SUGAR BEET (*Beta vulgaris* 'C-G675')
Cercospora Leaf Spot; *Cercospora beticola*

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Evaluation of LifeGard and ManKocide fungicides to manage Cercospora leaf spot of sugar beet in Michigan, 2020.

A field trial was established at the Saginaw Valley Research and Extension Center in Frankenmuth, MI with the objective of evaluating the efficacy of LifeGard and ManKocide fungicides at managing Cercospora leaf spot (CLS) in sugar beets. Variety C-G675 was planted on 7 Apr at 50,000 seed/A. Research plots were four rows wide (30-in. row spacing) by 35 ft long. The trial was inoculated with liquid *C. beticola* inoculum (100 spores/mL) on 9 Jul and 23 of Jul using a tractor mounted sprayer (15 gal/A). Four fungicide applications were made during the growing season (A, B, C, and D) on 30 Jun, 13 Jul, 21 Jul, and 20 Aug. Treatments were applied via CO_2 powered backpack sprayer equipped with four TJ 8004 XR nozzles (30-in. spacing) calibrated at 20 gal/A. Two maintenance applications of Badge (2 pt/A) were made by research farm staff on 7 Aug and 3 Sep. The trial was rated and scouted bi-weekly starting 1 Jul until the final rating on 16 Sep. 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%. These ratings were used to calculate area under the disease progress curve for disease severity (AUDPC). The center two rows of plots were harvested 18 Sep; plot weights were used to estimate yield in t/A and subsamples from each plot were sent to Michigan Sugar Company (Bay City, MI) to determine percent sugar and recoverable white sugar per ton (RWST). A generalized linear mixed model procedure was used to conduct the ANOVA (α=0.05) and mean separations (SAS version 9.4).

Despite late disease onset, significant differences were observed among treatment AUDPC values (P = 0.001). Fungicide programs 2, 5, 6, and 7 had significantly lower disease severities than the non-treated control. AUDPC values in these programs ranged from 32.0 to 41.1; these programs did not differ from one another. Programs 3 and 4 did not differ in AUDPC from the non-treated control. Differences were not observed among collected mean yield or sugar parameters (P > 0.05). Yield values in this trial ranged between 10.4 and 18.0 t/A, which is well below typical sugar beet yield in Michigan. Percent sugar and RWST values were comparable to state averages.

No.	Treatment, Rate[z], and Timing[y]	AUDPC[x, w]	Yield (t/A)	Sugar (%)	RWST[v]
2	Manzate Max (1.6 qt) ABCD + Inspire XT (7 fl oz) BD + Super Tin (8 fl oz) C	32.0 b	14.6	18.3	235.6
5	Manzate Max (1.6 qt) ABCD + LifeGard WG (4.5 oz/100 gal) ABD + Super Tin (8 fl oz) C	33.8 b	16.2	18.2	235.5
6	ManKocide (4.3 lb) ABCD	36.5 b	18.0	18.7	241.0
7	ManKocide (4.3 lb) ABCD + Inspire XT (7 fl oz) BD + Super Tin (8 fl oz) C	41.1 b	17.4	18.1	232.7
3	LifeGard WG (4.5 oz/100 gal) ABCD	83.6 a	16.9	18.4	236.9
4	LifeGard LC (1 gal/ 100 gal) ABCD	95.1 a	17.2	18.3	234.6
1	Non-treated Control	96.1 a	10.4	17.7	226.0

[z] 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.

[y] Application letters code for the following dates: A=29 Jun, B=13 Jul, C=21 Jul, D=20 Aug.

[x] Area under the disease progress curve was calculated using disease severity (0-10 scale).

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

[v] Pounds of recoverable white sugar per ton of beets.