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EDITOR'S NOTE

This issue of TurFax has been delayed as I have been involved in two trips to the hospital in the past month for approximately a one-week stay each. In the process I have learned that I have diabetes and must follow a strict diet, and the second trip involved a pacemaker replaced with a dual pacemaker/defibrillator. I am under restricted activities for approximately 8 to 10 weeks until the chest area has fully healed, and then can resume normal activities again. In this Holiday Season, it was thought appropriate to include a unique and longer article on the early history of the turfgrass industry and how it evolved during the Art and Invention Era. Hopefully you will find it of interest. It is important that we understand the origins and evolution of the profession to which we devote our life's work.

James B Beard

Ask Dr. Beard

Q. *At what temperature could Tifway bermudagrass be injured during the winter period? The location is in the transition zone.*

A. Anyone who gives you an answer to this question in terms of a specific temperature does not understand the causes and injury mechanisms of direct low-temperature kill. First, please note that **it is the soil temperature that is the most critical influence on lethal tissue temperatures, and not the air temperature.** Injury to a turf may only occur at very low air temperatures if the soil temperature is relatively high, whereas a turf can be damaged at higher relative air temperatures if the soil temperature has been below freezing for several weeks.

In addition there are numerous physiological and environmental factors that influence the specific lethal low-temperature. **Foremost is the degree of hydration of the meristematic tissues on lateral stems and crowns of turfgrasses.** The more hardy turfgrass species have the capability of lowering the hydration level during the late autumn hardening period in the order of 15 to 25% from a growing season norm of 85% tissue water content. If hardening temperatures in the range of 35 to 45°F (2–7°C) have persisted for 3 to 4 weeks, the turf should be fully hardened and possess the maximum survival capability. In contrast, **cold-hardened turfs that have been exposed to standing water for a period of time during the course of a winter thaw will exhibit a drastic increase in proneness to low-temperature kill** because of an elevated water content in the meristematic tissues.

In addition, the specific lethal low-temperature is controlled by the (a) rate of freezing, (b) rate of thawing, (c) number of times that freezing–thawing cycles occur, and (d) duration of the freezing exposure. Also, **turfgrasses growing in shaded environments are much more prone to low-temperature kill than those growing in full sun.** A typical example is St. Augustinegrass (*Stenotaphrum secundatum*). Cultural factors that can influence the lethal low-temperature include (a) the nitrogen fertility level, with modest to low nutritional levels best, (b) the height of cut, with a somewhat higher cut than the norm preferred, and (c) the potassium level, with higher levels preferred. **With this multiplicity of environmental and cultural factors influencing the potential for low-temperature kill, it is not possible to predict the lethal killing temperature unless all of these criteria are fully described for each specific site in question.**

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