

CERCOSPORA LEAF SPOT FORUM

The forum was introduced by Mark Bredehoeft. The forum discussion was initiated with reports of 1998 cercospora leaf spot infestation in various growing areas across the United States. Reports were given by Mark Bredehoeft for southern Minnesota, Allan Cattanach for North Dakota and northern Minnesota, Paul Pfenninger for Michigan, Russ Fullmer for Montana and Wyoming and John Gallian for Idaho. John Weiland from the USDA-ARS gave a report on studies done in relationship to tolerance to Triphenyl Tin Hydroxide and EBDC and resistance to Benzamidozols.

Mark Bredehoeft for southern Minnesota stated that there have been various changes in techniques and management of cercospora leaf spot following the onset of tolerance to Triphenyl Tin Hydroxide in 1994. Some of the changes that took place involving application techniques of the fungicide included maintaining an adequate volume of 20 gallon/acre, spray pressures of 100 psi or greater, and more disciplined spray intervals. Initiation of application of fungicides for cercospora leaf spot was changed from first identification of the fungus to a timing or row closure management technique. Row closure, as well as disease index values (DIV), are used to determine when the first application should take place. Seed companies have reacted promptly with tolerant genetics without losses in tonnage or quality. In the 1998 growing season growers in southern Minnesota initiated fungicide spraying approximately July 1 or row closure and maintained a ten day spray interval with Triphenyl Tin Hydroxide and seven day spray interval with EBDC's. Cercospora leaf spot control was adequate until approximately August 1 but declined significantly thereafter. This loss of control of cercospora leaf spot resulted in a significant loss in sucrose and tons/acre.

Paul Pfenninger for Michigan reported that Michigan typically has precipitation during the growing season of approximately 25 inches to 40 inches annually and thus, are typically on the wet side of the realm. Growers in Michigan practice a three to five year rotation. In the late 1970's cercospora leaf spot was not prominent in sugarbeets grown in Michigan. Within three years (early 1980's), Michigan growers were spraying 60% of their acreage. Due to the increased spraying, a change in the variety approval system was adopted towards greater variety tolerance to cercospora leaf spot. Within three to four years after the variety approval system changed, a significant drop in spraying for cercospora leaf spot was observed. During the years of 1985 to 1995 less than 1% of acres in Michigan were sprayed for cercospora leaf spot. Due to the initiation of sugarbeet root aphid in the mid 1990's, varieties were changed towards greater tolerance to sugarbeet root aphid. These varieties are less tolerant to cercospora leaf spot than previously used varieties. Therefore, there was an increase in fungicide spraying for cercospora leaf spot once again. In 1998 55% of acreage in Michigan was sprayed for cercospora leaf spot one time, and 13% was sprayed for a second time. Over time sugar content of varieties has increased but tons/acre has declined. However, the reason for the drop in tons per acre was inconclusive and the question is whether it is variety or environment related. The general practice of fungicide spray is benomyl or benalate for control of cercospora leaf spot. Resistance testing in 1998 that took place in Michigan showed 50% of samples collected were tolerant to Benomyl.

Allan Cattanach for northern Minnesota and North Dakota stated how changes in production practices have created a more conducive environment for cercospora leaf spot. However, recently the lack of labeled fungicide efficacy is probably the greatest factor for increase in cercospora leaf spot. Grower management of the disease is very important. The products available to the grower as of 1998 do not allow for mismanagement of the disease. Even with a relatively dry August in 1998, the onset of cercospora leaf spot was evident. The infection of cercospora leaf spot requires warm temperatures and free water caused by heavy dew and the lack of precipitation did not reduce the potential of cercospora leaf spot infection. Past research has shown that less tolerant varieties have performed better than varieties with greater tolerance to cercospora leaf spot. Allan Cattanach stated that in 1998 was the first time that research comparing various variety tolerances to cercospora leaf spot showed an advantage in performance with the more tolerant varieties (Michigan type). The use of a Michigan type variety would have eliminated possibly one application of fungicides. Losses in the Southern Minnesota Beet Sugar Cooperative, Minn-Dak Farmers Cooperative and American Crystal Cooperative growing area were conservatively estimated at 75 million dollars. Applications of fungicides ranged from eight to two from the southern Minnesota growing area to the northern Minnesota/North Dakota growing area. Typically one to two more applications were needed.

