



AG NOTES

Growing Advice for Superior Results

Cercospora Control BMP's Give Superior Results

Best management practice (BMP) strategies for control of Cercospora leafspot were extremely successful in 1999. The 45,000,000 dollars in revenue loss due to Cercospora leafspot in 1998 was reduced by about 90% in 1999. Fungicide applications were also reduced about 10% in Minnesota and North Dakota in 1999 versus 1998 using proper BMP strategies.

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- Fertility
- Variety Selection
- Stand Establishment
- Weed Control
- Disease & Insect Control
- Harvest

BMP Strategies for 2000 Cercospora Control:

- Know Cercospora resistance/tolerance levels in your township/section.
- Identify the disease as early as possible.
- Monitor disease progress carefully.
 - tape-recorded messages.
 - DTN/Internet data.
 - contact your agriculturist.
- Initiate fungicide application when disease is first identified in your area.
 - use correct rates of fungicides.
 - rotate use of fungicides to prevent resistance/tolerance increases.
 - properly apply fungicide with enough water per acre.
 - maintain effective application intervals between applications.
 - protect the crop into September.
- More Cercospora management information is available in the 1999 Sugarbeet Research and Extension Reports pgs. 257-265.

The Sugarbeet Research and Education Board of Minnesota and North Dakota again funded a survey of fields to determine resistance/tolerance levels. Agriculturists in Minnesota and North Dakota collected over 1,500 Cercospora leafspot samples from shareholder fields in 1999 for this survey. Dr. John Wieland, USDA Plant Pathologist in Fargo, tested over 12,000 individual leafspots from these samples for resistance/tolerance to Cercospora. The township maps in Figures 1-4 summarize these 1999 results. Excellent color maps are on the Internet site.

Tolerance means normal past use rates of a fungicide presently have **reduced** effectiveness for Cercospora control. **Resistance** means normal or higher fungicide use rates now give **no** Cercospora control. The table below defines the resistance and tolerance categories and relates them to the shaded townships in Figures 1-4.

Resistance/Tolerance Category	Percent of Leafspots in Category
None	0
Low	1-25
Moderate	26-50
High	51-75
Very High	76-100



American Crystal Sugar Company

Working Together for Superior Results

Knowledge of local levels of tolerance or resistance to fungicides are key to successful Cercospora control in 2000.

These 4 maps provide that information. Your agriculturist has similar information by **individual section** to further help you better manage Cercospora in 2000. Visit with your agriculturist to review this information and plan a Cercospora management strategy for 2000.

Tolerance to tin fungicides is very high in the southern and mid Red River Valley and generally moderately high in the northern Red River Valley Figure 1.

In Figure 3 the change in level of tolerance to 1.0 ppm TPTH from 1998 to 1999 is shown by township. Tolerance to tin fungicides **increased in over 71%** of the townships sampled, decreased in 24% and remained the same in 4%. The reduction in TPTH tolerance was greatest in the Moorhead factory district where Eminent use was higher and tin use decreased in 1999.

Resistance to Benzimidazole (Topsin and Benlate) fungicides was low in only 4% of the townships sampled, Figure 2. Continued use of Topsin M and Benlate in many areas of the Red River Valley causes this problem. Contrast the high resistance in the Red River Valley to only low to moderate resistance in southern Minnesota where these products have not been used for over 10 years. Figure 4 shows the comparison of levels of resistance in 1998 with that of 1999 for Topsin M. Resistance **increased in 87%** of the townships in 1999 in the American Crystal Sugar Co. growing area. Continued use of Topsin or Benlate fungicides by growers over much of the American Crystal Sugar Co. area caused this increase from 1998 to 1999. This change highlights the need to rotate products used for leafspot control in sugarbeets. **Topsin/Benlate should only be used in tank mixes and never more than once per season by any shareholder.**

1999 Grower Practice Results

The American Crystal agriculturists carefully compiled records of Cercospora management strategies on over 2,300 shareholder fields in 1999. These data indicate that proper Cercospora control dramatically increases sugarbeet crop revenue per acre.

Table 1. Return per acre from fungicide application to over 2300 American Crystal sugarbeet fields in 1999.

