

Plant Health Care

Certified Arborist Prep Course



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Key Concepts

- Philosophy of Plant Health Care (PHC)
- Appropriate response process (ARP)
- Allocation of Resources
- Effective Monitoring Program
- Pest Management Options
- Preventive strategies



Plant Health Care (PHC)

- A holistic and comprehensive program to manage the health, structure, and appearance of plants in the landscape.


(ISA)

- A multidimensional strategy for plant care that focuses on plant vigor and relies on plant selection and integration of a broad range of techniques aimed at protecting and enhancing plant health; an outgrowth of IPM.

(Smith and others, 1995)



Vigor vs. Vitality

- Vigor: inherent genetic capacity to resist stress
 - Vitality: ability to thrive in a given environment
- 



Vigor


- Inherent adaptability to various environmental conditions
 - Soil types
 - Moisture conditions
 - Cold or heat
- Select species well matched to environment and resistant to pests
 - Hardiness zone
 - Site characteristics
 - Varieties and cultivars
 - ...

Vigor





Vitality

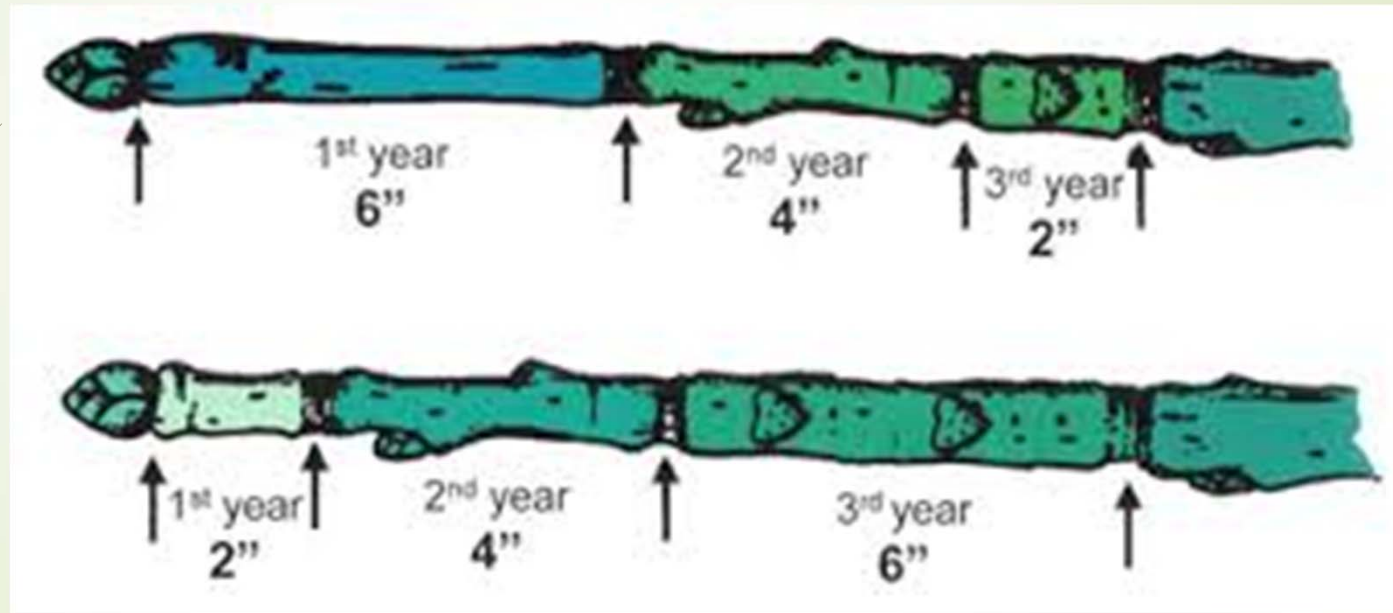
- Measure of Plant Vitality
 - Some only measure success of treatments and practices by increased growth in :
 - Height
 - Trunk diameter
 - Root mass
 - Total leaf area
- 

Vitality



Measure of Vigor and Vitality

Shoot Growth






Right Tree, Right Place

Not just for power lines

Match species to site first!

