

DATE OF PLANTING EFFECTS ON THE INCIDENCE AND SEVERITY OF CERCOSPORA LEAF SPOT AND RELATIONSHIP TO CONTROL MEASURES

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In 1999, 40% of the American Crystal Sugar Company (ACSC) sugarbeet crop was planted in late May or early June. It was observed that the later planted sugarbeet developed cercospora leaf spot later in the season, and had a lower level of incidence and severity than did those sugarbeet planted in April and early May. A fungicide screening trial planted on April 26, 1999, at the Northwest Research and Outreach Center (NWROC) had an at harvest KWS cercospora leaf spot rating of 7.5. The same variety planted in an adjacent fungicide trial on May 19 had an at harvest KWS score of 2.3. The same fungicide treatment applied to the early planting resulted in an increase of 2650 lb/acre of recoverable sucrose compared to the check while no increase was recorded in the late planted trial.

Objective: The objective of this trial was to determine the incidence and severity of cercospora leaf spot at different planting dates, the efficacy of various fungicide treatments applied on similar dates and the storability of sugarbeet roots with different planting dates, cercospora levels and fungicide treatments.

Materials and Methods: Van der Have H66240 sugarbeet seed was planted on April 24, May 9 and May 23, 2000. Fungicide treatments and rates shown in [Tables 1-4](#) were applied on 7/26, 8/9, 8/22 and 9/7 on the center two rows (22" wide), of a four-row plot, 35 ft. in length with a tractor operated sprayer operating at 100 psi and delivering 20 gpa spray solution through a two-nozzle boom with 8002 flat fan nozzles. Standard cultural practices were used for fertilization and weed control. The KWS cercospora leaf spot rating was made on September 25 and the trial harvested on September 26. Roots were washed and put into storage on September 27. Quality analysis at harvest was performed at the ACSC Quality Tare Laboratory in East Grand Forks, MN.

Results and Discussion: (Note - The data in this trial represents one year of research and the fungicide treatments applied are for experimental purposes only, and do not follow resistance management strategies necessary to protect the continued effectiveness of our current registered and experimental fungicides.)

Yield, quality and cercospora level as affected by fungicide treatment at the various planting dates are shown in [Tables 1-3](#). The check plot on the April 24 planting had the highest KWS cercospora rating (5.88), while the May 23 planting had the lowest plant rating (1.63) at harvest. At the initial fungicide application on July 26, the April 24 planting had approximately three percent of the plants showing at least one visible cercospora lesion. None were present in the second and third planting. Visual cercospora lesions were observed in the check plots of the second and third plantings on August 12 and August 19 respectively. With the exception of the TPTH (triphenyltin hydroxide) all fungicide treatments significantly increased recoverable sucrose per acre over the check at the first two planting dates. No increase in yield or quality resulted from fungicide application on the May 25 planting. The level of tolerance to the TPTH fungicide and possibly with Eminent is unknown at this writing. It should be noted that while not statistically significant the back-to-back use of Eminent in this

Summary: Based on data from this study in 2000 and observations made in 1999, later planted sugarbeet develop cercospora later in the season and at a lower severity level. Calendar fungicide application or application of fungicide on all fields or contracts regardless of planting time may result in unnecessary application and a resulting increase in production costs.

Table 1. Effects of fungicide and an April 24 planting date on Cercospora leaf spot, yield and quality

Treatment	Rate (ai or product/A)	Planting Date	CLS (1-9)	Recoverable Sucrose		Yield (T/A)	Sucrose (%)	LTM (%)
				lb/A	lb/T			
BAS 500/Eminent	0.15 ai/13 oz	4/24	1.50	9321	318.5	29.30	17.20	1.28
BAS 500	0.15 ai	4/24	1.50	8733	310.0	28.19	16.80	1.30
BAS 500/TPTH	0.15 ai/ 5 oz	4/24	1.75	8714	313.5	27.78	17.03	1.35
Eminent	13 Oz	4/24	1.75	8250	304.5	27.07	16.65	1.43
TPTH	5 oz	4/24	3.00	7965	298.5	26.67	16.33	1.40
Check	—	4/24	5.88	7253	286.5	25.35	15.85	1.53
Statistical Sign. ¹			**	**	**	**	**	NS
LSD ₀₅			0.39	737	15.1	2.13	0.65	---
CV			10.02	5.84	3.28	4.98	2.58	9.75

1. **, *, + statistically significant at the 1,5 and 10 percent level respectively.

Table 2. Effects of fungicide and a May 9 planting date on Cercospora leaf spot, yield and quality

Treatment	Rate (ai or product/A)	Planting Date	CLS (1-9)	Recoverable Sucrose		Yield (T/A)	Sucrose (%)	LTM (%)
				lb/A	lb/T			
BAS 500/TPTH	0.15 ai/ 5 oz	5/9	1.25	7525	321.0	23.46	17.35	1.30
BAS 500/Eminent	0.15 ai/ 13 oz	5/9	1.00	7234	309.5	23.38	16.80	1.33
BAS 500	0.15 ai	5/9	1.00	7133	307.0	23.26	16.72	1.38
Eminent	13 oz	5/9	1.25	6868	296.0	23.32	16.20	1.40
TPTH	5 oz	5/9	1.88	6811	303.5	22.43	16.52	1.35
Check	—	5/9	3.50	6288	297.5	21.16	16.32	1.45
Statistical Sign			**	**		NS	NS	NS

Table 3. Effects of fungicide and a May 23 planting date on Cercospora leaf spot, yield and quality

Treatment	Rate (ai or product/A)	Planting Date	CLS (1-9)	Recoverable Sucrose		Yield (T/A)	Sucrose (%)	LTM (%)
				lb/A	lb/T			
BAS 500/Eminent	0.15/ 13 oz	5/23	1.00	5433	303.5	17.96	16.52	1.35
TPTH	5 oz	5/23	1.50	5412	299.0	18.08	16.25	1.30
BAS 500/TPTH	0.15 ai/ 13 oz	5/23	1.13	5331	297.0	17.92	16.20	1.35
BAS 500	0.15 ai	5/23	1.00	5308	293.5	18.12	16.08	1.40
Check	—	5/23	1.63	5295	298.5	17.75	16.30	1.38
Eminent	13 oz	5/23	1.00	5087	282.0	18.12	15.45	1.35
Statistical Sign			**	NS	NS	NS	NS	NS
LSD ₀₅			0.19	—	—	—	—	
CV			10.68	5.23	4.12	5.43	3.44	5.81

Table 4. Yield, quality and Cercospora control in response to fungicides across planting dates -2000

Treatment	Rate (ai/product)	CLS (1-9)	Recoverable Sucrose		Yield (T/A)	Sucrose (%)	LTM (%)
			lb/A	lb/T			
BAS 500/Eminent	0.15 ai / 13 oz	1.17	7329	310.5	23.53	16.84	1.32
BAS 500/TPTH	0.15 ai / 5 oz	1.38	7190	310.5	23.06	16.85	1.33
BAS 500	0.15 ai	1.17	7058	303.5	23.19	16.53	1.36
Eminent	13 oz	1.33	6735	294.2	22.78	16.16	1.39
TPTH	5 oz	2.12	6729	300.3	22.39	16.37	1.35
Check	—	3.67	6279	294.2	21.42	16.10	1.45
Statistical Sign ₀₅							
	Planting Date (D)	**	**	*	**	**	NS