

Fall: Time to Feed Your Soil

By Janet Scheren, Fairfax Master Gardener

Leading soil scientists have drawn a line in the sand: soil is full of life; dirt is not. Healthy soil is a mixture of organic matter, minerals, gases, liquids and organisms that together support life. The richness and health of our soils determine the health of the plants that grow in it and, in turn, the entire food web dependent on them—including humans.

Nature over time — often the geologic time of thousands of years — converts the mineral elements of dirt to rich loamy soil. In the process of adding plant life and organisms to the soil it can fix almost any problem. The challenge we face in our gardens today is that we are often dealing with land that has been disturbed or degraded. It is often stripped of topsoil, poisoned with chemicals, left bare to oxidize in baking sun, flooded with too much water or left to dry into hard, cracked flats.

While most of us aren't dealing with those extremes in our yards or garden beds, we are dealing with the challenges of growing lawns, flowers, shrubs, trees or edible plants in less-than-optimal soil. This results in plants that aren't in peak form and are susceptible to pests and disease.

The good news is by imitating the processes of nature, we can regenerate the soil around us — often within one to two growing cycles. Fall is the perfect time to begin.

Step 1: Add Organic Matter

Before I started the journey of becoming a gardener, I took on trying to grow a decent lawn. Seeking advice from a master gardener, I was told I should start with a soil test. I dutifully returned with my soil sample only to be told that I didn't need to send it in. He could see from the rock-hard red clay in the box that without adding organic matter I couldn't expect too much better than what I was already growing. So that's where I began.

I chose to dive in and renovate the lawn — a full fresh start. This process included aerating the ground, seeding and applying a half-inch of rich compost over the whole yard, along with a light layer of straw to hold the seed in place. Following two weeks of almost consistent misting and drizzle, a lush lawn emerged. By staying organic and applying a thin layer of the same rich compost each year for several years, I wound up with more than 8 inches of resilient soil with grass roots growing deep into that layer of soil.

While organic matter already contains the word “organic,” it's important to note that organic matter needs to be organic. Compost that's been laced with pesticides, herbicides or heavy metals is not organic and will kill the biology so essential to building healthy soil.



photo: Michigan State University

Step 2: Enhance the Life of Your Soil

If the organic matter you've added comes from a variety of sources and contains a good mix of bacterial and fungal matter, you may already have all the ingredients you need for a vital food web matrix. Adding organic matter in the fall allows this basic building block of the soil food web to inoculate over winter and build the diversity of a healthy mix of good bacteria and mycorrhizal fungi. But as in any healthy ecosystem, you also need predators in the soil — protozoa, beneficial nematodes, micro arthropods, arthropods and even larger creatures such as worms. This whole web of life is needed to send the organic nutrients and minerals to the roots of plants in a form they can absorb and need to grow into healthy pest- and disease-resistant plants. In addition to adding organic matter, fall is a great time to ensure or enhance this process by inoculating your soil with organic additives such as organic, cold p

Another element essential to enhancing the life of your soil is oxygen. This is why heavy equipment or foot traffic can affect the health of shrubs, trees and garden beds. Plant roots need oxygen as do all the organisms in your soil. This again is where soil structure comes in. Bacteria build aggregates. Fungi build macro aggregates. Worms and other larger creatures in the soil build tunnels that allow oxygen in and other gasses to be released. Beware of tilling. In theory, it may seem that by incorporating organic matter by tilling will lighten the soil, add oxygen and enhance fertility. But, in reality, it destroys the soil structure that is already there, disrupts chains of mycorrhizal fungi and injures or kills the soil organisms you need, and brings weed seeds to the surface.

Step 3: Protect Your Soil

The best way to protect your soil and continue to build its health is with the roots in the ground. Roots help to attract and build healthy and abundant soil life by feeding carbohydrate-rich exudates to the microorganisms in the soil in exchange for the nutrients these organisms feed them. This cycle not only nourishes the plants you see above ground, it continues to build rich, fertile soil below the surface. Thus, when gardeners don't have plants actively growing in the soil, they use a variety of cover crops — often referred to as green manure — to preserve and build soil health when a plot of land is not in active fruit or vegetable production. It's important to apply this same principle to the landscape garden beds and to all exposed soil on your property as well.



photo: Agriculture and
Natural Resources,
University of California

If growing a cover crop isn't practical at the time, you will want to cover bare soil with a substantial layer of mulch, typically 2 to 4 inches. For vegetable beds you may also want to add a tarp or other appropriate landscape fabric. These coverings prevent oxidation of the soil and soil compression that can occur with heavy rains.

November is a great time of year to tuck your garden beds in for the winter with all the organic matter and microorganisms they need to repair and build their vitality. Garden beds may look like they are dormant during the winter, but in reality they are busy rebuilding health, structure and vigor for the spring garden ahead.

Resources

The Permaculture Student 2, by Matt Powers, 2017–2018

Grow Great Virginia Vegetables by Ira Wallace

Cover Crops, John Traunfeld, University of Maryland Extension

Improve Vegetable Garden Soil with Cover Crops, Valerie Vaughn Sesler, PennState Extension

Cover Crops and Soil Health, US Department of Agriculture, Natural Resources Conservation Service