MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Evaluation of foliar fungicide treatments to manage Cercospora leaf spot of sugar beet

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Location: Frankenmuth (SVREC)	**Treatment Timings:** 14 day interval starting at 45 DSV
Planting Dates: April 30, 2018	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.0 **pH:** 7.5
Replicates: 4	**Variety:** C-G351NT

Summary: Mean CLS ratings were significantly different among treatments ($P<0.0001$). Programs 1-7 provided the greatest level of plant protection, with a mean disease severity ranging from 4.3-5.0, which is below the economic threshold of 6. Disease levels in programs 17-19 were not significantly different from the non-treated control, and had disease severity range of 7.5-8.0. Significant differences among program yields were detected ($P=0.01$). Though numerically many programs had mean yields greater than the control plot (18.7 t/A), programs 3, 5, and 8 were the only programs with mean yields significantly greater than the control. Significant differences were found among treatments for percent sugar ($P<0.0001$) and RWST values ($P<0.001$). The greatest percent sugar values resulted from programs 1, 3, 4, and 6, with a range of 13.9-14.6%. RWST values were greatest in programs 1-8, and had mean values of 191.9-205.3 lb sugar/ton of beet. The lowest percent sugar and RWST means resulted from programs 15-20. It is noted that lower than normal yields, percent sugar, and RWST values are most likely due to the early harvest and stand establishment issues. Overall, the top three performing programs were numbers 2, 3, and 8.

Table 1. End of season disease severity and yield parameters from the tested fungicide programs.

No.	Treatment, Rate/A, and Timing[a]	Disease Severity[b,c]	Yield (t/A)	Sugar (%)	RWST
1	Minerva Duo (16 fl oz) ACDF + Super Tin (8 fl oz) BE + Koverall (1.5 lbs) BE	4.3 e	21.7 a-e	14.1 a-c	199.0 ab
2	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + Super Tin (8 fl oz) BD	4.5 de	22.0 a-e	13.8 b-d	192.3 a-d
3	Manzate Max (1.6 qt) ABCDEF + Acropolis (32 fl oz) AC + Super Tin (8 fl oz) BD	4.5 de	23.3 b	14.6 a	205.3 a
4	Inspire XT (7 fl oz) A + Manzate Max (1.6 qt) ABCDF + Super Tin (8 fl oz) C + Cuprofix Ultra (3 lb) E	4.7 de	22.5 a-d	13.9 a-d	193.6 a-c
5	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + MasterCop (1.5 pt) BCD + Super Tin (8 fl oz) BD	4.8 de	23.2 ab	13.6 b-f	191.9 a-e
6	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + AgriLife (1 qt) BCD + Super Tin (8 fl oz) BD	4.8 de	19.4 d-g	14.5 a-b	204.6 a
7	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + Badge SC (2 pt) BCD + Super Tin (8 fl oz) BD	5.0 de	22.4 a-e	13.8 b-e	192.2 a-d
8	Super Tin (8 fl oz) A + Manzate Max (1.6 qt) ACF + Dexter Max (2.1 lb) BD + Inspire XT (7 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	23.25 b	13.8 b-e	192.6 a-d
9	Super Tin (8 fl oz) A + Manzate Max (1.6 qt) ABCDF + Inspire XT (7 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	20.3 b-g	13.3 d-f	183.5 c-e
10	Inspire XT (7 fl oz) A + Manzate Max (1.6 qt) ACF + Dexter Max (2.1 lb) BD + Super Tin (8 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	20.7 b-g	13.3 d-f	183.2 c-e
11	Brixen (21 fl oz) AD + Super Tin (8 fl oz) BE + Koverall (1.5 lb) BE + Minerva Duo (16 fl oz) CF	5.3 d	19.6 a-g	13.5 c-f	188.1 b-e
12	Minerva (13 fl oz) AD + Super Tin (8 fl oz) BE + Koverall (1.5 lb) BE + Minerva Duo (16 fl oz) CF	5.3 d	21.3 b-f	13.6 c-e	189.4 b-e
13	Manzate Max (1.6 qt) ABDF + Inspire XT (7 fl oz) AB + LifeGard (4.5 oz/100gal) CE + Super Tin (8 fl oz) D	6.3 c	21.9 a-e	13.1 e-g	180.8 d-f
14	Manzate Max (1.6 qt) A + Badge SC (2 pt) BCDEF	6.5 c	22.7 a-d	13.6 c-e	189.3 b-e
15	Manzate Max (1.6 qt) A + MasterCop (1.5 pt) BCDEF	7.0 bc	19.1 e-g	12.5 gh	169.1 fg
16	Manzate Max (1.6 qt) A + AgriLife (1 qt) BCDEF	7.0 bc	18.3 fg	12.2 h	165.0 g
17	Double Nickel (1 qt) ABCDEF + Kocide 3000-O (1.5 lb) ABCDEF	7.5 ab	20.2 b-g	12.9 f-h	177.1 e-g
18	Experimental (1% v/v) ABCDEF	7.8 ab	19.5 d-g	12.2 h	166.7 g
19	LifeGard (4.5 oz/100 gal) ABCDEF	7.8 ab	17.6 g	12.4 gh	169.7 fg
20	Non-Treated Control	8.0 a	18.7 c-g	12.3 h	166.3 g

[a] Application letters code for the following dates: A=20 Jun, B=3 Jul, C=17 Jul, D=31 Jul, E=14 Aug, F=30 Aug.

[b] Disease severity based on a 0-10 scale with the following breakdown of 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%.

[c] Column values followed by the same letter are not significantly different based on Fisher's Protected LSD (α=0.05); if no letter, then the effect is not significant.