



## **Plant Environment Abiotic Factors:**

# **Soil and Its Impact on Plants**

## **Seventh lecture**

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## Plant Environment Abiotic Factors:

### Introduction

## The Essential Foundation of Terrestrial Ecosystems

**Soil** is a naturally occurring, dynamic mixture of mineral and organic matter at the Earth's surface that supports life. It's formed by weathering and decomposition, exhibiting distinct layers.





## Plant Environment Abiotic Factors:

### Introduction

Its essential roles in terrestrial ecosystems include:

- 1. Providing the primary medium for plant growth:** Offering physical support, water, nutrients, and aeration.
- 2. Serving as a habitat for a vast and diverse community of organisms:** Driving nutrient cycling and soil health.
- 3. Regulating water flow and quality:** Facilitating infiltration, storage, and natural filtration.



## **Plant Environment Abiotic Factors:**

**The importance of soil as a source of food and physical support for the plant.**

Soil is vital because it directly provides plants with food (nutrients) and physical support , enabling their growth and survival, which in turn sustains terrestrial ecosystems and food production.



## Plant Environment Abiotic Factors:

### The ecological role of soils in maintaining biological balance.

- 1. Plants:** Rely on soil for nutrients, water, and physical support, forming the base of most terrestrial food webs.
- 2. Animals:** Directly or indirectly depend on plants for food and habitat, both of which are supported by healthy soil. Soil also provides habitat for many animals (e.g., burrowing mammals, insects).
- 3. The Atmosphere:** Soil plays a role in gas exchange (carbon sequestration, greenhouse gas emissions), influencing atmospheric composition.



## Plant Environment Abiotic Factors:

**The ecological role of soils in maintaining biological balance.**

**4. Microorganisms (bacteria, fungi ):** These are integral to soil's biological balance, driving nutrient cycling, decomposition, and disease suppression. They are both inhabitants of and contributors to the balanced soil environment.

**5. Water Systems:** Healthy soil regulates water infiltration and storage, impacting groundwater recharge and surface water quality.

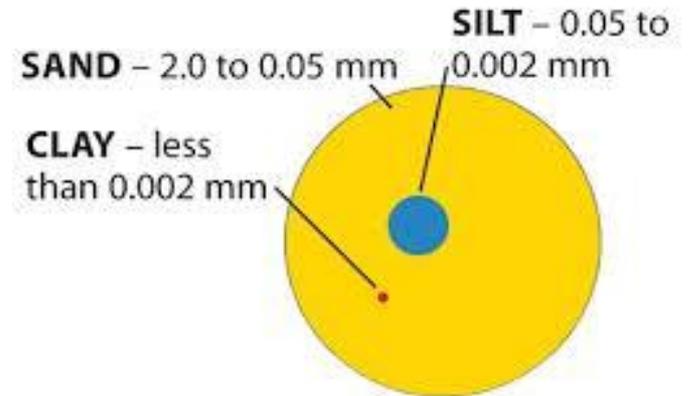


## Plant Environment Abiotic Factors:

### Environmental Properties of Soil Affecting Plants

#### 1. Physical Properties:

1. Soil texture (clayey, sandy, loamy).
2. Soil porosity and aeration.
3. Soil water retention and drainage capacity.





# **Plant Environment**

## **Abiotic Factors:**

### **Environmental Properties of Soil Affecting Plants**

#### **2. Chemical Properties**

- 1. pH (soil acidity or alkalinity) and its effect on nutrient absorption.**
- 2. Concentration of macronutrients (N, P, K) and micronutrients (Fe, Zn, Mn...).**
- 3. Soil salinity and its effect on the plant's ability to absorb water (salt stress).**



## Plant Environment Abiotic Factors:

### Environmental Properties of Soil Affecting Plants

#### 3. Biological Properties

1. Soil microorganisms (bacteria, fungi, earthworms).
2. Role in organic matter decomposition and nitrogen fixation.





## Plant Environment Abiotic Factors:

*Thanks for listening*