

VERTICAL MULCHING

Soil in an ideal state for tree growth contains 50% solids (Figure 1). The solids in a soil are composed of mineral material (weathered rock) and organic matter (decayed plants and animals). In an optimum condition, a soil contains 45% mineral material and 5% organic matter.

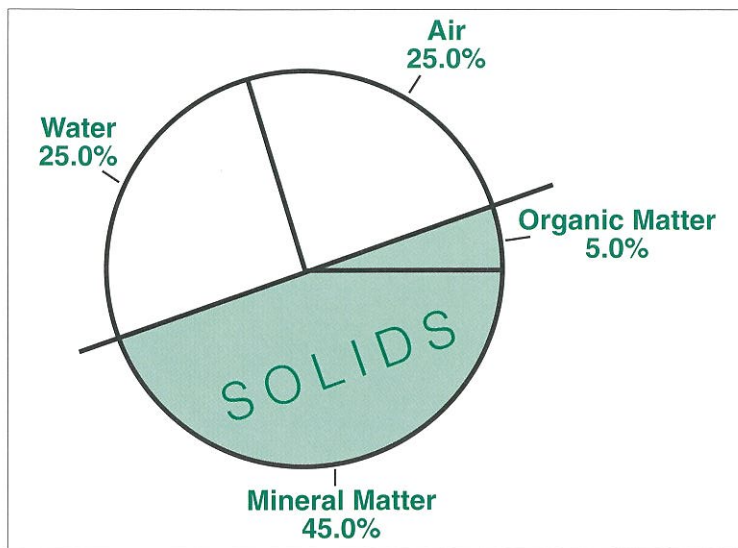


Figure 1

Figure 1

Individual solid particles in a soil combine into groups known as aggregates. Aggregates form the framework for the other 50% of a soil known as pore space. Pore space is the space between the solids and is occupied by air and water. In an ideal state, a soil's pore space contains 25% air and 25% water (Figure 1).

Compaction is the destruction of the aggregates in a soil. Compaction is caused when foot or vehicular traffic places downward pressure on a soil (Figure 2). When the solids in a soil are pressed together, pore space is lost. Eliminating pore space reduces the supply of air and water to trees.

Figure 2

The effect of soil compaction on tree growth is subtle. Symptoms include poor growth, susceptibility to pest problems and environmental stress, and failure of the tree to respond to proper care. The stress caused by soil compaction can lead to a gradual decline in tree health. If left untreated, soil compaction can cause premature death.

Vertical mulching is sometimes practiced to relieve soil compaction. Vertical mulching involves using a gasoline or electrically powered auger to drill holes into soil (Figure 3). The holes generally measure 1-2 inches (2.5-5.0 centimeters) in diameter, drilled to a depth of 12-18 inches (30-45 centimeters) and are spaced 1-3 feet (0.3-1.0 meter) apart. The holes generally begin 2-3 feet (0.6-1.0 meter) from the trunk and are made in the soil underneath the canopy of the tree.

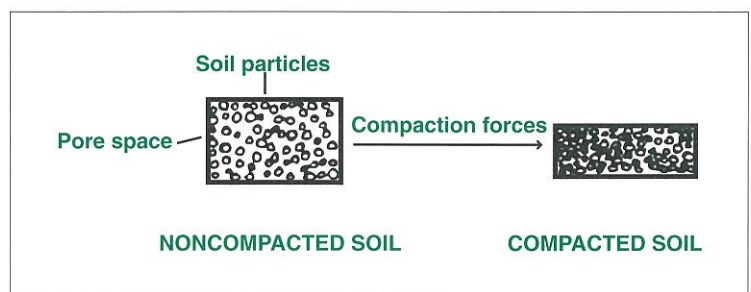


Figure 2: The influence of soil compaction on pore space.

Figure 3

The holes are frequently backfilled with porous materials like gravel, sand, perlite or peat moss. Likewise, if appropriate, fertilizer may be placed in the holes.

Vertical mulching may also be used if the area underneath a tree's canopy has received "fill." During construction, soil or fill is sometimes placed over the existing soil surface. The fill can limit availability of air and water and adversely affect tree growth. Depending on the species and situation, as little as 2 inches (5.0 centimeters) of soil placed over the existing soil can cause tree decline and death.



Figure 3