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Simulated canopy loss due to *Cercospora* leaf spot.

Cercospora beticola, causal agent of Cercospora leaf spot (CLS), can have destructive effects on the sugar beet canopy if left uncontrolled. Some studies have investigated the effects of partial or full defoliation as a single event caused by hail or insect damage, but we are not aware of studies looking at multiple canopy losses such as what CLS can cause throughout the growing season. In 2024, a study was conducted comparing 5 single-date to 4 multi-date defoliations. Defoliations were conducted beginning the week of July 8 and continued every two weeks. Plots were mechanically defoliated using a hedge trimmer without injuring the crown tissue. Canopy coverage, internal beet root and ambient temperature (delta T), and yield data were collected at the end of the growing season. Earlier defoliations (7/8, 7/22) showed the greatest difference for delta T. Plots defoliated multiple times on 7/8 followed by (fb.) 8/5 and 8/22 fb. 8/19 showed a similar trend. Strong correlations between percent canopy coverage and delta T were observed with late season defoliations (8/19, 9/2, 8/5 fb. 9/2, 7/8 fb. 8/5 fb. 9/2) resulting in smaller canopy coverage and reduced delta T. Increased internal root temperature due to defoliation can potentially hamper harvest operations based on existing heat policies. All treatments had significantly lower sucrose content (% sucrose) when compared to the untreated control. Percent sucrose was less affected by single defoliations with earlier events resulting in higher % sucrose than later defoliations. The opposite was observed for yield with earlier defoliations showing numerically lower yields than later defoliations. However, multiple defoliations nearly always resulted in the lowest % sucrose and yield of all treatments. This study demonstrates the importance of a healthy sugar canopy throughout the growing season and the need for effective control measures for CLS.