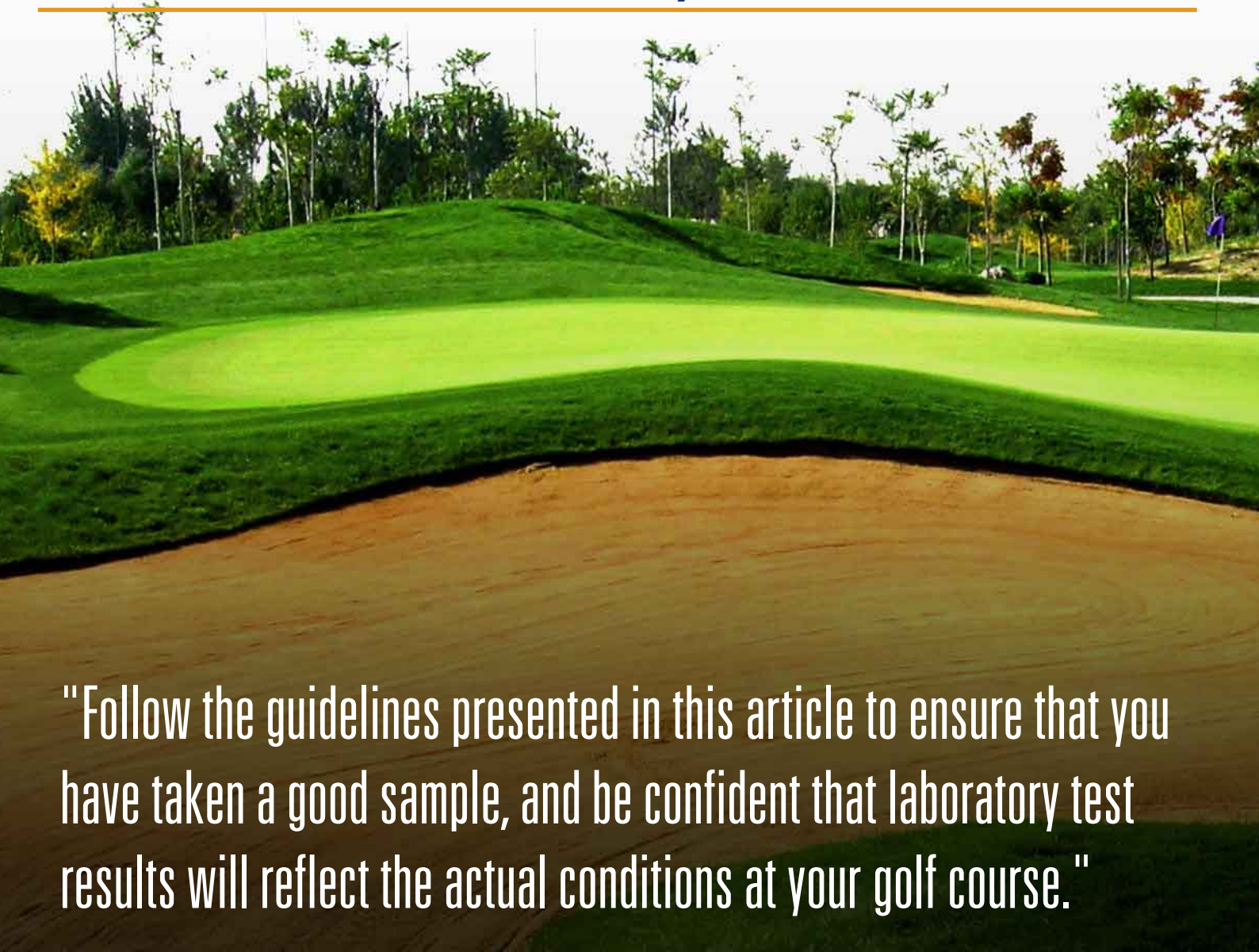


MAKE YOUR SAMPLE COUNT!

A PRIMER ON COLLECTING QUALITY, REPRESENTATIVE SAMPLES



"Follow the guidelines presented in this article to ensure that you have taken a good sample, and be confident that laboratory test results will reflect the actual conditions at your golf course."



