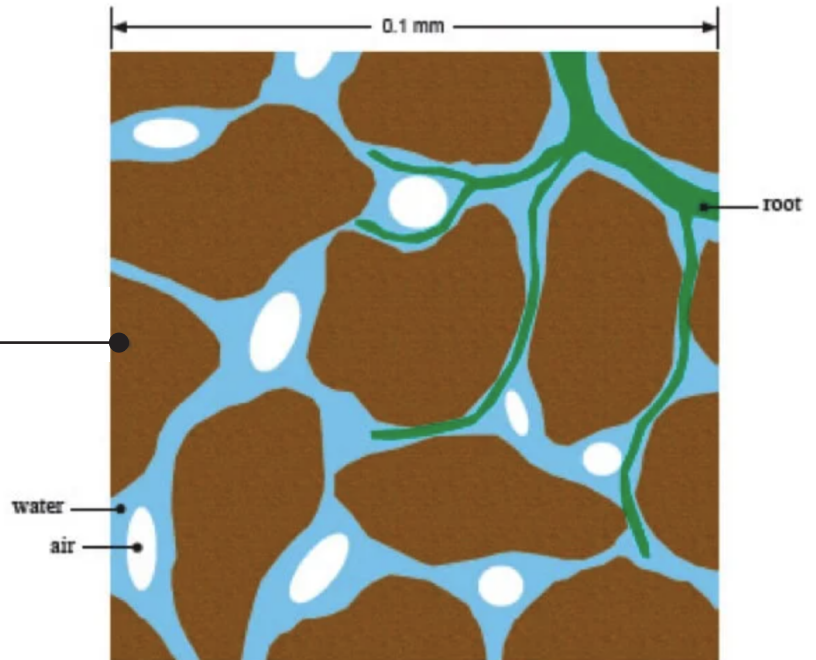


Soil Composition

Soil is composed of different kinds of particles of different sizes.

Soil particles have spaces in between called pores. Pores are filled with air, water, roots and other living material.

- Soil particles:
- Mineral particles from rock degradation
 - Organic particles from plants and animals



Soil Texture

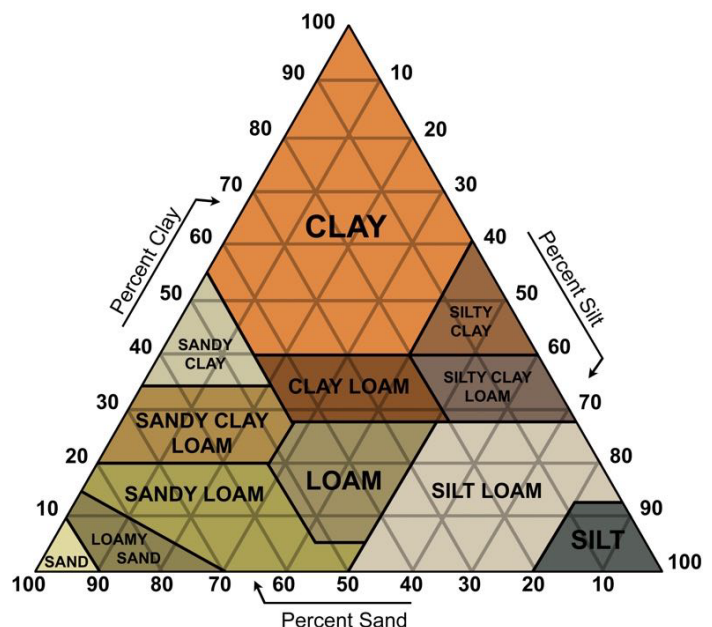
The mineral particles in the soil differ widely in size and can be classified as:

- Gravel (larger than 1 mm)
- Sand (0.5 to 1 mm)
- Silt (0.002 to 0.5 mm)
- Clay (less than 0.002 mm)

The amount of sand, silt and clay present in the soil determines the soil texture

- Sand is predominant in coarse textured sandy soils
- Silt is predominant in medium textured loamy soils
- Clay is predominant in fine textured clayey soils

The soil texture triangle on the right groups the different combinations of sand, silt and clay into 12 soil types exhibiting many similar properties such as hydrological performance



Basic Hydrology

During a rain shower event or an irrigation application, the soil pores fill with water. If all soil pores are filled the soil is said to be saturated. After the rain or the irrigation has stopped, part of the water present in the large pores will move downward due to gravity and is replaced by air. Excess water will also form puddles at the surface, run off or evaporate out of a crop's reach.

