Stop Treating soil Like Dirt!

By Donald Smith Jr.

I am Donald Smith

I am here because I love to find sustainable ways to farm and grow things.

You can find me at www.copperkettlefarms.com

What We Will Cover

Defining What Soil Is

What Destroys Soil

How to build and maintain good soil

What is Soil?

What is Soil made out of?

Soil is made out of 25% air, 25% water, 50% mineral & organic material

The Different types of soil

Sand, gritty that we can see with the naked eye

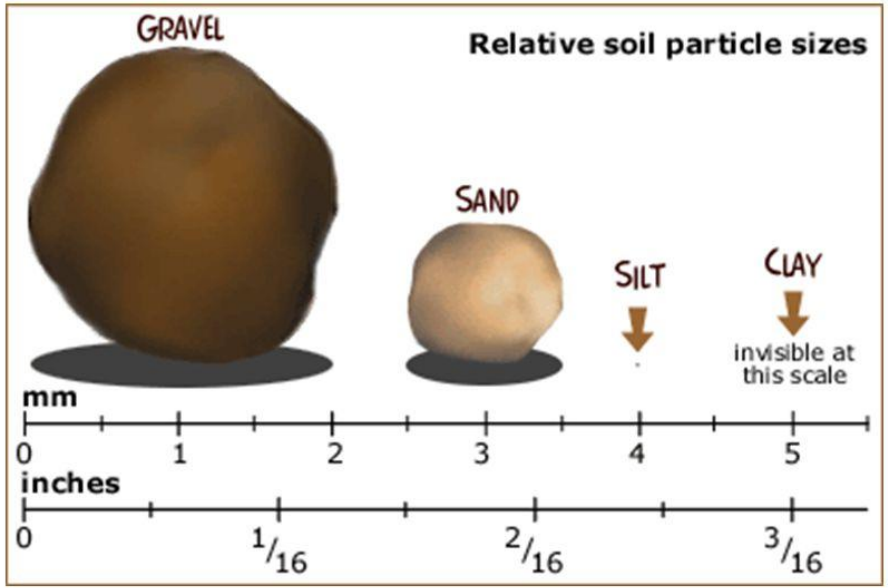
Silt (what you want), smooth and silky when wet

Clay, sticks to fingers and can be molded into shapes

Sand Silt Clay

The Sizes of Different Types of Soil

SAND, SILT & CLAY

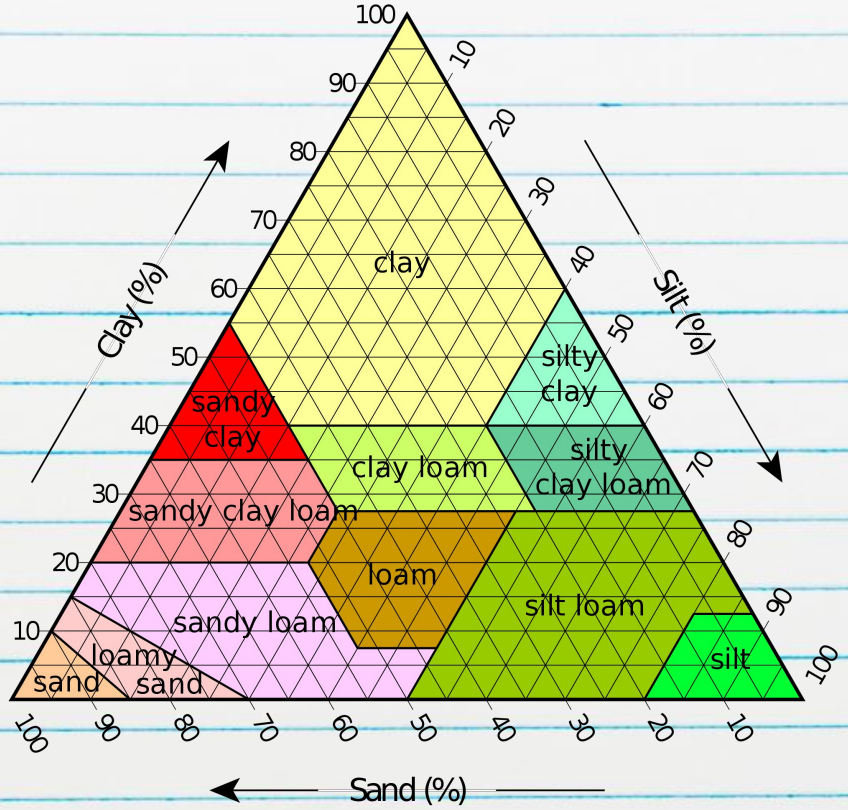


What Determines the Quality of Soil?

