Handheld, mobile data technologies compared for turfgrass

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Performance testing of natural turfgrass sports fields requires sampling to obtain information on surface properties (e.g., soil moisture, soil compaction, surface hardness, and turfgrass vigor). A study in the September 2016 issue of *HortScience* compared two sampling methodologies and provided recommendations to acquire reliable, cost-effective spatial data for turfgrass managers.

Chase Straw, Rebecca Grubbs, Kevin Tucker, and Gerald Henry from the Department of Crop and Soil Sciences at the University of Georgia compared handheld and mobile data acquisitions of soil moisture, soil compaction (penetration resistance), and turfgrass vigor on natural turfgrass sports fields. The experiments involved using two sampling grid sizes to determine if they would generate similar data. "Minimal research has been conducted on the spatial analysis of sports field surface properties," explained corresponding author Chase Straw. "Mobile data acquisition devices equipped with GPS are pertinent for rapid sampling of spatial data in agriculture; however, few mobile devices are currently available for use in turfgrass."

The researchers conducted studies on four natural turfgrass fields selected to represent a wide range of sport, use, management, and soil conditions. They said theirs was the first study designed to compare handheld and mobile data acquisition for spatial analysis of natural turfgrass sports fields.

Results showed that data collected on 4.8 x 4.8-m and 4.8 x 9.6-m

sampling grids did not differ greatly throughout the study on any field with both handheld and mobile devices for the measured field properties. "Sampling can be conducted as intensively as desired with mobile devices; however, handheld devices can be used on a 4.8 x 9.6-m grid (120-130 samples) while still achieving the same results as the 4.8 x 4.8-m grid (230-259 samples)," the authors said.

The study demonstrated that there are advantages to both technologies. "Mobile sampling devices are the most time-efficient sampling method for spatial analysis, but they may be expensive and difficult for managers of natural turfgrass sports fields to obtain," the authors added. "Handheld sampling devices are cheaper and more abundant, but take more time to sample." Minimal differences were observed between devices when measuring soil moisture and turfgrass vigor.

The authors said that increased adoption of spatial analysis of sports field properties, coupled with enhancements in technology, can create opportunities for the use of all devices. They recommended that future research focus on multisensor devices to improve the efficiency of handheld data acquisition.

More information: ASHS *HortScience*: hortsci.ashspublications.org/c … t/51/9/1176.abstract

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