



SOIL TESTING

How to take a Soil Sample

Soil tests will help you develop and maintain a more productive soil by providing information about the fertility of your soil. Information from a soil test will help you select the proper liming and fertilization program to obtain optimal growth of lawn, garden and ornamental plants.

One of the most important steps in soil testing is collecting the sample. Soil test results can be no better than the sample submitted to the laboratory for analysis. A soil sample weighing about 1 pound is used to represent thousands of pounds of soil in the landscape or garden. Therefore, it is extremely important that soil samples be properly and carefully taken.

Soil sample kits can be obtained from the University of Delaware Soil Testing Program, Department of Plant and Soil Science, at (302) 831-1392. Soil sample bags and other pertinent information are also available at your county Cooperative Extension Office.

Each soil sample should represent only one soil condition.

- Areas that have been treated differently should be sampled separately. Four samples should be taken; one each from the garden, the lawn, the ornamental shrubs in the landscape, and the azaleas. If the front and back lawns have been treated differently or if they are seeded with different grasses, take a separate sample from each.
- Take soil from a minimum of 10 random locations and mix together in a clean bucket.
- Areas where plants grow differently and/or the soil appears different should be sampled separately.
- Use clean sampling tools and containers.
- Never use tools or containers that have been used for mixing or applying fertilizer or limestone. A small amount of residue on containers can cause serious contamination of the sample.
- Remove any surface litter such as turf thatch or mulch.

For lawns, sample to a depth of 4 inches.

- Use a trowel or sample tube to collect soil samples. To use a trowel or spade, push the tool to the desired depth into the soil. Then push the handle forward, with the trowel or spade still in the soil, to make a wide opening. Cut a thin slice from the side of the opening that is of uniform thickness - about 1/4 inch thick and 2 inches wide, extending from the top of the ground to the depth of the cut. Scrape away any grass thatch or mulch, and place the slice of soil into a clean bucket or other container. After the soil is taken, remove the shovel or spade and let the soil fall back in place.

Soil samples should be carefully mixed and packaged.

- All cores taken for a given sample should be collected in a clean bucket and **thoroughly mixed**.
- Fill the soil sample bag to the indicated line with the mixed soil.
- Supply all the information asked for on the soil sample bag.

When should soils be tested?

- Soils can be tested any time during the year; however, be sure to sample well before planting or spring green-up. This is particularly important in areas where it is likely that lime will be needed. Lime reacts slowly and should be mixed with the soil several weeks before planting. Generally fall is the best time to sample soils, because landscapes and gardens are usually dry enough to till when sampling. If wet samples are collected, they should be air dried before being placed in the soil sample bag.

How often should soils be tested?

Use the results of your soil test to determine how much lime and fertilizer your soil needs. Retest the soil the next year. Continue annual testing until results show medium or high fertility levels - after that, lawn and ornamental areas need to be sampled only every two to three years.

Contact Information

University of Delaware Cooperative Extension

New Castle County

(302) 831-2506

Kent County

(302) 730-4000

Sussex County

(302) 856-7303

New Castle Conservation District

(302) 832-3100

Kent Conservation District

(302) 697-2600

Sussex Conservation District

(302) 856-3990

Credits

Center for the Inland Bays

Delaware Non Point Source Program

Delaware Nutrient Management Commission

Delaware Department of Agriculture

Delaware Department of Natural Resources and Environmental Control

Delaware Tributary Action Teams

University of Delaware

Delaware Nutrient Management Commission

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Managing Nutrients for your Turf Grass and Lawns



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Delaware Nutrient Management Act

What is Nutrient Management?

The overall goal of the Delaware Nutrient Management Act is to protect and improve water quality while maintaining profitable industries affected by nutrient management. Many areas of the state consist of relatively small lawns in urban and suburban areas, and fertilizing those lawns can have a significant cumulative impact. The information in this pamphlet is primarily for people who may not be directly affected by the Nutrient Management Act, but whose activities can have a great affect on water quality in the state of Delaware.

Why is Nutrient Management on lawns important?

Improving the management of nutrients applied to lawns is important because:

- Properly fertilized lawns will have minimal losses of nutrients. Applying more nutrients than plants can use may result in those nutrients being washed off the lawn into storm sewers, and eventually into surface waters. This is called “nonpoint-source pollution,” because it does not come from one specific source, such as a pipe from a sewage treatment plant. Nonpoint-source pollution contributes to water quality problems in many local streams, ponds and lakes that drain into our surrounding bays.
- Properly fertilized lawns will exhibit healthy root growth. By concentrating fertilization in the fall, you help promote root growth that improves lawn health.
- Properly fertilized lawns will require fewer pesticides. Healthy plants that have not been stressed by overfertilization are better able to resist attacks by insects and diseases.

