ASIAN TURFGRASS CENTER

Hello,

I've been intending to start this soil testing newsletter for a few years, and a couple things prompted me to finally get it started. I saw a blog post last week about a change in soil chemical properties that happened *after* samples were removed from the soil when they were not dried or refrigerated. And I recalled the survey from early 2022 in which I was surprised to find that 78.5% of respondents **do not dry** the samples prior to sending to the lab.

This newsletter is primarily for ATC soil testing clients (y'all are receiving this because I've added you to this list), and I've also made it available for anyone interested to subscribe. I intend to use this newsletter to explain and update you about recommendations for sampling procedures, sample handling, laboratory methods, new research related to soil testing, and interpretation of soil results.

Here are a few links to related resources:

- ATC's soil testing page
- ATC's OM246 page
- PACE Turf for expert and practical turf management guidance
- Other ATC newsletters on a wider range of topics
- ATC's MLSN reference

Soil nutrient analyses—sample collection and treatment

The purpose of routine soil nutrient analyses—what we'd commonly call "soil tests"—is to make fertilizer recommendations. Specifically, the tests are conducted to answer two questions.

1. Is an element required as fertilizer (or is a liming material required?)
2. If an element or lime is required, how much should be applied?

For turfgrass, I recommend taking samples to a 10 cm depth unless you've got a good reason to choose a different depth. If you are sampling to a different depth, please inform me of that on your sample metadata sheet so that I can be aware of that when I'm preparing the report.

I recommend air-drying the samples immediately after removing them from the ground and prior to shipping them to the laboratory. The purpose of the air-drying is to stop microbial activity and ion exchange reactions as soon as possible. Microbial activity continues until they are dried. I'd like to stop that process as soon as possible so that what is measured at the lab is as close to the conditions on the sampling date as possible. An additional benefit of air-drying the samples is the reduction in sample mass, and lower shipping costs.

I recommend leaving the verdure (the aboveground plant material) on the sample, and leaving the thatch and mat layers on the sample. There are machines at the laboratory that remove this stuff before any tests are run. I expect the machines at the lab can remove this material from the samples more consistently than we can.

Single core or composite samples?

This one I leave it to you to decide how you prefer to sample. My preference at the moment is to do single core sampling. Please be sure to let me know if you have taken single cores or if you have done composite sampling, because I prepare the reports slightly differently. I've written about this extensively on the ATC website.

Composite sampling is the standard way. This involves multiple soil cores, mixed together, and then a subsample is drawn from the mixed soil and this is the sample. The problem with this is it assumes soil nutrients are normally distributed in the soil. In sands they appear to be close to normally distributed, but in soils the distribution is more like log-normal. An invariable result of composite sampling in that case (with log-normally distributed nutrient concentrations) is a systematic *over-estimation* of the actual nutrient content of soils.

There are other advantages to single core sampling. Single core sampling is a lot faster. Single core sampling avoids the unknown error involved with subsampling from the larger composite sample. And single core sampling can capture more of the lows and highs in the soil that seem to me to be the types of things that we are actually trying to test for.

As you will realize by now, my preference at the moment is for single core sampling, but I leave it up to you whether you want to do the conventional way, or to try this radical change.

OM246 total organic material tests

I continue to find this testing incredibly useful as a way to assess the effect of sand topdressing and organic matter management work, and as a way to assess the results of growth. Basically, this is a way to measure how much the plants are growing underground. If clipping volume is a way to measure aboveground growth, then OM246 is a way to measure belowground growth.

Some clients tend to see soil organic material stay relatively constant year after year, together with excellent playing conditions. Other clients have been seeing organic material that goes up by 20, 50, even 100% over the course of one or two years, and they are seeing that together with excellent playing conditions. I can't quite figure that out—I have many speculations about what may be happening, but to write them all out here would be gratuitous. I'll explain as I get a better understanding of why this is happening.

My recommendations for OM246 sampling are in this document.

I also recommend air-drying these samples before sending to the lab.

A note about verdure-on or verdure-off on OM246 samples

For putting greens, I find it's impossible to make a consistent removal of verdure (remember, that's the aboveground plant material) without losing

some topdressing or sand that's in the canopy. I prefer to leave the verdure on putting green samples.

An increasing number of people are submitting OM246 samples from approaches, fairways, and tees, to get information about optimizing the organic material management of those surfaces. Please note that it should be a lot easier to remove verdure from these samples because they have a higher mowing height than putting greens, generally get topdressed less frequently, and these areas general receive less frequent plant growth regular applications. My advice for non-green areas is to remove the verdure. This is also something that can be noted on the sample metadata sheets. I would remove the verdure with scissors, not being too precious about it, but chopping away the bulk of the stems and leaves.

Particle size analysis of OM246 samples

A couple of you have already helped me out with a special test to check the sand particle sizes of OM246 samples after the organic material has been burned off. The general idea with this is that we can check the sand particle sizes that are present at the soil surface and can track how those change over time in response to topdressing, growth, and cultivation. I'll be offering this additional test option at a special price as I continue to do research about this; clients doing OM246 tests in the upcoming months may hear from me about this as you get ready to send your samples.

I've got a ton more I'd like to write about these topics, but I'm saving them as notes for future editions of this newsletter. I hope the information here will be useful for you as you prepare for the next set of soil samples.

Thank you.

Micah Woods, Ph.D.
President & Chief Scientist
www.asianturfgrass.com