Building Healthy Soil

By Elizabeth Campbell

Soil is the most important part of your garden. If your soil is healthy, it is actually alive! According to Seattle Tilth, one gram of healthy soil is home to as many as 500 million beings including bacteria, yeast, algae, protozoa, etc. These microscopic creatures can fix nutrients, hold water and ward off disease. If the soil is full of nutrients, your plants will be healthy and robust. If the soil is poor, your plants will struggle for survival. Just as people get run down when they are not eating enough good food, plants will wilt when they are hungry. One of the best ways to feed your soil is to introduce compost. You can also feed your soil by mulching with organic material. Leaves are a preferred mulch that almost everyone has access to. As they break down, they re-introduce nutrients into the soil.

For example, when you go out in an established forest and pick up the soil, it will feel light and loamy. The color is usually dark and if you look closely, you will see tiny bugs, beetles and other creatures in the soil. This is what we want to create in a garden – living soil. If your soil has a lot of clay, where water sits on the surface, you can add compost, mulch and sand to help break it up. If your soil is sandy, adding compost will improve its ability to hold moisture.

Traditional Northwest Coastal ways of building soil health include teachings from our animals. For instance, salmon swim up our rivers and into the tiny streams all over the Northwest. The eagles and the bear carry these fish carcasses up into the forest where they continue to break down and fertilize the earth. Planting salmon under corn is an old Indian tradition that has proven worthy over the centuries. Salmon carcasses add nitrogen, phosphorous, calcium and trace elements back into the soil. If you have access to fish carcasses and seaweed, then you can introduce balanced minerals back into your soil. These are often a part of costly commercial organic fertilizers. You can also dig a hole between plants to put the carcass in. Bury it deep enough so that dogs will not dig it up, or you will have to deal with the stink later! Some people work crushed up oyster shells or other shellfish into their soil. Seaweeds like bull kelp and Bladderwrack are high in potassium and all the trace minerals in seawater. Seaweed can be worked into the surface of the soil. You can cut up big pieces so they will compost more quickly. Remember, the minerals that you put back in the soil will be taken up by the plants to increase their strength and vitality, and then by you. It is worth the effort for your health.

Compost: Compost is being made all the time in nature. Imagine yourself in the forest. What do you see, smell, feel and hear? Cool damp air? Birds, squirrels and other animals? Get down and look closely as dead leaves fall, decay and turn into nutrient-rich soil for living plants. This cannot be done without the help of tiny bacteria, microorganisms, and insects that live in the soil. We can speed up the process of composting at home by creating the right environment.

A composting family can reduce their waste by as much as 50%. Rather than sending food scraps and yard waste to the dump, you can turn them into something beneficial for your plants. Compost is key to a healthy garden.

There are many great resources on composting. You can get as simple or as complicated as you choose. You can compost in an open pile in your back yard, in a hole in the ground, in a container, or even in a garbage can.

Making Compost

3-5 parts dry browns (carbon) – browns include one, or a combination, of the following: dried leaves, straw, shredded paper, cardboard, wood chips, chopped sticks, saw dust. Woody plant stems should be cut down to 4-inch lengths or smaller to break down faster. To speed compost cooking, 1-inch or less is best.
1 part wet greens (nitrogen) – greens include food scraps, grass clippings, weeds, coffee grounds, and manure from cows, chickens, goats or horses, etc.

Soil – you will need a few shovels full of soil or mature compost to get your pile started.
Water – the pile needs to stay moist to decompose, which is usually not a problem here in the Pacific Northwest until mid to late summer. During dry times, lightly mist the pile as you turn it to keep it damp. It should be no wetter than a wrung out sponge.
Pitchfork- for turning pile
Tarp- for covering pile

To start a compost pile you will need about one cubic yard (3'x3'x3') of the basic recipe. This size will heat up and decompose quickly. Smaller piles take longer. Begin by layering with about a six-inch brown layer and a two-inch layer of greens. Repeat. Incorporate several shovels full of soil throughout to introduce beneficial bacteria. Every seven to ten days you will need to turn or fluff the pile with a pitchfork so that the critters in the pile get enough oxygen to thrive. The more often you turn the pile, the sooner your compost will be done. It would not hurt it to turn it several times a week. You can continue adding food scraps to the pile, but make sure to bury them so you do not attract rodents and raccoons.

After a couple of weeks you will notice worms and tiny bugs crawling around in the pile. They are breaking things down for you! In our cool, wet climate, it is best to keep the pile covered. A simple tarp weighed down on the corners will do. Within two to three months you should have beautiful compost that is dark and earthy smelling. When my pile is nearing completion, I start another pile so that I can continue using food scraps. You will know when your compost is finished because it will look and smell like rich dark soil. Allow finished compost to rest/cure about 4 weeks after it has "cooled." You can sift your compost by placing a screen on top of a wheelbarrow to remove larger particles and return those to your new pile for further decomposition.

Manure: Manure is an affordable source of nitrogen that can easily be incorporated into your compost. Only mature manure from vegetarian animals should be used in compost that will be used on food crops. Cow manure and chicken manure are commonly used. Chickens produce very nitrogen rich manure, as do llama and alpaca. Ideally you want to use manure that has been cured. Manures are very hot, meaning that they are very high in nitrogen and can potentially burn your plants. Uncured manure can also harbor harmful pathogens.

To use in the garden: Simply spread the finished compost over garden areas or directly around plants, as a mulch, so it covers the surface of the soil one to two inches. Mulches can be anything from dried leaves, straw or freshly mowed lawn clippings to finished compost. Mulch covers your soil, suppresses weeds and helps to hold in moisture. The mulch breaks down over time and feeds your soil and protects microorganisms that benefit the soil. If you are planting a new bed, incorporate compost into the soil before planting.

Vermicompost: Who knew worms could be so helpful? Worms can consume half their body weight /day in organic matter, i.e. our garbage. Worm castings (waste) can substantially increase microbial activity in your soil. Humic acid, found in the castings, make the nutrients more available to your plants. Lechade is a nutrient dense liquid that runs off of the worm bin that can be diluted, made into tea and sprayed onto plants as a liquid fertilizer. Worms are typically kept in small bins. Shredded paper can be added to your bin as a bed for the worms and can help keep the bin healthy. Small food scraps can be added to the bin regularly to feed the worms and create a nutrient dense treat for your plants. To learn more, check out the book *Worms Eat My Garbage,* by Mary Appelhof.

Compost Resources:

WA State Dept of Ecology:

- Organic Materials Management site
- This site includes a Compost & Healthy Soil Page

Here are a few sites on this page:

- Solid Waste & Recycling Data (including Annual Status Reports)
- Ecology contacts (includes your Region contact and HQ contacts)

U.S. EPA:

- Organic Materials
- Generators of Food Waste
- Resource Conservation Challenge
- Free publications site

Here are a few examples of some of the compost equipment/resources available:

- BW Organics Rotating Drum - The Qualco Dairy/Anaerobic Digester facility in Snohomish County has one of these drums. The builder/operator of the facility is Qualco Energy. They are a non-profit group that represents farmers of the Sno/Sky Agricultural Alliance, Tulalip Tribes, and local environmental groups.
- Earth Tub - According to the manufacturer's website, this unit is ideal for schools, universities, restaurants, hospitals and supermarkets.

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