

Tree Compartmentalization: CODIT-Compartmentalization of Decay In Trees



Sponsored at New River Community
College

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What Is Compartmentalization?

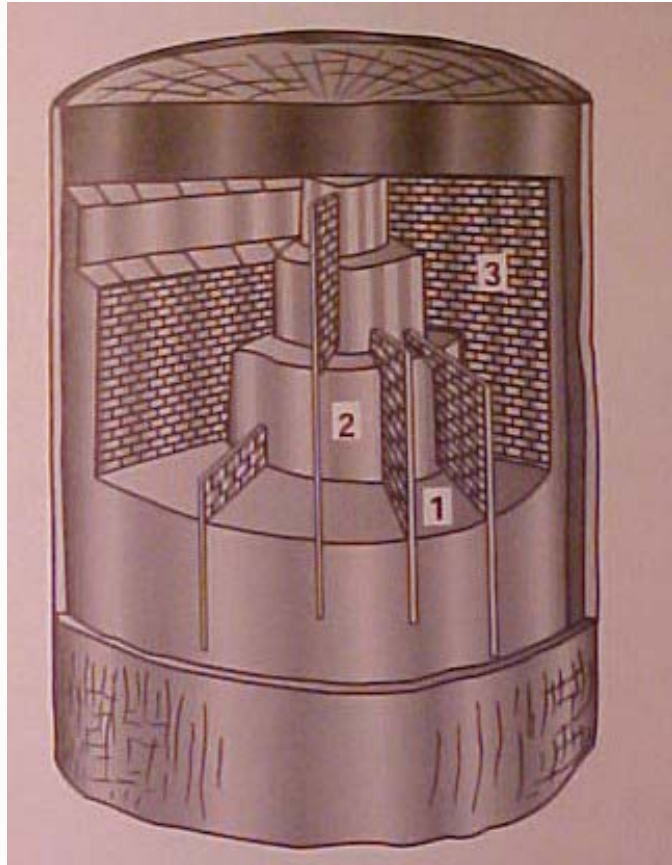
- When a tree has been wounded, disease and decay may infect the site of the damage. To protect itself against the spread of decay to healthy tissue trees are able to seal off or compartmentalize the wounded area.



Compartmentalization

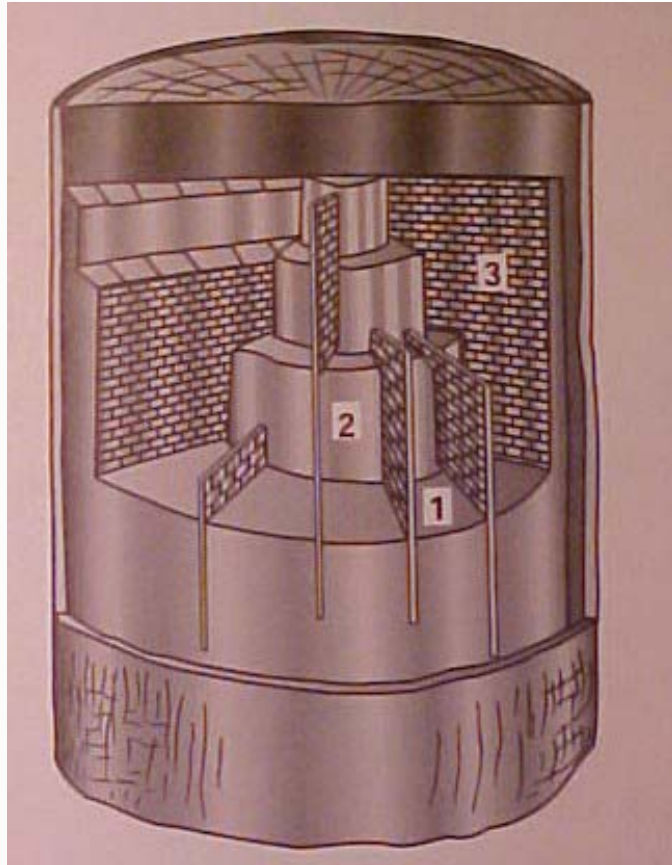
- The widely accepted theory of how this healing process occurs is referred to as “CODIT” was developed by Dr. Alex Shigo.
- Trees lay down barrier walls to prevent decay spread in four directions.

