

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, 2023.**

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 on 12 May 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 30 ft long. Liquid *C. beticola* inoculum ( $1 \times 10^4$  conidia/mL) was applied at 15 gal/A using a tractor mounted sprayer on 3 Jul. Five foliar applications were made for all programs (A, B, C, D, and E) on 3 Jul, 19 Jul, 1 Aug, 14 Aug, and 31 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 (42 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 2 Oct 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 88.8 and 155.0, while the control program had an AUDPC of 245.5. No significant differences were observed among estimated yields ( $P > 0.05$ ), however, all programs had numerically greater yields (5.1-14.4 t/A) than the control (3.6 t/A). All fungicide programs had significantly greater sugar content ( $P < 0.01$ ) and RWST than the control ( $P < 0.01$ ). High *Rhizoctonia solani* pressure was observed in the trial and severely impacted yield, resulting in the lack of significant differences in yield among treatments.

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	254.5 a	3.6	13.3 d	183.4 d
2	Manzate Max (1.6 qt) ACE; Propulse (13.6 fl oz) BD; Super Tin (8 fl oz) CE	104.0 cd	8.3	14.5 bc	204.3 bc
3	Manzate Max (1.6 qt) ACE; Proline (5.7 fl oz) BD; Super Tin (8 fl oz) CE	102.5 cd	12	15.2 ab	217.9 ab
4	Manzate Max (1.6 qt) ACE; Delaro (11 fl oz) BD; Proline (1.71 fl oz) BD; Super Tin (8 fl oz) CE	134.9 bc	5.1	14.6 bc	206.0 bc
5	Manzate Max (1.6 qt) ACE; Delaro (11 fl oz) BD; Luna Privilege (2 fl oz) BD; Proline (1.71 fl oz) BD; Super Tin (8 fl oz) CE	114.6 cd	14.4	14.8 bc	210.0 bc
6	Manzate Max (1.6 qt) ACE; Luna Flex (13.6 fl oz) BD; Super Tin (8 fl oz) CE	155.0 b	13.6	14.3 c	199.9 c
7	Manzate Max (1.6 qt) ACE; Luna Flex (13.6 fl oz) BD; Propulse (13.6 fl oz) BD; Super Tin (8 fl oz) CE	103.1 cd	8.7	14.5 bc	204.5 bc
8	Provysol (4 fl oz) A; Manzate Prostick (2 lb) ACE; Super Tin (8 fl oz) BD; Badge (32 fl oz) B; Proline (5 fl oz) C; Priaxor Xemium (6.7 fl oz) D	121.8 bd	11.6	15.1 ab	214.3 ac
9	Lucento (5.5 fl oz) A; Manzate Prostick (2 lb) ACE; Super Tin (8 fl oz) BD; Topsin M WSB (10 oz) B; Topguard (14 fl oz) C; Priaxor Xemium (6.7 fl oz) D	92.8 d	10.3	15.8 ab	227.2 a
10	Inspire XT (7 fl oz) A; Badge (32 fl oz) A; Super Tin (8 fl oz) BD; Topsin M WSB (10 oz) B; Proline (5 fl oz) C; Manzate Prostick (2 lb) CE; Priaxor Xemium (6.7 fl oz) D	88.8 d	9.5	15.2 ab	215.5 ac

<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=3 Jul, B=19 Jul, C=1 Aug, D=14 Aug, and E=31 Aug.

<sup>x</sup> Area under the disease progress curve was calculated using disease severity scores (0-10 scale) collected 3 Jul, 23 Jul, 8 Aug, 22 Aug, and 7 Sep.

<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.