Using Covers To Reduce Winter Injury On Ultradwarf Bermudagrass

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As ultradwarf bermudagrasses are used further north in the transition zone, there is an increased risk of winter injury from low-temperature exposure and crown desiccation. The benefits of utilizing covers for winter protection are well documented, but there is a significant labor cost associated with covering and uncovering greens to accommodate play during favorable weather. The standard recommendation is to cover ultradwarf bermudagrass greens when the temperature is forecast to be 25 degrees Fahrenheit or lower. However, it may be possible to lower the temperature threshold, resulting in fewer covering events, reduced labor costs and more days open for play.

Research currently being conducted at the University of Arkansas is examining predicted low-temperature thresholds for determining when to cover ultradwarf greens. The ultimate goal is to provide superintendents with firm numbers that will help them use covers in the most efficient manner.

A multiyear trial is underway on a green built to USGA specifications with replicated plots of Champion, Mini-Verde and Tifeagle ultradwarf bermudagrass. The covers, designed specifically for this study, are composed of permeable, black, woven polypropylene. Covers are deployed based on predicted low temperatures for Fayetteville, Arkansas from the National Oceanic and Atmospheric Administration. The predicted low-temperature thresholds include 25, 22, 18 and 15 degrees Fahrenheit and an uncovered control. The study was designed to mimic a golf course that would remove covers to allow play on warmer winter days, so covers remain in place until the temperature for the

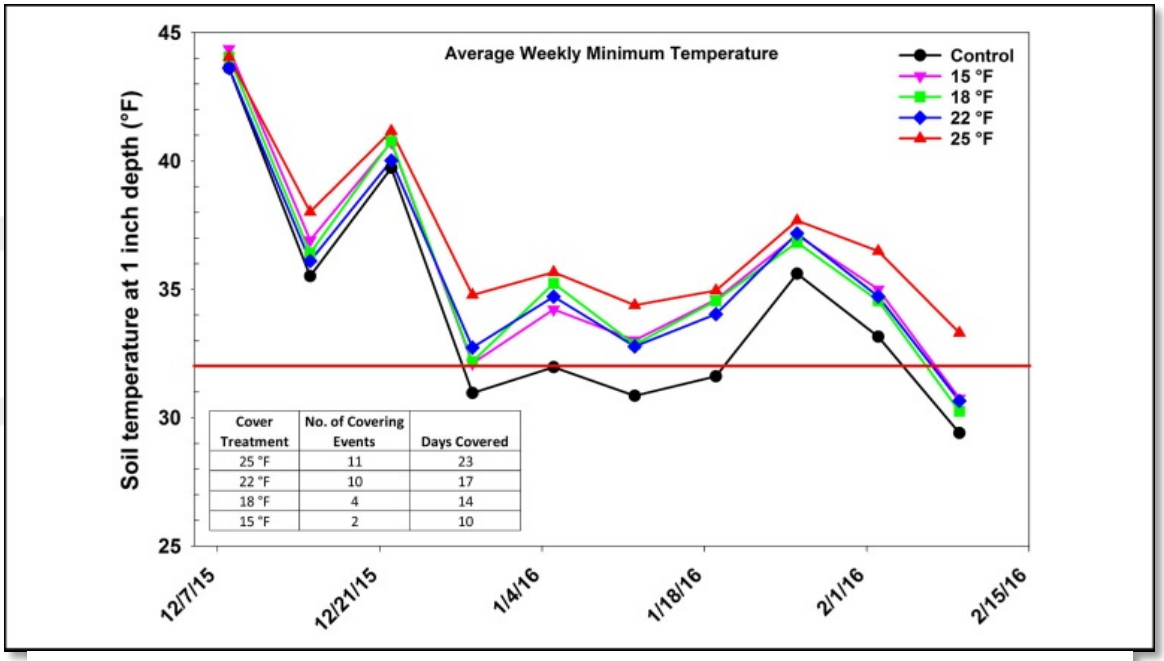

Figure 1. Average weekly minimum soil temperature at a depth of 1 inch for each cover treatment. The embedded table summarizes the number of covering events for each treatment and the total number of days plots were covered.

following day is predicted to exceed 45 degrees Fahrenheit. Temperature probes have been installed in each test plot to continuously monitor soil temperature at a depth of 1.0 inch. Soil volumetric water content in each test plot is recorded monthly using a Spectrum TDR 300 with 1.5-inch probes. During the green-up period, winter injury is assessed on all plots using digital image analysis and visual ratings of percent turfgrass coverage. Spring green-up and quality is monitored biweekly until all plots are fully green and recovered.

