

Whole Cycle Tuesday

Takeaway

Soil texture describes the proportion of sand, silt, and clay. By plotting these percentages on the textural triangle, we can better anticipate how the soil will drain, retain nutrients, respond to compaction, and support plant growth.

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SOIL TEXTURE



*"Nature does not hurry,
yet everything is
accomplished."*

— Lao Tzu

What Is Soil? Understanding Sand, Silt, Clay

Soil is much more than the material beneath our feet. It is a living, dynamic system made from mineral particles, organic matter, water, air, and countless organisms. Together, these components support plant growth, cycle nutrients, filter water, store carbon, and provide the foundation for natural and constructed landscapes. Although healthy soil depends on all these elements, its basic physical character is largely determined by the relative amounts of sand, silt, and clay it contains.

Sand, silt, and clay are not different minerals; they are particle-size categories. Under the classification system commonly used by the U.S. Department of Agriculture, sand particles range from 0.05 to 2.0 mm in diameter. Silt particles range from 0.002 to 0.05 mm, while clay particles are smaller than 0.002 mm. Particles larger than 2 mm, including gravel and stones, may influence drainage and soil behavior but are not included when determining soil texture.

Sand is the largest of the three soil particles and can often be seen or felt individually. Sandy soil typically feels gritty, contains relatively large pore spaces, and allow water and air to move through them quickly.

Silt particles are smaller than sand but larger than clay. Dry silt often feels smooth and flour-like, while moist silt may feel soft or silky. Silty soil generally holds more water and nutrients than sandy soils while still allowing moderate drainage.

Clay contains the smallest mineral particles, but its influence on soil performance is significant. Because clay particles have a very large surface area relative to their size, they can retain substantial amounts of water and nutrients. Clay-rich soils are often sticky and moldable when wet and hard when dry.

Soils contain a mixture of all three particle sizes. The percentages of sand, silt, and clay are used to determine the soil's textural class with a soil textural triangle. The three sides of the triangle represent percentages of sand, silt, and clay, and the three values must total 100%.

Texture is a permanent characteristic that cannot be significantly changed through normal management. Adding compost does not turn clay into loam because organic matter is not included in the sand-silt-clay calculation. Organic amendments can, however, improve aggregation, pore structure, infiltration, biological activity, and root growth.