Light, Water, CO₂, Chlorophyll → Photosynthesis

Light, CO₂, Chlorophyll → **STRESS**



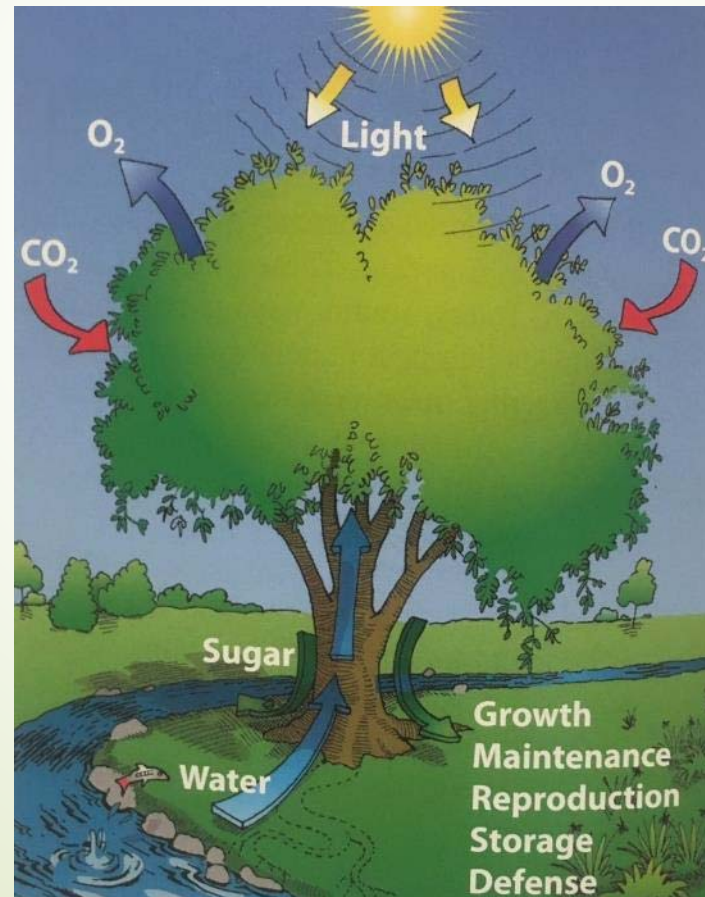
Plant resources, produced through photosynthesis, are allocated among four primary functions:


- Growth
- Storage
- Defense
- Maintenance(reproduction)

Resource Allocation

Photosynthesis \rightarrow Sugar = Energy

Primary Functions of Energy:





Stress can be described as any factor that limits a plant's ability to acquire sufficient light, water, or essential minerals.

