

Down to Earth

-by Susan Hyatt-

Welcome back to our earth-friendly corner of the newsletter. This month's installment is on soil structure and texture.



Soil vs. Dirt

Compost. Mulch. Black Gold. The be-all and end-all of good soil.

Tell that to my friend who splurged during her first season as a vegetable gardener. She had beautiful new raised beds built and filled them with the Cadillac of expensive options: Sea Soil. She watered dutifully and was off to a roaring start with her first veggie starts. But then...growth started to lag. Her beds of soil started to sag. She couldn't figure out what had gone wrong, because she'd bought such beautiful, fertile looking "soil".

It turns out that the one thing she forgot was, in fact, dirt. Good soil is composed of air, water, mineral materials, and organic matter. The mineral materials are essentially weathered rocks of different sizes called sand, silt, and clay. The organic matter is largely decaying plant residue and microbial organisms. The organic matter and the clay bind together the sand and tiny particles of silt into lumps or crumbs of soil, called aggregates. Good soil structure has adequate spaces between the aggregates to allow water and air to enter and drain, but can also hold enough water for plant growth.

For optimal plant growth, most soil scientists recommend a ratio of 50% pore space, 45% mineral matter, and 5% organic matter. Ideally, the pore space is filled with equal parts air and water. It's difficult to achieve this balance because, of course, all soil types are different and how we manage our soil affects the balance. For instance, if we compact the soil, we reduce pore space and if we till, dig or plant it, we increase pore space. Thus, the balance is always shifting.

Want to test your soil? To test for porosity, dig a small hole about 12" deep when your soil is damp but not saturated. Take a slice off the side of the hole and carefully lift it out so it stays in place on your shovel. A good crumbly soil is usually softer and is encouraging to root development. Look for channels created by earthworms, old plant roots, and crack lines. This is much preferable to large clots, flat plate-like structures, or soils where all the particles are the same size.

Testing for soil composition will help you learn the proportions of sand, silt and clay in your soil. Put about a cup of soil in a large clear container such as a pickle jar. Remove any large bits of gravel, wood, leaves etc. Fill the jar with clean water and shake vigorously for a few minutes. Stand the jar upright and wait until the particles settle. You will see clearly demarcated lines, starting from the bottom, of sand, silt and clay. Any particles which have not settled after six to eight hours are clay. You can mark each line on the side of the jar, and then use those measurements to help analyze the texture of your soil. Loam, the holy grail of soils for us gardeners, is a balanced mixture of sand, silt and clay. It holds the greatest amount of plant-available moisture, and has a good capacity to retain nutrients. And if you have something other than loam, that knowledge will help you with the important job of finding the right plant for the right place. There will always be something that loves the soil you've got.

Once you've tested your soil texture, we can have a further discussion about increasing the organic matter content beyond 5%. Many people believe that the ideal soil for home gardening is found when the organic content is greater than 30%. The soils are fluffy and easily worked. The organic matter will soak up water and release it when needed by plants. It also provides a strong glue that prevents soil aggregates from breaking down under heavy rain or tillage. And it also separates the soil granules so that they don't clump up, thus allowing more moisture and air to circulate throughout the soil. But...more on organic matter next newsletter!