



Super Science

// SURVIVING WINTER

CREEPING BENTGRASS VS. ANNUAL BLUEGRASS DURING COLD DEACCLIMATION

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Turfgrass deacclimation during winter and early spring can negatively impact freezing tolerance, leading to winter injury. Superintendents managing mixed stands of annual bluegrass (*Poa annua*) and creeping bentgrass (*Agrostis stolonifera*), have often observed differences in winter injury susceptibility of these two species. This may be attributed to differences in their ability to resist deacclimation in response to winter warming. To improve winter survival of annual bluegrass in northern climates, a better understanding of the physiological factors that contribute to freezing tolerance and deacclimation sensitivity is needed.

The objectives of this study were to compare the freezing tolerance of annual bluegrass and creeping bentgrass during cold acclimation and deacclimation and to examine changes in carbon metabolism during deacclimation. Plants were



Differences in winter survival of annual bluegrass and creeping bentgrass following a mid-winter warming event.

removed from the field and progressively exposed to the following treatments in a growth chamber: non-acclimated control at 68 °F; cold acclimation at 36 °F; cold acclimation at 28 °F; and deacclimation at 46 °F. Changes in freezing tolerance were determined based on lethal temperature resulting in 50 percent kill (LT₅₀). In addition, carbon metabolic activities were monitored based on canopy photosynthesis and respiration rates, along with chlorophyll fluorescence parameters.

Overall, creeping bentgrass exhibited higher freezing tolerance following cold acclimation and maintained higher freezing tolerance during deacclimation compared to annual bluegrass. Photosynthesis, respiration and photochemical yield of annual bluegrass increased more rapidly during deacclimation. This suggests that metabolic and physiological activities of annual bluegrass were activated earlier in response to warmer temperatures. Although rapid up-regulation of carbon metabolism may provide annual bluegrass with a competitive advantage during spring recovery, these responses may also lead to greater susceptibility to freezing injury in response to mid-winter warming. Research is currently underway to understand additional factors that may be responsible for differences in deacclimation sensitivity between annual bluegrass and creeping bentgrass.

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NEWS UPDATES

GCSAA TO BRING BACK DIRECTOR OF RESEARCH POSITION

In early April GCSAA posted on their website the open position of “Director of Research” — a position they eliminated in 2010.

“GCSAA is seeking a dynamic and innovative director of research to serve as the technical and scientific expert to support various internal programs and perform external outreach activities,” the position description states. “Key duties include conducting and directing GCSAA research projects, writing and evaluating research proposals and overseeing applied agronomic research projects on golf courses.”

The position will be located at GCSAA headquarters in Lawrence, Kan. A Ph.D. in Agronomy, Turfgrass Science or related field and extensive experience (7 to 10 years) in research and program development is required. Those interested have until May 2nd to apply.

The last person to hold the position of GCSAA’s director of research was Clark Throssell, Ph.D. He is now the research editor for *Golfdom*.



“IN MANY CASES, FUNGICIDE CLASSES SUCH AS THE BENZIMIDAZOLES, DICARBOXIMIDES AND DMIS MAY BE USELESS OR HAVE EXTREMELY SHORT RESIDUALS.”

Jim Kerns, Ph.D.

(see full story on page 34)