

Soil Testing

There are several nutrients that are essential for plant growth. A soil test is used to determine the amount of these nutrients in the soil. The soil test results are subsequently used to make a soil test report. In addition to indicating the level of nutrients in your soil, the report will also tell you the [pH](#) value or how acidic or basic your soil is, and it will make a recommendation for the amount and type of fertilizer and/or lime you need to add to the soil for optimum plant growth. This allows you to customize your soil fertilizer and lime applications to your plants' needs. Following the recommendations will help prevent problems with nutrient deficiencies (in the case of under-fertilization) or problems associated with over-fertilization such as excessive vegetative growth, delayed maturity, salt burn and wasted money. In addition, it can protect against any environmental hazards resulting from excessive fertilizer applications.

HOW TO TAKE SOIL SAMPLES

To have a soil analysis done you need to collect 12 or more cores which will be combined as one composite sample. The samples should include soil from the surface to a depth of 6 inches in all areas except for lawns where cores should be taken from a depth of only 2 to 3 inches. A simple garden trowel can be used to collect the samples. Place the samples in a clean bucket and mix them thoroughly. It is imperative to use clean sampling tools. Pesticide or fertilizer residues will create misleading results. The sample must not be excessively wet before it goes to the lab. Bring a minimum of 2 cups of soil per sample to your county Extension office. Be sure to keep track of which part of your yard the sample came from. At the Extension office they will ask you to fill out the information on a soil test box, fill out a record sheet and check the appropriate boxes for the analyses desired. The cost

of a standard soil test is \$6.00 per sample. This test provides unbiased, scientific information on:

- The [soil pH](#) value.
- The current soil levels of phosphorus, potassium, calcium, magnesium, zinc and manganese.
- Fertilizer and lime recommendations (if needed) for the plants you are growing.

HOW MANY SAMPLES TO TAKE

You need to take a soil sample from each section of your yard or garden. Usually this means, for example, one sample in your turf area, one in any foundation or perennial bed and one in your vegetable garden. If you have a problem area where plants do not seem to grow well, take a separate soil sample from that location.

SAMPLING FREQUENCY

The Clemson University Extension Service recommends soil sampling every year.

TIME OF SAMPLING

Soil samples can be taken at any time of the year, but it is best to sample the soil a couple months before planting a garden, establishing perennials or before the optimum time for fertilizing lawns to allow ample time for the lime to react with the soil.

SOIL TEST RESULTS

Within seven to fourteen days, a copy of your soil analysis will be mailed directly to you from the Agricultural Service Lab. Your county Extension office will also receive a copy. Your soil analysis will have a bar graph representing the amount of soil nutrients found and the soil pH value. It will have a section at the bottom of the first page which shows how much lime (if needed) to add for each 1000 square feet and refer you to specific comments on the last page. The comments page will tell you

what type of fertilizer you need, how much you need and how to apply it. These recommendations are specific for whatever type of plant you want to grow (as you indicated on the soil test record sheet).

UNDERSTANDING YOUR SOIL TEST REPORT

Soil pH: Soil pH is a measure of how acidic or alkaline your soil is. Soil pH directly affects nutrient availability. The pH scale ranges from 0 to 14, with 7 as neutral. Numbers less than 7 indicate acidity, while numbers greater than 7 indicate an alkaline soil. Plants thrive best in different soil pH ranges. Azaleas, rhododendrons, blueberries and conifers thrive best in acid soils (pH 5.0 to 5.5). Vegetables, grasses and most ornamentals do best in slightly acidic soils (pH 5.8 to 6.5). Soil pH values above or below these ranges may result in less vigorous growth or symptoms of nutrient deficiencies.

Nutrients: Nutrients for healthy plant growth are divided into three categories: primary, secondary and micronutrients. Nitrogen (N), phosphorus (P) and potassium (K) are primary nutrients, which are needed in fairly large quantities compared to the other nutrients. Calcium (Ca), magnesium (Mg) and sulfur (S) are secondary nutrients which are required by the plant in lesser quantities but are no less essential for good plant growth than the primary nutrients. Zinc (Zn) and manganese (Mn) are micronutrients which are required by plants in

very small amounts. Most secondary and micronutrient deficiencies are easily corrected by keeping the soil at the optimum pH value.

Nitrogen: Available nitrogen is taken up by plant roots in the form of nitrate (NO₃⁻) and ammonium (NH₄⁺). Nitrogen testing is not recommended because the levels of available nitrogen are variable due to its mobility in the soil. The available forms of nitrogen are very water soluble and move rapidly through the soil profile with rainfall and irrigation. This causes the amount in the root zone to fluctuate over time. Recommendations are based on the requirements of the particular plants you are growing.

If you need help interpreting the results of your soil tests, call the Home & Garden Information Center at 1-888-656-9988.

Prepared by Marjan Kluepfel, HGIC Information Specialist, and Bob Lippert, Extension Soil Fertility Specialist, Clemson University.

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