# of Fungicide Applications	MHD	HLB	CRK	EGF	DTN	RRV
	-----Dollars/Acre-----					
1	580	534	633	635	564	608
2	633	602	653	603	751	667
3	733	687	771	734	756	737
4	787	785	845	770	798	810

The data in Table 1 clearly shows the value of timely application of fungicides to American Crystal Sugar Co. shareholders in 1999 when Cercospora was present.

Conclusions from this data show:

- That 3 or 4 applications of fungicide were required to maximize return per acre.
- Each additional fungicide application increased revenue per acre.

2000 Cercospora Management Recommendations:

- South of Highway 2 use Eminent first followed by TPTH then continue to alternate these products.
- North of Highway 2 use TPTH first followed by Eminent then continue to alternate these products.
- North of Highway 2 use Topsin/Mancozeb tank mixes only in sections or townships with moderate or low resistance levels.
- Never use Topsin or Benlate alone, always tank mix with a Mancozeb product.
- Never use Topsin or Benlate more than once per year.

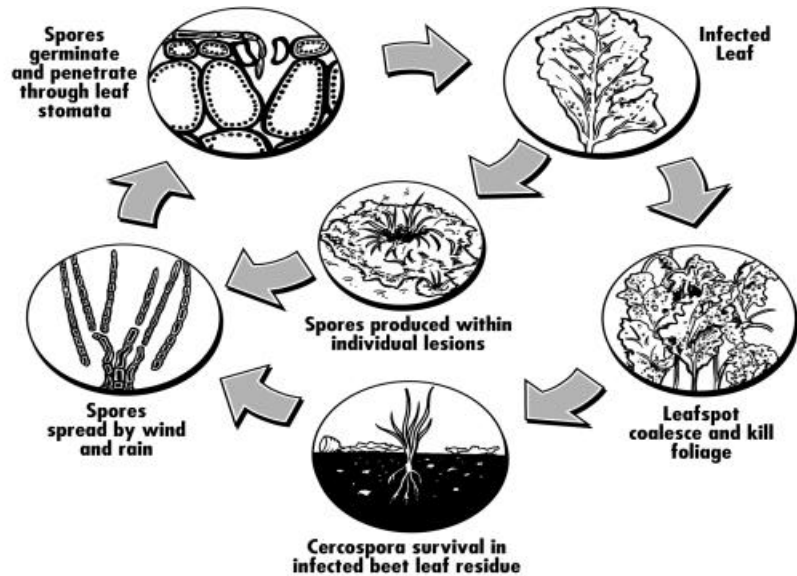
- Consult with your agriculturist or university specialist for best management recommendations in 2000.
- Use tolerance/resistance maps to refine choice of products north or south of Hwy 2.

Expect Cercospora Early in 2000.

Cercospora infection of sugarbeet leaves produces circular spots about 1/8 inch in diameter with ash gray centers and dark brown to reddish purple brown borders.

The most common source of the fungus is infected beet debris in the field or adjacent fields of 1998 or 1999. The spores are spread by wind, water and insects. The disease develops most rapidly at temperatures of 68-79°F and relative humidities of 90-100%. Night temperatures above 60°F favor disease development. **Early planting in 2000 and early row closure increase chances of early onset of leaf spot in 2000.**

**Figure 5:
Disease
cycle of
Cercospora
leaf spot of
sugarbeet**



Ag Notes by E-mail

If you would like to receive the Ag Notes via e-mail contact Mike Beltz at 218-236-4379 or mbeltz@crystalsugar.com and give him your e-mail address.

DTN Closure

Please note at the end of our contract on December 31, 2000, we will no longer be publishing American Crystal pages on DTN. We will instead utilize www.crystalsugar.com for our electronic shareholder communications.

New crystalsugar.com features:

Blue Book Reports on crystalsugar.com:

These reports are summaries of the Grower Practice System (GPS) information agriculturists collect from shareholders each year. The data analysis is compiled by agriculturist area, by factory district and over the entire RRV. Twenty-seven different reports are available. They are:

- seed variety performance
- planting date versus yield and quality
- seed spacing versus yield and quality
- crop rotation versus yield and quality
- 0-2' soil test N levels versus yield and quality
- 0-4' soil test N levels versus yield and quality
- P soil test level versus yield and quality
- K soil test level versus yield and quality
- nitrate grade versus yield and quality

Pest Alert:

The pest alert section contains root maggot survey results and will show the daily relative humidity, temperature, and daily infection value data for Cercospora leafspot.