



TEXAS A&M
FOREST SERVICE

How A Tree Grows

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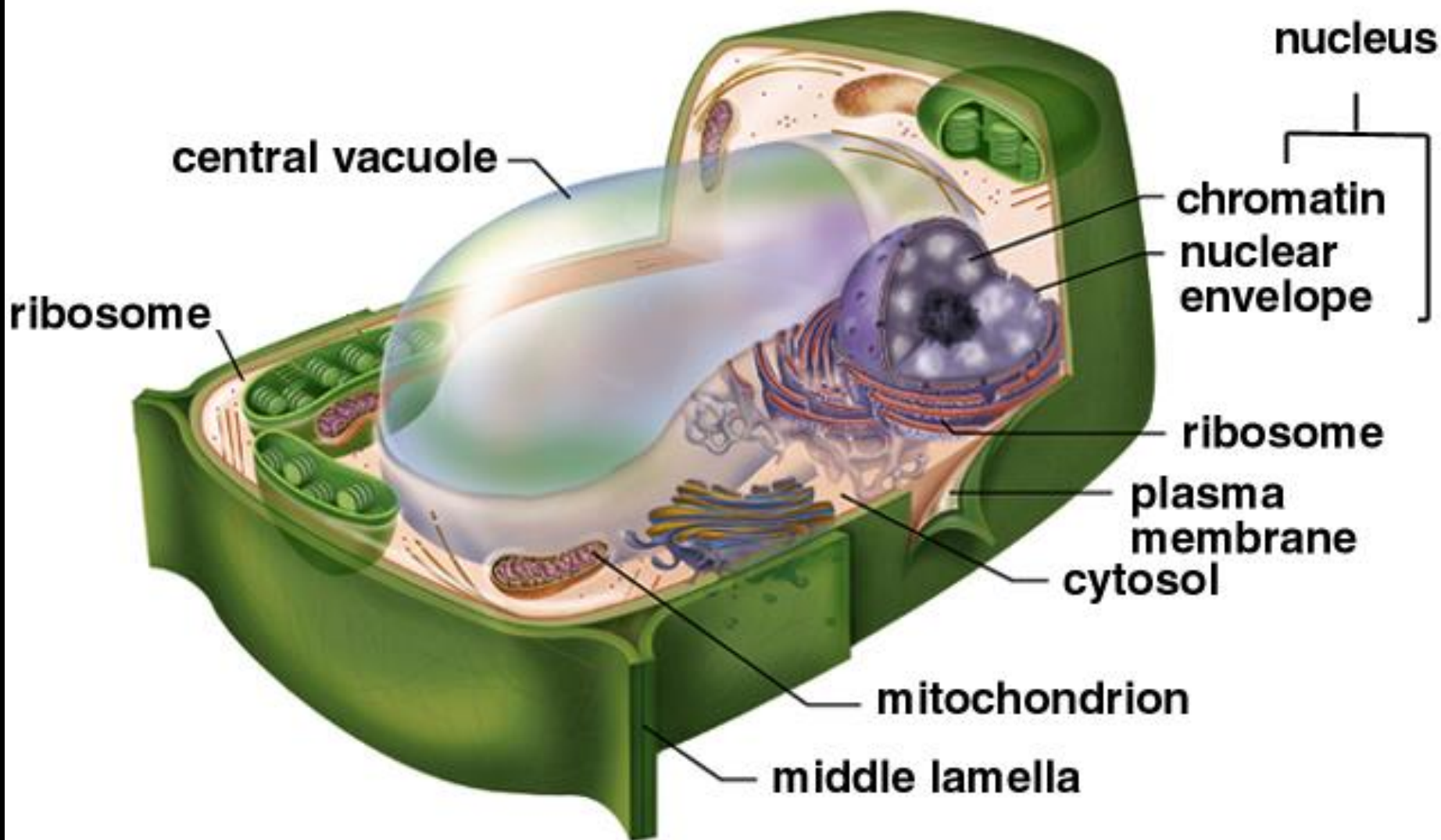


@treevangelist



Helping communities develop sustainable programs that provide Texans with healthy trees and forests.

Plant cell anatomy (1)



a.

What is a tree?



