

Healthy Soil = Healthy Plants

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Plants depend on the soil to provide oxygen, water and nutrients for the roots to take in. It is estimated that 80% of plant issues begin with soil conditions that reduce plant vigor. The soil texture made up of sand, silt and clay determines the potential to supply the needed oxygen, water and nutrients. The soil test most commonly performed is used to determine the nutrient capacity of the soil and not the texture. (See next page to determine soil texture.)

It is difficult to adjust the content of sand, silt and clay when they are not at the desired amount for plant growth. The incorporation of organic matter is an option to modify soil conditions to provide for plant needs. Because organic matter decomposes over time, it is suggested to add it annually. This makes the most sense for annual plantings. Although, it can be a short term boost to perennials at planting.

Organic matter will:

- Increase the air available to roots in tight clay soils.
- Increases water and nutrient holding capacity of sandy soils.
- Make the soil easier to till.
- Provide nutrients for plants and microorganisms.

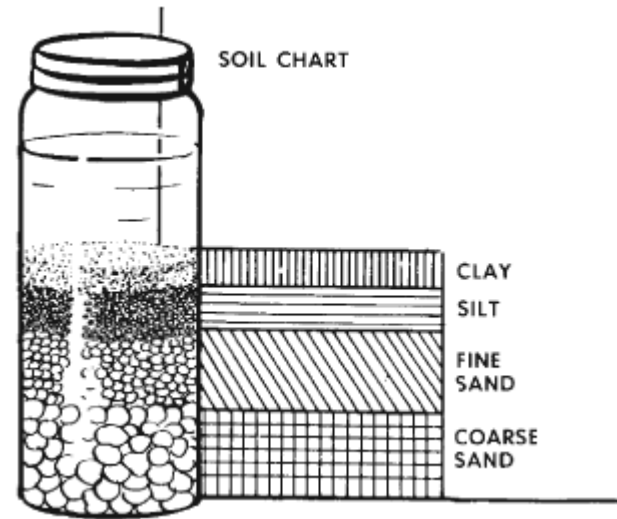
<u>Material</u>	<u>Amount per 100 Square Feet</u>	<u>Where to Locate</u>	<u>Costs</u>
Tree leaves	3-4 bushels chopped = 75 pounds	Neighborhood	Free
Compost	1-2 bushels = 50-100 lbs	Riley County Transfer Station	\$1
Horse manure	2 bushels = 50-100 lbs	Stable or retailer	\$7
Poultry/sheep manure	1/2 bushel = 10-20 lbs	Retailer or local producer	\$10
Alfalfa, straw, prairie hay	Use one bale = 60 lbs	Retailer or local farmer	\$8
Cotton burrs	5 bags that are 3 cubic feet	Retailer	\$25
Peat moss	6-10 cubic feet	Retailer	\$30

Blend the organic materials into the existing soil as deeply as possible prior to planting. The soil should be crumbly and not too wet to create clods when working.

Contact the office for soil testing and recommended plant selections.

Determining How Much Sand, Silt and Clay is Present in Your Soil

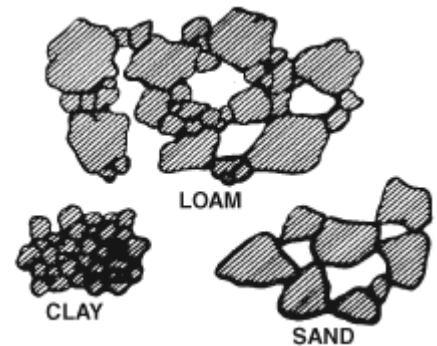
1. Dig down about 6 inches and remove several trowels full of soil.
2. Remove any rocks, trash, roots, etc. Crush larger lumps and clods.
3. Fill a tall, slender jar one-fourth to one-half full with the soil.
4. Add water until the jar is about three-fourths full.
5. Add 1 teaspoon of powdered, non-foaming dishwasher detergent.
6. Put on a tight fitting lid and shake hard for 10 to 15 minutes until the soil is broken up and well dispersed.
7. Set the jar down where it will not be disturbed for at least two to three days and allow the soil to settle. Normally this takes one to three days, but with some soils it may take weeks.
8. After one minute, mark on the jar the depth of the sand that settles to the bottom.
9. After two hours, mark on the jar the depth of the next layer, which is silt. When the water clears, mark on the jar the top level. This layer will be composed of clay particles. Most of the particulate organic material will float to the top and should not be used in the calculations.
10. Measure the thickness of the sand, silt and clay layers and calculate the percentage of each by comparing the thickness of the different component levels with the total thickness of the solids.



The structure of the soil will also determine how the soil compacts. Soil compaction is a common condition in our area. Soils with higher levels of organic matter generally have better structure and are more resistant to compaction than soils with lower organic matter levels.

Some signs of soil compaction include:

- Roots appearing enlarged, stubby, twisted or thin and flattened.
- Roots growing horizontally and close to the surface.
- Standing water.
- Excessive water erosion.
- Poor plant vigor.



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