

WORKING WITH FOOTHILL SOILS

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If your soil is not healthy the rest doesn't matter. You will work too hard, spend too much money, and never see the true potential of the plants in your garden.

Consider what you are planting. Many native plants, for instance, will be quite happy in unamended, healthy, native soil. You may find vegetable and flower gardens more demanding.

Knowing the characteristics of your soil is the starting place for making improvements. A simple soil test kit, available at nurseries and farm supply stores, will let you know what the pH level is and what nutrients are already in your soil. Farm supply stores can also assist you in having this done professionally.

PH LEVEL

Why is soil pH important? It is a measure of how acid or alkaline your soil is, and is important in selecting the best plants for your garden. Most plants do best when the pH is slightly acidic to neutral (pH 5.5 to 7.5). This range allows plant roots to absorb the necessary nutrients from the soil. Outside of this range, nutrients may be in the soil, but not available to plants.

AMENDMENTS OFTEN NEEDED

After determining nutrient levels in your soil, you need to think about what kind of amendments you want to use. If your soil is deficient in nitrogen, consider adding poultry manure, cottonseed meal, fish meal, fish emulsion, or blood meal. Nitrogen leaches easily, meaning that water carries it down through the soil layers away from the plant. Leached nitrogen from fertilizers is a common contaminant in creeks and streams. Because of nitrogen's mobility, apply it in slow release forms, such as compost or timed release fertilizer or in small amounts over a period of time.

Most foothill soils are low in phosphorus. If your soil needs phosphorus, add rock phosphate, bone meal, or superphosphate. Rock phosphate is for next year's growth, while superphosphate and bone meal are more immediately accessible. Phosphate moves slowly through the soil, so it is best dug into the root zone.

Calcium is also likely to be deficient in acid foothill soils. This may be added in the form of agricultural limestone, oyster shell lime or manure. Dolomite limestone is not recommended for foothill soils, as it adds excess magnesium to the soil.

SOIL TEXTURE AND STRUCTURE

Soil texture falls into one or a combination of three categories:

Coarse (sandy soil)

Medium (loamy soil)

Fine (clay soil)

Each type has advantages and disadvantages. Sandy soil drains well (sometimes too well), but may be less fertile than other soils. Loam is easy to dig, but may lack nutrients. Clay soil is harder to dig, but holds moisture well and may be more fertile.

The structure of your soil refers to how the air spaces, sand, silt, and clay particles are arranged. The structure influences how nutrients, oxygen, and moisture move through the soil to benefit the plants. The soil's structure may have been compacted by construction of buildings and septic systems on your property. This compaction restricts air and water movement through the soil. Adding large amounts of organic matter helps, as does tilling with a garden fork rather than a rototiller. Always avoid walking on or cultivating wet clay soil.



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ADD ORGANIC MATTER

What can you do to make your garden a more hospitable place for plants? The best thing you can do is to add organic matter to your soil. Organic amendments include compost, leaf mold, peat moss, manures, grass clippings, sawdust, and rice hulls. You can mulch with it or dig it into existing soil. Uncomposted organic material uses nitrogen from the soil during the breakdown process, so you will need to add nitrogen if you are adding large amounts of uncomposted organic material.

Another method of improving your soil health is by using green manures. A green manure is a cover crop planted from seed, grown until just before seed set and then dug into the soil. The cover crop decomposes, improving the structure and nutrition of the soil. There are cover crop varieties appropriate for summer planting or in winter, depending upon when you have space. Your local farm supply store can guide you with varieties and mixes.

A word of caution: Sometimes, an inch or so of topsoil is added to a planting area, making the garden area look more plant-friendly than it actually is. Water does not easily move between soil layers of different compositions, so water does not move beyond that newly added material. Be sure to completely mix any added material into the native soil down to the depth of plant roots.

CERTAIN FOOTHILL SOILS

Some special soil situations exist in the foothills, one being serpentine soils. Serpentine soils have a toxic level of magnesium which ties up any available calcium. Most plants require calcium, so there are only a few plants that are willing to grow in this soil. Raised beds are the best solution to this problem.

Another difficult soil is uncultivated forest soils in timbered areas. In this soil, instead of bacteria and earthworms, molds are the decomposers of the naturally occurring organic material. The result is nearly sterile soil. Additional organic material and lime will increase fertility in this situation.



REFERENCES

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California Master Gardener Handbook. 2001. Dennis R. Pittenger, Editor. University of California Agriculture and Natural Resources. Publication 3382.

Cover Crops for California Agriculture. 1989. P.R. Miller et al. UC ANR Publication 21471.

UC Vegetable Research and Information Center, "Soils" at <http://vric.ucdavis.edu/selectnewtopic.garden.htm> and "Compost" at <http://vric.ucdavis.edu/selectnewtopic.compost.htm>

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits and/or vegetables ready to be picked.

Dispose of empty containers carefully. Follow label instructions for disposal. Never reuse containers. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Do not pour down sink or toilet. Consult your county agricultural commissioner for correct ways of disposing of excess pesticides. Never burn pesticide containers.