Anaqua
Ehretia anaqua

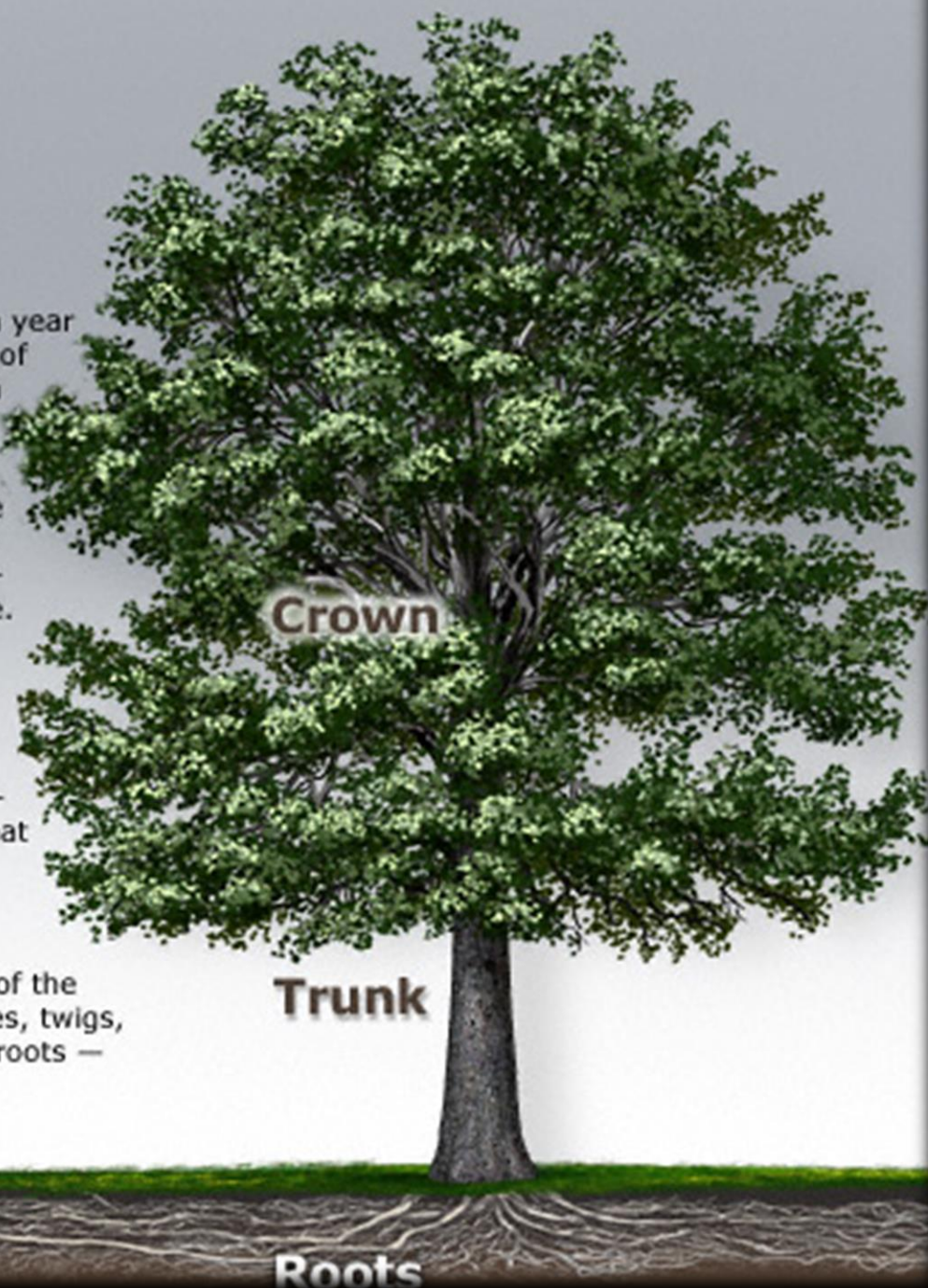
How a Tree Grows

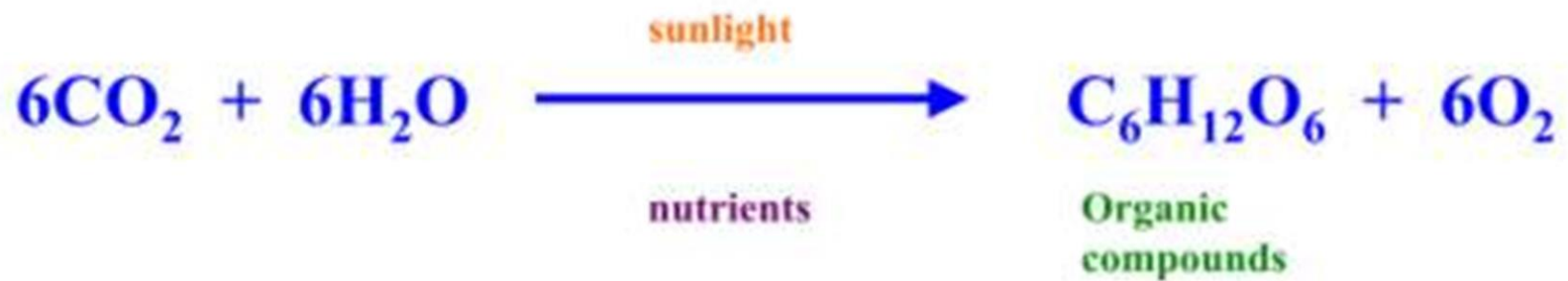
A tree increases each year in height and spread of branches by adding a new growth of twigs.

The undersides of the leaves absorb carbon from the air, the principal food for the tree.

Leaves prepare the food obtained from air and soil and give off moisture by transpiration. Light and heat are required for the chemical changes.

The breathing pores of the entire tree — on leaves, twigs, branches, trunk and roots — absorb oxygen.











Water Transportation Video







Organic
compounds

15-5-10

■ Balanced 3-1-2 Formula for Deep Greening Power.

■ Contains 1% Iron and 15% Stimulants.

■ Covers 3,000 sq. ft.

■ For St. Augustine, Bermuda, Fescue and all Southern Lawns.

