

MESSENGER-INQUIRER

	University of Kentucky College of Agriculture, Food and Environment <i>Cooperative Extension Service</i>
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Soil Testing Protects the Environment and Provides Needed Plant Nutrients

What fertilizer do I need for my plants in the garden? Do I need to add lime? These are common gardening questions. Testing the soil test is the best way to determine what is available for plants in the soil. For plants to grow properly, their roots need to take up nitrogen, phosphorus, and potassium. A soil test determines the amount of phosphorus and potassium in the soil as well as the pH of the soil.

Soil testing is important because excess or improperly applied fertilizer can end up in storm sewers and contribute to nutrient pollution in waterways. Excess phosphorus promotes rapid and abundant algae growth in freshwater. Too much algae disrupts ecosystems, harms wildlife, negatively impacts water recreation, and may contain toxins that sicken people and pets. Over-fertilizing or over-liming lawns and gardens can cause problems with plants and contaminate surface water. Testing the soil saves time in applying the materials, money, and the environment.

The soil test does not determine the nitrogen level. Plants need nitrogen to grow. The amount of nitrogen applied is determined by the plant or crop. The amount needed is reported on

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the soil test. The timing of application depends on the plant, so check before fertilizing. Lawns are best fertilized in the fall.

Phosphorus is essential for seed and fruit formation and root growth. The soil test, as well as the fertilizer bag, refers to phosphorus as P_2O_5 . The University of Kentucky soil test results refer to phosphorus as phosphate.

Potassium, also mentioned as potash, is essential for root development and plant growth. The soil test result and fertilizer bag use K_2O when referring to potassium.

The soil test determines pH of the soil. The pH indicates the degree of acidity or alkalinity of the soil. It is important because pH affects the availability of nutrients to plants.

The pH scale ranges from 0 to 14. A pH of 7 is neutral. Values below 7 make up the acidic range of the scale, and values above 7 make up the alkaline range. The pH scale is not a linear scale but a logarithmic scale. Soil with a pH of 8.5 is ten times more alkaline than soil with a pH of 7.5, and soil with a pH of 4.5 is ten times more acidic than soil with a pH of 5.5. Many plants will grow at pH levels of 6.0 to 7.0. Acid-loving plants, such as azaleas and rhododendrons, prefer a pH of 4.5 to 5.0. The pH is used to determine if lime should be applied to increase the pH of the soil or if sulfur should be applied to decrease the soil pH.

To collect soil for the test, the number of samples that should be tested from a lawn depends on your yard. If the soil in the front yard is different from the back, then two samples should be tested. Sample problem areas, areas from shrubs, flower beds, or vegetable gardens separate from the lawn.

When collecting a soil sample from the lawn, take a garden trowel and insert it 4 inches into the soil. Remove a trowel full of soil and set it aside on a sheet of newspaper so it will be easy to place back into the hole. Then go to the back of the hole and make a slice of soil about 1

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inch thick and 4 inches deep. Place it into a plastic container or reuse a plastic bag. Repeat these steps in 8 to 10 locations in your yard. Taking soil from different locations provides a representative sample test from the lawn.

Next, remove the thatch and aboveground parts of the grass from the container. Mix all the soil in the container together and crumble big clods. If the soil is wet, place it on newspaper to air dry for one or two days somewhere it will not be contaminated by foreign materials. Then take two cups of soil to the County Cooperative Extension Service Office. In Daviess County, the soil tests are free to residents due to a grant from the Daviess County Soil Conservation District. Tests will be completed in about ten working days.

To collect a soil sample from the vegetable garden, flower bed, or shrub area, repeat the steps listed for the lawn, except push the trowel down to a depth of 6 inches. Vegetables and other plants have deeper root systems than grass. Collect soil from 8 to 10 locations within the garden.

The soil test result comes back with the amount of nitrogen, phosphorus, and potassium needed. It also indicates if the pH needs to be changed by applying lime or sulfur.

When looking for the fertilizer, find the label on a bag of fertilizer with three numbers separated by hyphens. The numbers represent the amount of nitrogen, phosphorous, and potassium, respectively, contained in the bag on a percentage basis by weight. A bag of 10-10-10 fertilizer contains 10 percent nitrogen, 10 percent phosphorus, and 10 percent potassium. The remaining 70 percent is filler used to spread the fertilizer evenly.

The soil in your lawn and garden should be tested every three to four years. For more information, contact the Daviess County Cooperative Extension Service at 270-685-8480 or annette.heisdorffer@uky.edu.

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Annette's Tip:

As vegetables are finished producing in the garden, destroy or remove the plants to slow down the development of disease and to prevent insects from overwintering in the debris.

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