



## Managing Lawns on Clay or Compacted Soils

by Michelle Le Strange, UC Master Gardener Program

The underlying cause for most lawn problems is soil compaction. Rain drops, foot traffic, and using equipment on the lawn are what lead to soil compaction. These activities press soil particles closer together causing the pore spaces in soils to close. When soil porosity is reduced, then water infiltration and air exchange is slower or not at all. As time passes we notice an overall decline in grass growth, vigor, quality and longevity. Poor drainage is the single most common cause of lawn and athletic field failure.

Hardly anyone recognizes this well known fact, because compaction is considered a “hidden stress”. It is not obvious like an insect, disease, fertilizer or watering problem, but it is often the main reason why these other problems occur in our lawns. So if we can fix soil compaction, then we can have healthier lawns.

Most turf compaction is in the top 3-inches of soil with the top 1-inch the worst! Usually soil compaction is worse in the spring than in the fall and it is not usually uniform across the entire lawn. The fine particles of clay soils compact much easier than the coarse particles of sandy soils.

Aeration also called aerification is the solution to heavy (clay) or compacted soils. The remedy is to remove soil cores that are approximately one-half inch in diameter and 3-inches long. This practice is called aerating, aerifying, or coring. Aeration restores the balance of air and water in the soil, which are needed for healthy roots.

For small lawns, a hand aerifier, consisting of hollow tubes on a stirrup pushed in the soil by foot, is sufficient. For large or extremely compacted lawns, a machine-driven aerifier can be rented, or the aerification can be performed by a lawn maintenance company. Poking a pitch fork in the ground increases soil compaction because it pushes the soil particles closer together. Aeration alleviates compaction by making the soil less tight.



Many sizes and types of aerators (also called core aerifiers) are available in a wide price range that can affect the soil from 2 to 24 inches deep. Some slice, drill, vibrate or shatter, inject water, and spike the soil. Hollow tine aerators pull cores from the soil and are the most widely used. If using an aerifier that deeply penetrates the soil, be sure to watch out for any underground cables.

Aerification is also effective for correcting poor water penetration because it reduces the bulk density and toughness of the soil underneath a lawn. Most water penetration problems are caused by soils with physical problems not chemical (salt) problems. In the valley we have our fair share of both! Applying gypsum, often sold for “softening” hard soils, is useful only in high pH conditions in which the soils or water are relatively high in sodium. It doesn’t work on all soils that have water penetration problems.



To prevent compaction aerate lawns 3 times per year (early spring, summer and fall), use 5/8” hollow tines and try to reach a 3” depth. Athletic fields and golf courses are often dragged afterwards with a steel mat and or sand because of their high visibility and use, but the best solution is to leave the cores on the surface to melt down with irrigation. It only takes a week or so and the soil contains useful bacteria that help decompose turfgrass thatch. To alleviate compaction several passes with an aerator may be needed at regular intervals depending upon the degree of compaction and the lawn site until the situation is relieved.



April 19, 2012