



- **Soil suitability for crops:** Soil does not have the same properties everywhere, and therefore different varieties of plants can grow in different areas. That is why we have some places growing more of a particular crop than others.
- Cereals like wheat and gram grow best in clayey and loamy soil as these are good in retaining water. Also, they are rich in humus and are very fertile. Wheat primarily comes from Punjab, Uttar Pradesh, and Haryana.
- For rice, clayey soil is the best as it is good in retaining water. The major rice-producing states are Punjab, Andhra Pradesh, and Uttar Pradesh.
- For lentils and other pulses, loamy soil which drain water easily are required.
- For cotton, sandy-loam or loam which drain water easily and can hold plenty of air are more suitable.
- **Soil fertility refers to the capacity of the soil to provide nutrients in adequate amounts and in proper balance for the growth of plants.**
- For a soil to be fertile, other growth factors such as light, moisture, and temperature should be favorable. To make a soil more fertile, some adjustments are done to its property. These adjustments are (a) alteration of pH, (b) alteration of air content (aeration), and (c) addition of fertilizers.
- Acidity or alkalinity (pH) affects the ability of plant roots to take up minerals from the soil.
- A fertile soil should have somewhat neutral pH. Lime (calcium carbonate) is added to acidic soils to raise the pH (make soil more alkaline).
- Peat is added to alkaline soil to lower the pH (make soil more acidic). Soil with a low air content has high water content, and so is heavy and difficult to work with. It can be improved by drainage of water from the soil by ploughing.
- Fertilizers are added to soil which have low mineral content such as nitrate, phosphate, potassium, and magnesium.
- **Soil Erosion:** Sometimes, wind and water remove the fertile topsoil reducing the productivity of the soil in that area. This removal of soil by running water and wind is known as soil erosion.
- Generally, the rate of removal of fine particles from the surface is the same as the rate of formation of soil. But sometimes, disturbance in this balance, usually man-made leads to a greater rate of removal of soil.
- **Hydroponics is a technique leads to a greater rate of removal of soil, with the help of which plants are grown in mineral nutrient solutions not soil.**
- The major causes of soil erosion are:
 1. **Deforestation:** The removal of trees on a large scale is known as deforestation. When trees are removed, soil particles are left loose and can easily be carried away by running water and wind.
 2. **Overgrazing:** Repeated grazing by animals on the same patch of land without sufficient recovery periods, leads to the removal of grass on a large scale. This makes it easy for wind and running water to erode the soil.
 3. **Floods and heavy rainfall:** Floods and heavy rainfall wash off soil, especially when there are no trees and the land is lying bare.
 4. **Improper farming:** Improper farming on hills makes it easy for wind and water to erode soil.
- **Prevention of Soil Erosion:** Reduction or prevention of soil erosion is called soil conservation. The following are some of the measures that help in conserving soil:
- **Planting of trees** in large numbers on deforested land (reforestation) or planting of trees in large numbers in an area where there was no forest previously (afforestation). Grasses and herbs can be used to cover large patches of loose soil.

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- **Preventing Overgrazing:** overgrazing of a single patch by animals should be avoided. Animals should be moved to a different area after some time.
- **Control Floods** can be controlled to a large extent by building dams. Embankments or mud walls should be constructed around hill slopes or fields to stop the flow of water.
- **Terrace farming:** should be adopted in hilly areas. In this method, suitable crops are grown on sloping ground which is cut into large steps called terraces. This reduces the speed with which water flows down, thereby reducing soil erosion.
- **Contour ploughing:** farmers plough lands so that furrows like across the natural slope of the land. Furrows trap water and do not allow it to flow down carrying the top soil.
- **Soil Pollution:** Soil is one of the most valuable natural resources on Earth. When it gets polluted by various means, including careless human activities, necessary measures must be adopted to control the pollution. The major sources of soil pollution are:
 - Acid rain and acid water from factories, mines, and industries because of air pollution washes salts out of the top soil. This affect growth of plants and trees.
 - Improper dumping of garbage and sewage wastes in soil. They pollute the soil and now these days they have become a major environmental problem.
 - Excessive use of pesticides and fertilizers, which get accumulated in soil. The structure of soil deteriorates leading to increased erosion.
 - Waste materials such as plastic and metals which do not decay easily.
 - Spilling or leakage of chemicals.
- **Control of Soil Pollution:** The following measures will help to control soil pollution.
 - Solid wastes should not be dumped on land. They should be recycled and proper measures for disposal of sewage should be adopted.
 - Animal and domestic wastes should be used to produce biogas (an eco-friendly fuel).
 - Instead of chemical pesticides and fertilizers, organic pesticides should be used.
 - Liquid wastes from factories and mines should be properly treated before they are released into water bodies such as rivers and lakes.

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