Tree Defenses



- Wall 1- tree responds to wound by plugging the upper and lower vascular elements to limit vertical spread of decay.
- Wall 2- the last cells of the growth ring, limits inward spread.

Tree Defenses



- Wall 3- ray cells compartmentalize decay by limiting lateral spread.
- Wall 4- strongest wall, the new growth ring that forms after injury (not shown).




More Details of Defenses

- The tree barrier walls prevent decay from spreading in four directions.
- Plugging inactive xylem tissue prevents the vertical spread of damage.
- Plugging summerwood cells in the interior vascular rings prevents inward spread of decay.



More Details of Defenses

- Ray cells can be activated to desist decay movement laterally.
- Finally, the new injury creates an outer barrier. This final barrier seems to be the strongest, explaining why many trees can continue to grow forming healthy outer cambium layers despite a hollow, decayed interior.

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- ✦ In the past newly planted tree trunks were wrapped to prevent trunk cracking from temperatures-related expansion and contraction.
 - ✦ Research by Dr. Alex Shigo indicates that this damage begins forming inside the trunk rather than the outside. Cracks formed from wounds compartmentalized within the tree are stimulated to extend to the surface by environmental conditions rather than initiated by them.



Defenses cont.

- Trees do not “heal” themselves, but compartmentalize damage and, if possible, continue growing around and over the damage.
- Any damage to trees, including pruning cuts **DOES NOT HEAL**, but is walled off by compartmentalization to protect healthy tissue.

- Hollow trees lack stability in heavy winds and storms, and may need to be supported or removed to prevent safety hazards.



Photo by Beth Garter May 2002



Proper Pruning Cuts

- Where and how to prune is as important as what to prune.
- Always keep in mind that a tree seals off injuries as the actively growing cambium layers cover the wound.



Proper Pruning Cuts

- Learning to locate cuts at locations that allow the tree to best grow over the wounds speeds recovery from pruning.
- The sooner one can make those cuts, the smaller the wound and the faster the closure.

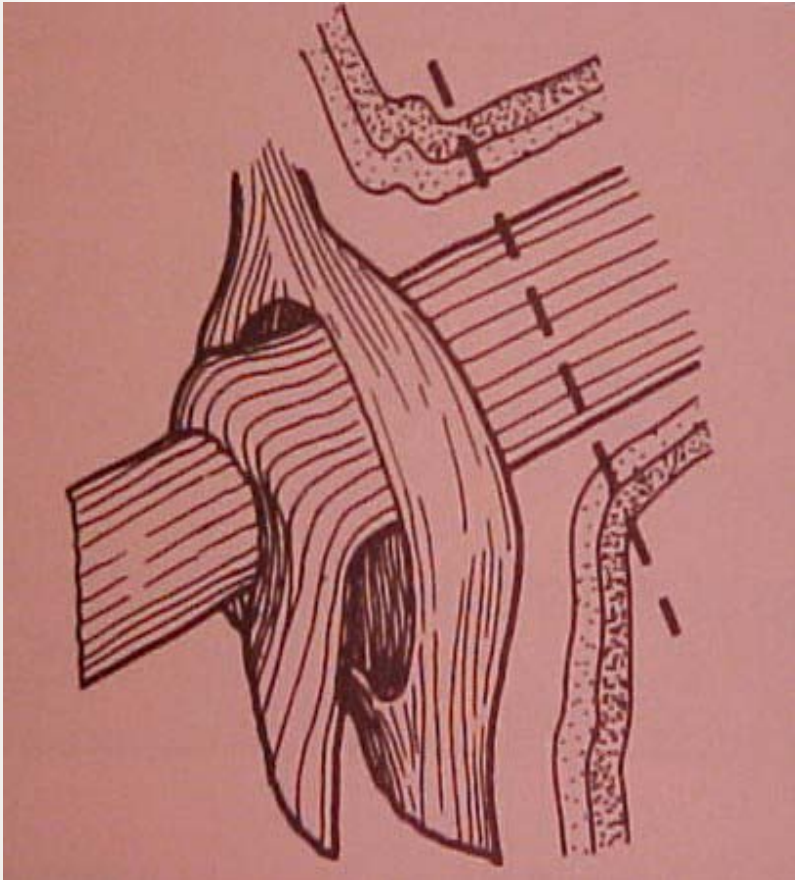
Remember that all pruning cuts are an injury to the tree and should only be undertaken when there is a clear need, and using only careful procedures.



