

SOIL

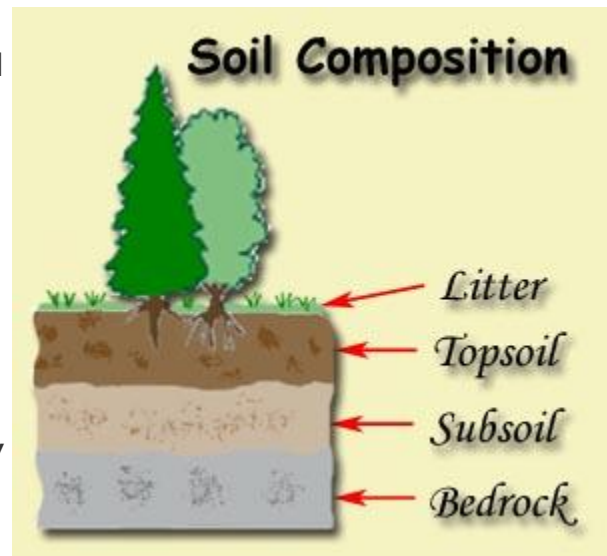
As the world's population grows, there is an increasing demand for food and an increased pressure on agricultural systems which includes soil use and management. This lesson will focus on the nature of soil (both abiotic and biotic). It will look at farming practice in relation to soil as a sustainable resource.



Components of Soil:

Soil is a natural resource that is best considered as a non-renewable resource. The physical and biological processes involved in the formation of soil take thousands of years to complete. Most soil scientists describe soil as a series of layers, each having different physical and chemical properties. In general the texture of the soil becomes more coarse, and the amount of organic or living material becomes reduced with greater depth.

The uppermost layer is known as **topsoil** and consists of fine textured mineral particles (sand, clay, etc.) and organic material (decaying plant and animal material) known as humus. This layer is important to life since this is the layer in which plants grow. The topsoil is actually an ecosystem of microscopic and macroscopic organisms including bacteria, fungi, protozoa, and several varieties of animals - nematodes, worms, arthropods, etc. The interaction between the mineral components and the life forms that exist in the soil make it possible to support the plants that normally associate with the soil, and those animals that depend on the plants for their existence.



Below the topsoil is a layer known as the **subsoil**. In general the subsoil is more coarse in texture and has less organic material. The number of organisms living in the subsoil is generally reduced. Plant roots often invade the subsoil to gather water and mineral resources stored in this layer.

Below these two layers is the **bedrock**, which is not considered a soil layer, but the support for the soil layers above. The focus of this lesson will be on the nature of the topsoil and subsoil and its management as a sustainable resource.

Factors which affect the ability of soil to support plant life are a major concern in both forestry and agricultural industries. These factors include:

- soil fertility,
- water storing capacity,
- soil pH,
- salinity,
- and porosity to air (oxygen, nitrogen, and carbon dioxide).

Farming practice, including the use of fertilizers, pesticides, tilling and plowing of soil, irrigation practice, and harvesting technologies all influence the soil as a living community. One of the more important questions to consider is whether or not soil use in forestry and agricultural industries can be maintained as a sustainable resource.