



Technical Bulletin

What your garden soil test tells you

By: Joel Symonds

Having your soil tested can help you become a more successful gardener. A soil test measures a number of important indicators of soil health. And, healthy soil often means healthy plants. Here are the things that a soil test measures.

Soil Texture

Soil texture describes the distribution of particle sizes in your soil (i.e. percentages of sand, silt and clay). Since soil texture affects water and nutrient holding capacity, much of your gardening success is dependent on your soil's texture. The best garden soil texture is a blend of all three particle sizes; and is called a **loam**. The smaller soil particles (silt and clay) of a loam hold moisture and nutrients and the larger particles (sand) ensure soil aeration and drainage.

pH

pH can range on a scale from 0 to 14. If a soil's pH is 7, the soil is defined as neutral. If the soil's pH value is below 7 it is considered an acidic soil, and above 7 it's considered an alkaline or basic soil. When we measure pH, what we're in fact measuring is the amount of amount of hydrogen (H⁺) ions in the soil; the more H⁺ ions, the more acidic the soil. Since plants absorb all of their essential nutrients in ionic form, acidic soils (with a greater concentration of H⁺ ions) hinder nutrients from being held by the soil particles and absorbed by plant roots. Each plant species has a "preferred" soil pH in which they grow best. Some plants are well adapted to, and even prefer, more acidic soil. Other plants are more sensitive to low pH. Most vegetables in your garden grow best in soils that are near neutral in pH.

Nutrients

Measuring the macronutrients in your soil is very important. Plants that do not receive macronutrients in the required amount can become undernourished, perform poorly and are more prone to disease. This group of nutrients are called macronutrients, not because of their size, but rather, the amount required by plants relative to other nutrients known as micronutrients. The macronutrients measured include nitrogen (N), phosphorus (P), and potassium (K).

Soluble salts

Measuring soluble salts identifies the level of ions dissolved in a soil-water solution. If soluble salts levels get too high (over 2mS/cm), plant growth can be hindered, and flowering and fruit production can also be inhibited. Seed germination and early seedling growth can also be negatively affected by high soluble salt levels. Some soils are naturally high in soluble salts, however, excessive fertilizer application, road salt, home de-icer, and pet urine/feces are other sources of soluble salt problems.

Organic matter

It is very important to have a sufficient level of organic matter in your soil. Soil organic matter, made up of decomposing plant material and soil microbial matter, serves several functions: 1) it helps hold nutrients, 2) retain moisture, and 3) create pore space which increases soil aeration. Be sure to apply well composted manure, yard and food waste only; fresh compost and manure can actually decrease the soil's available nitrogen levels.

**To contact LUCAS:
Dr. Francis Appoh, Director
Lakehead University Centre for Analytical Services (LUCAS)
955 Oliver Road, Thunder Bay, ON P7B 5E1
Tel: (807) 343-8010 ext 8853 Fax: (807) 346-7864
<http://lakeheadu.ca/centre/lucas>**