Do you ever wonder if the testing results you get from the laboratory truly represent the conditions at your golf course? They may not if the sample wasn't taken correctly. Whether testing soil, water, or plant tissue, one of the most important roles of the turf manager is to insure proper sample collection. It is critical that the sample sent to the lab properly represents the materials you are having tested. You must take a good sample to get good test results. Improperly acquired samples can yield improper or invalid test results.

TURF MATTERS I

DIAGNOSTIC SERVICES

Photo courtesy of Brad Burgess of Sports Turf Solutions



Sample collection procedures vary based on the type of material being tested and the location of the material during sampling. This article provides information on common sampling techniques used in golf course construction and maintenance. For special issues not covered here, consult with your testing lab for advice.

GOLF COURSE OR NATIVE SOIL SAMPLING

The following sampling procedure can be used for golf courses or native soils in order to document the physical or chemical properties of the soil. Recommended tools for sample collection are a cup cutter, clean soil probe or shovel, a tarp or piece of canvas, and a plastic bucket. Large areas 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.

Golf greens should be divided into sampling subunits based on topography or directional areas.

When sampling native soil areas the average sample depth is 10 to 15 cm, but in some cases, it may be necessary to sample deeper. When

Soil sample taken from a field. Samples such as this one can be tested individually, or combined with other subsamples to make composite sample.

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One sample can be submitted from each sampling unit and should consist of a composite of numerous randomly collected subsamples. The subsamples can be collected with a cup cutter, soil probe or shovel and combined in a plastic bucket.

After the entire area has been sampled, portion out and remove samples as follows. Dump the bucket out on a tarp or canvas and mix thoroughly. Split the material into quarters and discard opposing quarters. Mix remainder thoroughly, split and discard again. Continue to do this until four liters remains for physical testing or 1 liter for chemical testing. Transfer the sample to the sample bag and label the outside of the bag using a permanent marker. Sample location and depth should also be recorded, and a map of sample locations should be kept.

DIAGNOSTIC OR PROFILE CORE SAMPLING

This sample procedure is primarily for evaluation of existing golf greens in order to document the profile and/or diagnose physical problems. A 50 mm or 80 mm (2" or 3") diameter PVC pipe should be cut about 50 cm to 75 cm in length to extend down through the profile into the sub-grade. Bevel the outside of one end to provide a sharper end to cut into the green. Drill two opposing holes into the other end into which a metal rod or rope can be inserted to help pull out the core.

Drive the beveled end of the PVC pipe into the field far enough to reach sub-grade. Sub-grade is needed at the base of the core in order to hold in the gravel and/or choker layers. Pull the core out. Pack the ends very tightly with newspaper or towels to prevent shifting and tape shut.

Label the sample appropriately with a permanent marker.

SAMPLE COLLECTION PROCEDURE FOR STOCKPILES

Stockpile sampling of sand, root zone mix and gravel is performed during construction and renovation projects as part of the materials evaluation and quality control process. Stockpiled materials are tested prior to shipment to the project site to ensure they meet project specifications. The turf manager or some other owner's representative should be present during any construction materials sampling event.

To aid in sampling, a 50 mm to 80 mm PVC pipe about 100 to 130 cm long should be cut at a 45 degree angle at one end. The pipe acts as a sample collection tube. It is also useful to have a rubber mallet to tap samples out of the pipe.

At least 8 sampling locations should be randomly selected for a 1,000 metric ton stockpile. The 8 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. Brush away the outer 15 cm of the pile and push the clean pipe as far as possible into the stockpile. Pull the pipe out and tap the sample into a clean bucket. Thoroughly mix the material after all samples are taken. Remove one gallon out of the bucket to fill a zip-lock bag. Label the composite sample appropriately with a permanent marker, and indicate from which stockpile the sample was taken.

For information on taking proper tissue and water samples, I consulted with my esteemed colleague Kevin Klink of AgSource Harris Laboratories. AgSource Harris recommends the following sampling procedures.

