

THE NATURAL LAWN & GARDEN
Healthy Landscapes for a Healthy Environment

Growing Healthy Soil





Soil is alive! Billions of soil organisms create soil structure that allows air, water and plant roots into the soil, while recycling nutrients, storing water and protecting plants from disease. Those organisms live on organic matter such as dead leaves and stems, mulch and compost.

HEALTHY SOIL—AN INVESTMENT IN YOUR GARDEN

Simply improving your soil can beautify your garden, save water, improve water quality for lakes and streams, and even reduce lawn and garden maintenance. Healthy soils grow healthy plants.

Growing healthy soil—and a healthy garden—is as easy as adding compost. In fact, this is the single most important thing you can do for your garden.

Compost is the dark, earthy material naturally produced by decaying plants and animal wastes. This mix of living and dead organic matter supports an intricate web of soil life, which in turn keeps your soil loose, moisture-holding, fertile and well-drained. See the *Composting at Home* guide for more information.*

Follow these basic steps to grow healthy soil. This guide provides details for how.

- 1 Get to know your soil.**
Dig in and take a look for thatch, compaction or other soil problems you can fix.
- 2 Add compost.**
Dig or till 2 to 3 inches of compost into the soil when planting new garden beds or lawns. Every 2 to 3 years, spread another 1 inch on garden beds or ½ inch on lawns.
- 3 Use mulch.**
Spread 2 to 3 inches of fall leaves or grass clippings on beds in spring or fall. For woody plants and trees, use wood chips or coarse bark as mulch.
- 4 Fertilize responsibly.**
Trees and shrubs can get the nutrients they need from compost and mulch. For lawns, flowers and gardens, look for the words “Natural organic” or “Slow-release” on fertilizer products to feed plants slowly, develop healthier roots and reduce runoff to our streams and lakes.

*Refer to the back cover for a list of all Natural Lawn & Garden guides and how to obtain them.

COMPOST WORKS!

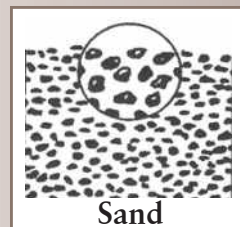
- ◆ Recycles yard and food waste, keeping it out of landfills.
- ◆ Builds the soil, removing carbon dioxide from the atmosphere and storing it as organic matter.
- ◆ Reduces the need for chemical fertilizers and pesticides in the garden.

STEP 1: GET TO KNOW YOUR SOIL

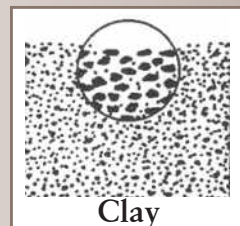
WHAT'S IN YOUR SOIL?

Soil is made up of minerals, air and water, and organic matter. The combination of these determines how healthy your plants are. And your garden may have different soils in different areas.

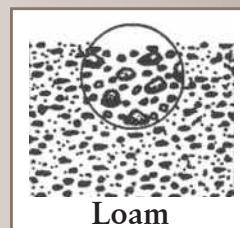
- ◆ **Mineral particles** (the “dirt”) come in different sizes.
 - Tiny clay or silt particles pack tightly; they can hold a lot of nutrients, but it’s hard for air and water to penetrate.
 - Larger sand particles let air and water in, but can’t hold much water or nutrients for plants.
- ◆ **Air and water:** about half the volume of a healthy soil is pore spaces made by soil life that provide aeration, water-holding capacity and room for roots to grow.
- ◆ **Organic matter** is all the billions of soil organisms plus the dead decaying plant matter that supports them. This soil life and organic matter create soil structure, hold moisture, protect plants from disease, and store and recycle nutrients for healthy plant growth.



Sand



Clay



Loam

FIXING SOIL PROBLEMS—DIG IN AND TAKE A LOOK!

If plants aren’t growing well, the problem is often in the soil. Slice and lift a shovel-width of soil to find these common problems, and solutions below.

- ◆ **Light-colored sandy or gravelly soil:** Indicates low organic content.