15-5-10

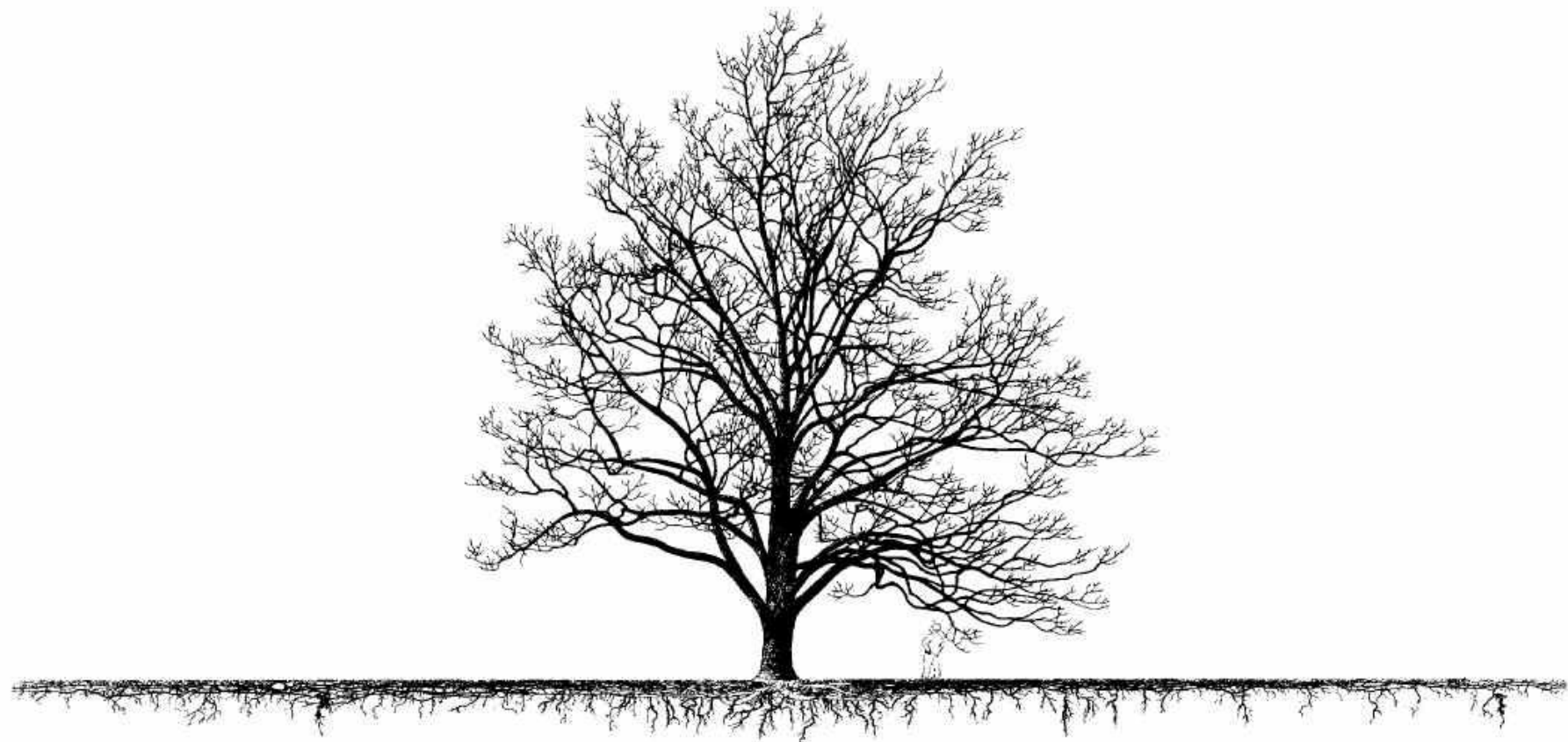


Parts of a Tree





\$1.50















CE
30
50
CEDAR MULCH
CEDAR MULCH







12709 Cobblestone Pkwy





**Actively growing right before dormancy
and right before bud break.**

Inactive in soil above about 90-92 degrees



Types of roots

- Tap roots
 - Rare on mature or planted trees
- Lateral roots
 - Shallow and wide
- Sinker roots
 - Stability

Life Inside the Trunk

Outer Bark protects tree from injuries.

Inner Bark (phloem) carries prepared food from leaves to cambium layer.

Cambium (microscopic) builds the cells.

Sapwood (xylem) carries food from roots to leaves.

