**TOPIC NAME :**

* **Water field capacity and soil water holding capacity**
* **Characteristics of xerophytes and hydrophytes**
* **Effect of precipitation on distribution of plants**

**1) Water Field Capacity and soil water holding capacity :**

* **Definition :**

The amount of moisture content held in the soil after excess water has removed and the rate of downward movement has decreased is called as **water field capacity.**

While; the maximum amount of water that a given soil can hold for a crop use is called as **soil holding capacity.**

* **Factors :**

Following are the factors which affect;

* **Soil texture:**

The finer the texture of soil is , the higher is the apparent field capacity, the slower is its attainment the less distinct its value.

* **Organic matter content:**

Soil organic matter helps retain water and increase the water field capacity of the soil.

* **Soil structure:**

These change the soil horizon and influence water retention , so the clay soils retain more water and longer than the sandy soils.

* **Temperature**

The temperature influences the amount of water held, if the soil has been previously wetted, then the amount of retained at field capacity decreases as the soil temperature increases.

* **Higher field capacity :**

A soil that is saturated and dries has a higher field capacity than a soil that is being wetted. For example clay soil has higher field capacity than the sandy soil.

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**2) characteristics of xerophytes and hydrophytes :**

**Xerophytes:-**

**Xerophytes** is a species of plant that has adaptations to survive in an environment with little liquid water, such as a desert or an ice- or snow-covered region in the Alps or the Arctic. Popular examples of xerophytes are cacti, pineapple and some Gymnosperm plants.



**Characteristics of xerophytes:-**

### 1. Thick cuticle.

### 2. Stomata closure.

### 3. Reduction in number of stomata.

### 4. Stomata hidden in crypts or depressions in leaf surface (less exposure to wind and sun).

### 5. Reduction in size of transpiration surface (lower leaf only).

### 6. Increased water storage.

### 7. Thicker leaves and stems, or leaves reduced in number, or leaves drop off during dry season.

### 8. Leaves covered with silvery hairs (creates wind break & light reflective surface).

### 9. Deep taproots or wide spreading fibrous roots near the soil surface.

### 10. Low growth form (reduces H2O loss from wind).

### 11. Reduced life cycles

**Hydrophytes:-**

A plant that grows either partly or totally submerged in water *also*a plant growing in waterlogged soil. **Examples** of **hydrophytes** are lotus and water hyacinths.



**Characteristics of Hydrophytes:-**

### 1. Thin cuticle.

### 2. Stomata open most of time (as water is abundant).

### 3. Increased number of stomata.

### 4. Plants in water have less structure (water pressure supports them).

### 5. Large flat leaves on surface plants for flotation.

### 6. Air sacs for flotation.

### 7. Reduction in roots (H2O can diffuse directly into leaves).

### 8. Roots of water plants are feathery to hold up plant.

### 9. Roots modified to pick up oxygen.

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### 3) Effect of precipitation on distribution of plants :

1. **Snowfall:**

Snow may be injurious or beneficial to plants in a number of ways such as ;

* Snow that melts at times when the soil is not frozen is a source of soil water. The gradual melting of snow feeds streams which supply water for irrigation purpose to aird regions.
* Heavy snowfall followed by wind or rain may break off tree branches. Similarly weight of the snow burdens the vegetation.
* At high altitudes and latitudes snowdrifts damage the vegetation growing on slopes.
* Deep snow may press the sliding down to the ground so that they may be attacked by fungus easily.

1. **Rainfall**:

Rain is important to plants in the following respects:

* Rain is of tremendous importance to plant as a source of soil moisture.
* Rain helps to crack open thin-skinned fruits such as cherries plums and tomatoes when wetted to release the seeds.
* The amount and distribution of rainfall determines the vegetational zones(desert, subtropical forests, rain forests) of the world and the type of vegetation in them .

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