

# Taking soil samples

**S**oil sampling — collecting soil for laboratory testing — is the first step in the process of determining the levels of plant nutrient elements at a particular site. Accurate soil testing and interpretation of the results begins with the proper techniques for sampling. Any mistakes made in sampling can lead to improper management strategies and wasted time and money.

Where sampling is done depends on the type of information the turfgrass manager is seeking. General sampling is done on a site or sites where the topographic, management, use and environmental conditions are similar. Problem site sampling should be done where information about a specific site or problem area is needed.

## General and problem area sampling

**General sampling** is done to get an overview of nutrient levels and their balance over a large site(s) with consistent conditions. General samples should be taken so that they are representative of the whole site and should not include any soil from any problem areas within the sampling site. The number of samples taken from any given area within a site should be relative to the relationship of the square footage of the area to the total square footage of the site.

For example, if the site can be divided into three areas A, B and C, and the relationship of the square footage of each area is 3 to 2 to 1, then three samples should be taken from area A, two from area B and one from area C.

Consistently following this practice will assure that sampling will accurately reflect the nutrient levels of the whole area at the time of testing and that comparison of current and future testing results will provide an accurate long-term picture of the nutrient levels of that site.

**Specific or problem-area sampling** is done to areas of limited size within a site

which have specific conditions that are different enough from the general site conditions that the area exhibits symptoms inconsistent with the whole site.

Problem-area sampling should be done only when the other possible causes of turfgrass decline (insect, diseases, traffic, compaction, management, etc.) have been eliminated.

Sample cores should be taken in a uniform manner and only from within the problem area. Also, another separate test sample should be taken from just outside the problem area to provide a comparison.

## Sampling volume, depth and frequency

**The minimum amount of soil** that is needed for testing is about one cup. If you are sampling from a large site with 30 to 50 cores, the individual cores can be thoroughly mixed and the one cup sample can be obtained from the mixture. On smaller sites, the minimum number of cores that should be taken is seven or eight.

The soil sample should be taken where the largest mass of roots for a particular species occurs. The following table illustrates where in the soil profile the mass of roots occurs for bluegrass, bentgrass and bermudagrass.

**TABLE 1**

**Percent of root mass profile**

Depth	Bluegrasses	Bentgrasses	Bermudagrasses
0 to 3 in.	89%	83%	80%
3 to 6 in.	7%	13%	12%
6 to 9 in.	4%	4%	8%

For all three species most of the root mass occurs in the top three inches; therefore, sampling should be confined to the top three inches of the soil profile. Try to avoid including cores that are less than three inches in the sample, if possible. If three-inch cores are not available, increase

## ADDITIONAL TIPS ON SOIL SAMPLING

The following techniques apply no matter what information is being sought:

- ▶ Sampling can be done any time the soil is not frozen.
- ▶ Above ground, undecomposed thatch that has no roots growing in it should not be included.
- ▶ Thatch that is decomposed and has a substantial portion of roots growing in it should be included.
- ▶ Plastic buckets and mixing utensils should be used to collect large multisite composite samples.
- ▶ Avoid using any galvanized utensils or buckets in taking or mixing cores as they may contaminate the samples.

- ▶ Wait at least two weeks after a fertilizer or amendment application before sampling.
- ▶ Remember that pH readings are generally higher in cool weather.
- ▶ Clean all sampling equipment after each sample is obtained, as residues from one site can affect the results for another site.
- ▶ Establish a consistent method and frequency of testing so the results of repeated testing can be accurately compared.

the number of cores in the sample to compensate for the lost soil volume.

In established, stable, well-balanced higher C.E.C. (Cation Exchange Capacity) soils (>15), bi-annual sampling should be enough. In less stable, established but well-balanced lower C.E.C. soils (<15), annual sampling is necessary. In poorly balanced soils, no matter what the C.E.C., annual or semi-annual sampling is essential.

Where monitoring of just soil pH is required, sampling can be done two to four weeks after an amendment application has been made. Newly constructed or renovated areas should be monitored up to four times a year, as nutrient levels will change rapidly in these unstable soil conditions.

**No matter what sites** you are testing and no matter which techniques you are using, be consistent. Once you have selected the boundaries of a sampling site, do not change them. Once you have established a sampling technique for a site, do not change. The information in soil test reports is only as good as the sampling techniques that you employ.

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