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Super Science

// TURF'S SHADY SIDE

BERMUDAGRASS: LIGHT INTEGRALS FOR GREEN ESTABLISHMENT

Benton Hedges, Ph.D.

In the transition zone, many superintendents are considering a putting green cultivar conversion. Whether the conversion is from creeping bentgrass to bermudagrass, upgrading from an older bermudagrass cultivar, or early adopters of the ultradwarf bermudagrasses, they are looking to renovate. A major constraint will be the successful establishment under reduced light environments due to the poor shade tolerance of bermudagrass. Currently, no research studies exist determining the light requirement for bermudagrass putting green establishment. Therefore, the objective of this research is to quantify a daily light integral requirement for successful bermudagrass putting green establishment.

A daily light integral is the amount of photosynthetic light a plant receives each day, measured in moles of light per day (mol/d). A field trial was initiated in June 2013 in Starkville, Miss. Four bermudagrass cultivars (Champion, TifEagle, MiniVerde and MS-285) were established under full-sunlight, 30 percent, 55 percent and 80 percent shade using a neutral density, polyfiber black shade cloth. Using data loggers and quantum light meters, daily light integrals were calculated for each shade level. Full-sunlight plots received 40.7 mol/d, while 30 percent, 55 percent and 80 percent shade received 31.3, 19.7 and 10.2 mol/d, respectively.

Shade tents on the research green at the Foil Plant Science Research Center in Starkville, Miss.

PHOTO BY: BENTON HODGES

At the conclusion of the study, using statistical regression analysis, the amount of daily light required to reach 70 percent cover was determined. MiniVerde required the least amount of light with 26.9 mol/d, followed by Champion with 29.9 mol/d. Meanwhile, TifEagle and MS-285 required 30.1 and 31.3 mol/d, respectively. When comparing full-sunlight and 30 percent shade to 55 percent shade, a 25 percent reduction in chlorophyll, a 45 percent reduction in clipping yield, a 28 percent reduction in color, and a 90 percent reduction in percent cover was noted.

The results noted above only represent 2013. This research will be repeated in summer 2014.

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NEWS UPDATES

KREUSER TO JOIN UNIVERSITY OF NEBRASKA FACULTY

Bill Kreuser is set to join the faculty as an assistant professor at the University of Nebraska-Lincoln this January. He will follow in the footsteps of Dr. Roch Gaussoin and serve as the Turfgrass Extension Specialist with a focus on soil and water management and plant physiology.

Kreuser graduated with a B.S. in 2009 and M.S. in 2010 from the University of Wisconsin-Madison where he studied Soil Science. During his M.S., Kreuser developed a GDD model for plant growth regulators and evaluated fertility requirements of creeping bentgrass putting greens.

He is set to earn his Ph.D. from Cornell University in December where he evaluated the effect Civitas and plant colorants have on turfgrass growth and physiology. Kreuser plans to use his research background in soil management and plant physiology to understand how nutrient cycling, water use and cultural practices affect turfgrass growth and stress tolerance. Additionally, Kreuser and his graduate student, Glen Obear, look to understand why iron oxide layers can form in sand putting greens and investigate methods to manage iron layer formation.

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James A. Murphy, Ph.D.

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