The amount of sand, silt, and clay determines the quality of your soil and is known as the "soil texture".

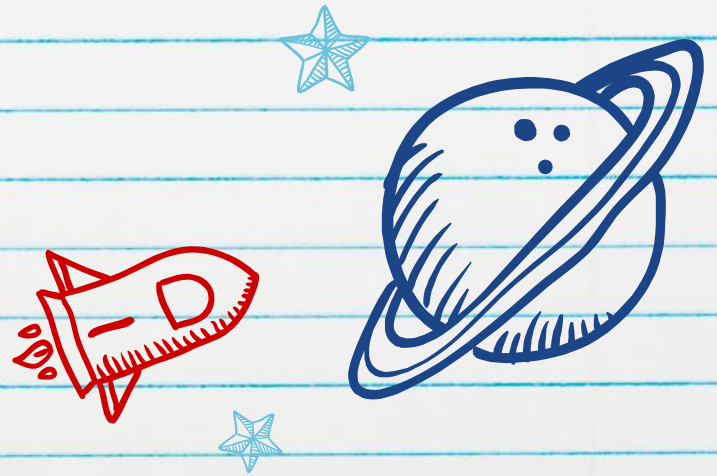
Using the USDA Soil texture triangle we can determine the name of our soil type

USDA Soil Texture Triangle

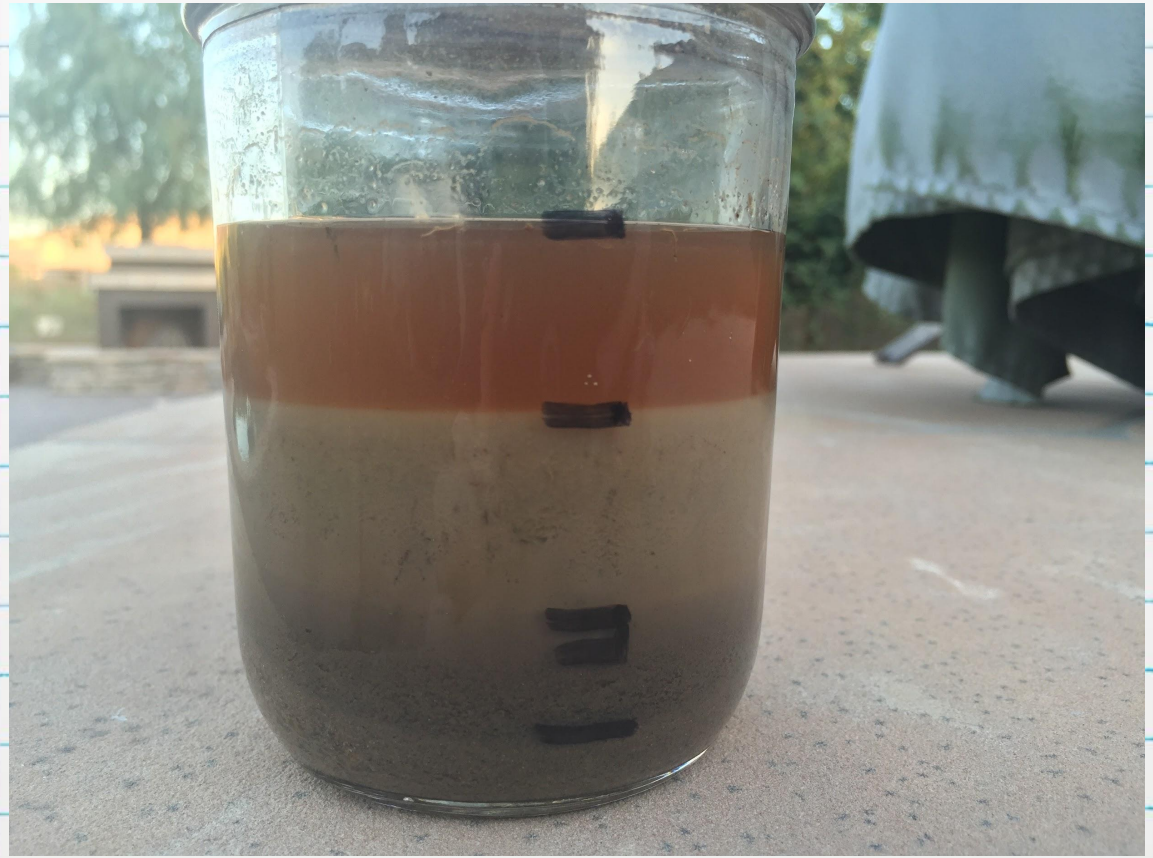


How to determine your soil type

Learn the art of the soil jar test



The Soil Jar Test



How to do the Soil Jar Test

Step 1:

Take soil sample once below the organic layer, 8 inches deep, then scrape a cup worth of soil from the bottom of that hole. Take several samples from around the garden.

