

GROULX, BRIAN J.<sup>1</sup>, JAMES F. STEWART<sup>1</sup>, COREY GUZA<sup>2</sup> AND DENNIS BISCHER<sup>2</sup>.  
<sup>1</sup>Michigan Sugar Company, Agricultural Research Center, 1459 S. Valley Center Dr., Bay City, MI 48706, <sup>2</sup>Michigan Sugar Company, 122 Uptown Drive, Suite 301, Bay City, MI 48708.  
**Managing *Rhizoctonia solani* root rot in sugarbeets in Michigan with registered and experimental fungicide applications.**

## EXPANDED ABSTRACT

Michigan sugarbeet growers lose an estimated 1 to 4 tons per acre to *Rhizoctonia* root rot infestations depending upon the region they farm in. Yield losses can be much higher when weather conditions prevent timely fungicide applications, when sprayer malfunctions occur or when the wrong variety is planted. Michigan Sugar Company has three distinct *Rhizoctonia* risk zones. The western region has a high risk of *Rhizoctonia* root rot and tolerant varieties in addition to Quadris applications are required to grow a successful crop. The central region has a moderate risk and the eastern growing region has a low to moderate risk of *Rhizoctonia*.

*Rhizoctonia* root and crown rot is caused by the fungus *Rhizoctonia solani*. This fungus is divided into several anastomosis groups (AGs). *R. solani* AG 2-2 IV and IIIB are the AGs that cause root and crown rot in sugarbeets. Surveys conducted by Dr. Linda Hanson, USDA-ARS, East Lansing Michigan, show that the IIIB strain is more virulent and prevalent than the IV strain.

Almost all of the Michigan sugarbeet growers utilize Quadris (azoxystrobin) in some manner. Approximately 50 percent of the growers apply Quadris in-furrow at planting followed by an 8 leaf foliar application directed at the sugarbeet crown. About 40 percent of the growers apply only a foliar Quadris application and about 10 percent apply only an in-furrow application.

### Objective

The objective of this study was to compare the efficacy of registered and experimental fungicides for the control of *Rhizoctonia solani* under natural conditions in area with high disease potential. Nearly all of the Michigan Sugar Company growing region can benefit financially from including at least one fungicide application for the control of *Rhizoctonia solani*. Approximately 1/4 – 1/3 of the growing region would benefit from making two fungicide applications. Lastly, the worst areas for disease require growing the most tolerant varieties as well as multiple fungicide applications.

### Method

The data used was generated from three trials performed in 2015, 2016, and 2017. The trials were small plot randomized complete block design. Trials ranged from four to six replications. Plots were planted in six 22 inch rows with the plot length being 38 feet. The four center rows were counted, rated, and taken to harvest for yield and sugar data. In-furrow applications were made in a 3.5 inch band over the row. The in-furrow application placement was after seed drop, but before closing the seed trench. Foliar applications were made at the 4, 8, and 12 leaf stage in a 7 inch band comparing those timings against each other. The goal was to target growing areas with consistently high levels of natural infection. Because of the possibility of the fungus developing resistance to azoxystrobin, several fungicides with different modes of action were evaluated by Michigan Sugar Company. Moncut (flutolanil) Group 7, Proline

(prothioconazole) Group 3, Headline (pyraclostrobin) Group 11 and Xanthion (pyraclostrobin plus a bacillus species) Group 11 and 44 have demonstrated effective *Rhizoctonia* control in research trials.

### Results

Quadris applied in-furrow (10 fl oz/A) at planting in a 3.5 inch T-band followed by a Quadris application at the 8 leaf stage (14 fl oz/A) in a 7 inch band has provided the best *Rhizoctonia* root rot control in Michigan as well as providing the highest yield and sugar content. When comparing the number of dead beets per 100 feet of row, in-furrow applications of Quadris at the 10 fl oz/A as well as the 14 fl oz/A also provided control that was not statistically different from two applications of Quadris. Proline SC applied at 5.7 fl oz/A in-furrow also gave comparable control. All Quadris in-furrow treatments reduced emergence significantly when compared to untreated plots, about 5% on average. This reduction in emergence was compensated by providing better disease control and achieving a higher harvestable stand. A one-time IF application of Quadris at the 10 oz. or 14.25 oz. rate provided significantly better results than a one-time IF application at 7 oz. rate, or a one-time foliar application at any rate or timing. Other products such as Proline SC, Xanthion, Priaxor, and Moncut SC applied either in furrow or foliar also provided control when compared to the untreated check. When only making foliar applications, the 8 leaf timing has been superior to either the 4 leaf timing or 12 leaf timing. Very late or “rescue” applications of Quadris at or near row closure have also been attempted with little or no success.

### Conclusion

Quadris applications at both the in-furrow and 8 leaf stage are providing the best control of *Rhizoctonia solani* as well as providing the most economic return. A single application of Quadris at the in-furrow timing should be at a rate of at least 10 oz. per acre in 22” rows. A single in-furrow application of at least 10 oz. per acre provides superior control over a foliar application at any rate or timing tested. Other products tested provided control when compared to the untreated check and could be used for resistance management. Seed treatments for *Rhizoctonia* control have also been tested, but do not improve control over a program with two applications of Quadris. Michigan Sugar Company recommends that growers who are not currently applying Quadris in-furrow to be sure to use seed treated with one of the available seed treatments. All seed suppliers for Michigan offer a *Rhizoctonia* seed treatment as a standard or option on each unit of seed provided.