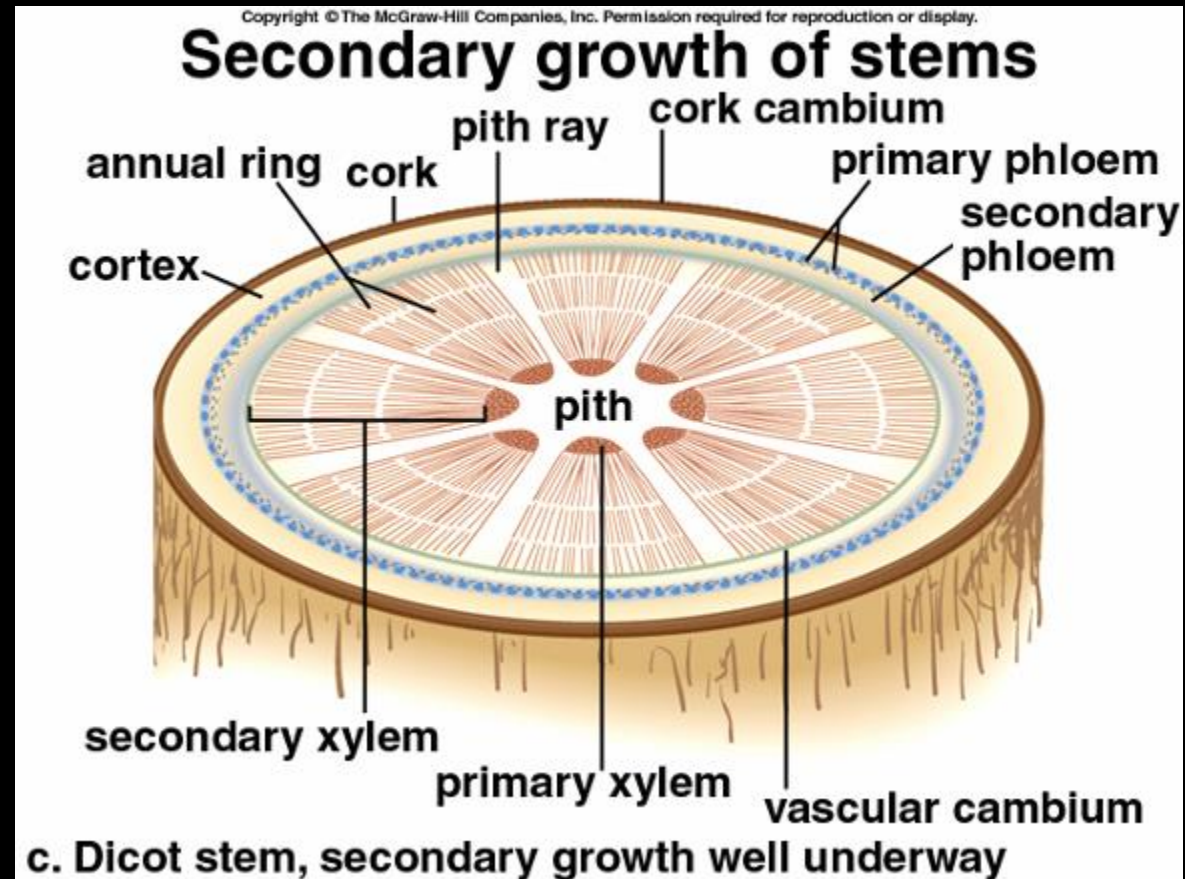


Heartwood
(inactive) gives
strength to tree.

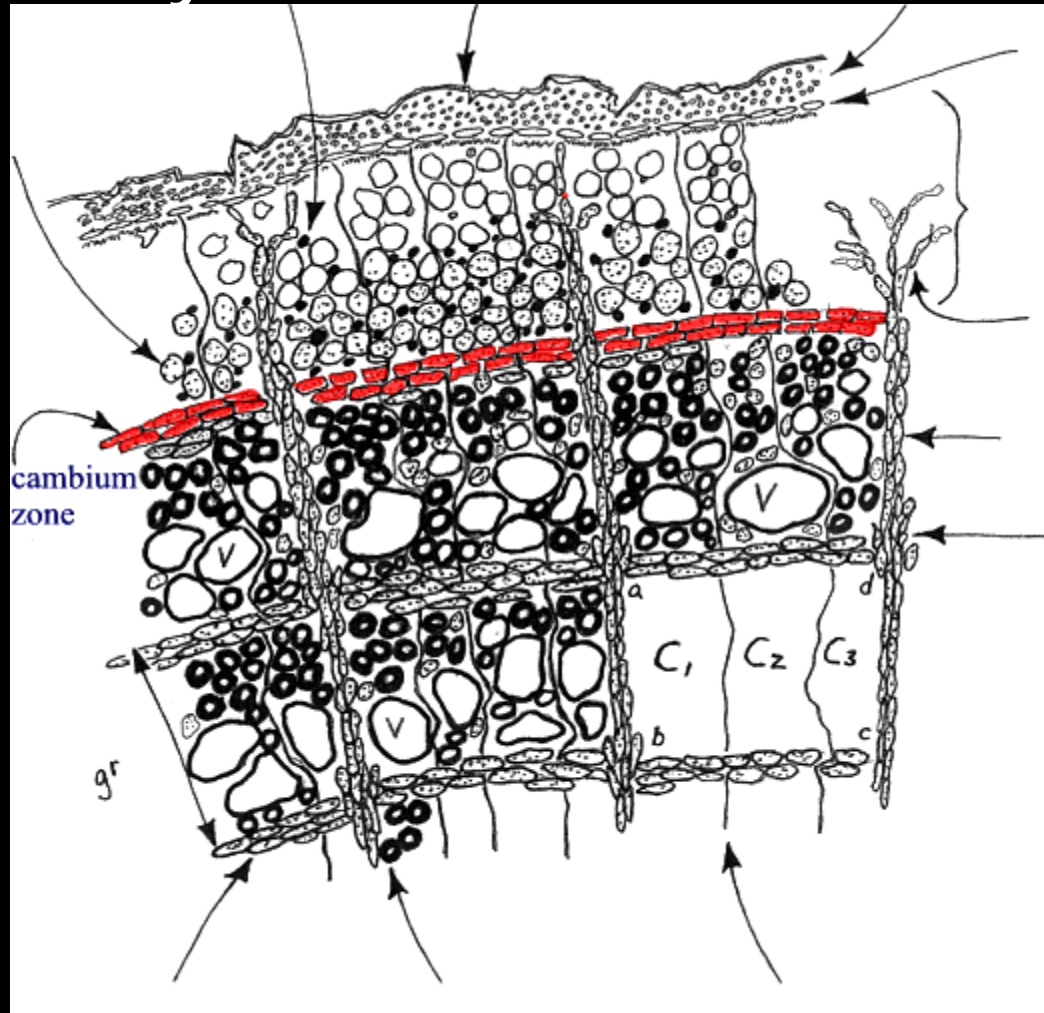
Where do trees really grow?

