

## ABSTRACT

### Stress and Fertility Management of Tropical Turfgrasses under Different Soil Types

Raymond Owen Ricardo Springer

Understanding turfgrass quality and performance under varying conditions on sport fields is important in maintaining a quality playing surface. A survey was conducted to investigate current turf management practices of stadiums across the region. From the survey it was concluded that there were differences in the way fields were managed. The survey showed fertilizer management practices were general and not based on diagnostic methods. The majority of the venues were multipurpose increasing the difficulty of maintaining turfgrass quality. From the outcome of the survey, a greenhouse study was conducted to investigate effects of different fertilizer rates and frequencies on turfgrass quality. Three fertilizer rates: low (15 kg N/ha), medium (45 kg N/ha), high (90 kg N/ha); three frequencies (weekly, fortnightly and monthly) were applied to three turfgrasses and four soils. Results showed that the medium fertilizer rate applied fortnightly produced better visual quality and clipping yield. All grasses had better visual rating and clipping yield in the fine sand soil. Significant differences were seen between the low (15 kg N/ha) and the medium fertilizer rate but no differences were present between the medium and high (90 kg N/ha) rate. Another critical factor in the management of these fields is stress and a second greenhouse study was conducted to investigate the effects of drought, compaction and waterlogging on the same grasses in different root media. Fertilization was based on the medium rate and fortnightly frequency used in the first study. Compaction level influenced surface hardness and bulk densities across treatments. Under drought conditions surface hardness increased across all soils but not for those with sand amendment. The soil-only treatments had the lower bulk densities whilst the treatments amended with sand had higher bulk densities. The use of the medium fertilizer rate applied fortnightly produced better visual quality whilst sand amendment reduced surface hardness.

**Keywords:** Turf management; fertilizer rates and frequencies; stress; surface hardness; sand amendment.