




Fertilizing

Ample nutrients are vital to growing healthy plants, but did you know that *too much* fertilizer can make plants vulnerable to pests, diseases, drought, and winter damage? Excess fertilizer use can also pollute local lakes and streams. Proper fertilizing keeps plants healthy, reduces lawn and garden maintenance, and protects clean water for fish and people. The keys to feeding plants what they need for healthy growth are:

-  **Fertilize moderately, based on plant needs.**
-  **Use natural organic or slow-release fertilizers that don't wash into streams.**
-  **Test soil for annuals and lawns every few years to find out if fertilizer and lime are needed.**

Fertilize Moderately Based on Plant Needs

Vegetables and annual flowers need regular fertilization for optimal growth, but most established trees and shrubs thrive with just the nutrients in the soil and mulches. Lawns on good soil can thrive with just the free nutrients from mulch mowing.

The nutrients available in any soil—and from added fertilizers—depends on whether it is sand or clay, the amount of decaying plant and animal wastes present, acidity, and other factors.




Sending a sample of your soil in for tests by a professional laboratory can help you to adjust fertilizer rates for these factors, but the amounts listed in the chart on the following page provide useful guidelines.




Use Natural Organic or Slow-Release Fertilizers


Much of the nutrients in quick-release fertilizers may be washed out of soil by rain or irrigation—wasting money and contaminating streams, lakes, or groundwater. Slow-release and natural organic fertilizers gradually discharge nutrients, providing plants a steady supply for healthy growth. Slow-release fertilizers may cost more than quick forms, but can be a better value since more of the nutrients actually feed plants and they do not need to be applied as often.

Quick Guide to Responsible Fertilizing


	Lawns	Annual Gardens	Trees and Shrubs
When?	September best, May if needed.	At planting. A few weeks after planting, especially in cool weather. As needed for repeat flowering or harvesting.	At planting, based on soil test. In spring if plants are stunted or show signs of need.
Best Fertilizer	Lawn fertilizers with 3-0-2 ratio (eg. 6-0-4, 18-0-12).* Lime every 2-4 years; based on soil test. Do not use "Weed and Feed" type products. Spot spray weeds that cannot be pulled.	Balanced fertilizers such as 10-10-10 or Alfalfa Meal (3-2-2). Liquid fertilizers like fish emulsion to spur growth in cool conditions. Lime in sandy soil every 2 years; in clay soil every 3 years.	Mulch and compost amendment at planting often provides adequate nutrients. Any added fertilizer should be based on testing. Fruit trees may benefit from extra fertilizer, though compost and mulch should supply enough.
(shown, left to right): lawn spreader; scratched along rows; spread on surface.			
How to Apply	Calibrated lawn fertilizer spreader. Leave clippings on lawn to recycle nutrients.	Mix into soil before transplanting or seeding. Scratch into soil along plant rows. Apply liquid fertilizer to soil around plants.	Mix with soil used to fill planting holes. Scratch into soil under branch tips, or spread on surface and cover with mulch.
How Much?	One-half to one pound of nitrogen each application per 1000 sq ft.	Follow product label or soil test results.	Follow soil test results.


Look for the words "natural organic" or "slow-release" on the fertilizer bag.

 **Natural organic fertilizers** include minerals like rock phosphate, crop residues such as alfalfa and cottonseed meals, and animal wastes like poultry manure and fish meal. Most nutrients in these fertilizers must be digested by bacteria before plants can use them. They are slowly released at variable rates when warm soil stimulates bacterial activity, and growing plants need them.

 **Slow-release fertilizers** such as sulfur coated urea contain non-organic, quick-release nutrients encased in protective coatings that must be dissolved

by water to release the nutrients over a period of weeks or months.

 **Quick-release fertilizers** (also called "water-soluble") like urea and ammonium sulfate are derived from natural gas. They quickly dissolve in water and are often washed out of the soil by rain or irrigation before they can be used by plants. These wasted nutrients end up polluting local streams and lakes.

 **Avoid fertilizer-pesticide combination products.** Fertilizers and mulches combined with weed or insect killers are not recommended.

*To protect water quality, Washington law prohibits application of phosphorus-containing fertilizers to lawns without a soil test within the last 3 years showing phosphorus deficiency. Choose fertilizer with N-P-K ratio like x-0-x. Fertilizers used for newly planted lawns are exempted from this ban.



Test Soil to Find Out How Much Fertilizer is Needed

Soil tests help to make sure you use only the fertilizers plants need and can help diagnose plant growth problems. Regular use of fertilizers does not guarantee healthy plants. Many plant problems are unrelated to nutrient needs, and sometimes nutrients are adequate but plants cannot use them due to imbalances. Annual soil testing is *not necessary* in most home gardens. However, it is useful to test before planting new garden areas, and to retest annual gardens and lawns every few years to ensure efficient fertilization.

