



Improve Soils Now for Better Growth Next Year

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Fall is often considered the optimal time for testing lawn and garden soils. Many garden chores have been completed, the vegetables mostly harvested, and the ground has yet to freeze. The Center often gets questions about which amendments should be added to a person's garden. Without a soil test, it is like someone asking what other ingredients should be added to their soup when we don't know what ingredients have already been put into it or what it tastes like.

Soil testing is an inexpensive way to find out if the soil's pH and nutrients are in the optimum range for the kind of plant one desires to grow. A standard nutrient analysis at the UConn Soil Nutrient Analysis Lab (www.soiltest.uconn.edu) costs \$12 and measures pH, major plant nutrients, trace elements and includes a lead scan. As long as the lab knows what you are growing, limestone and fertilizer recommendations, if necessary, are made.

Soil pH is of particular importance as it is a key determiner of what nutrients are available to plants. It does this by affecting their solubility in water. Keep in mind that plants take up most of their nutrients through their roots. The nutrients that are either naturally occurring or added as fertilizer are dissolved in the water in the soil that the plant roots take up.

If the pH is too low, elements like manganese, which is necessary for plant growth in tiny amounts, and aluminum, which is detrimental to plant growth are more abundant in the soil water and may be harmful to plants. If the soil pH is too high, phosphorus, which is an essential macronutrient, becomes insoluble and is unavailable to plants. Different species of plants have differing preferred pH ranges. If your soil pH needs to be changed, either limestone will be recommended to raise it or sulfur to lower it.

A chart accompanies soil nutrient values on your test result. Aim for the nutrients to be in the optimal range. Fertilizer recommendations will be made accordingly. Since plants are not actively growing as the season draws to a close, just add limestone or sulfur now, if recommended and hold off fertilizing until the spring before planting or as new growth starts.

Quite often the nutrients in backyard vegetable gardens are above optimum. This can be due to overapplying either synthetic or natural fertilizers, or by overapplying amendments like composts and manures. Both of these amendments contain variable amounts of plant nutrients.

As a general rule of thumb, only ½ inch of a high nutrient amendment such as manure or a manure-based compost should be added to the garden each year. Once the nutrients reach the above optimum category, stop adding manures and manure-based composts. Up to 2 inches of a low nutrient amendment such as leaf mold or leaf-based compost can be added to garden soils each year. But again, if the nutrients reach above optimum levels, refrain from adding more of these amendments.

Not only do amendments such as composts, organic mulches, and manures add nutrients, but they also add vital organic matter to the soil. Without organic matter, the soil would not be a living, dynamic ecosystem capable of sustaining plant and microbial life.

Organic matter supplies microbes, the lifeblood of the soil, with food and energy. It increases the amount of water and nutrients a soil can hold. As microbes decompose organic materials, necessary plant nutrients are released as are sticky exudates which bind together bits of mineral soil separates into natural aggregates. Better soil aggregation leads to better aeration as well as better drainage and soils less prone to compaction. Aim for your soil organic matter percent to be between 4 and 8 for most plants.

Compacted soils and shaded lawn areas are two common complaints the soil lab receives. Many plants, but especially turf grasses, are unable to thrive unless they receive a minimum of 4 hours of direct sun each day. Even ‘shade tolerant’ species like fescues require this minimum exposure. Consider removing some of the bottom limbs of trees to let in more light or replace the turf with mulch or shade tolerant ground covers.

Soils that are compacted need to be physically loosened. To test for compaction, thrust a long screwdriver or piece of sturdy wire the width of a coat hanger into the ground. If penetration is difficult, your soil is likely compacted. Think about activities that occur in that area. Repetitive walking, playing, driving or other activities can easily cause the soil to become compacted and perhaps can be relegated to other spots.

Soils can be loosened manually with pitch forks or the area can be tilled. Consider making permanent pathways for heavily traveled areas. Using organic fertilizers and topdressing with compost will, over time, increase the amount of organic matter in the soil and promote aggregates more tolerant of overuse.

Take care of your soils and they will support healthy plant growth. For questions about soil improvements or for questions on other gardening topics, feel free to contact us, toll-free, at the UConn Home & Garden Education Center at (877) 486-6271, visit our website at www.ladybug.uconn.edu or contact your local Cooperative Extension center.