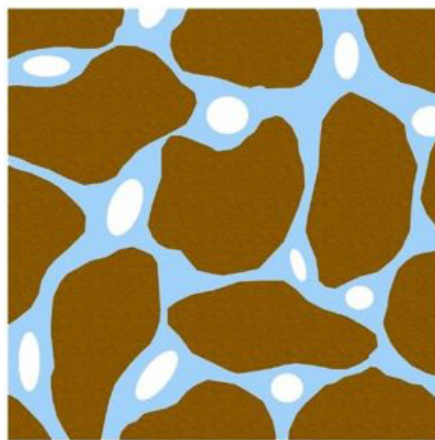
After drainage has stopped, the large pores are filled with both air and water, and the smaller pores are still full of water. At this stage, the soil is said to be at field capacity.

With soil moisture below field capacity, the water will stay suspended in between the soil particles due to capillary forces and will leave the soil profile with evaporation or evapotranspiration.

Little by little the water is taken up by the plant or evaporated from the topsoil. The dryer the soil becomes, the more tightly the remaining water is retained and the more difficult it is for the roots to extract it. The Permanent Wilting Point refers to the amount of water in the soil that is unavailable to the plant.



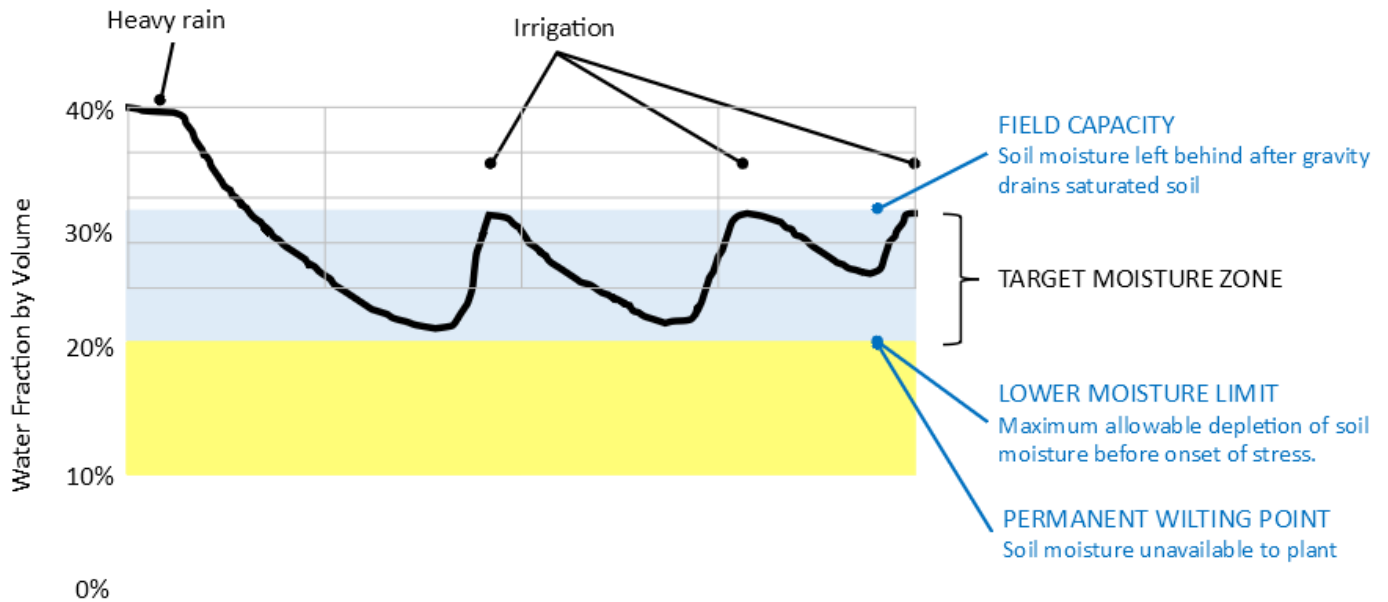
Saturation



Field Capacity



Less than
Field Capacity



Soil Moisture Target

