

SUGAR BEET (*Beta vulgaris* 'SX-1278N')  
Cercospora Leaf Spot; *Cercospora beticola*

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### **Evaluation of foliar fungicides to manage *Cercospora* leaf spot of sugar beet in Michigan, 2022.**

A field trial was established at the Saginaw Valley Research and Extension Center in Frankenmuth, MI to evaluate the efficacy of fungicides at managing *Cercospora* leaf spot (CLS) in sugar beets. The trial was planted 29 Apr at a rate of 50,000 seed/A using 30-in row spacing. A randomized complete block design was used, with four replicates, and plots were four rows wide and 35 ft long. Liquid *C. beticola* inoculum ( $1 \times 10^3$  conidia/mL) was applied at 15 gal/A using a tractor mounted sprayer on 12 Jul. Five foliar applications were made for all programs (A, B, C, D, and E) on 8 Jul, 19 Jul, 2 Aug, 16 Aug, and 30 Aug. Foliar applications were made using a CO<sub>2</sub>-powered backpack sprayer equipped with four TJ8004XR nozzles (30-in spacing), calibrated at 20 gal/A (32 psi). Disease ratings were collected through the summer; plots were assigned a severity using the following scale based on infected leaf area: 1=0.1% (1-5 spots/leaf), 2=0.35% (6-12 spots/leaf), 3=0.75% (13-25 spots/leaf), 4=1.5% (26-50 spots/leaf), 5=2.5% (51-75 spots/leaf), 6=3%, 7=6%, 8=12% 9=25%, 10=50%. The ratings were used to calculate area under the disease progress curve (AUDPC) for CLS severity. The center two rows of the plots were harvested on 23 Sep to estimate yield in t/A. After weights were collected, subsamples from each plot were sent to Michigan Sugar Company (Bay City, MI) to determine percent sugar and pounds of recoverable white sugar per ton (RWST). A generalized linear mixed model procedure was used to conduct the ANOVA and mean separations at the  $\alpha=0.05$  significance level (SAS version 9.4).

Significant CLS pressure was observed uniformly throughout this study; all fungicide programs had significantly lower AUDPCs than the non-treated control ( $P < 0.0001$ ). AUDPCs for fungicide programs ranged between 38.0 and 72.5, while the control program had a AUDPC of 177.8. No differences were observed among estimated yields ( $P > 0.05$ ), however, all programs had numerically greater yields (13.9-20.1 t/A) than the control (11.2 t/A). All fungicide programs had significantly greater sugar content than the control ( $P < 0.0001$ ) and all programs, except 3, 6, and 12, resulted in significantly greater RWST than the control ( $P < 0.0001$ ).

No.	Treatment, Rate <sup>z</sup> , and Timing <sup>y</sup>	AUDPC <sup>x, w</sup>	Yield (t/A)	Sugar (%)	RWST <sup>v</sup>
1	Non-treated Control	177.8 a	11.2	14.9 c	215.9 d
2	Manzate Max (1.6 qt) ABCDE; Inspire XT (7 fl oz) BD; Super Tin (8 fl oz) C	53.5 cd	16.9	17.0 ab	251.8 a-c
3	Manzate Max (1.6 qt) ACE; Propulse (13.7 fl oz) BD; Super Tin (8 fl oz) C	38.0 d	20.1	16.9 ab	250.4 a-c
4	Manzate Max (1.6 qt) ACE; Proline (5.7 fl oz) BD; Super Tin (8 fl oz) C	45.5 d	15.7	16.7 ab	246.9 a-c
5	Manzate Max (1.6 qt) ACE; Delaro (11 fl oz) B; Super Tin (8 fl oz) C; Proline (1.7 fl oz) D	46.0 d	19.7	17.0 ab	253.1 a-c
6	Manzate Max (1.6 qt) AE; Delaro (11 fl oz) B; Luna Privilege (2 fl oz) C; Proline (1.7 fl oz) D	67.3 bc	15.2	16.6 ab	243.4 bc
7	Badge (2 pt) ABCDE; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C; Inspire XT (7 fl oz) D	72.5 b	18.9	17.2 ab	254.9 ab
8	Manzate Max (1.6 qt) ABCDE; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C; Inspire XT (7 fl oz) D	44.5 d	15.9	17.0 ab	252.3 a-c
9	Badge (2 pt) ABCDE; Exp <sup>u</sup> (1.5 pt) A; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C; Inspire XT (7 fl oz) D	54.8 b-d	13.9	16.7 ab	245.8 a-c
10	Manzate Max (1.6 qt) ABCDE; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C; Exp (1.5 pt) C; Inspire XT (7 fl oz) D	46.0 d	15.2	16.5 b	242.7 c
11	Manzate Max (1.6 qt) ABCDE; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C; Inspire XT (7 fl oz) D; Exp (1.5 pt) E	44.5 d	16.4	16.7 ab	246.6 a-c
12	Manzate Max (1.6 qt) ABCDE; Exp (1.5 pt) ACE; Domark (6.9 fl oz) B; Super Tin (8 fl oz) C	45.0 d	15.2	17.2 a	256.3 a

<sup>z</sup> All rates, unless otherwise specified, are listed as a measure of product per acre. MasterLock was added to all tank mixes at a rate of 0.25 % v/v.

<sup>y</sup> Application letters code for the following dates: A=8 Jul, B=19 Jul, C=2 Aug, D=16 Aug, and E=30 Aug.

<sup>x</sup> Area under the disease progress curve was calculated using disease severity scores (0-10 scale) collected Jul 26, Aug 11, Aug 23, and Sep 8.

<sup>w</sup> Column values followed by the same letter were not significantly different based on Fisher's Protected LSD ( $\alpha=0.05$ ). If no letter, then means were not significantly different.

<sup>v</sup> Pounds of recoverable white sugar per ton of beets.

<sup>u</sup> Exp=Experimental compound