DOWN AND DIRTY

An understanding of the basic tenets of proper soil testing gives turf a solid base to grow. by Sam Ferro

Soil testing reports can be the turf manager's best ally when evaluating the golf course, or it can be a confusing jumble of numbers and charts.

To ensure you get the most out of your soil tests it is important to understand some of the basics tenets of proper soil testing.

Whether performing routine testing for fertilizer recommendations, diagnosing turf problems, or anything in between, the most important role of the turf manager is to ensure proper samples are taken.

We recently worked with a golf course that was having problems with poor drainage. They couldn't understand why their new greens weren't draining, even though they had test results showing a sand with high drainage rates. Turned out the sand that was purchased by the golf course was different than the sand that they had test results for. Appropriate sampling and testing of the actual sand delivered to the golf course would have allowed the golf course to reject the sand prior to placing it.

Proper sample collection procedures vary based on the type of material being tested and the location of the material during sampling. In order to get a truly representative sample, a composite sampling technique is most desirable. A composite sample is comprised of material obtained from multiple locations that are combined to create a single sample.

Golf greens should be divided into sampling subunits based on topography or directional areas. If there is concern about an entire green, the green can be divided into four to eight segments. Subsamples are then taken from each of the segments. The subsamples can be collected with a cup cutter, soil probe or shovel and combined in a plastic bucket. The combined sample is then mixed thoroughly to create the composite sample.

Large sample areas, such as fairways, should be divided into separate sampling units based on topography, vegetative cover, previous use, soil color and other visual differences. Small, non-uniform areas such as wet, rocky or eroded spots should always be a separate sampling unit.

When purchasing bunker sand, topdress sand or any high volume material that is stored in a stockpile, the stockpile should be tested before delivery to the golf course. A composite sample should be comprised of at least eight sampling locations. The eight locations should vary from the top to bottom and all around the pile. At least half of the samples should be taken from the lower third of the stockpile.

Most tissue samples are collected from mower clippings. To help prevent contamination wait at least two weeks from the last top dress application before sampling. Samples should be collected on actively growing turf. If growth patterns (yellow to lighter green color) are apparent, sample separately from "normal" growing areas. Let samples dry overnight to remove excess moisture before packing. Tissue samples should be shipped to the laboratory as soon as possible.

Once samples have been obtained, they should be labeled and a record of the samples should be kept by the golf course. The record should include sample locations and depths, and a map of sample locations. Sample names and identification should be written in permanent ink on the outside of each sample bag, bottle or container.

Sample submissions should include a letter or testing request form. Most laboratories can provide sample submittal forms and shipping labels that will help insure the sample submission process goes smoothly. Communicating with the lab can often help the lab to better tailor tests and reports to address golf course needs or concerns.

Lab test reports typically include an explanation of tests results and recommendations for action. Therefore, samples should be sent to laboratories that specialize in the demands associated with growing and maintaining a golf course.

With proper sampling techniques and lab testing, you can be confident that the information contained in the test reports accurately reflects the conditions of the material that was sampled. The information gained from the report can then be combined with on-site observations to make knowledgeable golf management decisions. **GCI**

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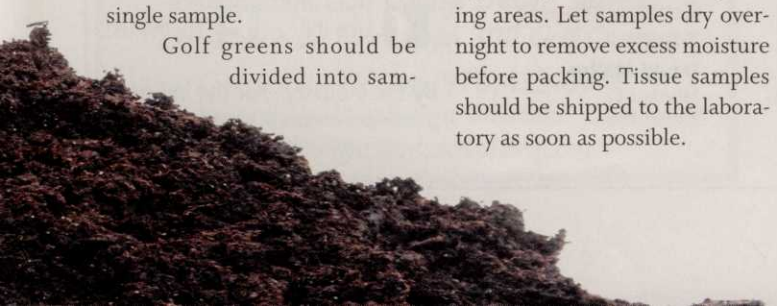

LIST OF INGREDIENTS

Soil content affects soil behavior, including the retention capacity for nutrients and water. By Chris Wilczynski

Each and every golf course that exists is this world has some form of vegetation. Vegetation comes in many different forms: turfgrasses, trees, agricultural crops, etc. One element all vegetation requires for establishment is soil. There are many soil types, but for growing purposes there are three main soil compositions: sand, silt and clay. Soil content affects soil behavior, including the retention capacity for nutrients and water.

