

Evaluation of Various Sand Topdressing Practices on Three Creeping Bentgrass Cultivars Maintained Under Two Fertility Levels

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Objectives:

- Determine the topdressing requirements of high shoot density (HSD) bentgrasses grown under two fertility regimes. Monitor the long-term changes in rootzone physical properties of a sand-based putting green rootzone topdressed with varying sand sizes and application frequencies.
- Determine the interaction of fertility rate and topdressing practices on three creeping bentgrass cultivars.

Rationale:

Sand topdressing is applied to putting greens for thatch management and to provide a firm surface. Some thatch is desirable because it provides a cushion for traffic and the impact of the golf balls. Excessive thatch, however, is detrimental. It reduces the environmental stress tolerance of stems and roots, predisposes plants to supraoptimal heating in summer, and promotes disease and insect pests. Wet thatch also provides the moist conditions needed for algae and moss to proliferate. Furthermore, thatchy or puffy stands of turfgrass are predisposed to scalping.

In recent years, there has been a trend towards the planting of high shoot density (HSD) bentgrasses like the A and G series bentgrasses. Field observations and scientific studies have demonstrated that these cultivars do develop more thatch than earlier developed cultivars. Thus, these grasses may require more aggressive strategies for proper thatch control. Previously, periodic, seasonal topdressing was sufficient for offsetting thatch development in older bentgrass cultivars. More recently, however, a more aggressive weekly approach seems appropriate.

Normally, topdressing sands have consisted of a particle size distribution that closely matches that of the underlying rootzone mixture. For sand-based rootzones constructed according to the USGA guidelines this sand would include a minimum 60% by weight in the coarse/medium fraction and not more than 20 % in the fine sand fraction. While these sands may closely match the underlying rootzone, problems have been reported with effectively incorporating the sand into the canopy of the HSD bentgrasses and finer sands are being used. If a finer textured sand were used that effectively filters into the HSD bentgrass canopy, long term concerns regarding layering and changes in rootzone physical properties may be occurring.

How it Was Done:

During the summer of 2003 an existing area of the sand-based research green at the W.H. Daniel Turfgrass Research and Diagnostic Center in West Lafayette was stripped of sod and removed. Additional sand-peat mixture matching the rootzone was brought in and the area was brought back to the proper grade. On 15 August 20 blocks (15 ft x 10 ft) were established to evaluate five topdressing treatments; none, periodic topdressing with a sand matching the underlying rootzone mixture or a fine textured topdressing, and weekly light topdressing with either sand. In each block six sub-plots (5 ft x 5 ft) were seeded with three bentgrass cultivars; 'Pennncross', 'L-93', and 'A-4' at 1 lb. of seed per 1000 ft² to evaluate the effect of cultivar and nitrogen fertilization rate on the topdressing treatment. Each large topdressing treatment block was separated by 2 ft wide borders of 'Backspin' creeping bentgrass. The area was covered with a spun-bonded geotextile fabric and irrigated frequently by an overhead irrigation system to promote germination and establishment.

In October 2003 a thin layer (< 2mm) of bright white silica blasting sand, consisting of > 90% medium sized sand particles, was applied across all the treatment areas. This sand was applied to delineate the starting point of the rootzone turfgrass interface so that over-time any increases in topdressing depth could be determined during future samplings. In the spring of 2004 fertility

treatments (low: 3.5 vs. high 6 lbs N 1000 ft yr⁻¹) will begin. The area will be mowed daily during the growing season with a triplex mower with clippings collected.

The following data will be recorded: Seasonal measurement of thatch depth, and determination of soil organic matter by combustion. Soil physical property measurements of the rootzones and surface will include water infiltration and percolation rates, water contents using time domain reflectometry, surface hardness using a Clegg impact hammer and penetrometer readings. Intact core samples will be removed from each plot and analyzed to monitor changes in rootzone/thatch physical properties. Additionally, the plots will be rated for visual turfgrass color, quality, disease, black-layer, and localized dry spot incidence and severity.

Results to Date:

Sand topdressing and fertility treatments were initiated during late-summer of 2004. Preliminary data including organic matter, and surface hardness were recorded. Plots receiving aerification and sand topdressing were core cultivated in September 2004. Intensive measurements on these plots will begin in 2005.

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