Where, exactly do I prune?

- As stems grow larger, the tissue at the base of the branch where it joins the trunk builds up to form the **branch collar**, a bulge surrounding the branch.
- In the crotch, this tissue is squeezed by the expanding diameter of the trunk to form a **Branch bark ridge**.

Where to Prune.....



- All pruning cuts are made **OUTSIDE** the branch collar.
- **DO NOT CUT INTO THE BARK AT THE BRANCH COLLAR.**
- This natural target pruning reflects the natural ways that trees attempt to seal off damaged branches by creating a barrier at the branch collar.



Where to Prune.....

- The branch collar tissues have the ability to alter cell chemistry to ward off pathogens from decay or insect attack.
- Removing this tissue makes the tree more susceptible to future problems



Pruning Back to Trunk.....

- Do NOT flush cut limbs against the trunk of the tree, as was once recommended, or leave a stub remaining stuck out from the trunk.



Pruning Back to Trunk.....

- Flush cuts remove the protective branch collar and expose the trunk wood.
- Stubbed cuts leave unprotected tissue that easily becomes subject to decay or disease.

Pruning Larger Branches:

- For branches larger than 1" diameter the three cut method is used to prevent tearing bark and to control the cut.

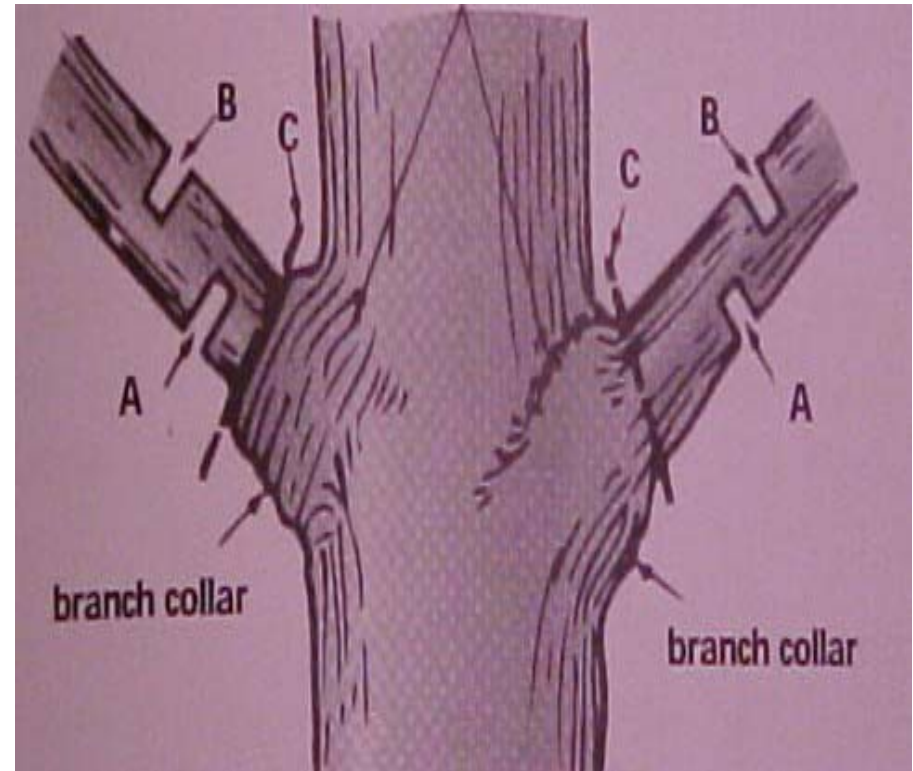
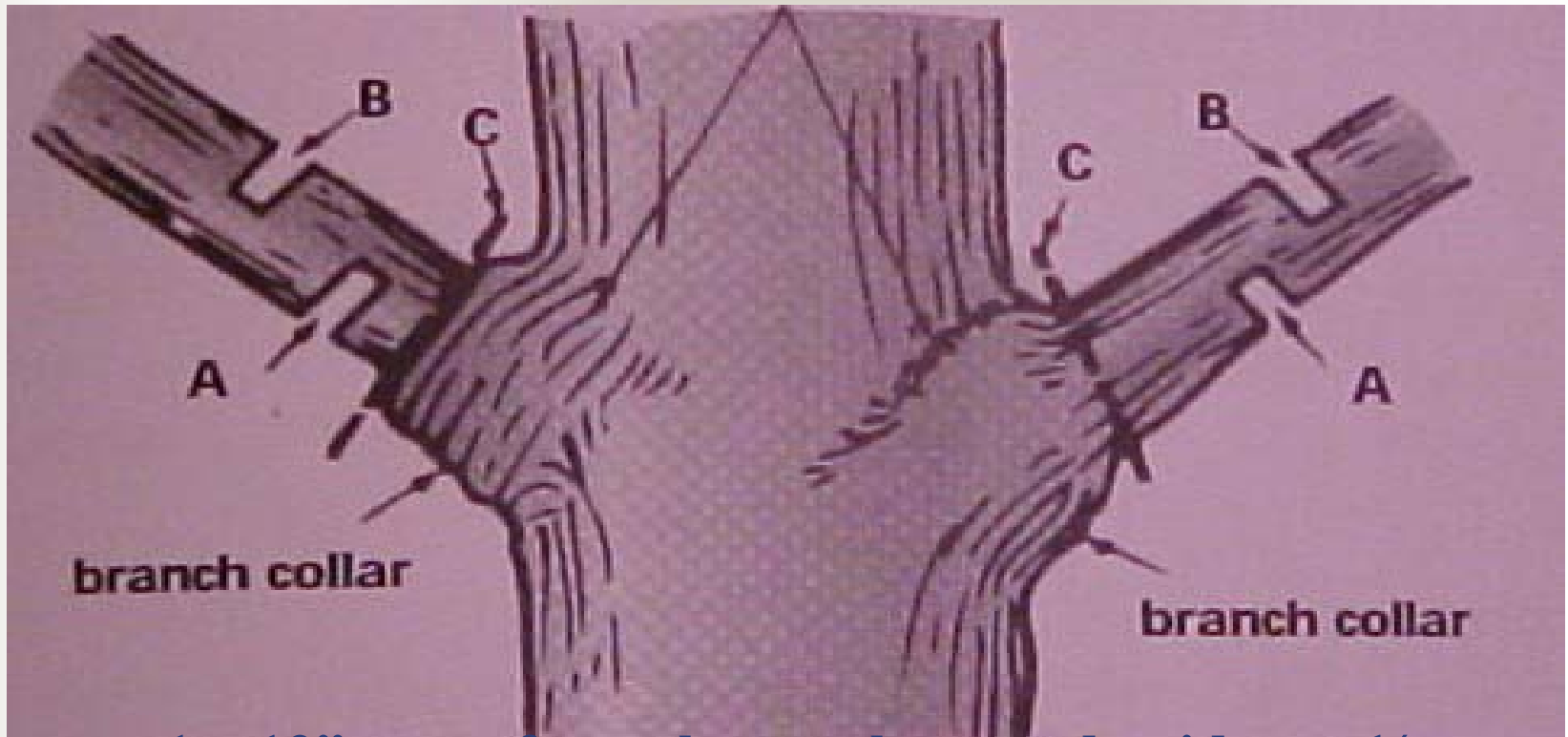
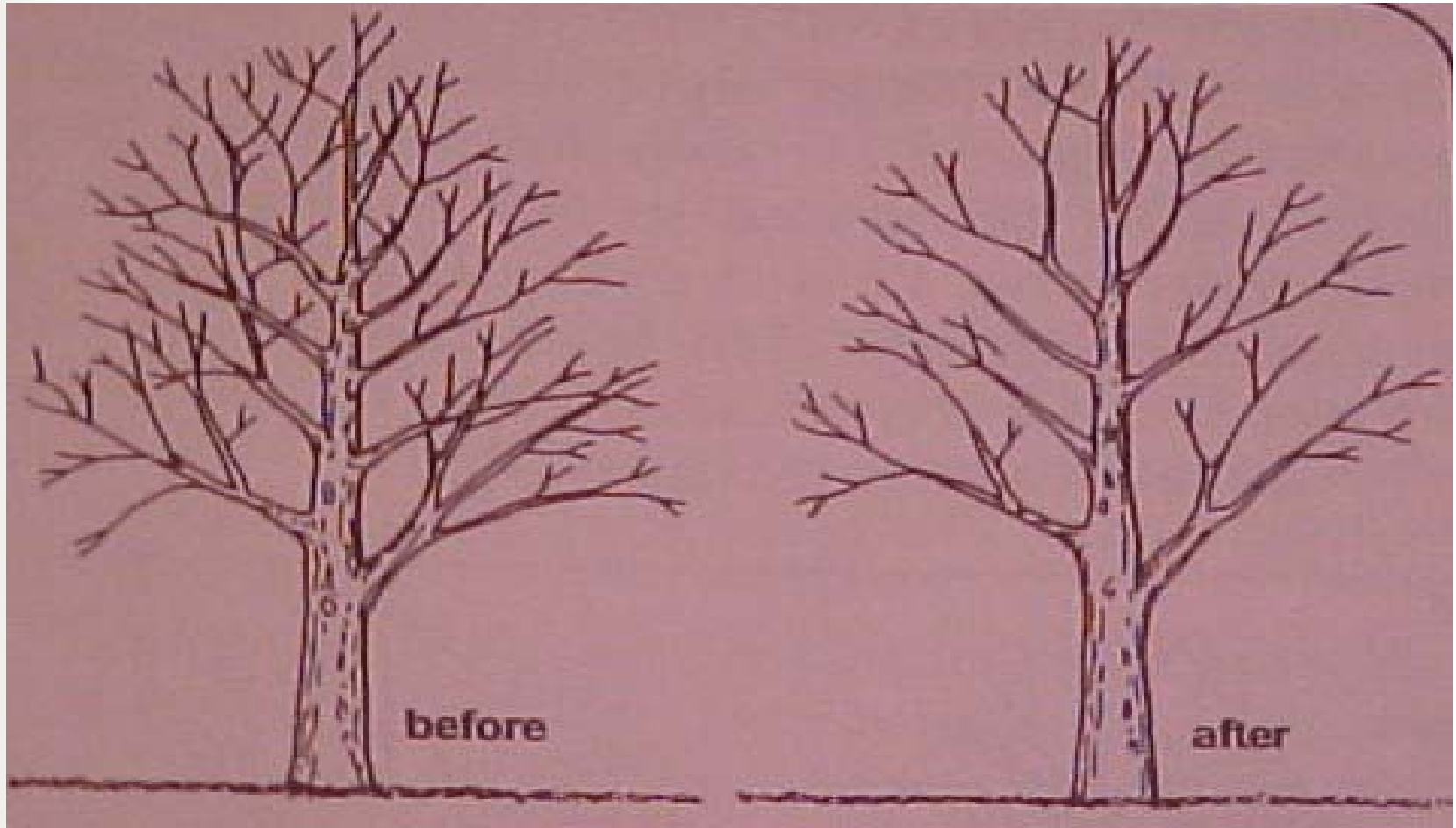


