SUBMITTED ABSTRACT

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Cercospora impact on tolerant to susceptible sugarbeet varieties.

Control of *Cercospora beticola* L. is an important management practice for maximizing grower profitability in many sugarbeet production areas of the US. Breeding efforts to incorporate increased levels of genetic tolerance to Cercospora into varieties has been successful but has tended to lower sugar production. Chemical companies are faced with need to justify R&D budgets as they develop compounds for lower acreage crops like sugarbeet. The objective of this study was to compare the genetic diversity available in germplasm today in an trial where Cercospora Leaf Spot is allowed to reduce yield potential compared to yields obtained utilizing a new fungicide by BASF (F500) to control Cercospora.

Two locations were planted in the Red River Valley (Moorhead and Wahpeton) and the varieties tested were HM E17 (Michigan variety), and HM Agate, Supreme, VDH 66240 and Beta 3712. Seeds were planted with a cone planter and thinned to a stand of 33,550 beets per acre (8.5 inch spacing). Six replicates were planted in a split plot design to compare untreated with F500 applied on a 14-day spray interval. Natural Cercospora infection in the untreated plots was not economic at the Moorhead site but severe infection occurred at Wahpeton. The Kjeinwanzlebener Saatziucht sale (0-9 KWS Scale) was used to evaluate the disease severity at harvest. F500 controlled nearly all Cercospora infections at both sites.

Evaluation of F500 ability to protect the genetic yield potential of various tolerant and susceptible varieties planted at Wahpeton. 2000.

VARIETY	TREATMENT	CLS RATING	REC/T	REC/A	TONS
E-17	UNTREATED	2.1	341.6	5186	15.2
E-17	F500	0.5	340.3	5645	16.6
HM AGATE	UNTREATED	3.9	333.2	5784	17.4
HM AGATE	F500	0.8	335.1	6762	20.2
HM SUPREME	UNTREATED	5.3	322.8	6433	20.0
HM SUPREME	F500	1.0	329.7	7169	21.8
BETA 3712	UNTREATED	5.6	333.4	5553	16.7
BETA 3712	F500	1.0	336.2	6753	19.9
VDH 66240	UNTREATED	5.7	333.2	6586	19.8
VDH 66240	F500	1.0	339.8	7479	22.2
ALL VARIETIES	UNTREATED		332.8	5908.4	17.8
ALL VARIETIES	F500		336.2	6761.6	20.1
TREATMENT-lsd.05			4.2	395	1.2
VARIETY- lsd.05			6.6	625	1.9
TRT*VAR.-lsd.05			NS	883	2.7

Untreated plots at Moorhead resulted in a 5% reduction in sugar per acre compared to controlled plots compared to a 14% difference which occurred at the Wahpeton site when all varieties averaged. The most tolerant variety E17, when compared to untreated vs F500 treated plots, resulted in 4.5% and 8.8% reduction in yields when cercospora was left unchecked at the

Moorhead and Wahpeton sites. The variety Beta 3712 had yields reduced by 2% and 21.6% at Moorhead and Wahpeton, respectively.

Yield potential of the most susceptible varieties Beta 3712 and Vanderhave 66240 were found to be 11% and 29% higher than the most tolerant variety E17 when compared to the Cercospora controlled situation at Moorhead and Wahpeton. The Wahpeton site with no control saw the susceptible varieties Beta 3712 and Vanderhave 66240 still outyield E17 by 6.8% and 22%, respectively.

Evaluation of F500 ability to protect the genetic yield potential of various tolerant and susceptible varieties planted at Moorhead. 2000.

VARIETY	TREATMENT	CLS RATING	REC/T	REC/A	TONS
E-17	UNTREATED	1.3	332.7	5461	16.4
E-17	F500	0.0	334.8	5710	17.1
HM AGATE	UNTREATED	2.4	339.1	5831	17.2
HM AGATE	F500	0.2	341.5	5999	17.6
HM SUPREME	UNTREATED	2.4	338.1	6435	19.0
HM SUPREME	F500	0.2	340.5	6668	19.7
BETA 3712	UNTREATED	2.7	342.2	5813	16.7
BETA 3712	F500	0.2	344.8	5926	17.1
VDH 66240	UNTREATED	2.9	342.2	6473	19.0
VDH 66240	F500	0.3	344.8	7260	21.1
ALL VARIETIES	UNTREATED		338.9	6002.6	17.7
ALL VARIETIES	F500		341.3	6312.6	18.5
TREATMENT-lsd.05			NS	296	0.9
VARIETY- lsd.05			6.6	468	1.5
TRT*VAR.-lsd.05			NS	NS	2.1