

# Gardening Basics

## LESSON 6: SOIL HEALTH

Soil is primarily composed of four main factors, in different amounts: minerals (clay, sand, and silt), organic material, water, air.

### Clay:

Very small particles that retain water and nutrients

### Sand:

Largest mineral particles. Provides excellent drainage, does not compact, and dries out quickly

### Silt:

Slightly larger particles than clay, provides most available plant water

### Organic Material:

Plant and animal residue in different stages of decomposition



Soils will have different compositions depending on geological factors and what the land has been used for.

## Soil Structure



### Micropores

- Soil micropores are the smaller spaces in your soil structure
- These pores are made up of a combination of water and oxygen
- The amount of micropores will vary between soils, but a good ratio is 50% macropores and 50% micropores

### Macropores

- Soil structure refers to the way clay, sand, and silt particles stick together in what are called aggregates
- Aggregates are what form the macropores of soil, or the large, solid pores in soil structure

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### Soil Structure Considerations: Compaction

- One of the main problems gardeners will run into with their soil structure is compaction
- Compaction occurs with heavy clay soils and very fine aggregates
- Compacted soil means that there is less oxygen in your soil
- Compaction can be avoided by using no-till methods and avoiding foot or machinery traffic over the soil
- Adding organic matter, sand, and ensuring good populations of beneficial organisms like earth worms are great ways to help remedy compacted soils



### Water Retention

- The composition and structure of your soil will give you an idea of your soil's ability to retain water, and its nutrient content
- Heavy clay soils typically retain water, sometimes in excess
- Very sandy soils provide excellent drainage, but this means they dry out very quickly and require much more watering



### The Soil Food Web

- Refers to the complex relationship between the community of organisms that live in soils made up of vertebrates, invertebrates, fungi and bacteria, and protozoa
- The *biota* of soil refers to all living things in your soil – both beneficial and harmful. Our goal as gardeners is to reduce the amount of harmful biota (bad bacteria, pests, viruses) so that the beneficial biota can outnumber them, creating a healthy balance
- By improving your soil structure and composition, we can help create an environment for the beneficial biota to thrive
- Beneficial biota in turn improve soil quality and add nutrients to your soil, helping your plants survive and thrive!

