

Soil as Your Garden Palette

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Your soil is your garden palette. Just as the painter's palette holds the pigments the artist uses to create a masterpiece, your soil provides the medium to make your garden grow and prosper."

Your gardening efforts are going to be enhanced or restrained by your soil, so the first step to good gardening is learning about its composition and how to improve it. The soil in your garden is comprised of air, water, organic material, microbes and minerals. These components work together to provide nutrients to your plants. As we will see, most aspects of your soil can be improved by adding organic matter. I'll be discussing each building block for healthy soil in this article – and there's a lot to mention.

Texture and Structure. The first thing you want to know about your soil is its texture, the percentage of sand, silt and clay. The minerals in your soil that support plant growth are divided by size. Sand can be seen with the naked eye, silt can be seen with a hand lens and clay particles are too fine to be seen without an electron microscope. Good garden soil is made up of a mixture of sand, silt, clay and organic materials.

Another important feature of your soil is its structure. Soil clumps together into aggregates rather than separating as single particles. While it is difficult to change the texture of your soil, management practices can change the structure within one growing season. Earthworms and microbes work added organic material to increase binding agents that encourage granular clumps of soil. Clumping soil allows roots to penetrate easily and allows water to easily drain through the granules, while each granule retains sufficient moisture to support plant growth.

The texture and structure of your soil determines its porosity. Remember, one of the components of soil is air. Air fills the spaces between the minerals or granules in your soil. Ideally, your soil will contain some air and some moisture. Equal amounts of air and water are best for plant growth. Oxygen is important for root respiration and for the soil organisms that are working to break down organic material and improve your soil structure. When soil is over watered or drains poorly, the spaces are filled with just water, and your plants can become oxygen starved.

Soil Color. The color of your soil is determined by the amount of organic material, the parent material and the type of weathering that produced the soil. Most California soil is gray or brown. Despite having little organic matter, these soils comprise the bulk of the productive soils found in the central valleys. You still may have productive soil even if it is not packed with organic material.

Older soils are red or yellow, meaning the soils are losing nutrients. Red soils have been exposed to extensive weathering, and often have hardpans or clay pans that restrict root

and water penetration. Water can accumulate above the hardpans, damaging roots with the poor aeration. Red soils are often lacking nitrogen, phosphorus, zinc and sulfur.

Soil Chemistry. An important component of soil that is often overlooked is the microbes that assist plants in taking up nutrients. Microbes decompose organic material, increase aeration, aggregate (clump) soil and provide food for worms that assist in moving soil components and aerating soil. Organisms found in your soil include bacteria, fungi, yeasts, protozoa, and algae.

The soil pH is the relative acidity or alkalinity of the soil. It is measured on a scale from 1 to 14. The lower the number, the more acidic the soil. pH is important because as soil becomes more alkaline (above 9), it will hold on to nutrients. California soils normally range from a pH of 5 to 8.5. Most plants do well between 5 and 7. Organic materials will buffer your soil pH by adding or holding the hydrogen atoms that allow the chemical reactions that feed your plants.

Soil test kits are available at your local nursery or online. These tests range from about \$10 to \$50 and up, based on the number of tests and associated support. Some tests have online support that help you evaluate your test results. Some of the local nurseries will also test your soil for a fee and recommend the organic additives to improve it.

Organic Additives. The best solution for your soil is the addition of lots of organic material. When I think organic gardening, I think of avoiding the use of pesticides and chemical fertilizers. Organic farming actually was based on adding organic material to soil to boost the ability to grow crops. This can be done by adding compost, growing green manure and adding thick mulches, as well as adding specific organic additives to correct individual deficiencies.

Organic material such as mulches and compost fulfill numerous functions in improving your soil. Organic material added to your soil keeps the soil from becoming too compacted. It provides nutrients both directly to the plants and also to the soil microbes which in turn improve the soil structure. Since our warm Mediterranean climate summers cause organic material to break down quickly, you will need to add organic material at least once a year.

You will know your soil structure is good when it forms small clumps and your soil resembles the consistency of granola. The activities of worms, bacteria and fungus within the soil break down the organic material and create clumps that naturally aerate the soil. Organic material will also add nutrients like nitrogen which is water soluble and washes out of your top soil level. It feeds the bugs that make it easier for plants to take up nutrients, and they feed worms who do a great job of improving your soil.

The components of your soil work together to provide nutrients to your plants. Knowing what your soil needs will allow you to focus on improving its deficiencies. You may find your soil is better than you thought and you only need to take some very basic steps to

improve your garden. The steps you take now can make a visible improvement in your soil by next season. Happy Gardening!

To learn more about soils and how to improve them, attend the free UCCE Master Gardener class on “Soils and Fertilizers”, tomorrow, Saturday, February 5. The class starts at 9:00 AM and will be held in the Veterans Memorial Building at 130 Placerville Dr. in Placerville.

Now that you know what you can do to improve your soil for a great gardening season, look for some plants at the Master Gardener 2nd Annual Spring Plant Sale. There will be a great selection of annuals, vegetables and perennials. Presentations on popular gardening topics will give you all sort of tips and hints. The sale will be held on Saturday, April 16th in the parking lot of the Veterans Memorial Building, 130 Placerville Dr. in Placerville and benefits Master Gardener community outreach programs.

The Master Gardeners are available to answer home gardening questions Tuesday through Friday, 9 a.m. to noon, by calling (530) 621-5512. The office is located at 311 Fair Lane in Placerville. Walk-ins are welcome. For more information about our public education classes and activities, go to our Master Gardener website at http://ceeldorado.ucdavis.edu/Master_Gardener/.