Meristem-
Primary
Secondary

Where is
meristematic
tissue for most
grasses?



Xylem vs Phloem



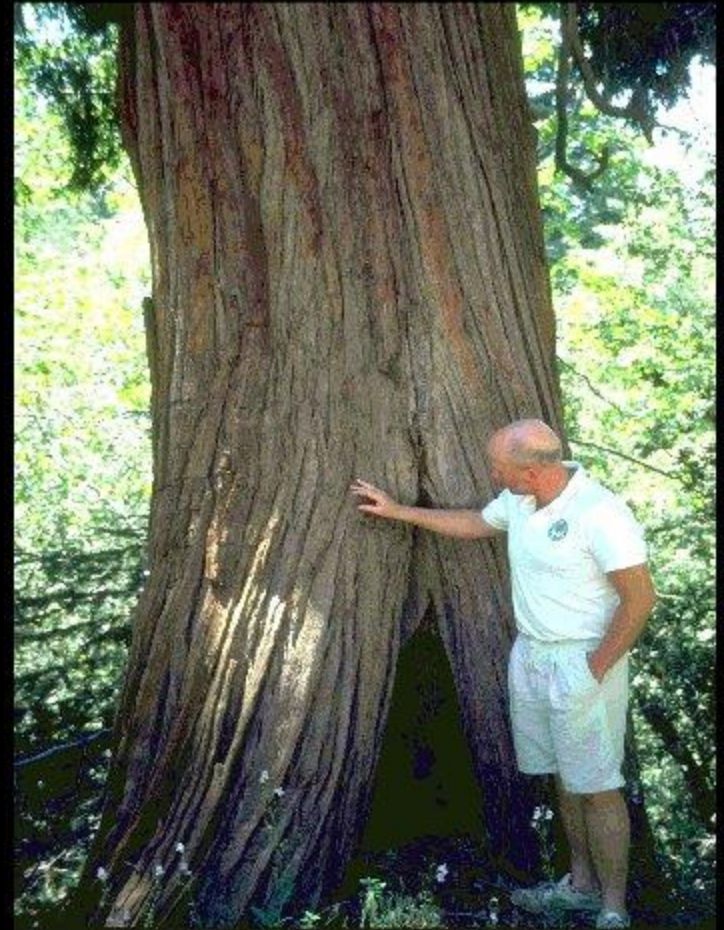


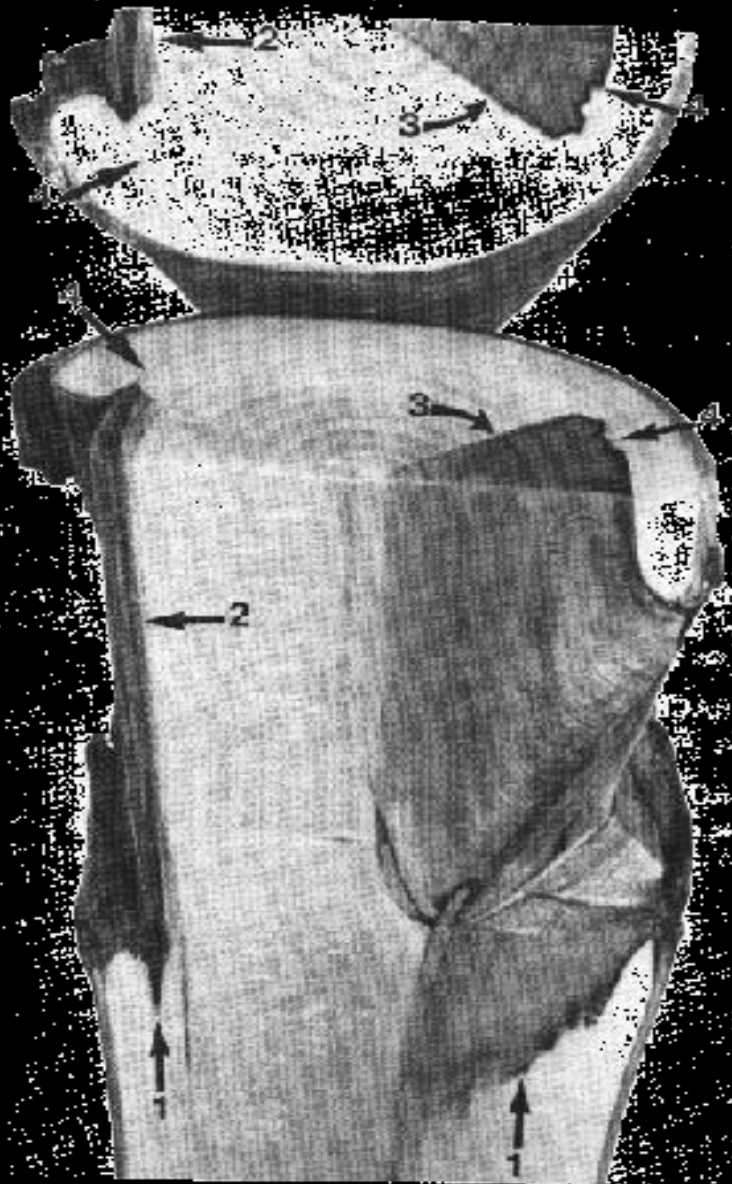
“Compartmentalization of Decay in Trees.”

