

Evaluation of in-furrow and banded fungicide applications to manage *Rhizoctonia* root and crown rot of sugar beet in Michigan, 2019.

The trial was established at the Saginaw Valley Research and Extension Center in Frankenmuth, MI with the objective of determining the efficacy of experimental and commercially available fungicides for managing *Rhizoctonia solani*. Sugar beets were planted at a rate of 50,000 seed/A on 7 May in loam soil. A randomized complete block design was used and each treatment was replicated four times; plot dimensions were four rows wide (30-in row spacing) by 40 ft long. In-furrow applications were made at planting. A tractor mounted CO₂ backpack sprayer, equipped with four TJ 2502E nozzles (30-in spacing), applied fungicides at a spray volume of 0.60 gal/1,000 row-ft (32 PSI). *Rhizoctonia solani* infested millet was applied atop rows at a rate of 1.03 g/row-ft on 7 Jun. Banded applications were made on 18 Jun, when plants were at the 6-8 leaf stage, using an 8-in band. A CO₂ powered backpack sprayer, equipped with four TJ 4001E nozzles, was used to apply treatments at a volume of 15 gal/A (19 PSI). Stand counts of live and dead beets were collected regularly during the growing season to determine disease progression and percent stand loss. The center two rows of plots were harvested 4 Sep. After being weighed, 20 beets were arbitrarily selected for disease rating using a 0-7 scale. The severity scale is based on the area of root infected: 0=0%, 1=0-2.5%, 2=2.5-5%, 3=5-25%, 4=25-50%, 5=50-75%, 6=95% (only tip not rotten), 7=100% (plant dead). The disease incidence and severity were combined into a single disease index (DX) to assess disease pressure among treatments. The disease index was calculated by multiplying the incidence from the 20 rated roots (0-100%) by the mean symptomatic root severity divided by seven. A generalized linear mixed model procedure was used to conduct the ANOVA ($\alpha=0.05$) and mean separations (SAS Institute Inc. Cary, NC).

Stand counts from 5 Aug show significant differences in percent stand loss among treatment programs ($P<0.001$). Mean values for stand death ranged between 7.1-74.2%. Programs 4, 6, 7, and 12 all exhibited significantly lower percent stand loss than program 1, the non-treated control. DX values were significantly different among programs ($P<0.0001$). Programs 4, 6, 7, 8, 12, and 13 resulted in statistically similar DX values (15.4-29.0%) and were significantly lower than the control (55.3%). There were also significant differences among mean yields of treatment programs ($P<0.0001$). Programs 6, 7, 8, 12, and 13, ranging from 6.8 to 10.1 t/A, yielded significantly higher than the non-treated control (3.9 t/A). All other tested programs did not have yields significantly different from the control. Overall, disease pressure was high in this trial and greater than would be expected in most commercial fields. All data presented should be interpreted relative to the trial, and not as averages for Michigan production.

No.	Treatment, Rate ^z	Application Type ^y	Stand Loss (%) ^x	Disease Index (%) ^w	Yield (t/A)
7	Excalia, 3 fl oz	Banded	7.1 e	18.0 gh	10.1 a
6	Excalia, 2 fl oz	Banded	19.4 de	29.0 d-h	9.3 ab
12	Serenade ASO, 2 qt	In-Furrow	20.9 de	27.1 e-h	6.9 bc
	Quadris, 9.2 fl oz	In-Furrow			
	Proline, 5.7 fl oz	Banded			
4	Quadris, 12 fl oz	Banded	21.1 de	26.9 f-h	4.5 c-f
15	Serenade ASO, 2 qt	In-Furrow	25.9 c-e	37.0 b-f	5.3 c-e
	Proline, 5.7 fl oz	Banded			
2	Quadris, 12 fl oz	In-Furrow	26.7 c-e	33.1 c-g	4.5 c-f
8	Excalia, 4 fl oz	Banded	28.3 c-e	15.4 h	4.0 d-f
13	B ^v , 12.8 fl oz	In-Furrow	32.7 b-e	24.9 f-h	3.1 ef
	Quadris, 9.2 fl oz	In-Furrow			
	Proline, 5.7 fl oz	Banded			
3	Vertisan, 30 fl oz	Banded	34.6 b-e	50.1 ab	6.2 cd
9	Moncut, 25 fl oz	In-Furrow	39.1 b-d	34.7 b-f	3.9 d-f
5	Priaxor, 8 fl oz	Banded	42.5 b-d	43.0 a-e	7.0 bc
1	Non-Treated Control	-	55.5 a-c	55.3 a	5.3 c-e
11	A ^v , 4.65 fl oz	In-Furrow	55.8 a-c	56.8 a	6.8 bc
10	A ^v , 3.1 fl oz	In-Furrow	60.4 ab	43.9 a-d	2.0 f
14	Serenade ASO, 2 qt	In-Furrow	74.2 a	48.0 a-c	4.8 c-f

^z All rates are listed as measure of a product per acre.

^y In-furrow treatments were applied at planting, banded applications were applied at the 6-8 leaf stage.

^x Column values followed by the same letter were not significantly different based on Fisher's Protected LSD ($\alpha=0.05$).

^w Disease index was calculated by multiplying the disease incidence (0-100%) by the mean symptomatic root severity (1-7) and dividing by 7.

^v Experimental treatment.