

The Dirt on Dirt

The Virginia Cooperative Extension Master Gardener Handbook is a weighty collection of about 600 pages and 25 of those pages discuss soils and fertilizers. It is Chapter 2, following the first on 'Basic Botany' so you know it is important. Although we know good soil is the prime factor in successful gardening we are confused as to exactly what it looks like.

From top to bottom a soil profile consists of leaf litter, then a mineral horizon at the surface showing organic matter enrichment: this is the topsoil. The next layer is a subsurface horizon showing depletion of organic matter, clay, iron and aluminum compounds. The layer beneath that contains the same material but those elements are enriched rather than depleted. This is the deeper area where you want your plant roots to grow into. The next layer is "horizon of loosened or unconsolidated parent material" and as you have surmised, the lowest layer is hard bedrock.

The surface and subsurface are usually the coarsest layers. Soils with the darkest colors have most organic matter. The physical properties are those characteristics that can be seen and felt, such as color, texture, structure drainage, and surface features such as stoniness, slope, and erosion. Texture refers to the differently sized soil particles, the proportions of sand, silt, and clay in a fistful of soil. Sand is coarse and, living here, we know about sand! The soft as talcum powder particles are called silt. If it is wet it still feels smooth but is not slick or sticky. Even finer are the clay particles and through extremely smooth when dry, they are slick and sticky when wet.

Loam is a class of soil that has moderate amounts of sand, silt, and clay, approximately 7 to 27% clay, 28 to 50% silt, and 23 to 50% sand. A good surface soil has 50% solid material and 50% open pore space, the reason you do not want your soil compacted by cars parking on it.

As the percentage of mineral matter and organic matter in soil varies from place to place, even in one garden plot, the best way to enhance the organic matter is by adding compost, aged manures, and other organic amendments. Cover crops replenish the nitrogen needed especially by roses, corn, lettuce, tomatoes, squash, cucumbers, and cabbage. Leguminous cover crops such as alfalfa, clover, hairy vetch, and peas, absorb nitrogen from the air and deposit it in tiny root nodules. This process of nitrogen fixation supplies what is needed.

A compost pile that decomposes to a soil as rich as chocolate cake is the best treatment for poor soil but even leaving clippings to decay when you mow the lawn is a plus. Vegetable gardens need fertilizer if the soil lacks the 16 elements essential for plant growth. Carbon, hydrogen, and oxygen come from air and water; nitrogen, phosphorus, and potassium are macronutrients; secondary elements are calcium, magnesium, and sulfur and are probably sufficient. The other seven are micronutrients, necessary but in smaller amounts.

You need to send off a soil sample to Tech for information on texture, pH, lime content, and available phosphorus and potassium. The small fee will save you lots of money! Pick up a kit at the Extension Office in Carriage Court off Main St. in Gloucester Courthouse and follow the directions.

Most of us have that tendency to believe that, if a little is good, more is better? Not always. Ignore those insistent ads that would have you toting huge bags to your car. A tip from the Tidewater Soil and Water Conservation District experts: "Over fertilizing can do serious harm to plants, not to mention it is expensive." They suggest organics such as cottonseed meal, blood meal, bone meal, fish emulsion and manure that help improve the structure of the soil.

From experience, always the hardest way to learn anything, is the suggestion to be careful with even the best fertilizer. Last spring I potted up rooted Aucuba cuttings for the Plant Extravaganza, gave them a jolt of chicken manure in the planting mixture when a bit would have sufficed and killed them. Live and learn! If you do want to fertilize a plant, don't mix the amendment with the soil for the tender roots but add it on the topsoil where it will find its way to the root section eventually.

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