Fix: Mix 3 inches of compost into the upper 6 to 8 inches of the soil before planting new beds or new lawns. On existing lawns, aerate and rake in ½ inch of compost. Cover bare soils around existing trees and perennials with 1 to 2 inches of compost—the worms will work it into the soil.
- ◆ **Gray, sticky soil:** Indicates clay.

Fix: The same compost applications will “open up” clay soils so air and water can enter. Use a little less compost when amending clay soils—about 2 inches of compost mixed into the upper 6 to 8 inches of soil.
- ◆ **Yellow, gray, blue, or black heavy soil, sometimes bad-smelling:** Indicates poor drainage due to tiny particle size. Air cannot enter.

Fix: These saturated soils may require installation of subsurface drainage. Or you can change to plantings that don’t mind “wet feet.” See *The Plant List* guide for suggestions.* Build up raised planting beds for plants that need better drainage.
- ◆ **Hard, compacted soil:** This common garden problem may be caused by low organic matter (add compost), heavy traffic, or overuse of chemicals like “weed and feed.”

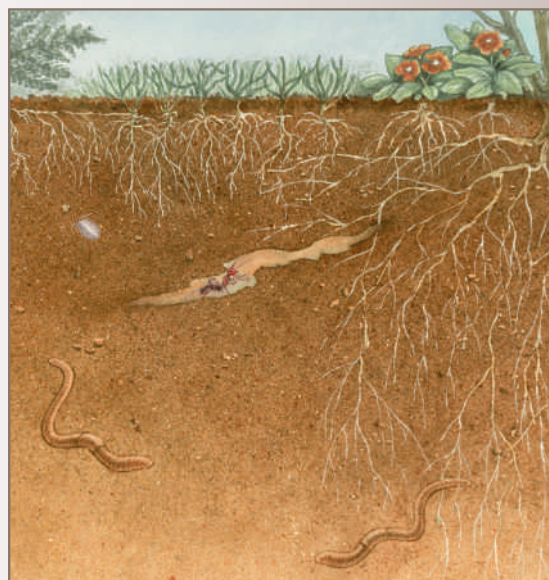
Fix: Aerate and/or till in compost.

- ◆ **Few worms or other soil creatures:** This can be a result of overuse of pesticides and soluble fertilizers.

Fix: Reducing chemical use and adding compost will bring soil back to life.
- ◆ **Thatch in lawn:** Thatch is the build up of more than ½ inch of brown, fibrous, old turf stems. It may be caused by overwatering, over-fertilizing and incorrect mowing height.

Fix: Aeration or dethatching and changing practices will reduce thatch build up.
- ◆ **Shallow lawn roots:** Lawns with less than 3-inch deep roots are caused by watering too frequently and soil compaction.

Fix: Aerate, then topdress with compost. Encourage deeper root growth by watering deeply but less frequently. See the *Natural Lawn Care* guide for details.*



HOW DO I KNOW GOOD COMPOST?

Poor quality compost can introduce weeds to a planting bed, and make nutrients unavailable to plants while it finishes decomposing.

Good compost has:

- ◆ Sweet, earthy smell.
- ◆ Dark brown or black color.
- ◆ Fibrous texture (like peat).
- ◆ No weed sprouts.



COMPOST AND MULCH CALCULATOR

How much do you need?
The answer is just a few clicks away.

