

Soil Testing

One of the most common questions gardeners have is how to fertilize specific plants. Many plants have individual nutrient needs, but for all plants it's challenging to guess at what you need without knowing what you have.

Although soil tests are generally done to find out what nutrients are deficient, it is just as important to know if you have adequate levels of nutrients so you don't add unneeded fertilizer. The most basic soil test checks pH and the levels of phosphorus and potassium. Most of the lawn and garden soil tests that come out of our soil-testing lab show more than adequate levels of both phosphorus and potassium. If those nutrients are not needed, applying them is a waste of money and can be a source of pollution. In extreme cases, excess phosphorus can interfere with the uptake of micronutrients.

Soil testing can be done at any time, but spring is generally recommended in order to allow time for nutrients to be added prior to the growing season.

Begin by taking a representative sample from a number of locations in the garden or lawn. Each sample tested should be composed of about 5 sub-samples. If you're testing your lawn soil, samples should go 3-4 inches deep. For vegetables, flowers and small fruit, dig to a depth of 5-6 inches. Tree and shrub soil samples should be at a depth of 10-12 inches. Mix the sub-samples together in a clean container and select from that about 1 pint of soil.

Take the soil to the Shawnee County Research and Extension office, or to your local county office. Samples will then be sent to the K-State soil-testing laboratory for a fee. Depending on the package you choose, this fee will range from \$10-\$18.

Soil tests take 2-3 weeks to be processed, although that time can be longer in peak seasons, generally spring and fall. Once the soil tests return to our office, our staff will process them, and recommendations will be added.

Soil samples should not be taken or brought in while the soil is wet. If your soil is wet, it is best to wait to retrieve the sample or allow the sample to air-dry before submitting it for testing. Do NOT use artificial means of drying such as an oven or microwave as such treatment may result in inaccurate readings of nutrient levels. Also, be sure to use a clean container to collect the sample. Wet samples are more likely to absorb foreign materials adhering to the container, which may also influence soil test results.

Though soil tests are useful for identifying nutrient deficiencies as well as soil pH, they do not tell the whole story. We often receive soils from gardeners that are having a difficult time growing crops even though the soil test shows the pH is fine and nutrients are not deficient. There are some factors that can affect plant growth that are not due to nutrient deficiencies or pH.

Not enough sun: Plants need a certain minimum amount of sun before they will grow well. As a general rule, flowering (and fruiting) plants need at least 6 to 8 hours of full sun per day. There are, of course, exceptions such as impatiens that bloom well in shade. Move sun-loving plants into more sun or use plants that are better adapted to shady conditions.

Poor soil physical characteristics: Roots need oxygen as much as they need water. A tight clay soil or excessive water can restrict soil oxygen levels as well as make root penetration of the soil difficult. Increasing the organic matter content of clay soils can help rebuild good structure. Add a 2-inch layer of organic matter and till it in.

Walnut trees: Walnuts give off a natural herbicide that interferes with the growth of some plants such as tomatoes. Vegetable gardens should be at least 50 feet away from walnut trees if possible.

Tree roots: Trees not only compete with other plants for sun but also for water and nutrients. Extra water and nutrients may be needed if you're growing plants near a tree.

Shallow soils: When new homes are built, the topsoil is often stripped off before the soils are brought to grade. Though the topsoil should be replaced, it sometimes is not or is not replaced to the same depth as it was originally. You are left with a subsoil that usually does not allow plants to grow well due to a lack of soil structure. Adding topsoil to a depth of 8 to 12 inches would be best but this often is not practical. In such cases, try to rebuild structure by adding organic matter and working it into the soil.

Too much phosphorus: Most Kansas soils are naturally low in phosphorus. However, soils that have been fertilized for a number of years may have phosphorus levels that are quite high. Extremely high phosphorus levels can interfere with the uptake of some micronutrients such as iron, manganese and zinc. High phosphorus soils should only be fertilized with fertilizers that have relatively low amounts of phosphorus.

Improper watering: Roots develop where conditions are best for growth. Shallow, frequent watering leads to roots developing primarily near the surface of the soil where the soil is moist. It is better to water less frequently and to a greater depth to encourage a deeper root system that is less sensitive to heat and water stress.

Overwatering: Roots need to breathe. In other words, they must have oxygen in order to survive. Be careful to not water so heavily that the soil remains saturated. Water deeply but allow soil to dry somewhat between waterings.

For more information on soil testing in Shawnee County visit: <http://www.shawnee.k-state.edu/lawn-garden/soil-testing.html>