Who: Send soil samples to a laboratory familiar with local soils. Lists of certified test services are available from the King Conservation District, the Garden Hotline, and the WSU King County Extension (see the Resources listings on back). Call or check out the laboratory website before sending a sample to make sure you provide enough soil and use their forms for specifying test packages.

When to test: Test the soil in spring or summer—as close as possible to planned fertilization or liming. Test after making large compost applications, to take account of the nutrients added.

Where to check: Conduct separate tests for areas with different soil textures (sand, clay or silt), or persistent plant problems. Get recommendations for each planting type separately: lawn, annual garden, perennials, fruits, deciduous trees and shrubs, and evergreens.

How to gather samples: Each sample should be a mix of soil from several spots within the garden area to be tested.

- Dig an 8-10 inch deep hole in each spot. Shave a 1 inch thick slice of soil from the side of each hole for the sample. In lawn areas, remove grass and surface root mat or thatch buildup from the slices. In planting beds, remove any mulch layer.
- Mix the samples from each hole together in a clean bucket.
- Put 2 cups (or more if lab requires) of the mix into a plastic bag labeled with your name and address, and the type of plants to be grown in the area.

WHAT DO THOSE NUMBERS MEAN?

Soil test reports typically recommend how many pounds of a *nutrient* (Nitrogen, Phosphorous, etc.) is needed per 100 or 1000 square feet—but how do you know how much *fertilizer* to apply?

Example: The following example shows how to figure out how many pounds of a fertilizer are needed to supply a recommended amount of nutrient.

Recommendation: Apply 2 pounds of nitrogen per 1,000 square feet.

Fertilizer: "10-0-6" Organic Lawn Fertilizer

Determine the Product Nutrient Content: The three numbers on front of the fertilizer package shown below indicate it contains 10% Nitrogen, 0% Phosphorous and 6% Potassium. To calculate how many pounds of fertilizer are needed to supply one pound of nitrogen: Divide the percentage of the nutrient in the fertilizer into 100. For example $100 / 10 = 10$ pounds of fertilizer needed to supply 1 pound of nitrogen.

Calculate how many pounds to use: Multiply this answer by 2 to determine that you need 20 pounds of fertilizer per 1,000 feet to supply 2 pounds of nitrogen.





WHAT ABOUT HOME GARDEN TEST KITS?

There are many kits available to test soil for major nutrients and acidity. These kits are interesting for monitoring nutrient changes, but provide an incomplete picture of a complex system. Professional laboratories should be used to evaluate soil before planting new gardens, manage large areas, or solve persistent plant problems.

What to Test For: Many soil labs offer inexpensive "home garden" packages that include all the tests needed to recommend amendments and fertilizers. At a minimum, tests should include:

Soil texture: The mix of sand, silt, and clay affects fertilization need and frequency.

pH (acidity): Soil acidity affects nutrient availability and need for limestone.

Major Nutrients: Nitrogen, phosphorous, potassium, calcium, and magnesium are the most important plant nutrients. Some labs include sodium or sulfur.

Minor Nutrients: Elements plants need in smaller amounts such as boron, iron, and manganese.

Organic Matter: Amount of decomposing plant and animal waste in soil affects nutrient availability and beneficial soil life.

RESOURCES

Bellevue's Natural Lawn and Garden website

www.bellevuewa.gov/naturalyardcare.htm

Bellevue's Natural Gardening Guides

Composting Food Scraps • Composting Yard Trimmings • Drip and Soak • Fertilizer • Garden Design • Lawn Alternatives • Lawns • Mulch • Pests, Weeds, and Diseases • Plant Right • Seasonal Calendar • Soil • Watering

For copies, visit Bellevue's Natural Lawn and Garden website (above) or call Bellevue Utilities at 425-452-6932.

WSU King County Extension Gardening Factsheet #6—Soil Testing and Soil Improvements

<http://extension.wsu.edu/king/gardening/fact-sheets/numerical>

King Conservation District—Soil Testing Service

www.kingcd.org or 425-282-1905

The Garden Hotline

www.gardenhotline.org or 206-633-0224

Natural Yard Care Neighborhoods

www.naturalyardcare.info

Grow Smart, Grow Safe

www.growsmartgrowsafe.org

Heavy Metals: Urban soils and old fruit orchards can contain unhealthy levels of lead, cadmium, and arsenic that need to be removed or covered with clean soil to be safe for growing food.

Fertilizer and Lime Recommendations: Most labs include fertilizer recommendations for one planting type per test. Be sure to specify plant type and if you only want to use organic fertilizers.

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