Step 2:

Blend in a bucket and fill a glass jar about half full

Step 3:

Mark the level of your dry sample on the jar, fill the jar two-thirds full of water

How to do the Soil Jar Test

Step 4:

Shake vigorously, let settle for 30 seconds then mark a line at the top of the soil

Step 5:

Wait three minutes, then mark line again, after marking second line you should have two clear layers, sand, and silt.

How to do the Soil Jar Test

Step 6:

Estimate the percentage of each particle in relation to the original level of soil in the jar. The particles above the silt line are clays, as this size of particle takes a long time to fully settle, estimate the percentage of clay by the difference after accounting for sand and silt

The Soil Jar Test

Soil Health is defined as:

"The capacity of a soil to function within ecosystems and land use applications that can sustain productivity, maintain environmental quality and promote plant and animal health"

What determines a good soil ecosystem

Diverse Soil Organisms

- Single cell bacteria
- Worms and insects
- Microscopic Portists

Soil Structure

The better your soil structure, the better your diversity.

Healthy Soil Includes:

- Good soil tilthg (physical condition)
- Sufficient depth
- Proper levels of nutrients
- Good drainage
- Large populations of beneficial organisms
- Resistance to weeds and degradation
- Resilient when unfavorable conditions occur

What Destroys Soil Structure

Tillage
Leaves soil particles exposed to the forces of wind and water. They settle into pores causing surface sealing, compaction, and reduced infiltration. Less water is available to plants and erosion increases.

Compaction
The destruction of the soil structure. It leaves little to no space between soil particles for air and water. Hard and do not absorb water or nutrients well. Restrict plants root development

Overgrazing, Overcropping, Deforestation
:Leads to desertification, the spread of desert like lands due to human activity accelerating natural erosion of soil.

How to protect your Soil and prevent erosion

Plant

Planting trees, grasses and shrubs. These help prevent erosion and help hold the soil together

Mulch

Adding mulch regularly helps to add nutrients through decomposition. This will weigh down the soil and prevent seeds from getting washed away. Slows absorption of water to reduce run-off.

Improve Drainage

Without adequate drainage, heavy rain could wash away a whole layer of topsoil.

How to build Soil

Building soil is the #1 thing any gardener needs in order to have a successful crop.

How to Improve your soil

Sandy Soil

Sand particles are large, irregularly shaped bits of rock. In a sandy soil, large air spaces between the sand particles allow water to drain very quickly. Nutrients tend to drain away with the water, often before plants have a chance to absorb them. For this reason, sandy soils are usually nutrient-poor.

A sandy soil also has so much air in it that microbes consume organic matter very quickly. Because sandy soils usually contain very little clay or organic matter, they don't have much of a crumb structure. The soil particles don't stick together, even when they're wet.

How to Improve your soil

To Improve Sandy Soil

- Work in 3 to 4 inches of organic matter such as well-rotted manure or finished compost.
- Mulch around your plants with leaves, wood chips, bark, hay or straw. Mulch retains moisture and cools the soil.
- Add at least 2 inches of organic matter each year.
- Grow cover crops or green manures.

How to Improve your soil

Clay Soil

Clay particles are small and flat. They tend to pack together so tightly that there is hardly any pore space at all. When clay soils are wet, they are sticky and practically unworkable. They drain slowly and can stay waterlogged well into the spring. Once they finally dry out, they often become hard and cloddy, and the surface cracks into flat plates.

Lack of pore space means that clay soils are generally low in both organic matter and microbial activity. Plant roots are stunted because it is too hard for them to push their way through the soil. Foot traffic and garden equipment can cause compaction problems. Fortunately, most clay soils are rich in minerals which will become available to your plants once you improve the texture of the soil.

How to Improve your soil

To Improve Clay Soil

- Work 2 to 3 inches of organic matter into the surface of the soil. Then add at least 1 inch more each year after that.
- Add the organic matter in the fall, if possible.
- Use permanent raised beds to improve drainage and keep foot traffic out of the growing area.
- Minimize tilling and spading.

How to Improve your soil

Silty Soil

Silty soils contain small irregularly shaped particles of weathered rock, which means they are usually quite dense and have relatively small pore spaces and poor drainage. They tend to be more fertile than either sandy or clayey soils.