Photo from Urban and Community Forest Handbook

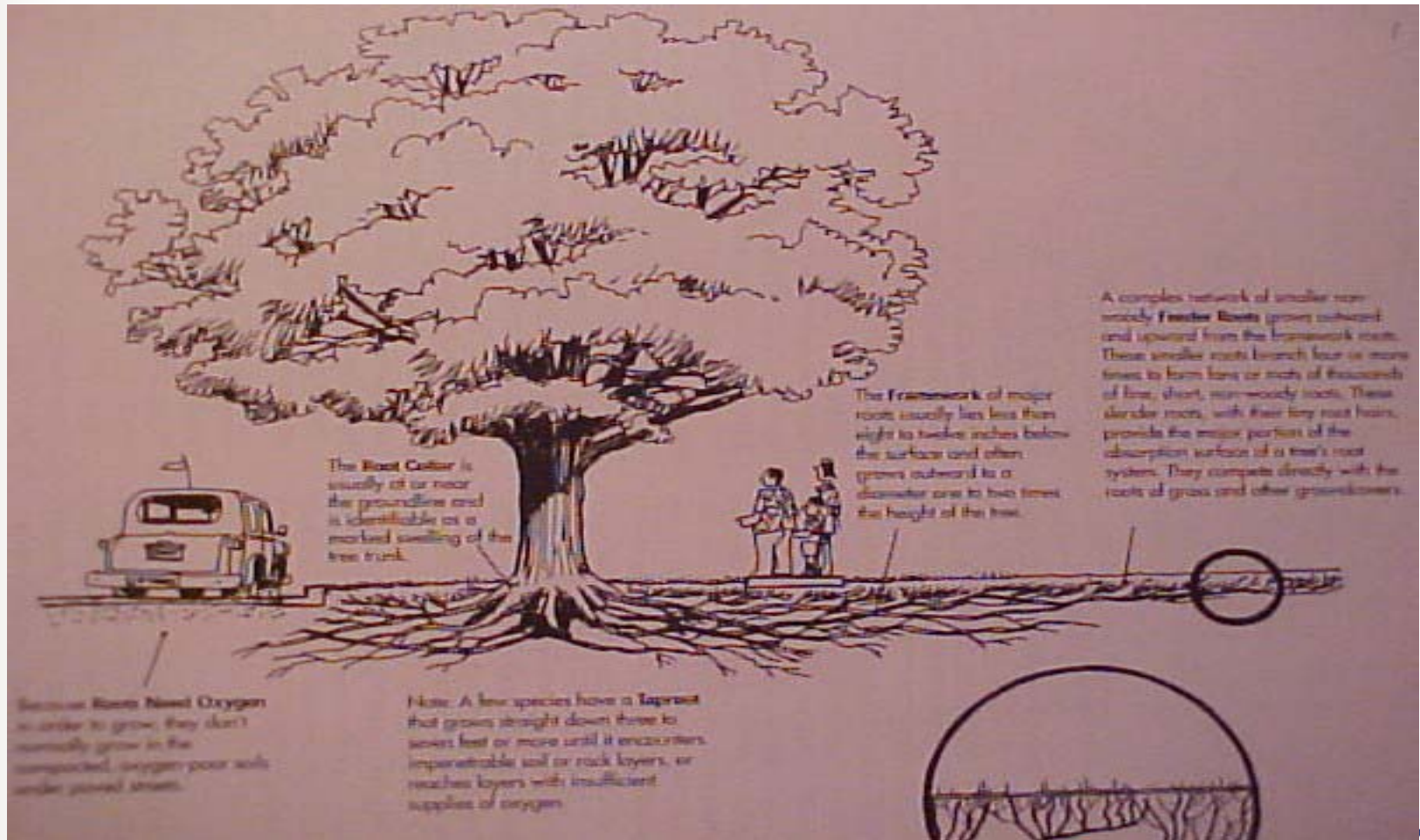


- 1. 12” away from the trunk on underside cut $\frac{1}{2}$ way through the branch.**
- 2. 1inch beyond cut 1 cut thru the limb from top side down.**
- 3. Final cut outside the branch collar.**

A properly thinned tree should look like this.



Roots Need Air Space to grow...





Preventative Maintenance

- ISA estimates that 90% of the problems encountered are not caused by living agents (pests or pathogens) but result from environmental stresses, mechanical injuries, or from planting the wrong species for a given site.




Pests and Pathogens

- Often pests and pathogens invading the tree serve as a warning of an underlying problem or weakening the tree and making it susceptible to attack. One good pm for pests and disease involves improving the site and environmental factors to invigorate the trees at a given location.



The use of Pruning paint and sealer

- In class I told you that pruning paint is no longer used to “protect” the tree, as it was shown that more often than not paint sealed bugs and disease into the tree. There is, however, one exception to this practice:
- When pruning OAKS in the SPRING, seal your pruning cuts with sealer to protect against OAK WILT(blight).
- Try to avoid pruning any OAK in the spring to avoid the spread of this devastating disease that can wipe out the oak population.

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- The header of the slide features a collage of nature-related images. On the left, there's a close-up of a green plant with yellow flowers. In the center, a brown bird is perched on a branch. On the right, there's a blue, rocky or crystalline structure. The background of the header is a mix of these colors and textures.
- Plants are available that withstand adverse conditions. Some plants can demonstrate adaptability to tolerate adverse conditions.
 - Ginkgo biloba trees show excellent resistance to city pollution as does Platanus x acerfolia, the London planetree.