SUGAR BEET (*Beta vulgaris* 'HIL-9879NT')
Rhizoctonia root and crown rot; *Rhizoctonia solani*

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Evaluation of in-furrow and banded fungicide applications to manage Rhizoctonia root and crown rot of sugar beet in Michigan, 2020.

The trial was established at the Saginaw Valley Research and Extension Center in Frankenmuth, MI to investigate the efficacy of experimental and commercially available fungicides at managing *Rhizoctonia solani* in sugar beets. Sugar beets were planted 5 May at a rate of 50,000 seed/A in loam soil. Plots were set up in a randomized complete block design, with four replicates. Plot dimensions were four rows wide (30-in. row spacing) by 35 ft long. In-furrow applications were made at planting using a tractor mounted CO_2 backpack sprayer equipped with four TJ 2502E nozzles and applying fungicides at a spray volume of 0.60 gal/1,000 row-ft (32 PSI). The trial was inoculated with *R. solani* infested barley on 16 Jun at a rate of 1.0 g/row-ft placed atop rows. Banded applications were made 22 Jun when plants were at the 6-8 leaf stage. A CO_2 powered backpack sprayer (four TJ4001E nozzles) was used to apply treatments in an 8-in. band at 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 15 Sep. After weighing to estimate yield, 20 beets from each row 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 40 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 (α=0.05) and mean separations (SAS version 9.4).

No differences were observed in the percent stand loss of treatments ($P > 0.05$), which had mean values ranging between 1.6-14.7%. Mean yield values ranged between 15.4-19.7 t/A but were not significantly different among treatment programs ($P > 0.05$). Significant differences were observed in root disease index ratings at harvest ($P = 0.05$). DX values ranged from 3.9 to 9.8%, and though differences were detected among fungicide programs, no program differed from the controls.

No.	Treatment, Rate[z]	Application Type[y]	Stand Loss (%)	Yield (t/A)	Disease Index (%)[x,w]
3	Quadris, 9.2 fl oz Proline, 5.7 fl oz	In-Furrow Banded	1.6	18.6	3.9 c
9	Actinovate AG, 6 oz Excalia, 2 fl oz	In-Furrow Banded	4.4	19.2	3.9 c
11	Elatus, 7 oz Elatus, 7 oz	In-Furrow Banded	8.4	17.9	3.9 c
8	Excalia, 4 oz	Banded	6.5	19.7	4.3 bc
10	Quadris, 13.9 fl oz Quadris, 13.9 fl oz	In-Furrow Banded	4.6	15.4	4.3 bc
6	Quadris, 12 fl oz	Banded	5.4	17.4	4.4 bc
7	Excalia, 2 fl oz	Banded	11.6	18.7	4.9 bc
2	Non-Inoculated Control[v]	-	5.2	19.0	6.1 abc
4	Experimental, 12.8 fl oz Quadris, 9.2 fl oz Proline, 5.7 fl oz	In-Furrow In-Furrow Banded	11.9	18.2	7.5 abc
1	Inoculated Control[v]	-	13.1	17.1	7.6 abc
12	Quadris, 13.9 fl oz Elatus, 7 oz	In-Furrow Banded	14.7	17.6	8.4 ab
5	Quadris, 12 fl oz	In-Furrow	7.6	17.5	9.8 a

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

[w] Column values followed by the same letter were not significantly different based on Fisher's Protected LSD (α=0.05).

[v] Non-treated.