Tree Pruning Workshop

DNR – UW Extension Fall 2023

TREE ANATOMY, PRUNING OBJECTIVES, AND PRUNING TECHNIQUES

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Your Presenters

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- ISA Certified Arborist RM-8302A
- ISA Tree Risk Assessment Qualified (TRAQ)
- Consulting Department Assistant, Wachtel Tree Science, Inc.
- Six years green industry experience

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Your Presenters

Michael Peterson

- ISA Certified Arborist WI-1283A
- Client Service Arborist, Wachtel Tree Science, Inc.
- 9 years green industry experience

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Class Objectives

What do **YOU** want to get out of today?

Here's what I hope you get:

Gain knowledge!

- Understand the Why before the What
- This understanding allows you to make educated, efficient decisions in the field
- Pass this knowledge to public

Implement Structural pruning techniques

- Proper structural pruning now (with newly planted trees) makes your future work easier

Inspiration to Continue Learning

- You can never learn everything – there's always more!

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Today's Outline

1. Tree Anatomy and Physiology

What is going on inside the tree?

2. Pruning Objectives

Why are you pruning a tree?

3. Pruning techniques

How are you going to prune this tree?

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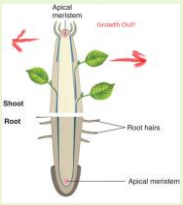
Growth

Primary Growth
- -Apical Meristem (elongation)
- -Buds

Secondary Growth
- -Lateral Meristems (diameter increase)
- -Cambium and cork cambium



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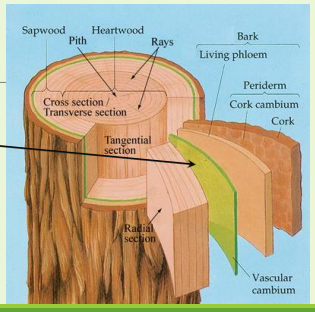
Growth cont…

Lateral growth



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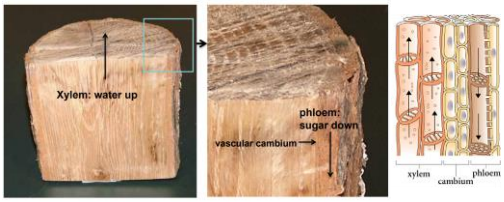

A discussion of Phloem and Xylem

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What type of wood are your floors?

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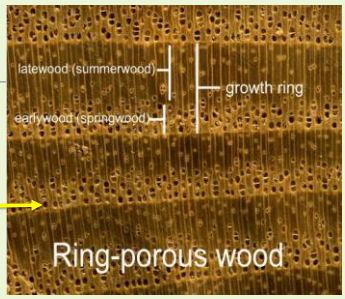
Ring Porous

Elm, Oak, Ash, etc.



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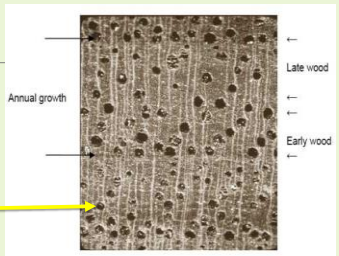
Diffuse porous

Poplar, Planetree, Maple, etc



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Attachment of Branches to Stem

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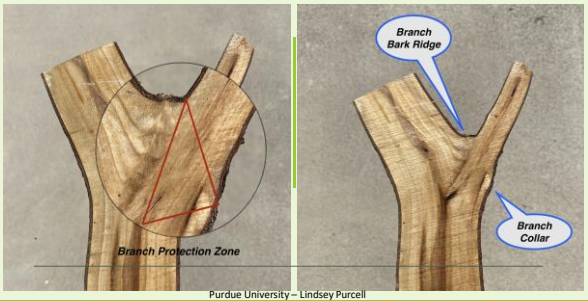

Purdue University – Lindsey Purcell

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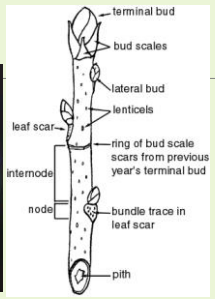
Twig Anatomy



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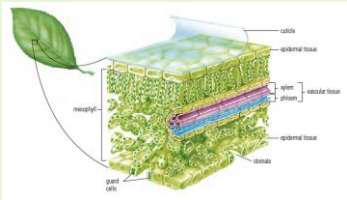
Leaves



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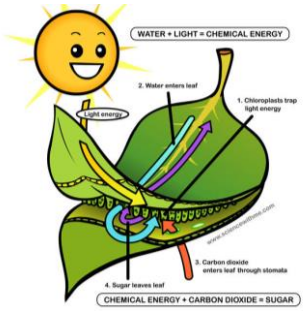