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TISSUE SAMPLE COLLECTION

Most turf samples are collected from mower clippings. Keep in mind that soil and fertilizer material can also be picked up by the mower and can contaminate the sample. For best results wait at least 2 weeks from the last top dress application (fertilizer, fungicide or sand top dress) before sampling.

Samples should be collected on actively growing turf. Do not sample drought or severely diseased areas. If growth patterns (yellow to lighter green color) are apparent, sample separately from "normal" growing areas.

Collect approximately one cup of fresh clippings. Let samples dry over night to remove excess moisture before packing and shipping. Because of the moist nature of turf clippings, mold and degradation is a concern. Samples should be stored and shipped in paper or cloth bags and loosely pack in the shipping box. Do not ship in plastic bags or plastic containers. Ship samples to laboratory as soon as possible preferably by express delivery.

WATER SAMPLE COLLECTION

Always use clean plastic containers with lids that will make a tight seal. Rinse the bottle (including the lid) several times with the water to be tested. The laboratory needs a sample size of at least 100 ml of water. Fill the sample bottle completely and eliminate all head space (no air space). Be sure the lid is tight so that samples do not leak out during transit. If possible, collect and ship samples on the same day.

To reflect the water quality at the time of application, collect samples from the pumping station or within the irrigation system. If a system of irrigation wells (ground water) is being used, sample each well separately. This will qualify the water specifically from each well. This is important if pumping into a holding pond.



Samples without proper packing material inside of a shipping box. Samples that are not packaged properly often break open in transit.

When collecting a sample from an irrigation system, let the water run for two to three minutes before collecting the sample. This will purge static water from the system.

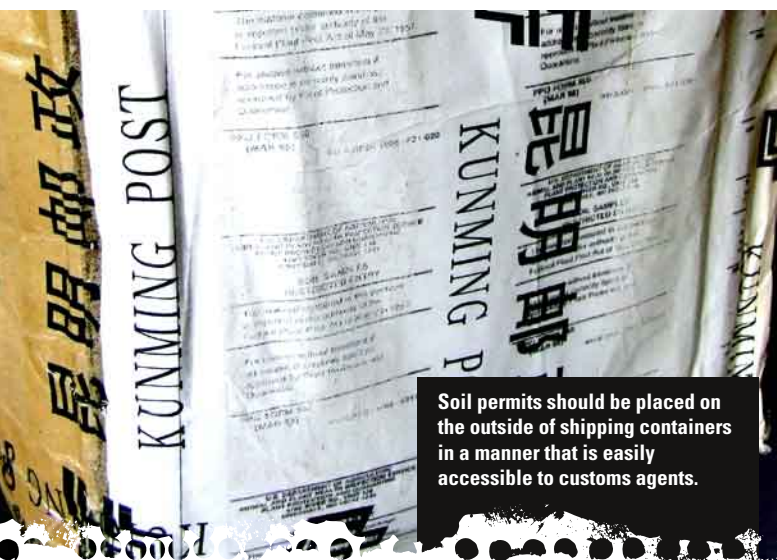
When sampling from a pond, collect water from the pumping station. If possible, do not collect the water from the side of the irrigation pond; because sediment will act as a contaminant. If you must collect water near the edge of a pond, use a dipper or other type of extension to take the sample away from the edges.

SAMPLE SUBMITTAL

To protect the samples during shipment, it is best to send the samples in a sturdy box. Sufficient packing material should be included to prevent sample movement or breakage.

Sample names and identification should always be on the outside of each sample bag, bottle or container. A letter or testing request should also be included with the sample submittal. The letter should include sampling information, testing required and contact information, including contact name, company name, mailing address, phone number and email address. International shipping typically requires a soil permit or label placed on the outside of the box to aid going through customs. Most laboratories can provide sample submittal forms and shipping labels that will help insure the sample submission process goes smoothly.

Follow the guidelines presented in this article to ensure that you have taken a good sample, and be confident that laboratory test results will reflect the actual conditions at your golf course. You can also feel free to contact me sferro@turfdiag.com with any questions or concerns related to sampling, testing, or diagnostics at your golf course, and I will do my best to assist you.



Soil permits should be placed on the outside of shipping containers in a manner that is easily accessible to customs agents.



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