The Occurrence and Management of Localized Dry Spots

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Localized dry spots are common on high-sand content greens or older style mineral soil (i.e., push-up) greens that have been aggressively topdressed for several years with a mix containing more than 80% sand by volume. They normally develop in new golf course greens within 6 months to 3 years of seeding. While they tend to decline in number and severity over time, some dry spots can be a persistent problem for indefinite periods. These dry spots develop with the advent of high temperatures and dry periods from late spring to autumn. They often disappear during extended overcast and rainy periods. Localized dry spots appear as solid patches of wilted or dried-out turf. Their appearance is sometimes preceded by fairy ring development or simply by the presence of numerous mushrooms. Patches can be circular and range from a few inches (6 to 8 cm) to several feet (0.5 to 1.0 m) in diameter, or they may appear as large serpentine or irregularly-shaped areas of wilted or dead turf. Soil within the patches remains bone dry despite frequent irrigation. Water will penetrate the thatch, but not the thatch-soil interface, and will usually run-off dry spot areas. Plants within affected areas develop a blue or purplish color that is indicative of wilt, and eventually they die as a result of drought stress.

The cause of localized dry spots has been attributed to the decomposition activities of unidentified basidiomycetous (mushroom) fungi in the same group that cause fairy rings and other microorganisms in soil. These microorganisms cannot be isolated from samples obtained from the hydrophobic (water repellent) soil. It is believed that water repellency is caused by the breakdown of older fungal mycelium and other organic matter, which releases substances that provide a coating of organic material around individual sand particles. This organic coating, however, also may result from the breakdown of plant tissues such as roots, shoots, and stems or organic soil amendments such as peat moss or composts. Individually coated sand particles pack together, thus rendering the soil impervious to water infiltration. The water repellent, i.e., hydrophobic condition is normally restricted to the upper few inches (3 to 6 cm) of soil. Removal of thatch alone will not significantly improve water infiltration.

Management. Verti-draining, core aerification, quadratine aeration, water injection aeration, or hand pitch-forking in combination with frequent applications of a wetting agent will help to alleviate this condition. Water injection aeration is least destructive and quite effective, however, it does not cure the condition. Keeping turf alive in localized dry spots may require numerous daily syringes and treatments of wetting agents and/or water injection aeration during dry summer periods. Where localized dry spot is chronic, the application of wetting agents should begin several weeks in advance of the time they normally appear. Pretreatment with wetting agents in conjunction with some form of aeration is the preferred preventive control strategy for this problem. Isolated spots can be individually treated by frequent probing with a water-fork or a tree deep-root feeder that injects water. Fungicides have no known impact on the incidence, severity, or control of localized dry spots.

High-Density Cultivars for Putting Greens Have Different Nitrogen Requirements

A number of golf course superintendents have expressed an opinion that the new high-density cultivars of hybrid bermudagrass (*Cynodon dactylon* x *C. transvaalensis*) for closely mowed putting greens are very similar. This comment is ill conceived! While the five cultivars released to date have not been fully characterized, there is now enough information available to know there are distinct differences among a number of them.

First, **it should be recognized that some cultivars are vertical-dwarf hybrid bermudagrasses, while others are full-dwarf hybrid bermudagrasses.** The importance of this growth habit differential was discussed in a previous Turfax article.

More recently, comparative experimental plot assessments have revealed distinct differences in the minimum nitrogen fertility requirement to sustain a green color. It is becoming evident that the range is quite great being from 6 to 18 pounds of nitrogen per 1,000 ft^2 (3 to 9 kg N/100 m^2) per year. **Cultivars requiring only 0.5 lb N/1,000 ft^2 (0.25 kg N/100 m^2) per growing month (gm) range are Champion, Mini Verde, and MS Supreme, which are vertical dwarfs. At the other extreme is Floradwarf which requires 1.5 lb N/1,000 ft^2/gm (0.75 kg N/100 m^2/gm); while TifEagle is intermediate at 1.0 to 1.2 lb N/1,000 ft^2/gm (0.5–0.6 kg N/100 m^2/gm).** In the case of Floradwarf and TifEagle, the use of nitrogen fertility rates lower than the rates listed above can result in a distinct loss of green color. Whether the other three cultivars would tolerate nitrogen rates below 0.5 lb N/1,000 ft^2/gm has yet to be assessed.

Cultivars that can maintain an acceptable green color at lower nitrogen rates, as well as sustain a high shoot density at very-close mowing heights, also have the beneficial attributes of (1) a slower vertical leaf extension rate which means a faster, day-long putting green speed and (2) a reduced tendency to form excessive canopy biomass which requires an increased frequency of vertical cutting. In this regard, **by far the best control of excess canopy biomass accumulation with these high-density cultivars is extraordinarily close mowing at 1/8 to 1/10 inch (3.2–2.5 mm).**