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Management of *Cercospora beticola*, the cause of Cercospora leaf spot of sugarbeet, is a major effort in many sugarbeet production regions. As part of the management effort, disease decision support systems (DSS) are used to predict timing of periods for spread and infection by *C. beticola*. Most of the DSS in use incorporate factors such as temperature and humidity as well as other environmental parameters and have assisted in determining risk of disease development. Anecdotal reports have indicated that minimal development of CLS has been observed after periods of high temperature (95 – 100°F/35-38°C) occur, although most of the models predict moderate to high risk. Previous studies have shown that extended exposure to temperatures above the optimum for disease development (80 - 90°F/27-32°C) can inhibit *C. beticola* and reduce disease severity. However, in the Michigan growing region temperatures above the optimum are rarely present for eight hours or longer (the shortest time periods previously tested). This work was to examine the effect of short term exposure to elevated temperatures on *C. beticola* to obtain information that may improve disease forecasting and management.

Growth of isolates was compared on media maintained at temperatures around the optimum for growth (~28°C) to those exposed to elevated temperatures (34°C, 36°C, 38°C, or 40°C) for durations between 2 and 8 hours followed by incubation at optimal temperatures. Pure cultures of the different isolates on V8 vegetable juice media were placed at the various temperatures or maintained at a constant 28°C. Plates were randomly returned to 28°C from the elevated temperatures following different times (2, 4, or 8 hr). Growth was measured at 24 hours after initial differential temperature exposure. In initial tests, growth was measured again 36 and 48 hours after differential temperature exposure, but all isolates had returned to growth rates not significantly different from the control by 36-48 hours, so the majority of measurements were done at 24 hr.

Isolates showed some variability in tolerance to elevated temperatures, but for all isolates tested there was a significant effect of temperature, time of exposure, and of the interaction ($p=0.001$) between duration of elevated temperature exposure and the temperature used. Consistent with what had been reported by Pool and McKay (1916), no growth was visible for any isolates exposed to 40°C for 8 hours when examined at 24 hours after exposure (so 8hr at 40°C followed by 16 hr at 28°C). The fungus was not killed as growth was visible shortly thereafter and was at the same rate as controls by 48 hrs after initial exposure to the elevated temperature. When fungal growth was measured at 1 day after initial exposure to elevated temperatures, growth was significantly less in isolates exposed to 36°C (97°F) for 2 hours or longer than in those kept at 28°C (82°F). Growth was inhibited at even lower temperatures following 8 hr exposures. Similar results were observed for sporulation, with little or no sporulation detected on *Cercospora* leaf spot lesions exposed to 40°C for 8 hours followed by optimal temperatures for 16 hours, even at 100% relative humidity.

Results indicate that exposure to temperatures above the optimum and the duration of that exposure should be considered when predicting risk of *Cercospora* leaf spot.