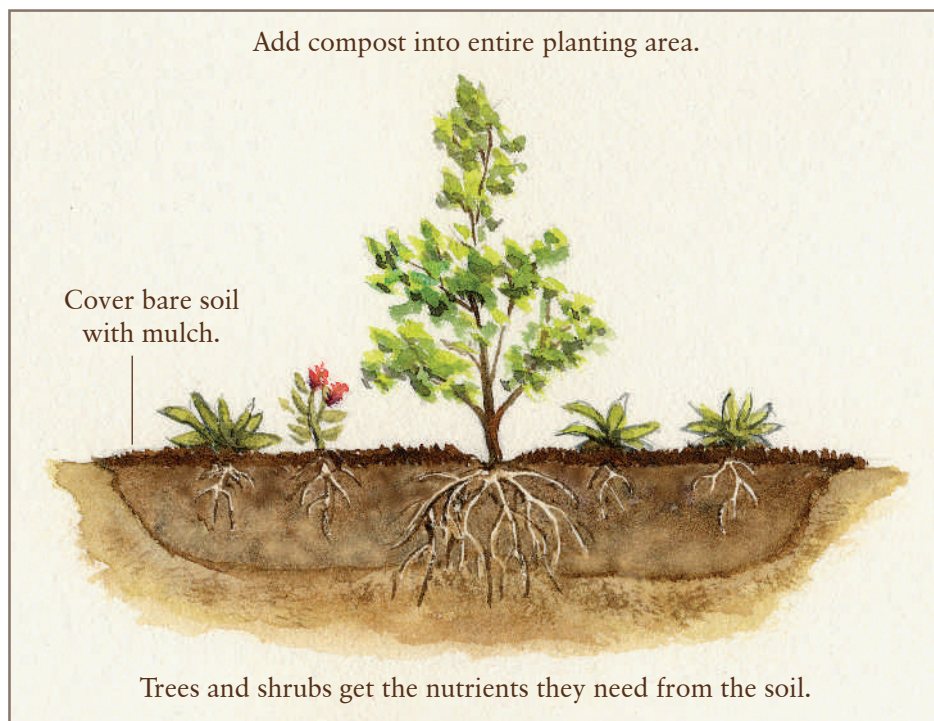
- ◆ Visit savingwater.org and search for “Compost and Mulch Calculator.”
- ◆ Then enter how thick a layer you need to add and the area it needs to cover.
- ◆ Select “calculate” and it immediately shows how much you will need to purchase—and even calculates it by bag volume as well as by bulk.

STEP 2: FEED YOUR SOIL WITH COMPOST

The best way to improve any soil is to add compost. Before you plant new garden beds or lawns, mix the compost into the soil. If your lawn or garden beds are already established, mulch them by applying a thin layer over the top and letting the soil microbes and worms do the rototilling for you.

Dig or rototill compost into the soil before planting new garden beds or lawns.

- ◆ Loosen soil at least 10 to 12 inches deep throughout new planting beds, and 6 to 8 inches deep in new lawn areas. Use a shovel or digging fork, or a rototiller for large areas. Try a pick or mattock to break through compacted layers.
- ◆ Thoroughly mix compost into the loosened soil.
 - Lawns: mix 1 to 2 inches of compost into the top 6 inches of soil.
 - Garden beds: mix 2 to 3 inches of compost 8 to 12 inches deep.
 - Use 1 to 2 inches for clay soils. Use 3 inches to improve sandy soils.
 - Amend the whole bed, not just planting holes.
- ◆ For additional planting instructions, see the *Choosing the Right Plants* and *Natural Lawn Care* guides.*



- 1 **Dig** compost into the soil in the entire planting area rather than in individual holes. As in a forest soil, organic matter should be most concentrated near the surface.
- 2 **Mulch** the entire area, keeping mulch away from the crown of trees and shrubs.
- 3 **Fertilize** established trees and shrubs **only** if they are stunted or show signs of need.

STEP 3: MULCH YOUR PLANTINGS

Mulch is any organic material spread on the surface to conserve water and control weeds. It also slowly feeds the soil and helps prevent soil erosion. Different mulches work better for different plants. View samples on page 7.

Spread the mulch over the entire area, covering up all bare soil. Worms and microbes in the soil do the decomposing and rototilling for you!

MULCHING TIPS

- ◆ Remove weeds before spreading mulch.
- ◆ Keep mulch at least an inch away from plant stems.
- ◆ Apply in early summer or in fall.
- ◆ Re-apply annually or as needed to keep soils covered.

GARDEN AREA	DEPTH TO APPLY	MULCH CHOICES
Flower beds and vegetable gardens	1 to 3 inches	— Fall leaves — Compost — Straw — Aged barnyard manure* — Grass clippings (up to 1 inch deep)
Trees, shrubs and perennials	2 to 4 inches	— Wood chips — Fall leaves — Coarse bark (fine bark can plug the soil)**
Lawn	Mulch mow (leave the clippings). Improve your lawn by taking these steps in spring or fall: aerate, overseed and then rake in 1/4 inch to 1/2 inch of compost. See the <i>Natural Lawn Care</i> guide for step-by-step details.*	

* Fresh and/or incompletely composted manure should never be used as it contains harmful bacteria.