Photosynthesis

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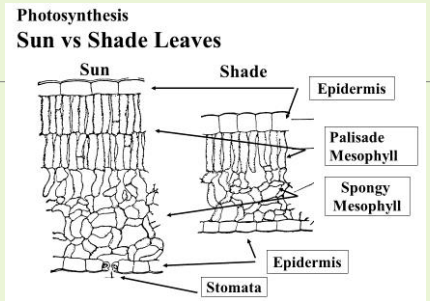

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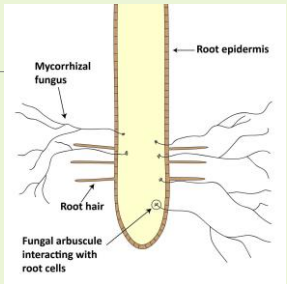
Roots

Absorbing roots vs structural/woody roots

Root hairs absorb most of the water required by trees
- only live 6-8 weeks
- can live up to a year with the assistance of fungi



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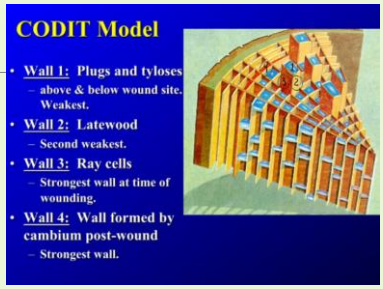
CODIT

Compartmentalization Of Decay In Trees



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CODIT cont....

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Growth Characteristics

Excurrent

Decurrent

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Growth cont...

Opposite

Alternate

Whorled

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Leaves

Simple

Compound

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Compound Leaves

Pinnately Compound

Bi-pinnately Compound

Palmate

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Tree response to pruning

"First time pruning?"

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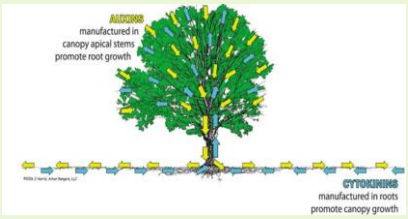
Hormones & Apical Dominance



Auxins- Produced in canopy, promote root growth, facilitates apical dominance

Cytokinins-- produced in roots, promote canopy growth

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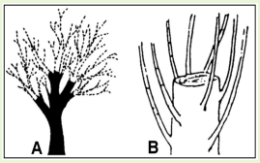
When apical dominance is lost, lateral growth is released.

With nowhere to go, cytokinins collect at pruning cut until a path to apical dominance is established.

A flush of new growth at improper pruning cuts is often the result



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Pruning Objectives

Pruning serves multiple purposes

- Benefits the **future** life of the tree as well as the surrounding **environment**

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Pruning Objectives-Safety

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Pruning Objectives-Space Efficiency

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Pruning Objectives-Structure


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Pruning Objectives-Improve tree health


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Pruning Objectives-Improved Views


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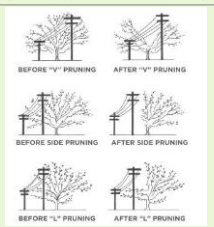
Pruning Objectives-Utilities (Clearance)



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Natural Pruning vs Unnatural Pruning

Forest growth shape:	Forced shape or size:
1. Promote Apical Dominance	1. pollarding
2. Remove “bad” branches	2. shearing
3. Reduce Competing Laterals	3. pleaching

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Removing Bad Branches

Dead, Dying, Diseased, Damaged

THE 4 D’S!!!!!


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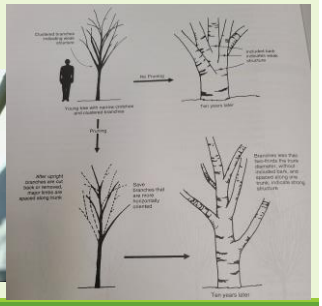
Reduce Competing Laterals



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Codominant Branches

Aspect ratio - 50% or less branch to parent stem

Avoid included bark at all costs!

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Apical dominance

Does anyone remember what I said about apical dominance?

Subordination Cut

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Recap!

Set the tree up for the future!

- Promote a strong leader
- Remove rubbing branches
- Remove the 4 D's
- Keep your OBJECTIVE in mind

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% Live Growth Removed

Check your work, compare your pile of pruned branches to the size of the canopy

How much is too much?

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Live Crown Ratio

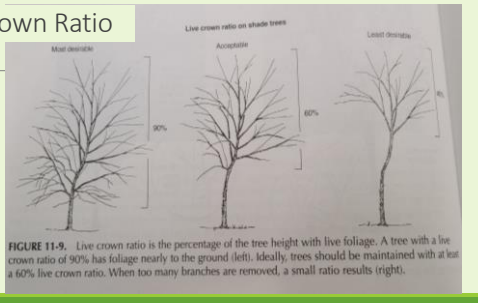

FIGURE 11-9. Live crown ratio is the percentage of the tree height with live foliage. A tree with a live crown ratio of 90% has foliage nearly to the ground (left). Ideally, trees should be maintained with at least a 60% live crown ratio. When too many branches are removed, a small ratio results (right).

