

# MANAGING CLAY SOILS IN THE HOME GARDEN

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Soils that are predominantly clay also contain small amounts of silt and sand. Clay soils that crack excessively while drying are often called "adobe soils." If they are very low in organic matter, clay soils lose their structure and become cloddy and compact if plowed, stirred, walked on, or otherwise manipulated when they are too wet. Once a clay soil is badly puddled, it may take years of careful handling to restore good structure.

## **Till with Care**

Tillage is commonly the first and most important step in preparing garden soil. Tilling helps to produce and maintain a good structure for seedling growth and rooting, control weeds, keep the soil permeable to water, and allow proper oxygen diffusion. Clay soils in particular must be handled with great care if favorable results are to be obtained from ordinary tillage practices.

## **Use a Spading Fork**

When moist, clay soils should be dug with a spading fork rather than with a shovel or spade. As the soil is turned over, the large clods should be broken up with the side of the fork. The clods that remain should be exposed to the sun and air. After they have dried and crumbled somewhat, they can be wetted with a fine spray to soften them, and then raked when sufficiently dried again. The combination of air-drying, wetting, and raking will break up most of the clods.

Although clay soils cannot be made ideal, they can be improved by any treatment which will cause the particles to form small granules and crumbs. The best treatment for this purpose is to incorporate large amounts of organic matter into the soil to promote better soil structure. The improved condition may remain long after organic matter has disappeared.

## **Use Organic Materials**

Animal manures, green plant material, compost, and leaf mold are especially good for improving soil condition. Manure should be leached of the excessive salts to avoid injury to plants. Materials decaying very slowly, such as peat moss, straw, sawdust, rice hulls, and shredded bark, are somewhat less desirable because they do not aggregate the soil as well. These organic materials, when first incorporated into the soil, will compete with plants for the available nitrogen. It is advisable, therefore, to add extra nitrogen to the soil when using these materials. For example, to offset the competitive effect of a ton of straw, sawdust, or bark, it may be necessary to add an extra 30 to 50 pounds of elemental nitrogen; check label for nitrogen analysis in the fertilizer material purchased.

These slowly decaying materials do not aid in bringing about good soil structure. They serve merely as fillers to increase the percentage of large pores and to improve the soil permeability.

Large quantities of these materials are generally required to have value as a filler; as much as one-half by volume of soil could be needed for the treatment. Such additions may be economically feasible in garden areas or in preparing potting or bedding mixes. However, if only small amounts of good soil are required, as for potted plants, it would be better to import new soil rather than attempt to improve a tough clay soil.

If organic materials that decompose slowly are used, cover the soil to a depth of about 4 inches. Incorporate this organic matter into the soil to a depth of about 8 inches. Watering should be done carefully to avoid excessive wetness below the 8-inch depth.

### **Use Chemicals-Sometimes**

Gypsum is often recommended to improve clay soil. It is beneficial for sodic (alkali) soils, which often have poor structure. Although gypsum is seldom beneficial to garden soils it may be tried, at the rate of 1 pound per 5 square feet. The benefits obtained, if any, will be temporary, since irrigation water will gradually dissolve the gypsum out of the soil.

In areas of high rainfall, lime may improve soil structure. However, most clay soils in California already contain sufficient lime. Lime should not be used for structure problems unless the soil is excessively acid.

### **Use Mulch**

A surface mulch or thin layers of organic matter may eliminate the necessity for frequent cultivations and reduce evaporation. Organic mulch reduces the formation of soil crust, which impedes water entry into the soil. A good layer of mulch also prevents water droplets from eroding the soil.

### **Planted Areas**

Lawns planted on poor clay soils are often hard to water and may develop shallow rooted ground cover. To improve lawns on these soils, an aerification program may be followed. Select aerifiers that remove soil cores 3 to 4 inches deep. The holes should be filled with chopped organic or other appropriate material. Repeating this procedure several times will improve the soil gradually. Gardeners who use time clocks should split water application into several intervals to avoid runoff and improve depth of water penetration.

*\*For more information see Leaflet 2149, Gypsum and Other Chemical Amendments for Soil Improvement.*

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