** Fine bark can cause water to run off instead of soak through to the soil below.

WHERE TO BUY COMPOST AND MULCH

- ◆ **Compost** is available in bulk or bags. Check your local nursery, home improvement store, or conduct an online search for local suppliers.
- ◆ **Arborist wood chips** are often free from tree services. Inquire from your local arborist or visit chipdrop.in to learn how to receive a load.
- ◆ **Straw bales** are available at local farm supply stores.
- ◆ **Grass clippings** from your yard can be used as long as it is free of weed-and-feed or other herbicides.

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SHEET MULCHING

“Sheet mulching” is a way to convert lawn into planting beds. Instead of using herbicides, the process applies layers, or sheets, of organic material. As the material decomposes, it smothers the lawn below and turns it into healthy soil.

- ◆ **First**, mow the lawn short.
- ◆ **Next**, cover the area with overlapping layers of thick cardboard or several sheets of newspaper.
- ◆ **Then**, apply 2 to 3 inches of compost. (optional)
- ◆ **Finally**, cover the area with 3 to 4 inches of wood chips.

Wait 3 to 4 months, or longer, before planting. For each planting hole, pull aside the woodchips before digging each plant in. Then, rake wood chips back around each plant. See the *Choosing the Right Plants* guide for additional planting instructions.*



LAKE PROTECTION

Wood chips mulch should be used near and along lake shorelines. Since they break down slowly, wood chips help prevent nutrients from leaching into the water.

STEP 4: FERTILIZE RESPONSIBLY

START PLANTS RIGHT—WITH COMPOST

Overuse of chemical fertilizers can pollute our waterways and damage soil and plant health. The best start for all plants is to amend the soil with compost before planting. For planting instructions, see the *Choosing the Right Plants* guide.*

Trees, shrubs, and most perennials get all the nutrients they need from healthy soil and regular mulching with organic matter like compost, leaves, or wood chips. If plants aren't doing well, call the WSU Master Gardeners to diagnose the need—it may be a soil problem, disease or a particular nutrient need.

NEED A FERTILIZER? GO NATURAL!

Lawns, flowers and gardens sometimes need extra nutrients. Look for the words “Natural organic” or “Slow-release” on the fertilizer bag. These products are released slowly by soil organisms, feed plants longer, and are less likely to wash off into streams.

◆ Lawns

- Use a natural or slow release fertilizer with a 3-0-2 formula (3 parts nitrogen, 0 parts phosphorus, 2 parts potassium) or that same ratio of nutrients (6-0-4, 12-0-8 etc.).
- Fertilize lawns in the fall (September-October) at a rate of 1 lb. nitrogen per 1000 square feet of lawn.
- Apply lime in the fall or spring, but separately from when you fertilize.
- Grasscycling (mulch mowing) returns free nutrients every time you mow.

◆ Annuals and vegetable gardens

- Use a balanced “natural organic” fertilizer, such as 5-5-5 or 10-10-10 formula that contains other micro-nutrients as well.
- Add lime every few years.
- Get a soil test if plants aren't doing well to find out what nutrients are needed.

◆ Trees, shrubs, and perennials

- Organic mulches provide most nutrient needed by these plants. Refer to page 5 for details.