The project was initiated in fall 2015, so there are no winter survival data to report at this time. However, some interesting trends from soil temperature data have been observed (Figure 1). The soil temperature for the uncovered controls dropped below the freezing mark for a number of days during the winter while using the 25 F threshold resulted in the warmest soil temperature throughout winter. However, it is noteworthy that the other cover thresholds also sustained soil temperatures above freezing for most of winter while reducing the number of coverings and the number of days that greens were covered. Also, there have been interesting observations of surface thermal conditions using an infrared camera, with as much as a 6-degree difference between covered and uncovered plots (Figure 2).

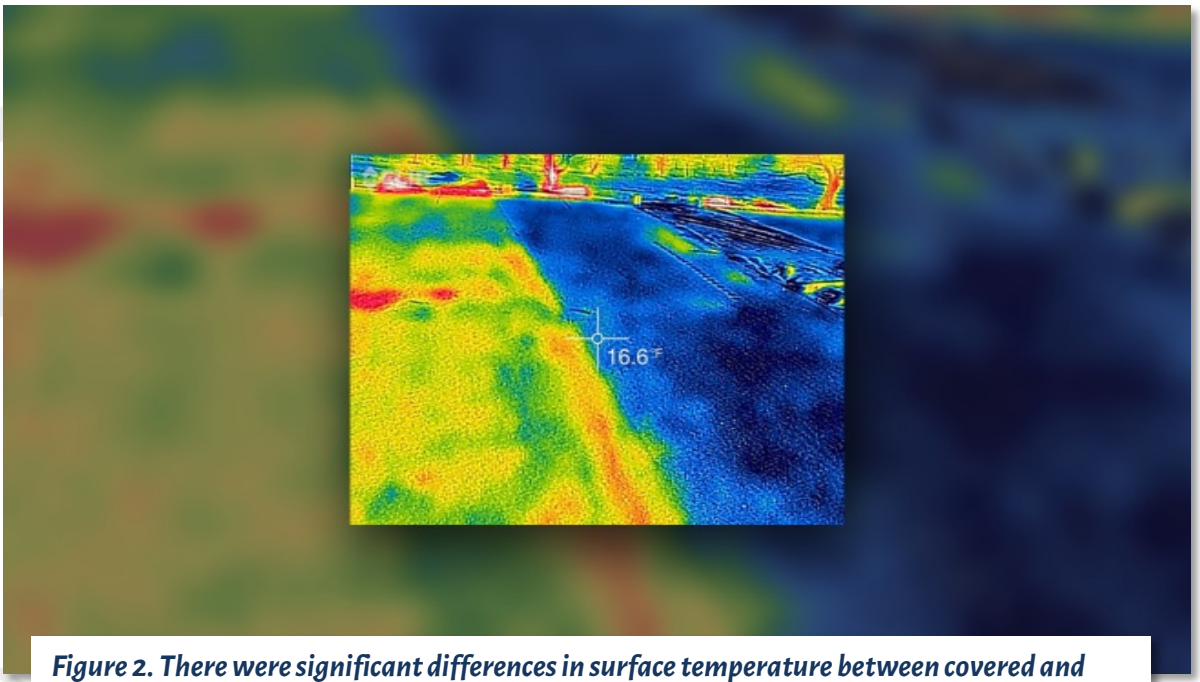

Figure 2. There were significant differences in surface temperature between covered and uncovered plots. This thermal image shows a covered plot on the left and an uncovered control plot on the right.