How Nutrient Management Affects the Environment

Many of today’s water-quality problems are caused by human activities on the land. By becoming aware of how our actions affect the environment, we can reduce pollution.

Take a minute to think about water and how it cycles. All the water on earth exists in different forms and different places - in the atmosphere; in icebergs; in oceans, lakes and ponds; in plants and animals; and in our soil. Water falls as rain, which either runs off hard surfaces or soaks into the porous soil. The water that runs off usually enters a body of water. The water that soaks into the soil becomes ground water. Ground water feeds our lawns, crops and trees, and we can draw it up through wells for our personal use. It all gradually seeps into our bays, rivers and other waterways. As you can see, this water cycle will wash pollutants from our land into our waterways and water supply.

Ground water and open waterways can be polluted by nutrients that come from excess lawn fertilizer. While nutrients are good for plants and grass in proper amounts, applying too much fertilizer will result in a surplus that inevitably follows the flow of ground water. The main nutrients that contribute to water pollution are nitrogen and phosphorus.

Nitrogen (usually in the form of nitrate) is the nutrient that produces the greatest growth response in plants. But if we put too much nitrate fertilizer on our lawns and landscaping, the excess nitrogen not taken up by plants will leach downward, entering the ground water supply that we use for drinking water. Nitrate contamination is most commonly caused by pet wastes, improperly designed or improperly installed septic tanks and overapplication of nitrogen fertilizers. Sandy, coarse soils common in southern Delaware are most susceptible

to nitrate pollution, because they drain polluted ground water so freely.

Phosphorus is an important nutrient necessary for plant growth. But when an excess washes into our lakes and ponds, it causes rampant algae and weed growth. The overabundance of decaying algae depletes the water’s oxygen supply, which can kill fish and desirable vegetation.

Each of us contributes to this serious environmental impact. Although nature has the ability to reduce the effect of some of our activities, we have to do what we can to eliminate the pollution we cause.

Common Lawn Care Mistakes

- Overapplication of fertilizers
- Too much or too little irrigation
- Improper mowing

General Fertilizer Tips

Follow these practices to help avoid nitrate and phosphate pollution of our surface and ground water.

- Keep fertilizer off sidewalks and driveways, where it can easily wash into storm drains and gutters. Sweep up any spillage.
- Avoid overwatering - this will prevent water and nutrients from seeping below the root zone, and it will keep excess water from running off the surface into drains, gutters and streams.
- Never apply more fertilizer than is recommended. Just because a little is good, more is **not** better.
- Apply the amount of nitrogen needed, at the optimum time.
- Use slow-release fertilizer during slow plant growth to provide nitrogen more gradually.
- Avoid late spring and summer fertilization except for application schedules that “spoon feed” nutrients throughout the growth season. Excess nutrients promote lush growth that makes it susceptible to disease, insects and drought.

- Never apply fertilizer to frozen ground.
- Remove plant debris, which contains phosphorus, from streets, gutters, sidewalks and driveways as quickly as possible so it does not run off with surface water. Use the debris as compost or mulch.
- Test your soil to determine the pH and fertilizer needs of your lawn. The ideal pH for turf is between 6.0 and 7.0. Delaware soils tends to be acidic, so regular applications of lime are often necessary.
- Control weeds in your lawn. Weeds reduce the quality of the turf and compete with desirable turf species for precious water.
- Cut the lawn no shorter than 2-1/2 to 3 inches during the summer. This mowing height is less stressful to turf than closer mowing, and longer turf shades the ground, conserving water. Don’t cut more than 1/3 of the grass length or plant health will decline.

When watering the lawn, use a slow watering technique, such as trickle irrigation or soaker hoses. Trickle irrigation is 90 percent efficient compared to sprinklers which are only 70 percent efficient.

If you use sprinklers, be sure to place them so you do not water sidewalks, driveways and streets. Avoid watering on windy days. Set an alarm to remind you to turn off sprinklers when you have applied enough water.

The best way to reduce lawn watering needs is to maintain a healthy, vigorous lawn. Healthy turf will bounce back from a summer drought with few, if any, problems.

The lawn is an important part of the landscape. It can provide a wonderful play surface, a carpet for trees and shrubs and can serve as the unifying feature for the entire property. In addition, the lawn controls soil erosion, moderates summer heat and acts as a filter for rainwater from roofs, downspouts and driveways. If managed properly, a lawn can be a successful component of water conservation and nutrient management.