
RHIZOCTONIA CONTROL WITH QUADRIS IN MICHIGAN

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ABSTRACT

Rhizoctonia solani, root and crown rot causes significant loss in the Michigan beet growing area. A few specialty varieties have been available that contain some tolerance but usually have lower production potential. The promise of a fungicide to help control rhizoctonia led to this research. The objective was to confirm benefit, if any, and evaluate application timings. There was a significant benefit from quadris application in various levels of natural disease infestation.

INTRODUCTION

Rhizoctonia root and crown rot is a significant problem in Michigan. The disease has become more severe in recent years and causes loss in many fields. A few varieties have become available with some level of resistance to *Rhizoctonia*, but in the absence of much disease, most of these varieties produce less sugar per acre. The lack of a good method to control *Rhizoctonia* was the reason for interest when fungicides were approved for control. Quadris has proven to be the most effective fungicide available. (Stewart, J.; Jacobsen *et al.*, 2001). The Sugarbeet Advancement program in Michigan made it possible to conduct research in large scale replicated strips. They have equipment to document larger weights. One significant advantage of this method was using natural field infection, not inoculated trials. The natural infection was important in establishing best application timings. An evaluation of Quadris was possible at different disease levels because of the variation between fields.

MATERIALS AND METHODS

This work was conducted in large field length strip trials with three replications. They were planted by the grower using his normal practices. Quadris was applied in strips to match the harvester width. *Rhizoctonia* was not inoculated. The disease pressure was the natural infection present in the field used. The weights were obtained by using a trailer dump cart equipped with a scale. The beets for the sugar analysis were hand dug and two samples were taken from each replication. The rate of Quadris used was: banded in-furrow and 6-8 leaf, 0.6 ounces per 1000 foot of row, and broadcast near row closure, 9.2 ounces per acre.