Russ Fullmer from Montana/Wyoming area stated that Wyoming was able to control cercospora leaf spot in 1998 relatively well due to the correct management of the disease in that area. Sugarbeet production in Montana has not been so lucky. Varieties grown in the area in early to mid 1990 lacked tolerance to cercospora leaf spot and contributed to a build up in inoculum. Thus, since the use of these varieties cercospora leaf spot control has taken an increasing effort. Short rotations of two years has added to the increased cercospora leaf spot pressure. Climatic conditions have changed over time to conditions that are more favorable for cercospora leaf spot infection. In 1998 applications of fungicides started at the proper time before infection occurred. Application techniques, especially by aerial applicators, were inadequate. Intervals between applications were longer than could be managed with current products. Varieties with greater tolerance to cercospora leaf spot have been implemented in the seed policy. Quality of sugarbeets has been detrimentally effected by cercospora leaf spot.

John Galian from Idaho reported that cercospora leaf spot is a minor problem in that region. Dry climate and low relative humidity probably contributes to the lack of this disease. In 1997 this region had one of the most infectious periods observed in this region due to wetter conditions than normal. Application of fungicides for sugarbeets are usually in direct competition with spraying on potatoes. Recommendations for cercospora leaf spot control is that if .5% of the leaf has cercospora leaf spot or approximately 12 spots per leaf and if conditions conducive for cercospora leaf are suspected to continue, then growers are recommended to spray. Some cercospora leaf spot is found in 65 to 70 percent of the fields and yet the disease does not progress to an economic loss stage.

John Weiland from USDA-ARS in Fargo, ND indicated the history of USDA's involvement in cercospora leaf spot research. USDA's emphasis has been on the long range high risk type research. Research has indicated that gene transfer could be used in the development of variety tolerance to cercospora leaf spot. The use of molecular marker research can be used to screen fungicides more rapidly.

Art Quinn commented on cercospora leaf spot nursery techniques used by Beta Seed. The KWS scale of 1-9 is used in which numbers or ratings are assigned essentially at the end of July with inoculation occurring in the second week of July. Ratings are taken two times a week into the first part of September. Susceptible varieties tend to increase more rapid in their KWS rating compared to more resistant varieties. The least sensitive varieties are typically at a 3.5 and more sensitive varieties are typically at a 5.5 on the KWS scale. In comparing Minnesota/North Dakota varieties (more susceptible) to Michigan type varieties (more resistant), it was noted that the varieties grown in Michigan are much more resistant than Minnesota/North Dakota on the average. However, the most commonly used varieties used in southern Minnesota would approach the resistance level found in Michigan type varieties. Greater variety resistant is being developed throughout the United States.

Paul Pfenninger referred the theory of which is the best scenario, the loss of possibly 2 tons per acre of sugarbeets or applications that equal the dollar amounts of 2 tons per acre. Larry Smith indicated that in his opinion the varieties with less tolerance would need to be sprayed just as much and could yield significantly more than 2 tons/acre less. The problem with variety selection is that cercospora leaf spot is not the only desired trait in a sugarbeet variety. Currently there are varieties with very good tolerance to cercospora leaf spot and have excellent quality and tons/acre available and the grower needs to recognize these varieties. Russ Fullmer commented in reference to loss not considered on the agronomic economics in relation to storage and processing losses. The processing losses experienced, as well as all the agronomic impacts, is why there is a need to be well aware how to manage this disease. One needs to strongly consider what areas of the industry are enduring currently and as new products are introduced for cercospora leaf spot control resistance/tolerance management needs to be an emphasis. The production areas that do not have a significant problem with cercospora leaf spot at this time need to be aware of the cercospora leaf spot problems in other areas.