Dr. Alex Shigo

Vascular plants differ from us greatly when faced with wounding or infectious diseases. Unlike us, they lack *IMMUNE* systems. Instead, they have developed a process to cope known as,

COMPARTMENTALIZATION.





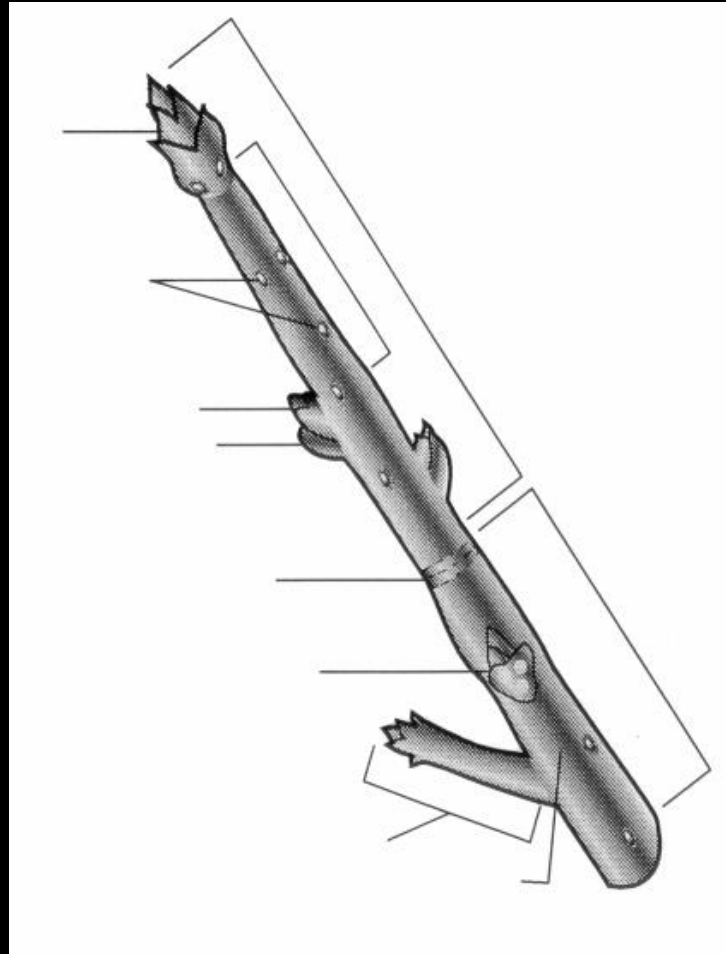
Wall 1: Stops VERTICAL spread by plugging vessel & tracheid cells in the xylem (weakest boundary).

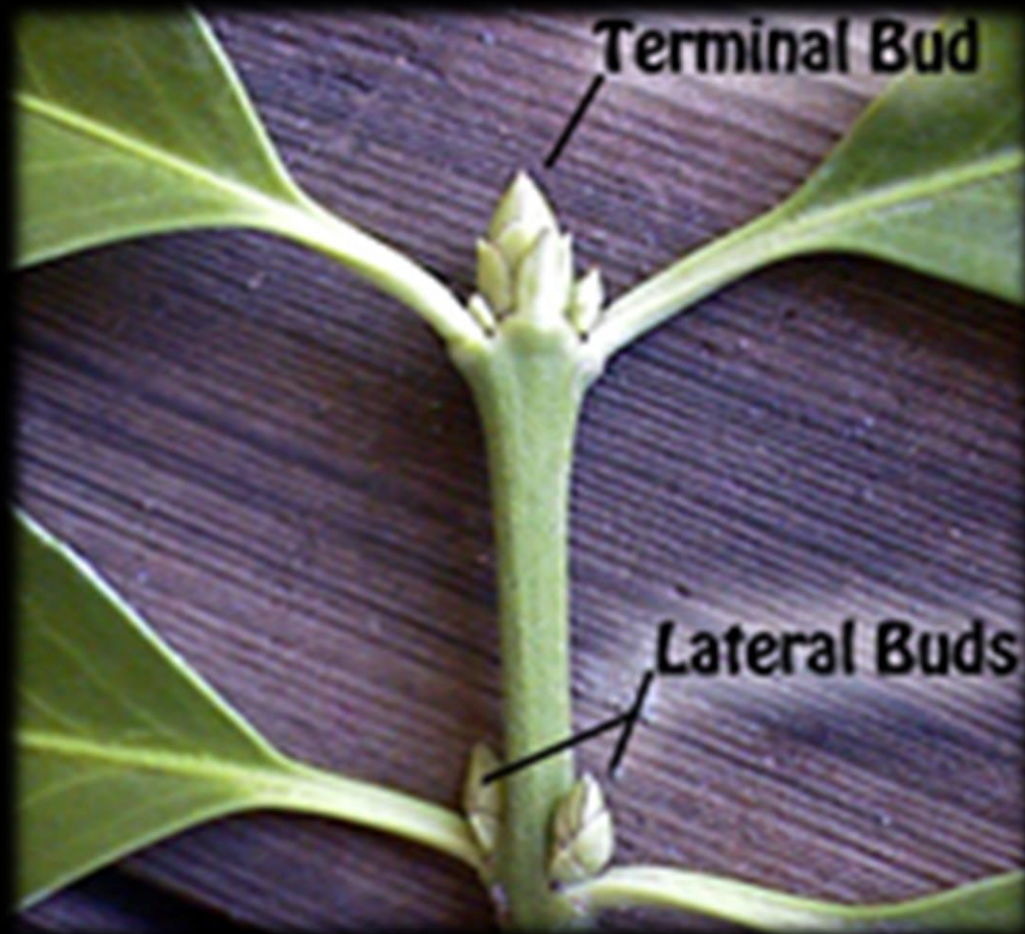
Wall 2: Stops INWARD spread toward the pith.