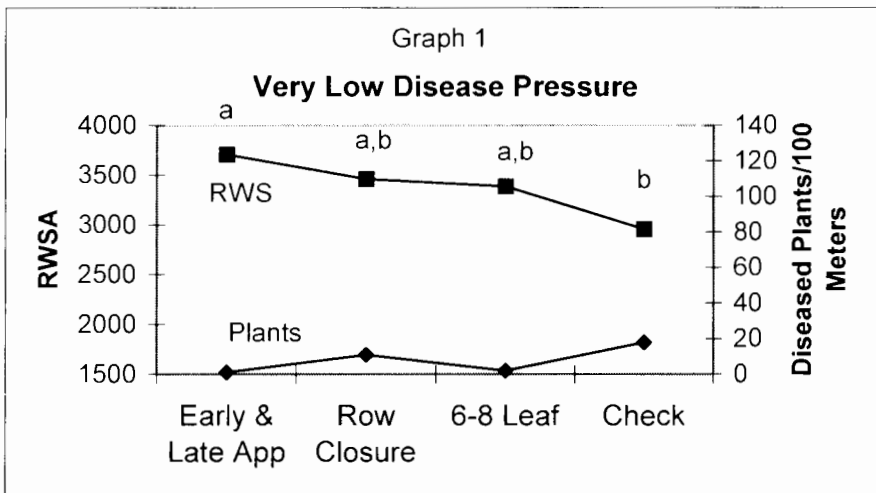
RESULTS

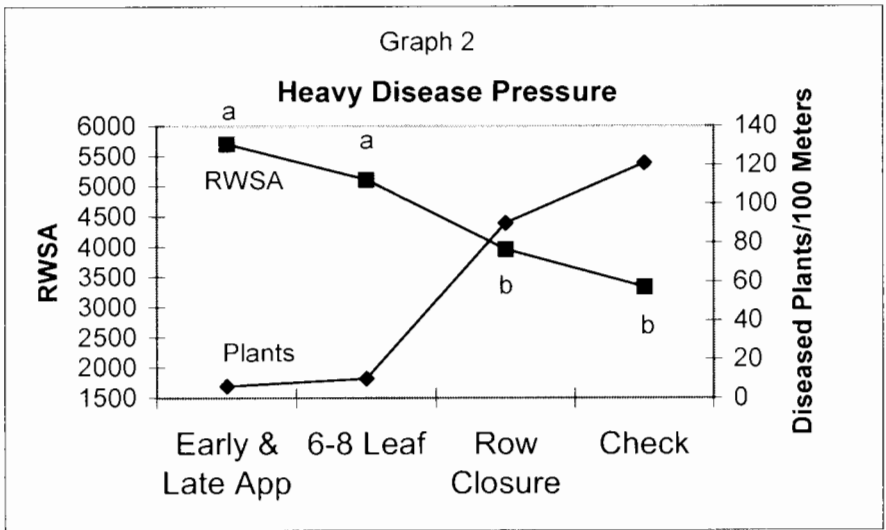
One interesting comparison was made where the previous crop was different in two parts of the same field, corn and soybeans. There was much more disease and loss in Recoverable Sugar per Acre (RWSA) after soybeans compared to after corn (Table 1).

Table 1

TREATMENT Quadris	<u>Soybeans</u> RWSA	<u>Corn</u> RWSA	<u>Soybean</u> DISEASED PLANTS PER 100 METERS	Com DISEASED PLANTS PER 100 METERS
Early & Late Application	5076 b	5251 c	6 b	3 d
Early Application	5115 b	5092 bc	10 b	5 b
Late Application	3961 a	4754 ab	90 b	36 a
Check	3338 a	4692 a	121 a	42 a
Average	4530	4947	57	22

There were three locations in 2001. Treatments: check, 6-8 leaf, row closure, and both timings. Where there was the least *Rhizoctonia* (Graph 1), only the two-application treatment had significantly better recoverable sugar per acre (RWSA) than the check. In a second test with some more disease, but still rated low, both the 6-8 leaf treatment and the two-application treatment had significantly better RWSA than the check. In the test with heavy *Rhizoctonia* pressure (Graph 2), both the 6-8 leaf treatment and the two-application treatment had significantly better RWSA than the check and the row closure treatment.





In 2002 an in-furrow treatment was added and the row closure treatment was dropped from most locations. The in-furrow treatment was promoted to reduce seedling disease but not persist to control root and crown rot. There was no advantage in stand observed with the in-furrow treatment (Table 2). At one location, the check had a better stand than the in-furrow at 30 days. At one location with severe disease, on a susceptible variety, the in-furrow treatment had a better stand than the check at harvest. Results from one year, in 2002, were mixed for RWSA from the in-furrow treatment. More testing will be done.

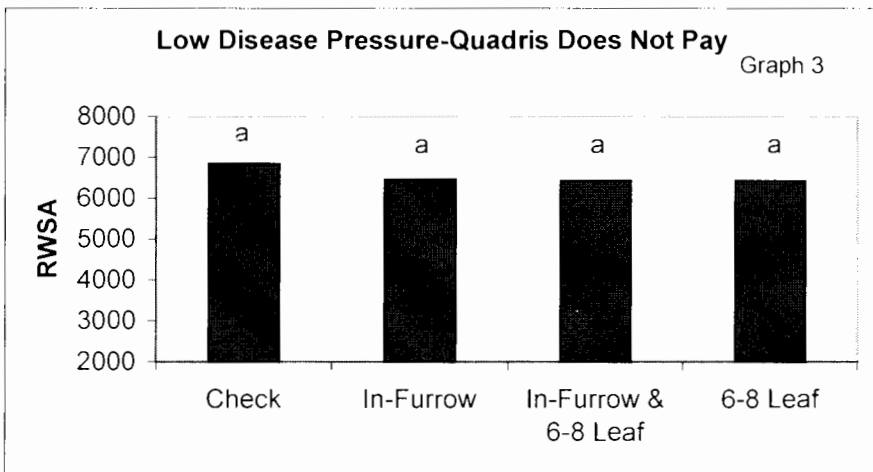
At one location with moderately low disease, the row closure treatment was better for RWSA than the check of the same susceptible variety. At another location with low disease pressure, the treatment with in-furrow and row closure was better than the check of the same susceptible variety. At a location with very high disease pressure, the treatment of in-furrow and 6-8 leaf was better than the check of the same susceptible variety. In addition to these three with a significant difference, the trend indicated control with Quadris (Graph 4). With low disease pressure, the use of Quadris may not be profitable (Graphs 3).