Clay soils are heavier and tend to stay wet. Sandy soils

are lighter and dry out quicker. Silt is more or less a combination of sand and clay, the ideal growing medium for vegetation. The soil composition plays a very important role in the health and success of the plant. The care for the plant can vary widely depending on the type of soil that exists.

Golf courses typically have 25-30 acres of tee, fairway and green grasses and another 40-60 acres of rough and native grasses. Some golf courses are treeless, but most have several different coniferous and deciduous tree species. Anyone who cares for such a diverse landscape knows how much the soil effects the day-to-day maintenance and health of the plant. The more consistent soil, whether it is sand or clay, the better. Having multiple soil compositions throughout any landscape will test the best of any agronomic professional. Having one or two soil types on a golf course that are consistent from the first to the 18th hole is the goal.

When completing golf course construction projects, whether constructing a new golf course or renovating an existing golf course, one of the most critical steps to success is to manage the existing topsoil. The goal is to have a consistent growing medium throughout the entire project site upon the completion of the project. Prior to any excavation, grading or shaping, 4 to 6 inches of topsoil should be stripped from the affected area and stockpiled away from the area in which the construction work will take place.

Upon the completion of the construction, the same topsoil that was removed should be replaced prior to the seedbed preparation work and grassing. Again, the intent is to have consistency throughout the entire managed turfgrass area. This effort takes time and money, but it also creates positive results and success.

In the fall of 2010 my firm and Eagle Golf Construction completed a four-hole renovation project at Wanakah Country Club in Buffalo, N.Y. Wanakah sits just a few hundred feet away from the shores of Lake Erie. The soil at Wanakah is heavy clay, typical western New York soil. It is not the ideal growing medium but the golf course superintendent, Gale Hultquist, who has managed the grounds at Wanakah for over 30 years, knows the soil and knows how it needs to be managed. The first step of the renovation project following the removal of the existing turfgrass was to strip 6 inches of topsoil from all of the areas that were to be disturbed and graded. The topsoil was stripped and stockpiled along the sides of the affected areas.

Upon completion of the project, the same topsoil that was stripped was replaced over all of the disturbed and graded areas. The goal was to create a consistent 6-inch depth of topsoil. What did this create? Consistency! Can you imagine trying to grow turfgrass on the varied composition of the subsoil? In some areas we made 3 to 6-foot cuts into the heavy clay, and the deeper we cut the worse the clay became. This patch-quilt effect

of different soil compositions would be endless if the existing topsoil was not stripped and replaced. Just think how much fun it would be to manage the new turfgrass within all of the different soil compositions. This area needs a little bit of water but not much fertilizer, this area doesn't grow anything and this area needs a lot of fertilizer and four to five aerifications per year to loosen the soil. This is what it can be like with varying, inconsistent soil types. I have seen it first-hand.

In the early 2000's I worked on a new golf course construction project with Arthur Hills in Yorba Linda, Calif. The golf course is called Black Gold Golf Club and it was developed by the City of Yorba Linda, Calif. and the Aera Energy Company. The property was an old oil field that was managed by Shell Oil. The project included an 18-hole golf course and an upscale residential development that was developed by Toll Brothers. The area that the golf course and residential development was to be developed was rugged and severely undulating. For the entire project, 13 million cubic yards of soil were excavated. 3 million cubic yards were moved on the golf course. In some instances, there were 60- to 80-foot cuts into the existing soil and 50- to 80-foot fills. We strongly recommended that the existing topsoil be stripped and stockpiled, and replaced within the golf course. But, for whatever reason this never happened. The golf course turned out great and the residential development was very successful due to the timing of the real estate market. But, the golf course turfgrass has suffered from day one because of the inconsistent soil composition. Just about every soil type that exists can be found throughout the golf course. In the heat of the summer the cool season grasses really struggle. The heat plays a factor in this but the inconsistent soils play a larger factor. The golf course turfgrass will struggle into the foreseeable future. The cost to maintain the turfgrass on the inconsistent soil will eventually far exceed the initial cost to strip and replace the topsoil. In hindsight, everyone knows what should have happened.

The two projects that were cited vary greatly in scope and cost. But, the one thing that should have taken place regardless of the type of project was to strip and replace the existing topsoil. Let's face it, managing a landscape and hundreds of acres of turfgrass is not easy, especially given the crazy weather that most regions experienced in 2011. Let's not make it any harder than it has to be. Let's do the right thing and start off with a good consistent foundation. Just like the importance of a foundation to a home or building, the soil is the foundation for the vegetation. The foundation needs to be consistent. **GCI**

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