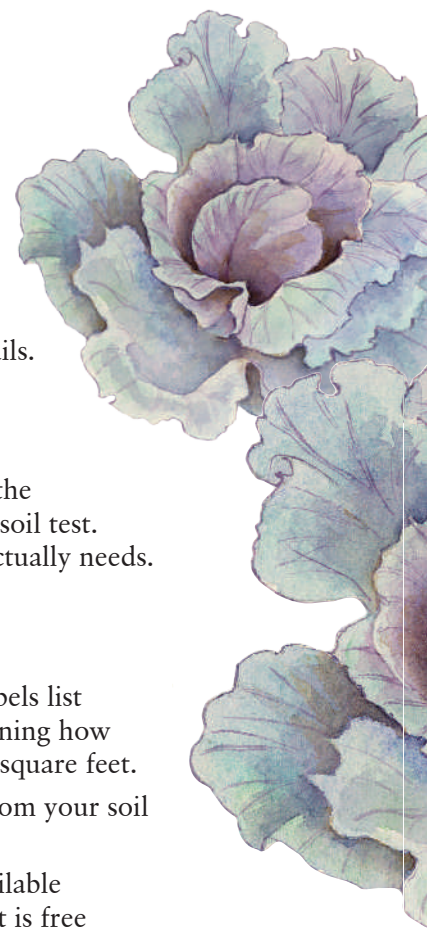
REALITY CHECK—GET A SOIL TEST

Using too much or the wrong fertilizer can damage plants and our streams and lakes. Contact the WSU Master Gardeners to diagnose plant problems and to find out how to get an inexpensive soil test. A soil test will tell you what's really in your soil and what nutrients your lawn or garden soil actually needs.

TIPS FOR CALCULATING FERTILIZER RATES

Soil tests recommend actual pounds of nutrients to apply per 1000 square feet, yet fertilizer labels list nutrient contents by percentages. There are many free and easy-to-use online tools for determining how much fertilizer is needed to supply your soil test's recommended amount of nutrient per 1000 square feet.

- ◆ Use your internet browser to search for “fertilizer rate calculator.” Then plug in numbers from your soil test and your fertilizer product's label.
- ◆ Your fertilizer label will have three numbers on the front, representing its percentage of available nitrogen, phosphorus and potassium. For example, if the middle number is “0,” the product is free of phosphorus.
- ◆ If you use soluble fertilizers, prevent nutrient runoff by applying only half of the suggested amount twice as often as recommended.
- ◆ To prevent pollution, avoid using any fertilizer near bodies of water.



LEAF MULCH



WOOD CHIP MULCH



COMPOST MULCH



RESOURCES

PROFESSIONAL ASSISTANCE

- ◆ WSU Master Gardener Hotline. Call (253) 798-7170 or email: pierce.mg@wsu.edu
- ◆ Your local nursery or landscape professional

WEBSITES

- ◆ Learn more about soil from the Smithsonian: visit forces.si.edu/soils/index.html
- ◆ Discover how to build healthy soils: visit soilsforsalmon.org
- ◆ View soil survey information for your location: visit websoilsurvey.nrcs.usda.gov/app/

BOOKS

- ◆ *Mulch It!* by Stu Campbell; Storey Books, 2001.
- ◆ *Start with the Soil: The Organic Gardener's Guide to Improving Soil for Higher Yields, More Beautiful Flowers, and a Healthy, Easy-Care Garden* by Grace Gershuny; Rodale Press, 1997.

*Refer to the back cover for a list of all Natural Lawn & Garden guides and how to obtain them.

Cover photo by Ian Edelstein; Interior photos by Richard Hartlage and Peggy Campbell; Illustrations by Wilda Boyd



TO REQUEST A NATURAL LAWN & GARDEN GUIDE, CONTACT:

- ◆ Tacoma-Pierce County Health Department
(253) 798-6500, tpchd.org/naturallyardcare
- ◆ Pierce County Public Works
(253) 798-2725, piercecountywa.org/naturallyardcare
- ◆ City of Tacoma Environmental Services
(253) 591-5000, friendlytacomayards.org
- ◆ WSU Pierce County Extension Master Gardeners
(253) 798-7170, ext100.wsu.edu/pierce/mg
Email: pierce.mg@wsu.edu

NATURAL LAWN & GARDEN GUIDES:

- ◆ Composting at Home
- ◆ Choosing the Right Plants
- ◆ Growing Healthy Soil
- ◆ Natural Lawn Care
- ◆ Natural Pest, Weed & Disease Control
- ◆ Natural Yard Care (summary)
- ◆ Smart Watering
- ◆ The Plant List

FOR ADDITIONAL INFORMATION, VISIT:
naturallyardcare.info



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Tacoma-Pierce County
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Healthy People in Healthy Communities

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