

Acton Garden Club

Horticulture Hints

March, 2024

HAVE YOU RECENTLY HAD YOUR SOIL TESTED?

There is more to soil than its texture, the amounts of sand, silt and clay. A SOIL TEST will give the best analysis about the quality of the soil*.

Soil kits for home tests are unreliable.

Soil is formed from rocks that weather over time to form smaller to finer particles. Soils are modified by rainfall. High rainfall areas have leached soils, are usually forested, and have acid soil reaction (pH). Arid soils tend toward being alkaline.

Residential landscapes are often on *fill soils* with various textures and interfaces. Here decomposing granite surface soils cover the actual clay loam textures underneath. Soils can vary significantly on the same property.

The essential component of any soil test is *soil reaction* or pH. Soil reaction affects the uptake of plant required mineral salts.

The essential elements that a plant needs in relatively large amounts are the *macronutrients*: calcium, carbon, hydrogen, magnesium, nitrogen, and oxygen. Plants also take up carbon, hydrogen and oxygen from air and water.

Micronutrients are needed in very small amounts. Micronutrients come from weathered minerals or decomposing organic matter dissolved in the water in the soil. The essential micronutrients are zinc, iron, manganese, boron, chlorine, copper, molybdenum, cobalt, vanadium, sodium, and silicon. Deficiencies of the last four minerals are very rare.

A pH below 6.0 reduces the availability of nitrogen, phosphorus, and potassium. A pH above 7.5 reduces the availability of iron, manganese, and phosphorus to plants. Soil pH for most plants is 6.8 which allows required minerals to be available for absorption by plant roots. Soil pH between 6.8 and 7.2 pose few problems for most plants.

Soil can be harmed physically by tilling with a rototiller. Tilling destroys the structure of the soil. Structured soils support plants and help prevent disease.

Compacted soil tends to hold less water, causes run off and has less space for gas exchange. In severely compacted soil, plant roots have difficulty penetrating the soil and do not grow well.

Gardeners generally add more fertilizers to soils than are needed. Excess levels of phosphate can interfere with the uptake of other needed minerals.

Organic matter supplies carbon for soil microbes and promotes soil structure. Organic matter can hold and release positively charged (cations) soil mineral nutrients used by plants. Organic soils have the highest cation exchange capacity, a measure of soil fertility. Organic matter tends to bring soil pH back toward neutral. Very acid or alkaline soils can be modified by adding organic matter. Finally, organic matter may contain nutrients that help plants grow. While arborist chip mulches yield nutrients to soils slowly over years, composts provide nutrients immediately. (Be sure to check the provider of arborist chip mulches to make sure that it is of good quality.)

Usually there are enough fertilizer elements in most soils that landscapes can remain unfertilized, especially if leaf litter and mulches are utilized.

If plants show deficiency symptoms be sure to check your soil reaction to make sure that the pH is in a growing range for the plants you are cultivating. If the pH is right but you still have symptoms, then consider using fertilizers based on soils tests results.

Applying fertilizer to landscapes above what is needed can pollute creeks and other bodies of water. It is important to let your **soil test** guide fertilizer applications.

Judy Dembsey, Environmental Education

*SOIL TEST INFORMATION

Go to the [University of Massachusetts Soil and Plant Nutrient Testing Laboratory](#)

Sources: My Soil Is Crap by Jim Downer, The Garden Professors, May 8, 2021
Purdue University Extension Service