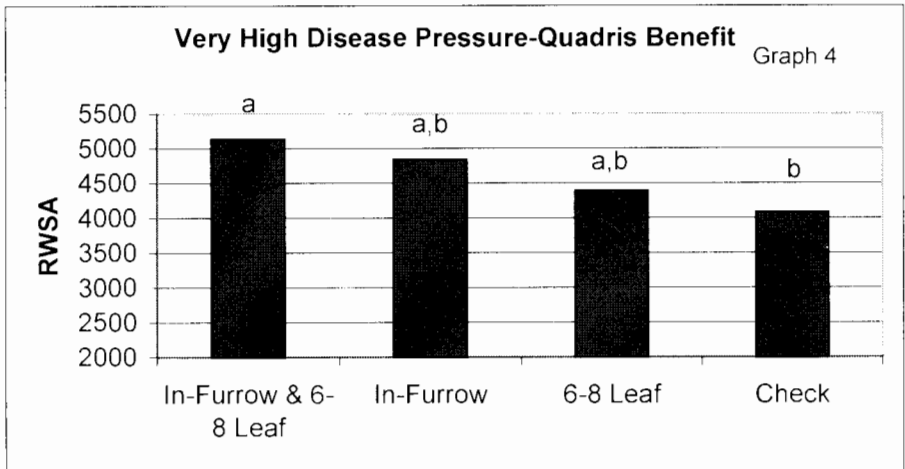
At most locations, there were two varieties, one susceptible and one resistant. In a low level of Rhizoctonia, the susceptible variety produced as good or better than the resistant variety. At a location with a very high level of disease, the resistant variety produced better.

Table 2

QUADRI IN-FURROW STAND COMPARISONS							
Location	Variety	Variety	Disease	30 Days Stand		Harvest Stand	
		Resistan t	Pressure	In-furrow	Check	In-furrow	Check
Zimmer	HM E-17	No	LOw	285*	302*	252	243
	HM RH-15	Good		270	283	248	253
Helmreich	SX Prompt	Fair	Moderate	147	153	138	126
	Crystal 1353	Excellent		160	165	131	123
Schultz	HM E-17	No	Very Hlgh	274	277	200*	95*
	HM RH-5	Good		236	260	223	203
Fisher	HM E-17	No	Low	86	89	76	74
	HM RH-5	Good		55	59	50	54
W Marion	Blend 50-50		Low	184	182	162	146
	SX Prompt	Fair					
	Beta 5736	Good					
Mean				188,6	196,7	164,4	146,3

* Significant Difference





SUMMARY

Quadris application to sugar beets does reduce the amount of *Rhizoctonia* root and crown rot. Early application at 6-8 leaf, is more effective than row closure. An application of 6-8 leaf and row closure is more effective than just the 6-8 leaf application but may not cover the extra cost. We may recommend the early application to be made at the 4-6 leaf size to be confident of application before infection starts. The in-furrow treatments in 2002 indicated increased production at some locations. The persistence of Quadris would not indicate late season control. More tests will be conducted.

REFERENCES

1. Jacobsen B., Zidack N., Kephart K., Mickelson J., Ansley J. (2001). Integrated Management strategies for *Rhizoctonia* Crown and Root Rot. Unpublished.
2. Stewart J., Michigan Sugar Company, Unpublished