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Pruning = Wounding

Make reasonable cuts

Do not over-prune (size or quantity)

The tree has to survive the pruning, and outgrow the wounds



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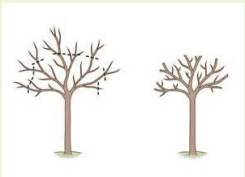
Heading Cuts (internodal or less than 1/3)

Referring to our previous slide, is heading acceptable?

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Absolutely! (within reason)

Young trees can handle heading cuts, follow a few guidelines:

- Only make heading cuts on YOUNG trees
- Only make heading cuts on TEMPORARY branches
- RETURN to remove these branches in the near future

Implementing heading cuts allows crews a quick way to prune a lot of young trees. Just make sure that you return to remove them

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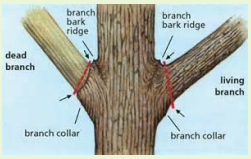
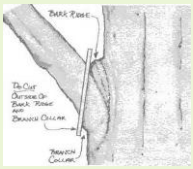
Proper Cuts Vs. Improper cuts

Do not cut past the branch collar





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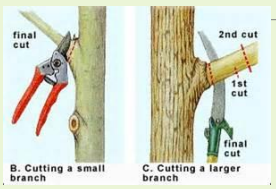

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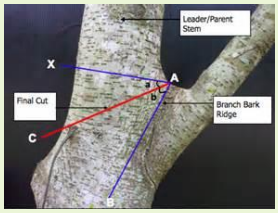
Reduction Cuts



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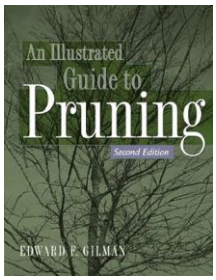

Natural Pruning Techniques

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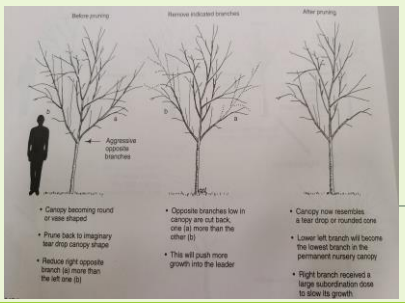

Slowing Vigorous Branches

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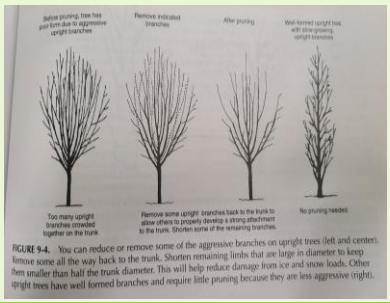

Creating a Central Leader

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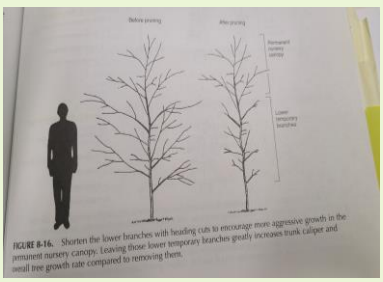

Reducing Temporary Branches

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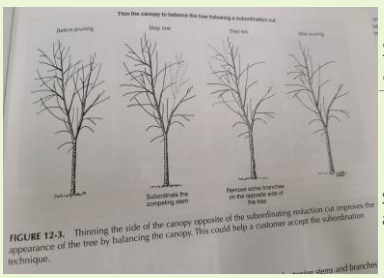

Subordinate Stem & Balance Crown

Should you do this to a newly planted tree?

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Unnatural Pruning Techniques

Tanzlinde – The Dancing Linden of Peesten (Germany)

Photo Credit: Henry Kuppen

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Pruning Technique-Pleaching

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Pruning technique-espalier

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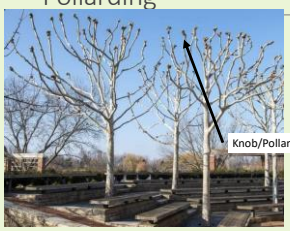
Pruning technique-Pollarding



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Pruning technique-Topiary

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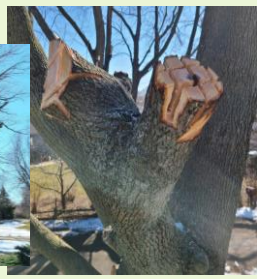
Wild Card! –

Fracture Pruning

Coronet Cuts



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Unacceptable Pruning Techniques

Topping and "Lion's tailing"

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Other avoidable mistakes

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Girdling Vs Grafting

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Response wood – Adaptive, Wound Wood

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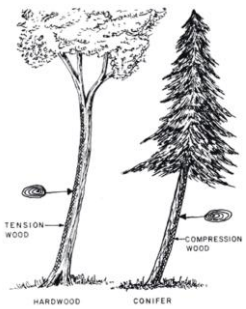

Response Growth – Reactive

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Pruning Equipment-PPE

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Pruning Equipment-Hand tools



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Pruning Equipment-Ascent methods


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Questions?

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