Large Patch on Zoysiagrass and Spring Dead Spot on Bermudagrass as Affected by Establishment Method and Cultural Practices

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Objectives:

The objectives of this study are to determine the effects of establishment method (sod, washed sod, aerified sod, sprigs, and post-establishment maintenance (core aerification and sand topdressing) on the establishment time, turf quality, and rootzone physical properties of a bermudagrass and zoysiagrass sand-capped fairway.

Sand-capped tees and fairways are commonly utilized during golf course construction or renovation to optimize drainage and minimize compaction. However, these areas are often established with sod containing a native soil layer, which may compromise long-term quality and increase the incidence of large patch in zoysiagrass or spring dead spot in bermudagrass. The objective of this study was to determine the effects of establishment method (sod, washed sod, aerified sod, or sprigs), and post-establishment maintenance (core aerification and sand topdressing) on the severity of large patch and spring dead spot on a sand-capped zoysiagrass and bermudagrass fairway.

Table 1. Effect of rootzone, establishment method, and sand-topdressing on large patch incidence during spring 2013. LSD value is Fisher's protected least significant difference value (alpha = 0.05).

Large patch incidence (%) - Spring 2013					
Rootzone		Establishment method		Sand topdressing	
Native soil	23.7	Washed sod	20.3	0.25 inch /yr.	19.6
Sand-capped	7.7	Standard sod	20.2	1.0 inch /yr.	11.8
		Aerified sod	13.4		
		Springs	8.9		
P-value	*0.046*		*0.015*		*0.007*
LSD	*15.5*		*7.7*		*5.2*

Large Patch Results

Large patch was present across the experimental area during spring 2013 and 2014. (16 and 13 %, respectively). In 2013, rootzone, establishment method, and sand-topdressing affected large patch severity (Table 1). Sand-capped rootzones had significantly more large patch that native soil rootzones, planting with sprigs or aerified sod significantly reduced large patch incidence, and heavy sand-topdressing (1 inch / yr.) increased large patch incidence compared to light sand topdressing (0.25 inch / yr.). The following spring (2014), large patch incidence was more complete across rootzone types and establishment methods and those effects were no longer significant. However, the heavy sand-topdressing treatment (17.6 %) had over twice the large patch incidence than light-sand topdressing treatment (8.7 %) in 2014 (Figure 1).

Spring Dead Spot Results

There was no occurrence of spring dead spot in 2013. However, following an unusually cold winter spring dead spot incidence averaged 11% across the experimental during spring 2014. At that time rootzone and sand-topdressing significantly affected spring dead spot incidence. Sand-capped rootzones (17.7%) had nearly four times more spring dead spot than native soil rootzones (4.4 %) (Figure 2). Heavy-sand topdressing increased spring dead spot incidence from 9.0% to 13.0% compared to bermudagrass that was only lightly sand-topdressed.

Other Significant Results

Other significant results were present following mower scalp injury and earthworm casting evaluations. These were mostly due to sand-topdressing effects. On the bermudagrass experimental area following a prolonged wet period in early autumn 2014 between mowing events, there was significantly less mower scalp injury on plots that were heavily sand-topdressed (Figure 1 and 3). Significant scalping injury was not present on the zoysiagrass experimental area. Earthworm casting events have occurred periodically across both the bermudagrass and zoysiagrass experimental areas, especially during wet cool periods. During casting events, sand topdressing has had a striking effect ($P < 0.0001$) on the number of casts per plot (Figure 1 and 3). On zoysiagrass, plots sand-topdressed at the heavy rate had 5 times the number of casts in September 2014 compared to the light rate. On that same date on the bermudagrass experimental area, the heavy topdressing rate had over 10 times the number of earthworm casts as the light topdressing rate. This is somewhat counterintuitive, as earthworms typically do not prefer sandy rootzones. Nonetheless, this effect has been observed repeatedly and we are currently investigating possible explanations for this phenomenon. In both species, there was a significant rootzone x sand-topdressing interaction on earthworm castings. This interaction occurred because the increase in castings when going from light to heavy sand-topdressing was much greater in sand-capped

Summary Points

- Large patch and spring dead spot incidence has been more severe in sand-capped rootzones compared to native soil.
- Sprigged zoysiagrass turf had significantly less large patch incidence than areas established with zoysiagrass sod. Establishment method did not affect spring dead spot incidence.
- Although heavy sand-topdressing reduced mower scalp in bermudagrass, it increased the incidence of large patch in zoysiagrass, spring dead spot in bermudagrass, and earthworm castings in both species.

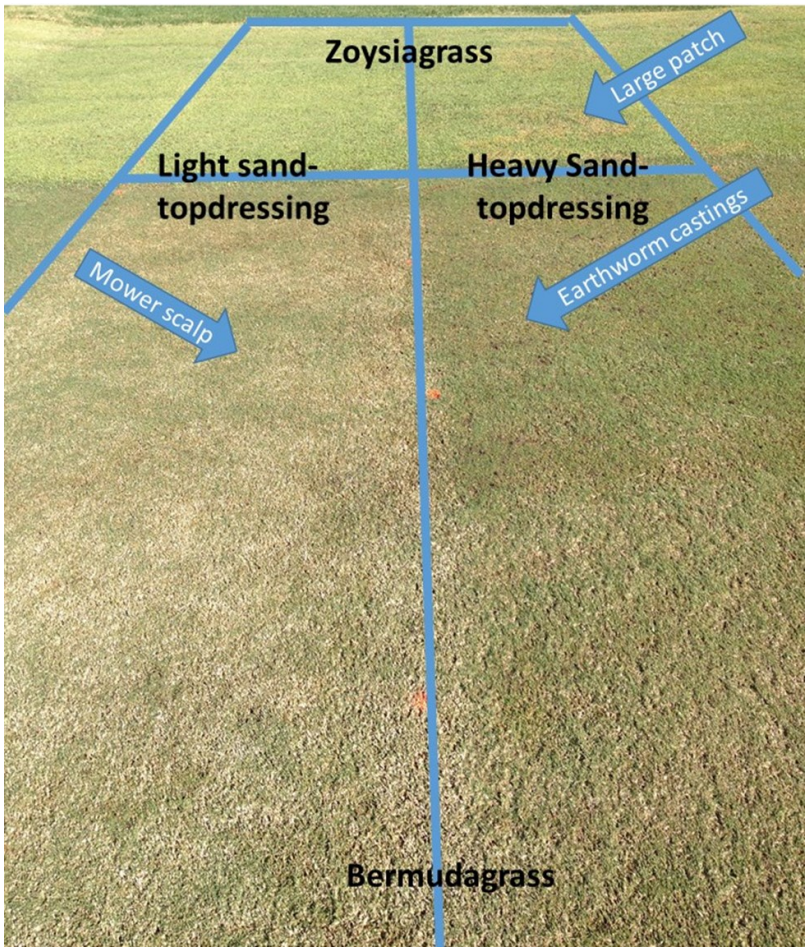

Figure 1. Although heavy sand-topdressing resulted in less mower scalp on bermudagrass, it also significantly increased earthworm casting activity, large patch, and spring dead spot (not shown here) incidence. Photo taken 25 October 2014.

Figure 2. Heavy infestation of spring dead spot on a sand-capped rootzone (foreground) relative to a native soil rootzone (background). Photo taken on 23 May 2014.

Figure 3. Bermudagrass turf that was either lightly (0.25 inch / yr.; left) or heavily (1.0 inch /yr.; right) sand-topdressed. Heavy sand-topdressing resulted in significantly more earthworm casting activity on both species. Photo taken 24 October 2014.