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EFFECT OF DIFFERENT WATER VOLUMES WITH FUNGICIDES ON CERCOSPORA LEAF SPOT CONTROL OF SUGARBEET

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Cercospora leaf spot, caused by the fungus *Cercospora beticola* Sacc. is the most serious leaf disease of sugarbeet (*Beta vulgaris* L.) in the production areas of North Dakota and Minnesota. This disease may cause reductions in tonnage and sucrose, and increase impurities. Losses as high as 30 percent in recoverable sucrose are fairly common under moderate disease conditions. Fungicides applied with water at 20 gpa for ground rigs (and 5 to 7 gpa for aerial application) at a pressure of 100 to 120 psi provide effective control of Cercospora leaf spot. However, in practice, growers use different volumes of water with fungicides for Cercospora control.

OBJECTIVE:

The research objectives of these trials were to evaluate the effect of different volumes of water used with recommended fungicides at controlling Cercospora leaf spot.

PROCEDURES:

Research was conducted at Glyndon and Foxhome, Minnesota. Eminent, Headline, and TPTH, were applied at 14 d intervals with 7, 10, 15, and 20 gpa of water. There was also an untreated check. The middle four rows of 6 row plots 30 ft. long received the fungicide treatments. The middle two rows of each plot were harvested for yield and quality determinations. Quality analysis was completed at the American Crystal Sugar Company Quality Tare Laboratory, East Grand Forks, MN. The experiments were all arranged in a randomized complete block design with four replications. Cercospora leaf spot severity was rated on the KWS scale of 1 to 9. One indicates there was no disease, a rating of 3 indicates the early stages of economic loss level, and a rating of 9 indicates that the plants assessed have only new leaf growth, all earlier leaves being dead, and severe economic loss.

Both sites were affected by Cercospora leaf spot, but disease severity was moderate at Glyndon and high at Foxhome.

SUMMARY OF RESULTS:

The effects of the treatments for Cercospora leaf spot control for the Glyndon test site are shown in Table 2. Data from Foxhome will be presented in a subsequent paper. Cercospora leaf spot control was not significantly different using fungicides with 10, 15, and 20 gpa of water. However, the 20 gpa of water resulted in the lowest leaf spot rating, or the most effective leaf spot control. The 20 and 15 gpa of water treatments resulted in significantly higher recoverable sucrose per acre compared to the untreated check. This data suggests that for the most effective Cercospora leaf spot control, fungicides should be applied with 20 or 15 gpa of water when using ground rigs. The water volume should never be lower than 10 gpa with ground rigs since this may result in poor disease control which adversely affects sucrose content and lowers the recoverable sucrose per acre.

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Table 1. Cultural Practices And Application Date Information

	Glyndon	Foxhome
Planting Date	April 26	May 13
Previous Crop	Wheat	Wheat
Variety	Seedex Titan	HH Agate
Weed Control	Betamix –micro-rate	Betamix –micro-rate
Insecticide	Counter	Counter
Plant Population at Thinning	35,000 plant/A	35,000 plant/A
Spray Application		
	Glyndon	**Foxhome**
1st	August 13	July 23
2nd	August 27	August 5
3rd	September 8	August 18
4th		September 2
Harvest Date	September 23	September 17

Table 2: Effect of fungicides with different volumes of water at Cercospora leaf spot control at Glyndon

Treatments	Net T/A	Recoverable Sucrose/A	% Sucrose	% SLM	CLS rating KWS Scale
Untreated Check	**23.3 b**	**7289 b**	**17.1 ab**	**1.38 a**	**7.8 a**
20 gpa water + fungicides	**25.5 a**	**8032 a**	**17.2 ab**	**1.35 a**	**3.0 c**
15 gpa water + fungicides	**23.8 b**	**7878 a**	**17.8 a**	**1.18 a**	**3.4 c**
10 gpa water + fungicides	**24.0 b**	**7803 ab**	**17.5 ab**	**1.18 a**	**3.3 c**
7 gpa water + fungicides	**24.5 ab**	**7623 ab**	**17.0 b**	**1.30 a**	**5.0 b**
LSD (P=0.05)	**1.2**	**515**	**0.79**	**0.21**	**0.54**
CV	**3.23**	**4.32**	**2.98**	**10.79**	**7.77**