NEWSPAPER ARTICLES

Let's Talk Dirt (March 29, 2025)

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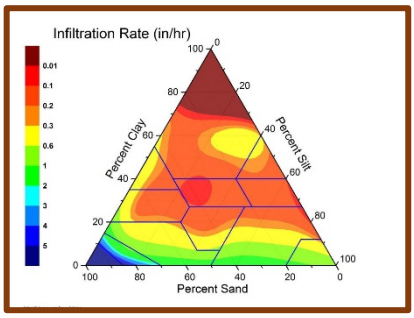
Early Spring is the perfect time to amend your soil in preparation for future plantings of flowers and vegetables in April and May.

Understanding soil is an important aspect of gardening. Soil is merely small particles of rock mixed with air, water, and organic matter. Particle sizes called clay, silt, and sand, as well as their ratio, determine the soil's texture. Particle size also affects pore size, which affects water drainage, water retention, aeration, nutrient supply, and soil strength. All plant roots need air, water, and certain mineral nutrients to grow in the soil.

Clays are microscopic-sized grains that are flat and fit snugly together. Pore spaces between grains for air and water are tiny, so when clay soils get wet, drainage is painfully slow, and the air supply to roots is small.

Sandy soils have larger, rounder grains that fit loosely together so that aeration is good, but water drains fast, sometimes too fast, taking soluble plant nutrients along with the water.

The ideal soil has clay, sand, and intermediate-sized "silt" particles. Gardeners refer to these soil types as loam soils. The particles are in the right proportion to maximize water drainage yet capitalize on water retention, nutrient availability, and air supply. There are sandy loams, clay loams, loam sands, and loamy clays.



Soil structure relates to how soil particles clump together. Except for sand, soil particles do not exist singly in the soil. Clumps or aggregates are formed by the natural weathering of soils and by binding chemicals that result from the decomposition of organic matter (OM). Soil clumps increase porosity (air and water channels).

Most California valley soils average one percent OM by weight. Mixing in more OM in the form of compost, manure, straw, leaves, etc., immediately improves the aeration and drainage of clay soils because their larger particles wedge between the super small clay particles to form bigger channels for air and water (porosity is increased). In sandy soils, organic amendments help hold water and nutrients in the channels, so the soil stays moist and holds dissolved nutrients longer (porosity is decreased). Soil organisms decompose OM, which slowly releases nutrients into the soil solution.

Soil pH (power of Hydrogen) is measured on a scale of 1-14. The pH affects whether plant nutrients are available in soil solution or form unavailable solids that don't go into solution when water is added. Soil pH is easy to measure, and nurseries and hardware stores sell test kits.

A pH of 7 means the soil is neutral, and it can support a wide variety of plants. As the pH number gets lower, soils become more acidic; as the pH number gets higher, soils become more alkaline. Soils in Tulare and Kings Counties are slightly acid to alkaline, pH 6.5 to 8.5. There are only a few areas with a pH 6.0.

Alkaline soils contain carbonates and form calcium, magnesium, and sodium salts, often forming a white crust on the soil surface as water evaporates. High concentrations of salts keep seeds from germinating, burn roots, stunt plant growth, and cause leaves to scorch. If sodium predominates, then further damage occurs to the soil. Aggregates are destroyed, pores collapse, and water infiltration problems intensify.

Between pH 6.5 and 7.5, essential plant nutrients are readily available. When pH is eight or higher, iron and zinc become less available to plants, and yellow leaves with brown edges result from salt burn from excessive sodium and boron. When pH is 6.5 or lower, iron and zinc become more available, and excess aluminum becomes a problem.

Amending soils: The pH of soil does not fluctuate very much on its own. In fact, repeated additions of soil amendments change the pH of soil. Sulfur is added to lower the pH; lime is added to raise the pH.

Salty soils can be fixed relatively easily with several applications of water to leech the salts; providing drainage is good, but many salty soils have poor drainage because they have poor porosity. Gypsum is added to displace sodium from soil particles and replace it with calcium; gypsum does not affect pH but does improve drainage by allowing soils to aggregate (increase porosity).

Acid-loving plants like azaleas, camellias, gardenias, and hydrangeas can be grown on slightly alkaline soils if soils are first amended with sulfur, peat moss, or acid plant mix and if careful attention is paid to iron and zinc nutrition.

Vegetable and flower plantings will grow better when OM is mixed in the soil before planting. Composted steer manure, nitro humus, green waste, and many planting mixes are good sources of OM. These can be purchased in bulk or in bags. Add two or three inches of OM to the soil surface and let it sit there until the ground is workable.

Timing is everything: If you get too anxious and work the soil when it is wet, you will end up with big, rock-hard dirt clods that will be difficult to break into smaller pieces. So be patient and wait until the ground is dry enough to rototill or double dig with a shovel in order to get nutrients to the root zone of future plants. You and your plants will be glad that you did!

Questions? Call the Master Gardeners:
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