Limited Resources = Stress

Often related to soil and environmental conditions

- pH
- drought
- excessive water
- heat

Not enough water

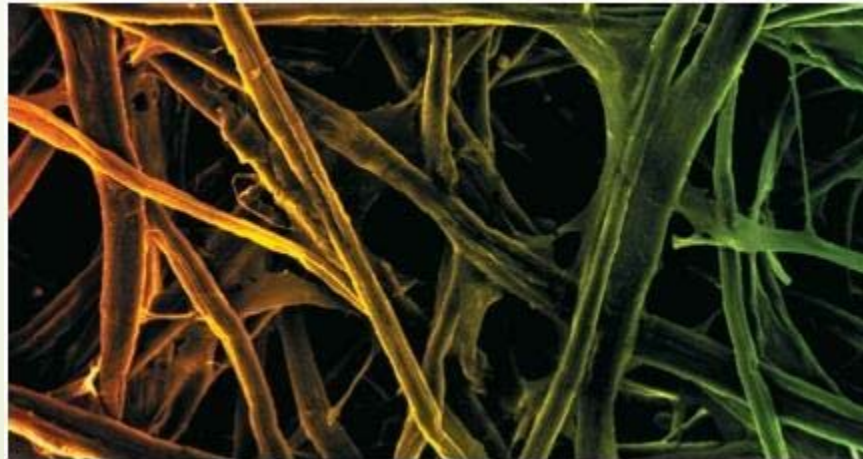


Excessive water



Cellulose

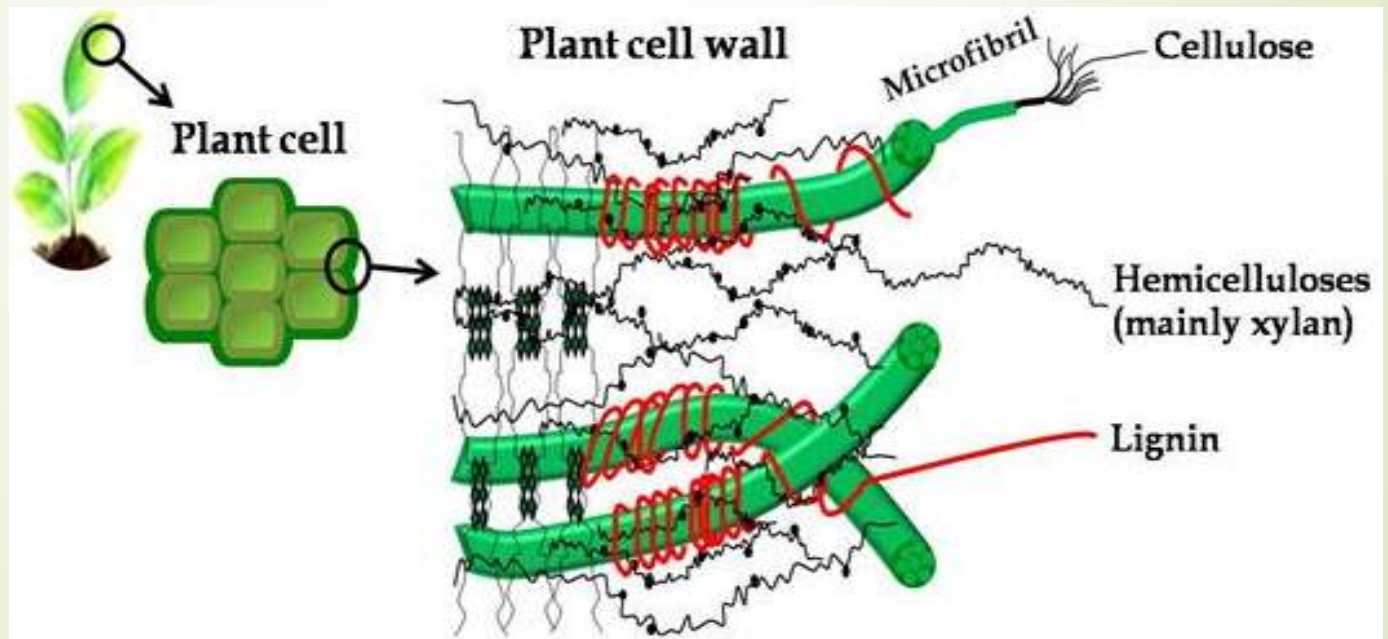
- Chain-like molecules found in the cell wall of trees
- Provides strength to stand and enables water and nutrient movement
- Defense mechanism as many insects cannot digest it



Micrograph of wood cellulose

Lignin

- Further strengthens cell walls
- Also indigestible by many insects



Trees don't heal!

- Trees don't have an immune system
- *Trees have a defense system*
- *Trees Compartmentalize*



