

Permanent Aeration for Clay Soils

Soils are not generic in structure, so why should the methods of conditioning them be? In the urban environment the process of soil aggregation must be done artificially by providing macro pores in the soil allowing for the necessary balance of air, water and support for the roots. The more air available deeper in the soil profile, the deeper the roots can survive, taking advantage of the moist and cooler conditions way below the water depleted, extreme temperatures at the surface. Deeper roots mean healthier plants.

Soils consist of three space-occupying components:

- Solid particles 50%
- Available pore space for Water 25%
- Available pore space for air 25%

When good soils are compacted by any means the soil composition becomes less balanced due to the change in the soil structure. When the solid particles are pressed together, there is less pore space and the soil becomes hard and too dense for easy cultivation and proper root development. As a result the microbial activity in the soil is reduced and plant performance is inhibited. Adding organic matter to soil has been the answer to amending most soils to get to the proper balance. Unfortunately, the urban environment does not allow for this natural process to sustain itself. Even with the addition of organic matter as an attempt to fix the damaged soil, the constant soil compaction from machinery, human traffic and pounding rain does not allow the complex soil aggregation process to complete the aeration transformation.

Foremost, the surface water must drain away. Water always runs down hill and standing water is a sign of trouble. The addition of underground drainage pipes may be necessary. The suggested practices of amending clay soils have changed a number of times during the past twenty years. Preparing holes for planting in clay soil keyed the phrase "creating a clay pot" situation. Just digging a hole and shoving a plant into it probably will not provide the results intended. However, digging a hole and filling around the root ball with loose organic matter may be just as bad. This is because the water in the soil will travel to the point of least resistance, such as the clay pot you just created. A plant will die just as quickly from drowning as from drought and the symptoms look curiously similar. Preparing the entire plant bed creates the best situation. Compost will perform best if the soil is well aerated. *PermaTill* can remedy this situation. Properly proportioned (about 35% to 50%) in the native clay with about 15% to 20% organic matter will continuously allow the exchange of air to occur between the surface and soil. The other benefit of *PermaTill* is it allows water to

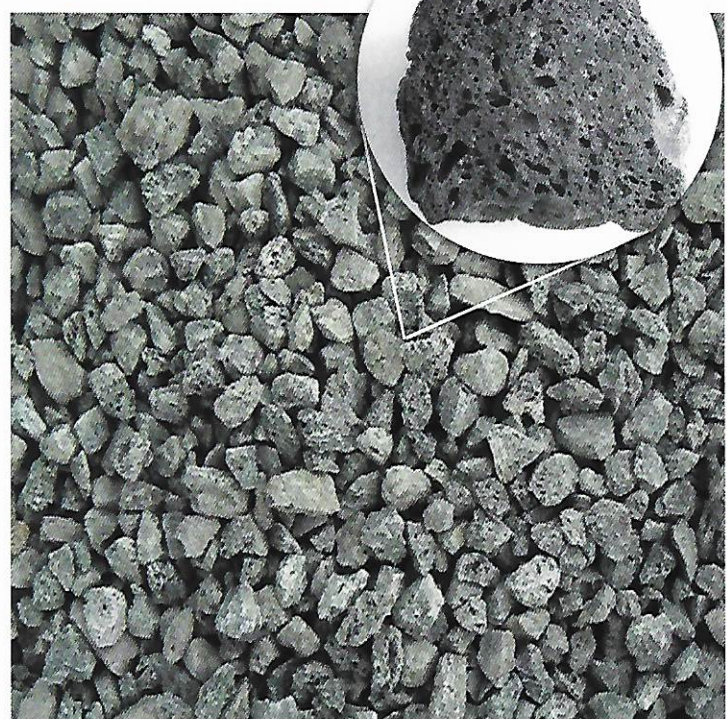
penetrate and move through the soil, while the air space in the *PermaTill* particles allows the roots to grow deeper into the soil which protects them from the summer heat and drought. The recommended method of bed preparation is:

Application Methods:

1. For heavy clays place 2" of *PermaTill* on the surface, work or till the *PermaTill* into the soil to a depth of 6 to 8 inches providing a 35% amendment for planting beds. Include 1/2 inches of compost to increase organic content if needed.
2. For around existing plants, use a garden spading fork to loosen the soil around the drip line of the plant. Fill the cracks and crevices with 100% *PermaTill* to the surface and topdress with compost.

Good decomposed organic matter should be added in the garden as needed to continuously feed the necessary microbes in the soil. A product like *PermaTill* is permanent and only has to be applied one time. The *PermaTill* will keep the organic matter well aerated which in return should improve the soil structure over time. Just think, no more jack hammering.

Enlarged view of a PermaTill particle



PermaTill 5/16" aggregate