SOIL IMPROVEMENT AND AMENDMENTS: SOIL TESTING

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SOIL TESTING

- Soil testing is done to determine how much of each soil component (mineral, water, air and organic matter) is present in the soil.
- Soil testing laboratories can give a detailed and accurate measurement of the soils components.
- However, simple tests can reveal much about the soil.
Soil Improvement

- Dig a hole 18" deep and wide enough that the soil can be seen.
- Sand can be seen or felt.
- Black color indicates high organic matter;
- Gray indicates medium organic matter.
- Red, tan or blue color indicates little organic matter and high clay.
- Blue color indicates that there is no oxygen in the clay. Therefore, no roots will grow in blue clay.
• Normally, the organic matter is mainly in the topsoil.
• Forest soils have a one to four inch thick layer of organic matter on top of mineral soil.
• Grassland soils have a much thicker layer of organic matter mixed with mineral soil.
• Wetland soil may have a layer of organic matter several feet thick because the lack of air in wet soil slows down the decay of organic matter.
SEPARATING SOIL IN WATER TEST

- Fill a glass jar about half full with soil.
- Fill to the top with water.
- Shake the jar, but do not swirl.
- Let stand.
- Sand will settle in about ten seconds. Silt will settle in two minutes. Clay will take hours to settle. Larger pieces of organic matter will float for a while.
- The thickness of the layers indicates the proportions of sand, silt, clay and organic matter.
Soil pH is a measure of hydrogen ion concentration. It is tested either with a chemical pH test, or by a pH meter. 7.0 is neutral. 4.0 is very acid. 10.0 is very alkaline. High rainfall and high organic matter produces acid soil. Low rainfall and high lime or sodium produces alkaline soils. Soils naturally have a pH between 4.5 and 5.5 are fine for acid loving plants such as rhododendrons, azaleas, camellias and conifers. Lawns, roses, lilacs, fruit trees, vegetables and many flowers prefer a soil pH near neutral, 6.5 to 7.0.
The majority of plant nutrients are most available at slightly acid to neutral, though iron is more available as soil is more acid.

Soil can be made less acid by adding lime (calcium carbonate), or more acid by adding sulfur or aluminum sulfate.

Aluminum sulfate is especially helpful to produce good blue flowers on hydrangeas. Adding lime produces pink hydrangea flowers. Lime will raise the soil pH in a few weeks or several months depending on how finely ground the lime particles are.

Sulfur takes about a year to lower soil pH since bacteria are required to complete the process.
There are thirteen essential nutrients which plants get from soil. The six that the plants need the most of are called Macronutrients. They are N, P, K, Ca, Mg and S. The other nutrients, which are needed only in trace amounts, are called Micronutrients. They are Fe, Mn, B, Zn, Cu, Mo and Cl.
Nitrogen encourages leaf growth. Phosphorus encourages roots and flowers. Potassium encourages general vigor. If one of these nutrients isn’t available, then plant growth will be slower or stunted, and leaves will be discolored. For example, lack of nitrogen causes the old leaves to turn yellow. Lack of iron causes the new leaves to be yellow.

Nutrient deficiencies will form patterns on the leaves that follow the vein patterns: sometimes along the veins, sometimes between the veins. Disease symptoms don’t follow the veins.
• Soil laboratories will test soils for nutrients as well as pH and organic matter.
• However, a general recommendation is: All soils are short on nitrogen; shallow rooted plants such as lawns and flowers need extra phosphorus and potassium; iron and sulfur are often deficient, especially around acid loving plants.
• Usually, the soil contains enough of the other nutrients, although some may be deficient in certain parts of the country.
• Boron is sometimes deficient in the Northwest.
The nutrients are identical whether they come from organic or synthetic sources, but the source will affect how fast the nutrients are available to plants.

Organic fertilizers and specially treated synthetic fertilizers are slow release so they won’t burn and the nitrogen won’t wash away in the rain before plants can use it.
Thanks