GET TO KNOW YOUR SOIL

Taking a soil core sample is like using a "periscope" to look down underneath the surface of the soil. You can use the T-handled core sampler shown here, or just take a slice with a trowel, knife or spade. It can help you diagnose soil problems, so you can select amendments and identify practices to fix those problems. It can also help you improve your watering practices. Healthy soil and wise water use will conserve resources, reduce the need for chemicals, and protect water quality for salmon. They also save you money and help you have a healthier lawn and garden that are easier to care for. So dig in, and take a look down under!

Taking a soil core sample

If you're using a spade or trowel, lift out a wedge-shaped slice for examination (just press it back into place afterwards). To use a soil core sampler as shown here, lean on the T-handle to push the core sampler down into the ground 3 to 6 inches. If the soil is dry or compacted you may need to twist from side to side as you push down. Lift up and the soil cross-section comes out in the tube. Sample a variety of locations, especially where conditions seem to change or you see problems in the lawn or garden.

Evaluating Soil Quality

Looking below the surface: problems and solutions

Look for these signs in the soil core, for clues to building better soil and better plant health:

Signs	Problem	Solution
Light-colored, loose, sandy or gravelly soil	Low organic content – indicates infertile soil; doesn't hold water well.	Thoroughly mix 2-4 inches of compost into upper 8-12 inches of soil. Mulch and topdress lawns.
Blue or gray clay soil (sticky when moist)	Heavy clay stays too wet in winter, repels water in summer, keeps air out.	Thoroughly mix 2-4" of compost into upper 8-12 inches of soil to "open up" clay soils.
Yellow, gray, blue or black soils, sometimes bad-smelling	Poor drainage, so soil stays saturated.	Install subsurface drainage. Or, change plantings to species that don't mind "wet feet". Build up raised planting areas for plants that need good drainage.
Hard, compacted soil (can't push soil core sampler in very far)	Compaction is caused by heavy traffic, low organic content, and sometimes overuse of chemicals.	Use a power aerator to loosen upper two inches in lawns to increase air and water infiltration. On gardens and more deeply compacted lawns, till in compost, then replant.
Few worms or other soil creatures	Heavy pesticide or fertilizer use can kill beneficial soil creatures. (Worms aerate soil and recycle nutrients)	Reduce chemical use. Mix compost into gardens or topdress lawns with ½ inch of compost to help restore life to soil. See Natural Lawn Care resources below.

Signs	Problem	Solution
More than ½ inch of brown fibrous "thatch" at soil surface in lawns	Thatch is dead grass roots and stems (not clippings). Buildup is caused by overwatering, overuse of chemicals, and wrong mowing heights.	Aerate or dethatch. Topdress with compost. Start grasscycling (leaving clippings). Water properly and reduce chemical use. See Natural Lawn Care resources below.
Shallow roots (less than 3" deep) in lawns	Overwatering and compacted soils cause shallow rooting.	Water deeply but infrequently. Aerate compacted soils.

Evaluating Soil Moisture

How much water is enough? A soil core can tell you!

Overwatering causes lawn and plant disease. Frequent shallow watering (along with infertile or compacted soil) promotes shallow rooting. How do you know how much water to apply, and how often? The key is to apply just enough to wet the whole root zone: 3-6 inches deep for lawns, 6 inches for annual plants, and 12 inches deep for shrubs and trees. Then let the soil partially dry out before watering again.

Using a soil core sample can take the guesswork – and the waste – out of watering. Here's how:

1. Before you decide to water, take a soil core sample. This should be in the vicinity of the plant roots and go from 6 to 12 inches down, depending on the plant.
2. If the top layer of soil is fairly dry, it's time to water. ***See table below for guidelines.*** If this layer is still moist, wait one or more days and try this test again. Keep doing this until it is time to water. You don't need to do this every time you water, but it's an easy way to get a feel for how your soil holds and releases moisture, and how often you'll need to water.
3. When it's time to water, water as long as you think is needed to moisten the root zone of the plants. Then wait an hour for it to soak in, and take another soil sample. If the sample is moist to the bottom or beyond, you may be able to shorten the watering next time to save water. If it is not yet moist, water longer and then repeat the test after an hour as before. Repeat this process until the sample is moistened to desired depth. If water runs off the surface before the soil is adequately moistened, stop watering for 30 minutes and then re-start, to allow the water time to penetrate.

How long you need to water will depend on many things, including the output of your watering system and your soil type. To minimize water use in beds make sure you use 2-3 inches of mulch on the soil surface, and use a drip or soaker system, which can save 50% compared to a sprinkler. If you are creating a new planting bed, till in plenty of organic material such as compost to improve drainage, rooting depth, and the moisture-holding capacity of the soil. Plants whose needs are met by your site may not need any supplemental water after an establishment period, usually the first one to three years.

The following chart gives a rule of thumb to help you determine when to water. However, many "low water use" plants can grow quite well through extended dry periods if they have been established properly and have deep roots. So consult plant reference books, experiment, and see what works in your garden.

Plant Type	Typical Root Depth	Let Dry Before Watering
Lawn	3-6"	1-2" deep
Annuals	6-12"	1-2" deep
Shrubs and trees	12" or more	2-4" deep

Questions? Call the Natural Lawn and Garden Hotline (206) 633-0224

You can also request the Natural Lawn & Garden Guides: *Natural Lawn Care* • *Growing Healthy Soil* • *Smart Watering* • *Choosing the Right Plants* • *Natural Pest, Weed & Disease Control* • *Composting* • These guides can also be viewed or downloaded at www.savingwater.org (click on Your Lawn & Garden) or under "Landscaping" at www.cityofseattle.net/util/rescons