

Sugarbeet (*Beta vulgaris* L. 'BETA 5355')
Rhizoctonia crown and root rot; *Rhizoctonia solani*

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Control of sugarbeet *Rhizoctonia* crown and root rot with fungicides, 2007.

Sugar beet cv. BETA 5355 was PAT-treated and planted at the Michigan State University Bean and Beet Farm, Saginaw, MI on 25 Apr. Seed was planted at 1-in. depth into four-row by 50 ft plots (ca. 4.375 in. between plants to give a target population of 275 plants/100ft. row) with 30-in. between rows replicated four times in a randomized complete block design. Fertilizer was drilled into plots immediately before planting, formulated according to results of soil tests (125 lb 46-0-0/A). No additional nitrogen was applied. All fungicides were applied with a hand held R&D spray boom delivering 10 gal/A (50 p.s.i.) and using one XR8003 nozzle per row in a 6-in. band at planting or at GS 2-4 and 4-6. Fungicides were applied broadcast with a hand-held R&D spray boom delivering 25 gal/A (80 p.s.i.) and using three XR11003VS nozzles per row. Applications were made at planting (A); and banded applications on 16 and 29 May at GS 2-4 (B) and 4-6 (C), respectively and the broadcast application on 6 Jun equivalent to GS 6-8 (D). *Cercospora* leaf spot was controlled with an application of Eminent 125SL (13 fl oz) on 28 Jun. Weeds were controlled by cultivation and Pyramin DF at 5 lb/A plus Nortron at 4 pt/A applied at planting. Insects were controlled as necessary. Plant stand was rated 19, 28 and 38 days after planting (DAP) and relative rate of emergence was calculated as the Relative Area Under the Emergence Progress Curve [RAUEPC from 0 – 38 DAP, maximum value = 100]. Plots were inoculated on 30 May [35 days after planting (DAP)] by spreading *R. solani* Anastomoses Group 2.2 IIIB infested millet grain across all plants in the middle two rows of each plot. Plants with signs and symptoms of *Rhizoctonia* crown and root rot were counted 161 DAP on 25 Sep and expressed as the percentage of dead-beets. Beet roots were machine-harvested on 25 Sep.

Average daily soil temperature at 4-in. depth did not exceed 70°F until 23 May, 28 DAP. Average soil temperature was 58.4 (Apr), 61.2 (May), 71.1 (Jun), 72.0 (Jul), 73.3 (Aug) and 67.0 (Sep). Soil moisture was above 79.8% soil moisture capacity throughout the experiment. These conditions enhanced development of crown and root rot. There were no significant differences among treatments in terms of plant stand or RAUEPC from planting to 38 days after planting (DAP). The mean percentage of dead and dying sugarbeets 153 DAP in the non-treated plots was 23.1%. Some treatments such as LEM 17 gave outstanding control of crown and root rot but were not significantly different from any other treatment except Quadris applied at GS 4-6. The excessive amount of crown and root rot in Quadris applied at GS 4-6 was due to an extremely potent batch of inoculum that destroyed one replicate completely. The effect of crown and root mortality was reflected in the yield analysis

Treatment and rate/acre or 1000 ft. row	Plant stand (%) ^z			RAUEPC ^x	Dead beets (%) ^w	Yield (t/A)
	19 DAP ^y	28 DAP	38 DAP			
LEM 17 200EC 1.63 fl oz wt/1000 row-ft (A) ¹	11.3	73.7	71.0	31.9	0.2 c	19.5 a
LEM 17 200EC 1.63 fl oz wt/1000 row-ft (C).....	10.1	72.0	72.0	31.2	1.2 c	19.0 a
LEM 17 200EC 1.63 fl oz wt/1000 row-ft (A,C)....	16.1	74.0	73.1	34.0	0.8 c	18.4 a
Quadris 2.08FL 0.6oz/1000 row-ft (A).....	12.6	75.8	75.2	33.5	6.3 bc	19.0 a
Quadris 2.08FL 0.6oz/1000 row-ft (B).....	17.9	75.1	71.3	34.7	9.1 bc	17.2 a
Quadris 2.08FL 0.6oz/1000 row-ft (C).....	11.5	75.6	71.3	32.5	29.5 a	11.5 c
Quadris 2.08FL 0.6oz/1000 row-ft (D).....	16.5	75.7	74.6	34.8	3.8 bc	16.8 ab
Proline 480SC 5.7 fl oz + Induce 0.125% (B).....	11.5	76.9	75.2	33.4	10.9 abc	16.0 abc
Proline 480SC 5.7 fl oz + Induce 0.125% (C).....	12.3	76.3	76.1	33.6	2.5 c	15.6 abc
Proline 480SC 5.7 fl oz + Induce 0.125% (D).....	17.5	76.3	74.5	35.3	3.6 bc	17.9 a
Untreated.....	12.0	68.6	77.4	31.8	23.1 ab	12.2 bc
LSD _{0.05}	13.32	15.15	12.36	7.36	20.36	4.70*

^a Plant stand expressed as a percentage of the target population of 275 plants/100ft. row from a sample of 2 x 50 ft rows per plot.

^y DAP = days after planting on 25 Apr.

^x Relative area under the emergence progress curve from planting to 35 days after planting.

^w Dead and dying sugarbeets (%)153 DAP on 25 Sep.

^v Application dates; A= 25 Apr; B= 14 May; C= 23 May; D= 1 Jun.

^s Means followed by same letter are not significantly different at P = 0.05 (Fishers LSD) or *P= 0.10 (yield only).