Wall 3: Stops LATERAL movement by plugging parenchyma and ray cells that are primarily for energy storage (strong).

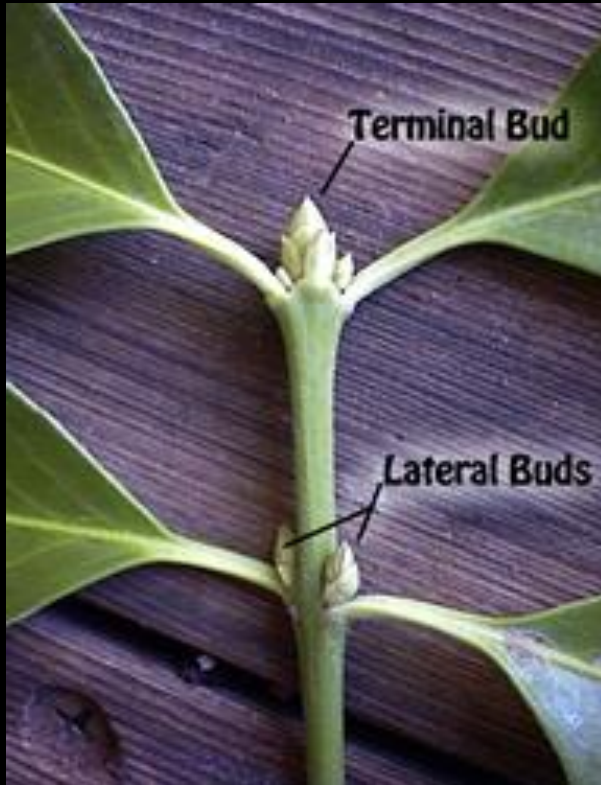
Wall 4: Separates NEW wood from that which was present from the time of the damage (the strongest boundary).

Nodes/Internodes





Apical dominance



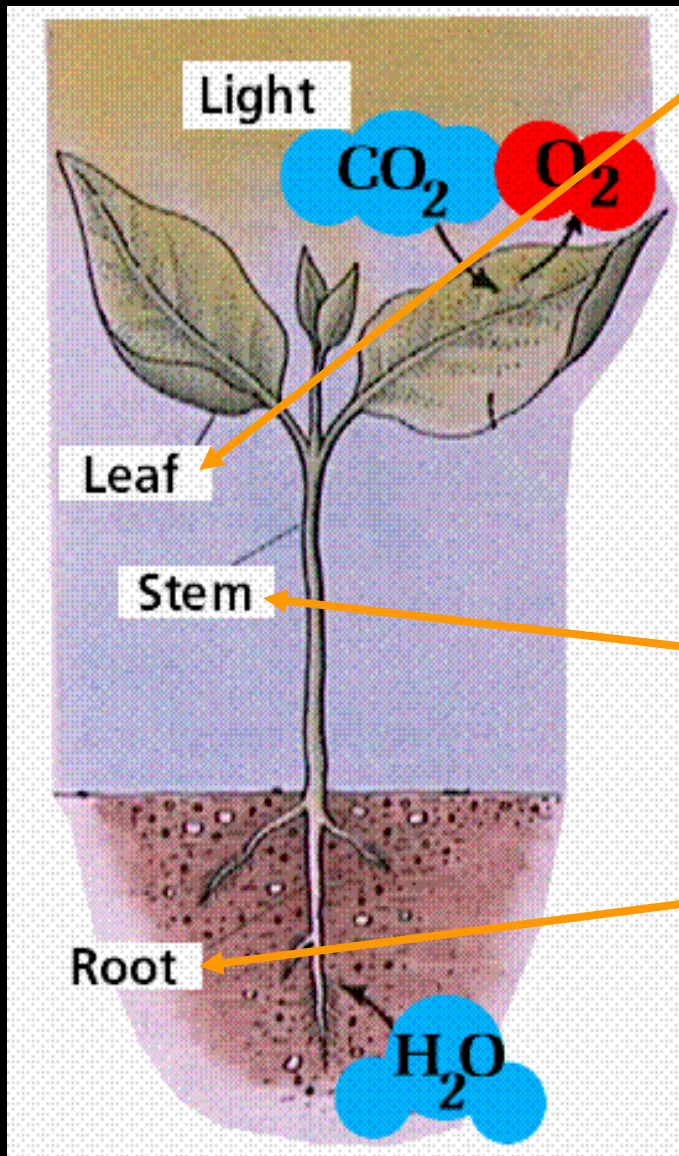


Types of Leaves

Evergreen: leaves are persistent, stay on longer than one year.

