

Soil testing for better-informed decisions

Lee Strutt and Sharon Singleton-Bruce explain how soil testing is helping drive plans for the renovation of the RAC golf course in Surrey, England



Golfers' expectations have never been as demanding as they are now. Tournaments worldwide portray golf courses in immaculate condition creating sublime playing surfaces that all golfers desire – and come to expect. Golf course maintenance costs now easily run into the hundreds of thousands pounds to maintain and continue improving playing surfaces to meet expectations. While golf is starting to thrive again after the financial downturn, much focus is now on 'how and where' that money is directed and how best it is performing on the golf course.

Material testing has always been seen as an essential element in construction for product performance and specification suitability. This formula of testing stabilises the risk for the outcome of any project, reducing potential long term costly maintenance mistakes. The strength of this quality objective testing process, provides clear information on a forecast outcome. But the strength of this formula is now being seen as an essential element for annual maintenance too.

Having worked through an extensive construction and grow in where testing materials and their physical parameters formed a major part of that process, the benefits of this testing system far outweighed the potential cost of using the wrong materials. As the course matured through daily maintenance, it was apparent there was a need to assess playing surface performance and measure this through objective testing, and form a benchmarking process.

The playing surfaces are scrutinised by players and their demands are driven by media peer tournaments raising player expectations. It is often felt that anything less as seen as unforgivable. The Stimpmeter has long been used as the tool to measure green speed with speed being misunderstood as the biggest dominator of surface quality.

As with construction materials, these assessments indicate a matrix guide on the daily performance of the turf and the factors behind on whether we are improving, declining or hitting a level of diminishing returns. This information has a significant influence on current and future annual maintenance plans from material selection, use, frequency but also the effectiveness of cultural tasks.

Historically turf management would dictate annual or biannual hollow-tining and or intensive Graden work because of the belief this was necessary without any verification or evidence. This would have increased the disruption to the playing surface and reduced player satisfaction, important if they were a fee payer.

Today's technology and verification of data can fully establish the true performance of playing surfaces allowing the turf manager to make better informed decisions on maintenance inputs and defend surface quality from subjective opinions from players.

With great effect, we have been able to establish implement a testing programme as part of our decision making process. This programme has been devised and verified using onsite industry testing systems on site, and off site testing verified by European Turfgrass Laboratories Ltd (ETL), based in Scotland.

ETL was selected for use, largely due to the company's 20-year experience in the testing of construction materials, the experience of the staff and the fact the laboratory is one of a handful of accredited laboratories in the world. ETL is accredited by the American Association for Laboratory Accreditation (otherwise known as the A2LA) in the Geotechnical field of 'Putting Greens Materials' and not the USGA, as is the common misconception. In actual fact, the USGA does not have any laboratory accreditation schemes= in place, but do recommend the use of A2LA accredited laboratories for testing.



A thorough soil testing programme at the Royal Automobile Club golf course in Surrey, England reduces the potential for costly maintenance mistakes



The relationship between a client and a laboratory testing facility is incredibly important. As strategic decisions are largely based on the correct sampling, test data and its interpretation, the client must trust that the laboratory's results are accurate. Using the same laboratory is advisable and reduces the potential risk of unnecessary variables when conducting a year upon year testing plan.

Laboratory accreditation provides formal recognition to competent laboratories – thus, providing a suitable and reliable facility for customers. To maintain this international recognition, accredited laboratories are assessed on a regular basis to ensure continued requirements and compliance with ISO 17025 and also to demonstrate that the standard of operation is maintained. Participation in a suitable proficiency-testing program is also compulsory and also demonstrates technical excellence.

Accreditation provides clients with the reassurance that the professionalism of the laboratory is constant. Repeatability, reliability, consistency and accuracy of techniques and data production are the key factors for clients. Without these, the interpretation of test data by the superintendent would be challenging, particularly where the club are conducting an annual benchmark program of testing and then adjusting management techniques according to the results.

As part of the ongoing golf club testing program at the Royal Automobile Club, the

laboratory is sent representative samples from various areas of the golf course. Testing by internationally recognised methods include particle size distribution (breakdown of the different sized fractions in the rootzone/soil), pH (measure of the alkalinity or acidity) and the percentage moisture content (quantity of water/moisture retained in the rootzone/soil). Bulk density is also tested and is an indicator of soil compaction, calculated as the dry weight of soil divided by its volume. As a rule, bulk density increases with compaction. Soils with high bulk densities may see restrictions to root growth and also poor movement of air and water through the soil. Saturated hydraulic conductivity gives an indication of the rate of water movement through the rootzone/soil and can be affected by other physical parameters such as particle size distribution, the level of organic matter/thatch and the depth of the rootzone/soil profile. Nutrient analysis is completed regularly testing the macro and micronutrients present in the rootzone and their availability to the grass are assessed. Results are essential to determine the level of fertiliser application that is needed. Organic matter is classified as organic materials at various stages of decomposition including roots, clippings, stolons and rhizomes. Testing is an assessment of percentage organic matter at 20mm increments to establish where there is a build-up of thatch and importantly at what depth. This level of detail enables the

superintendent to determine the choice of cultural practices that either maintains at a predetermined performance level as a whole or as each segment depth. If there were issues, the problem could be pin pointed and rectified by utilising cultural practices that provide the correction.

Onsite data collection includes species composition, green speed, trueness and smoothness, any presence of disease is recorded and the height of cut is noted. Data collected from the onsite measurements and the results received from the laboratory are scrutinised and management practices altered if necessary. General correction and maintenance can be controlled via testing through less invasive cultural practices e.g. frequent light topdressings, reduction or increased nutrient analysis or plant growth regulators.

Having a specifically designed testing program tailored to each individual club, which is performed at an accredited laboratory, ensures that any management decisions concerning the golf course are informed, rather than guesswork. There is no doubt that the evidence of test data is invaluable and beneficial to turf managers.

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