

Fungicides Protect High-Yielding Sugarbeets from Disease

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Sugar produced from sugarbeets totals approximately eight billion pounds annually in the U.S. More than half of the sugar produced in the U.S. comes from sugarbeets. The crop produces large storage roots that are harvested for sugar extraction. Sugarbeets are known for their abundant foliage; sugar content is proportional to the size and development of leaf surface.



Sugarbeets

The fungus causing *Cercospora* leaf spot of sugarbeets overwinters on infected beet residue in the soil. During humid weather, spores are formed and are spread by wind, water and insects. An individual spot on a beet leaf results from the invasion of a germ tube from a spore and the subsequent fungal growth in the tissues of the plant. The fungus produces a toxin called cercosporin, which produces molecules that attack the fatty acids that make up plant membranes. Eventually, the membranes rupture and the plant cells die. As the disease progresses, numerous individual spots coalesce to form large areas of dead tissue. Severely infected leaves wither and die. The entire plant can be defoliated. Under conditions of severe leaf spot attack, every green leaf may dry up, causing the field to appear as if it had been scorched [1].



Spraying sugarbeets

Cercospora leaf spot was not economically important to the sugarbeet crop produced in the Red River Valley and southern Minnesota before 1980. In the late 1970s growers began switching the varieties they planted from cultivars that were highly resistant to *Cercospora* to ones that were highly susceptible but had higher yield potentials [2]. Favorable weather conditions in 1980 resulted in an epidemic of *Cercospora* affecting 80% of the crop with loss estimated at 4,000 to 6,000 lbs/acre [2]. Starting with the 1981 crop, sugar cooperatives instituted an aggressive calendar spray schedule policy to control *Cercospora* [3]. Most currently approved sugarbeet varieties in North Dakota and Minnesota are considered moderately resistant to moderately susceptible to *Cercospora*, but yield well. Varieties that are more resistant have lower sugar yield [4].



Cercospora leaf spot on sugarbeet leaf

Cercospora leaf spot control relies on the use of fungicides. Recent research demonstrated that fungicide treatments increased the amount of extractable sucrose by 30% in comparison to plots untreated for *Cercospora* [3]. *Cercospora* now infects about half of all U.S. sugarbeet acreage [5].

References

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