Deciduous: leaves are shed usually annually (in the fall).





The Leaves process water and carbon dioxide (Photosynthesis) to form complex sugars (fuel), which are sent back down (Phloem) the tree for storage and use.

The Stem transports water and solutes (Diffusion & Osmosis), to the crown via the Xylem.

The Roots absorb water and nutrients with help from Root Hairs.

Hormones

- Auxins - Top bud - Apical dominance
- Cytokinin – Roots - Bud break, stem elongation
- Ethylene – many parts – aging, leaf drop
- Abscissic acid – Roots - Drought stress
- Gibberellin - many parts – cell elongation

The Life Cycle of a Tree

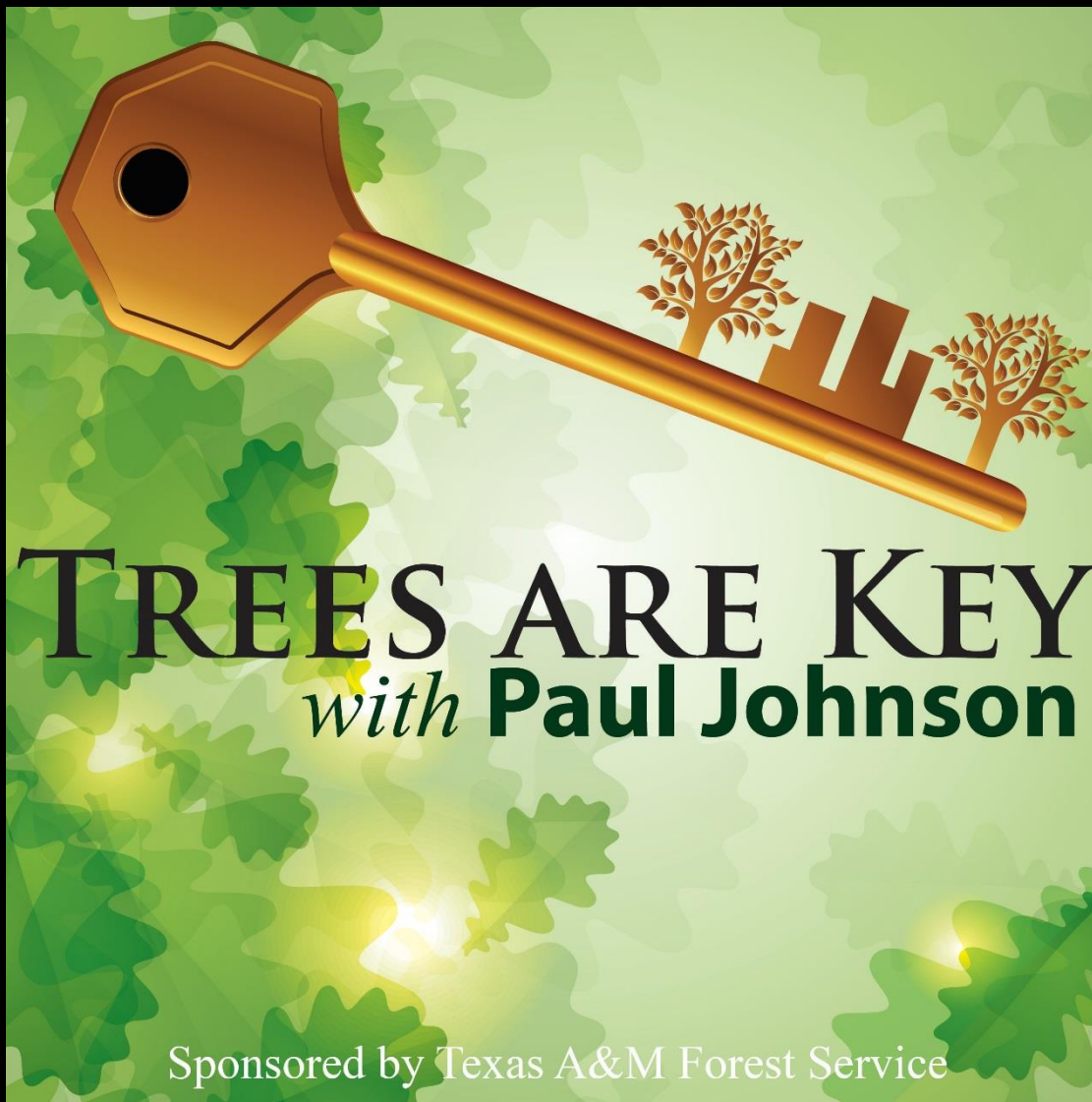


Tropisms

- Geotropism
- Phototropism
- Thigmotropism







TREES ARE KEY

with **Paul Johnson**

Sponsored by Texas A&M Forest Service

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PLANTING THE SEEDS OF SUCCESS.

