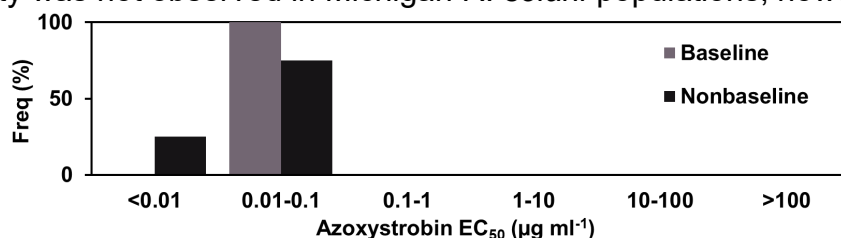
### Methods

- *R. solani* isolates collected from Michigan sugar beet fields between 2015-2018
- Isolates were screened and compared to baseline isolates when exposed to V8 broth with salicylhydroxamic acid and azoxystrobin at concentrations of 0, 0.01, 0.1, 1, 10, and 100 µg/ml<sup>-1</sup>
- After 96 hours, mycelial mats were removed and dried for 48 hours to determine colony mass
- Percent inhibition was calculated using the equation:

$$100 - [(response\ amended / response\ non\ amended) * 100]$$

### Discussion

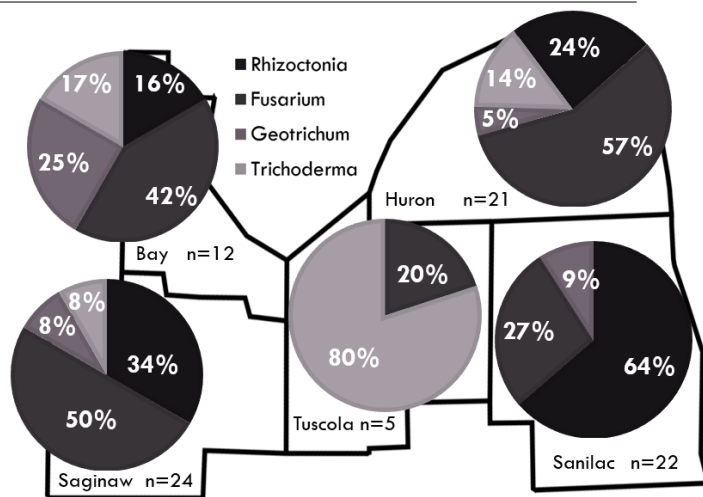
In amended broth studies, isolates were sensitive to azoxystrobin concentrations below label rates and were comparable to baseline isolates, except those exhibiting hypersensitive responses (Fig. 1). Azoxystrobin insensitivity was not observed in Michigan *R. solani* populations, however continued testing is necessary.



**Figure 1. Frequency of isolates within sensitivity categories.** Isolates sensitive to concentrations less than label rates: 0.4 fl oz 1000 row ft<sup>-1</sup> (low; 1.35 µg ml<sup>-1</sup>) to 0.8 fl oz 1000 row ft<sup>-1</sup> (high; 2.7 µg ml<sup>-1</sup>).

### 2019 Progress Report

- Isolations from 13 locations across 5 counties; Bay, Huron, Saginaw, Sanilac, and Tuscola.
- 38% *Rhizoctonia*, 40% *Fusarium*, 16% *Geotrichum* and 6% *Trichoderma* isolated from samples (Fig. 2)
- *Geotrichum* causes a rubbery rot in potato, and is common in waterlogged soils. Recently, *Geotrichum* was reported causing a similar wet rot on beets in Minnesota and North Dakota (Khan et al. 2019).
- *Trichoderma* found in Bay, Saginaw and Huron counties. Not characterized on sugar beet in Michigan before, however it is prevalent in the Red River Valley. It is often used as a biological control in greenhouses.



**Figure 2. Frequency of root pathogens per county.** Of 85 total samples, 12 from Bay, 24 from Saginaw, 5 from Tuscola, 21 from Huron and 22 from Sanilac.