Defense Mechanisms

- Physical
- Cellular
- Allelochemicals



Defense Mechanisms

- Physical

- Thorns



- Thick leaves

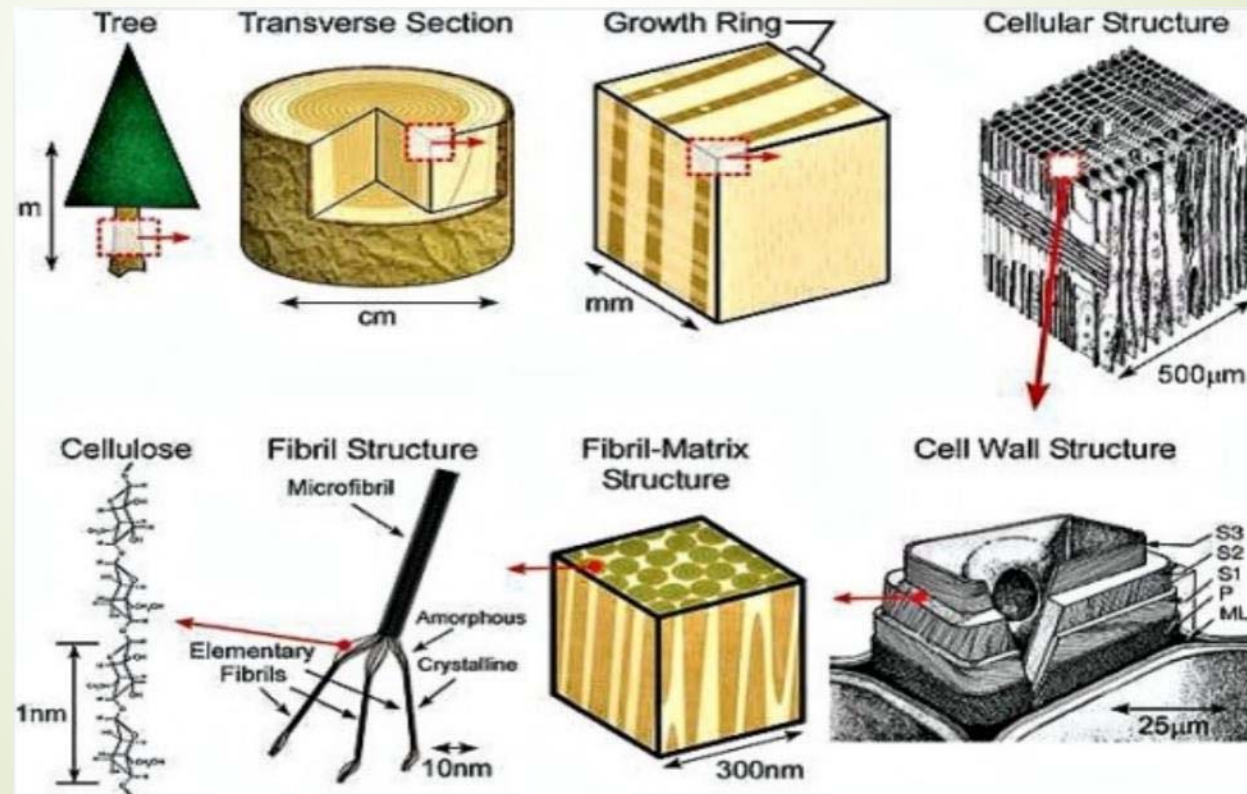


- Hairs



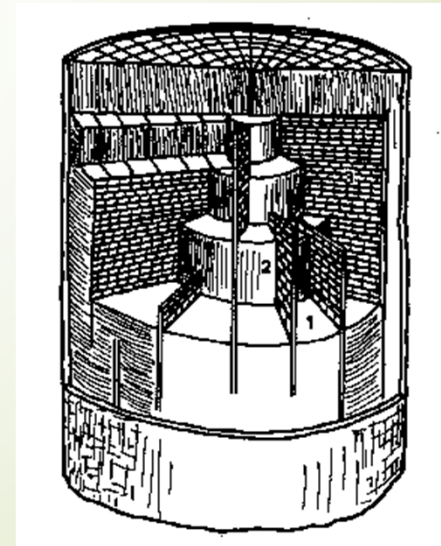
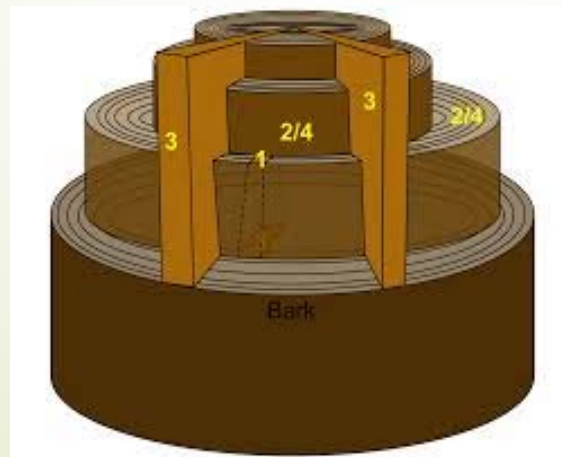
Defense Mechanisms

Cellular



C.O.D.I.T.

- Compartmentalize
- Of
- Decay
- In
- Trees



Defense Mechanisms

➤ Allelochemicals





The Process of PHC

Monitoring is the essential part of PHC

- observe
- identify
- record
- analyze

PHC – Monitoring

- Site info
 - Changes in drainage
 - New plantings
 - New hardscape or maintenance



PHC – Monitoring

- Plant Condition
 - Leaf size, color
 - Twig growth
 - Symptoms or signs

