



Plant Environment Abiotic Factors:

Types of Irrigation Water and Their Impact on Plants

Fifth lecture

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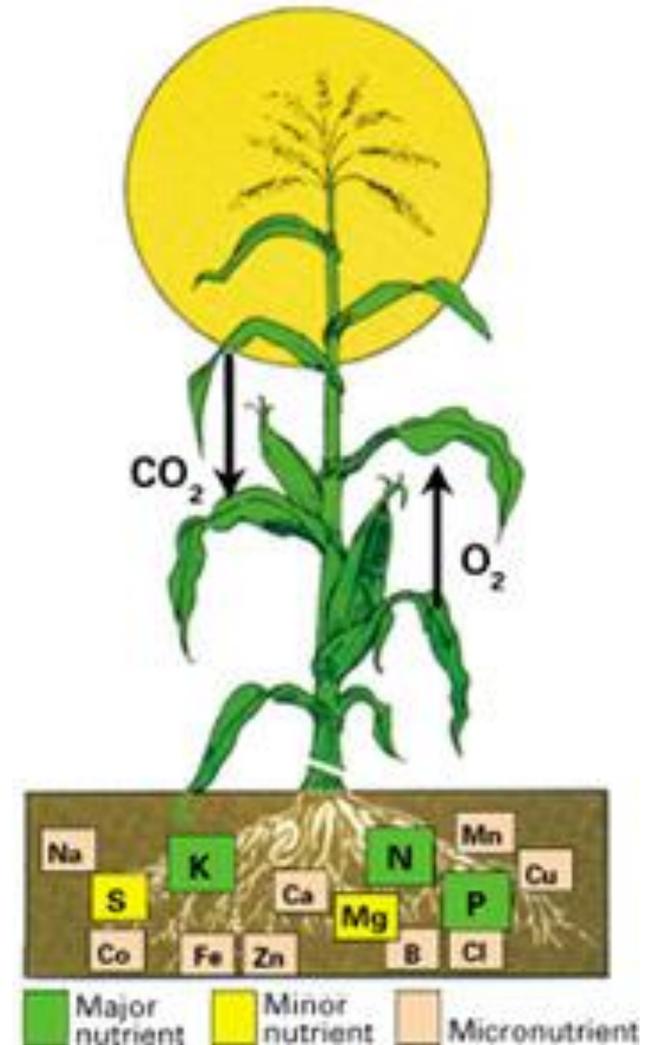


Plant Environment Abiotic Factors:

Introduction

Why is irrigation water important?

- ❖ Essential for plant growth and food production
- ❖ Determines soil health and nutrient availability
- ❖ Influences on crop yield and quality





Plant Environment Abiotic Factors:

Major Types of Irrigation Water

1. Surface Water (Rivers, Lakes, Reservoirs)

Pros:

1. Readily available
2. Rich in minerals and nutrients

Cons:

1. High sediment content
2. Risk of pollution (chemicals, industrial waste, pathogens)

Impact on Plants:

1. Provides essential nutrients (if clean)
2. Contaminants may lead to toxicity or disease spread



Plant Environment

Abiotic Factors:

2. Groundwater (Well Water)

Pros:

1. Generally free from surface contaminants
2. Available year-round

Cons:

1. High salt content in arid regions
2. May contain excess minerals (iron, calcium, magnesium)

Impact on Plants:

1. Hard water may cause nutrient imbalances
2. High salinity affects seed germination and root function



Plant Environment

Abiotic Factors:

3. Rainwater

Pros:

1. Naturally soft and free of salts
2. Environmentally sustainable

Cons:

1. Seasonal availability
2. Risk of contamination from collection surfaces

Impact on Plants:

1. Ideal for sensitive plants
2. Low in minerals, requiring nutrient supplementation



Plant Environment

Abiotic Factors:

4. Treated Wastewater (Reclaimed Water)

Pros:

1. Sustainable water management solution
2. Contains organic matter and nutrients beneficial to plants

Cons:

1. Risk of residual pathogens and heavy metals

Impact on Plants:

1. Can enhance soil fertility when properly treated
2. Contaminants may reduce plant health if not monitored



Plant Environment

Abiotic Factors:

5. Desalinated Water

Pros:

1. Provides fresh water in arid regions
2. Free from pathogens and contaminants

Cons:

1. Expensive and energy-intensive
2. Lacks essential minerals (may require fertilization)

Impact on Plants:

1. Suitable for hydroponics and controlled environments
2. Can lead to nutrient deficiencies if not supplemented



Plant Environment Abiotic Factors:

Salinity Issues in Irrigation Water

- **Effects of High Salinity:**

1. Reduces water uptake (osmotic stress)
2. Causes leaf burn, stunted growth, and lower yields

- **Management Strategies:**

1. Selecting salt-tolerant crops
2. Leaching excess salts from soil
3. Using gypsum or organic matter to improve soil quality



Plant Environment Abiotic Factors:

Thanks for listening