

CHAPTER 9: Soil

- Soil is a natural resource
- It carries out many important functions.
- Plants require soil for their growth and development.
- A large diversity of microorganisms lives in soil.
- For crop production fertile soil is essential.
- Agricultural practices use soil n help in generation of food, cloths and shelter.

I. SOIL PROFILE

- Soil is composed of different layers like humus, water, clay, sand and gravel.
- The dead and decaying matter in soil is called humus. It forms the topmost layer of soil.
- Weathering: It is a natural process by which soil is formed by the breaking down of rocks. Different natural processes like wind, varied climatic conditions are responsible for soil formation.
- Nature of soil is dependent of type of rocks undergoing degradation.
- **Soil profile:** A vertical profile by which one can analyze the different layers of soil.
- **Horizons:** soil is composed of different layers and each layer has a unique texture, color, physical and chemical composition.
- Only the top surface of the soil is visible to the human eyes.
- Soil profiles can be viewed and analyzed in recently dug ditches, wells, or in construction sites when foundation of buildings are laid

• **TYPES OF HORIZONS:**

A) A-horizon:

- it is composed of the topmost layer of soil which has a soft texture and porous nature.
- The color of soil is dark.it has good water retention ability.
- It is fertile as it has large amounts of humas and minerals.
- Owing to this property plant growth is optimum in this horizon.
- This layer also supports the habitation of small rodents, earthworms and other insects.

B) B-Horizon:

- The layer of soil below the A- Horizon which has a harder texture is the B- horizon
- This layer has low humas content and amount of minerals in this layer is high,
- The layer is more compact.

C) C-Horizon:

- It is the third layer is called C-horizon.
- It is composed of small lumps of rocks which have fissures, gaps etc.
- The layer below this is a rock bed which cannot be dug by simple equipment like the spade.

➤ **SOIL TYPES:**

- 1.) SOIL: Soil can be defined as a natural material generated by erosion of rocks which generates sand and clay in varying amounts depending on the type of rock. It is a mixture of humas, sand and clay along with living things like bacteria, plant rootsand earthworm.
- 2.) Sandy soil:

Soil containing larger quantities of large rocky particles is called sandy soil. As sandy particles are comparably large, they cannot be arranged in a compact fashion and this generates large gaps or air-filled pockets in the soil which drains water quickly

3.) Clayey soil:

Soil containing a comparatively high number of fine particles is called clayey soil. These particles are smaller in size and hence can be packed together tightly. They do not have air spaces and easily holds water which makes it heavier than the sandy soil.

4.) Loamy soil:

Soil which is composed of large and fine particles is about equal quantities along with silt, is called loamy soil. It is optimum for growth of plants as humus is present.

5.) Silt is soil deposited near riverbeds with intermediate size of the silt particles between those of sand and clay and has good water retention capability.

➤ **PROPERTIES OF SOIL**

➤ Percolation rate of water in soil:

- The rate of percolation (mL/min) is calculated by using the formula: amount of water (mL) / percolation time (min)

➤ Moisture in soil:

- Soil contains water. Water can evaporate on hot summer days.

➤ Absorption of water by soil:

- Volume of water absorbed by the soil can be calculated using the difference in the final volume of water and initial volume of water in the sample.

➤ **SOIL AND CROPS:**

- India is a diverse country with many different types of soils, which supports different types of crops in different seasons.
- The soil texture is affected by wind, rainfall, temperature, light and humidity.
- Clayey and loamy soils are suitable to grow cereals like wheat and gram as they have good water holding capacity.
- Paddy soils have good water holding capacity, organic matter and clay which helps in growth of lentils (*masoor*) and
- Many pulses require loamy soils which drain water easily
- A mixture of sandy and loamy soil which drains water easily and can hold plenty of air, are more suitable.
- To grow wheat fine clay soil is required.

➤ **Soil erosion:**

- 1) Soil erosion is a common phenomenon.
- 2) The land gets corroded by action of water, wind or ice is known as erosion.
- 3) Plant roots are anchored in soil and hold the soil due to which soil erosion is prevented.
- 4) Deforestation, lack of vegetation leads to soil erosion.