How to Improve your soil

To Improve Silty Soil

- Add at least 1 inch of organic matter each year.
- Concentrate on the top few inches of soil to avoid surface crusting.
- Avoid soil compaction by avoiding unnecessary tilling and walking on garden beds.
- Consider constructing raised beds.

QUIZ TIME!

Question #1

Soil is made out of 25% air, 25% water, and 50% of what?

Answer #1

Mineral & Organic Material

QUIZ TIME!

Question #2

What are the three types of soil?

Answer #2

Sandy, Silt and Clay

QUIZ TIME!

Question #3

What is one indicator of healthy soil?

Answer #3

- Good soil tilth
- Sufficient depth
- Proper levels of nutrients
- Good drainage
- Large populations of beneficial organisms
- Resistance to weeds and degradation
- Resilient when unfavorable conditions occur

QUIZ TIME!

Question #4

What is something that destroys soil?

Answer #4

Tillage, Overcropping, Deforestation, Overgrazing and Compaction

QUIZ TIME!

Question #5

What is one way to protect soil?

Answer #5

- Plant shrubs, grass, and trees
- Mulch
- Improve Drainage

Any questions?

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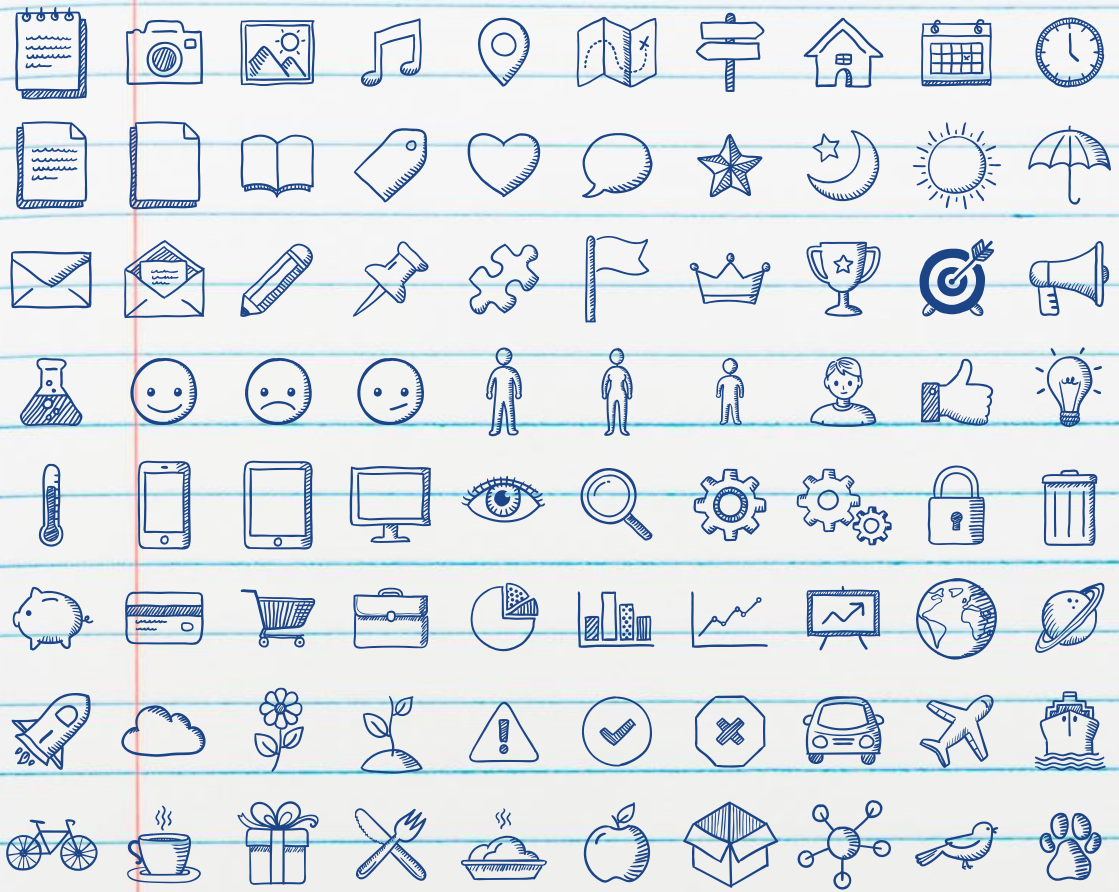

SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change fill color and opacity.
- Change line color, width and style.

Isn't that nice? :)

Examples: