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Tree Compartmentalization: CODIT Model

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Tree Compartmentalization: CODIT Model

Compartmentalization Of Decay In Trees

What Is Compartmentalization?

- When a tree is wounded, disease and decay infect the site of the damage.

What Is Compartmentalization?

- To protect itself against the spread of decay to healthy tissue, trees seal off or compartmentalize the wounded area.

Defenses cont.

- Trees do not “heal” themselves, but compartmentalize damage and, if possible, continue growing around and over the damage.

Defenses cont.

- Any damage to trees, including pruning cuts DOES NOT HEAL, but is walled off by compartmentalization to protect healthy tissue.

Compartmentalization

- The widely accepted theory of how this process occurs referred to as “CODIT” was developed by Dr. Alex Shigo.

Compartmentalization

- Trees lay down barrier walls to prevent decay spread in four directions.

More Details of Defenses

- The tree barrier walls prevent decay from spreading in four directions.

More Details of Defenses

- Plugging inactive xylem tissue prevents the vertical spread of damage.

More Details of Defenses

- 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.

More Details of Defenses

- 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.

More Details of Defenses

- In the past newly planted tree trunks were wrapped to prevent trunk cracking from temperatures-related expansion and contraction.

More Details of Defenses

- 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.

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

Proper Pruning Cuts

- Where and how to prune is as important as what to prune.

Proper Pruning Cuts

- 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.

Proper Pruning Cuts

- The sooner one can make those cuts, the smaller the wound and the faster the closure.

Remember that all pruning cuts injure the tree so only prune when needed using correct 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.

Where, exactly do I prune?

- 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.

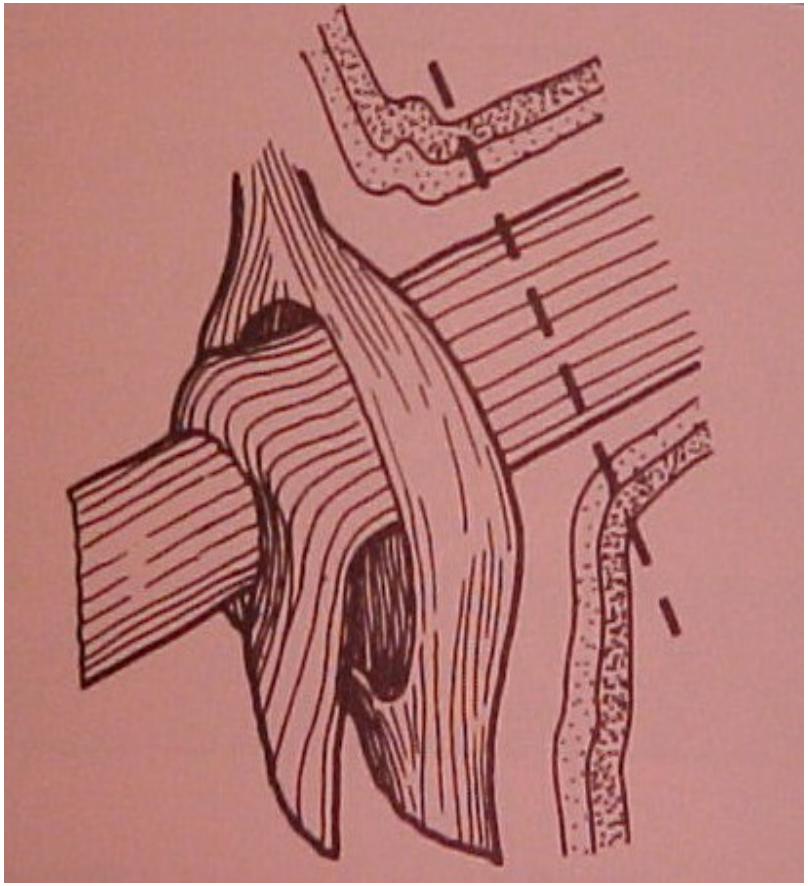
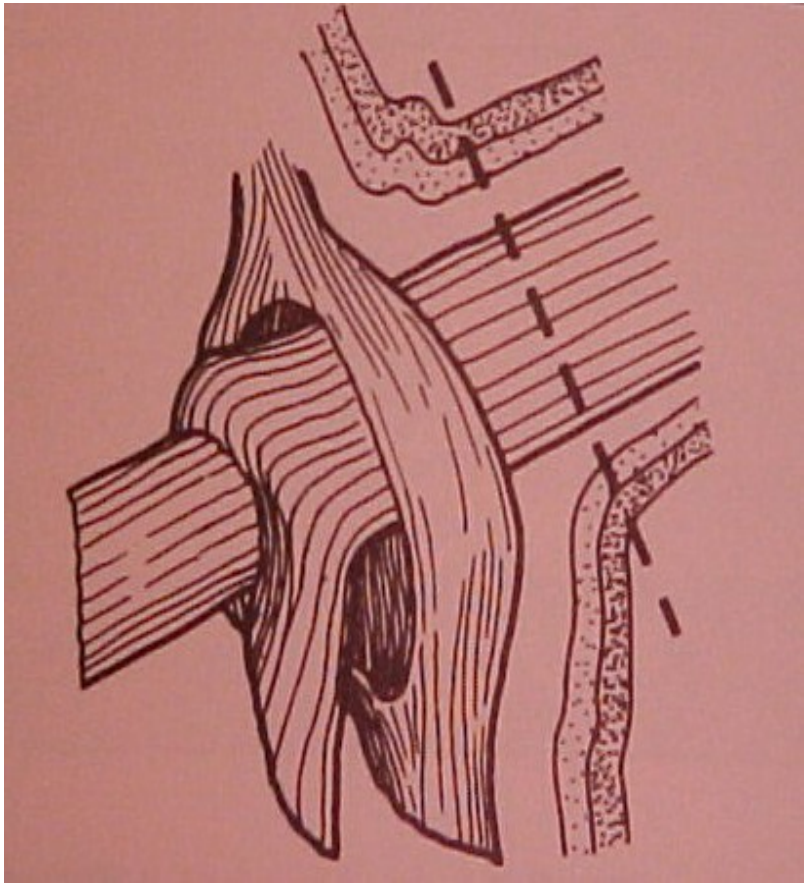


Photo from Urban and Community Forest Handbook

Where to Prune.....

- **DO NOT CUT INTO THE BARK AT THE BRANCH COLLAR.**



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Where to Prune.....

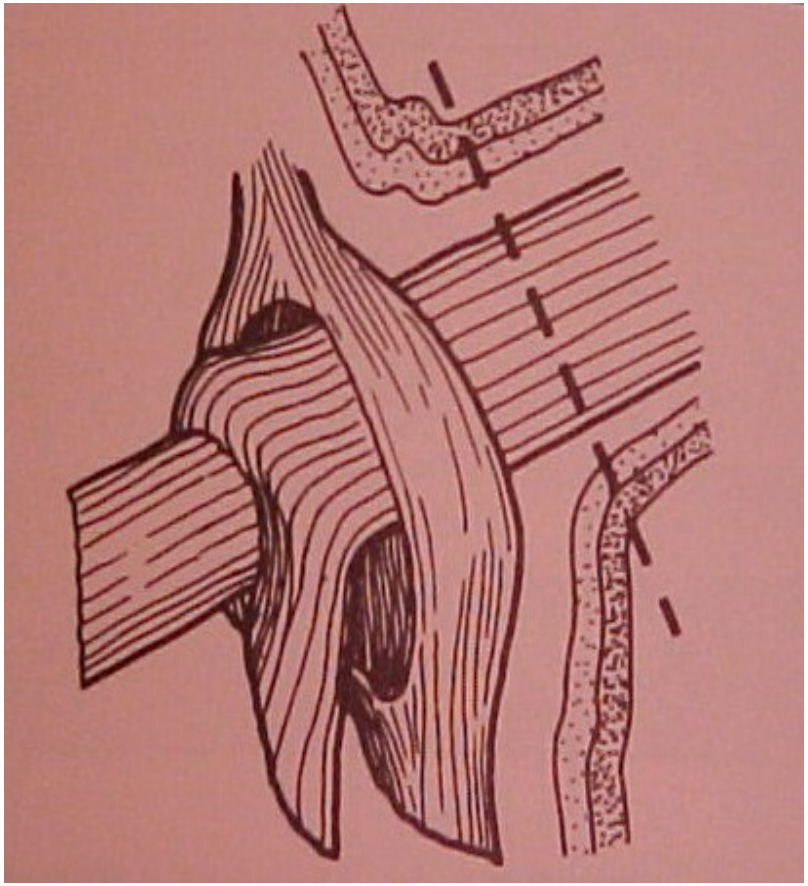


Photo from Urban and Community Forest Handbook

- **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.

Where to Prune…..

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……

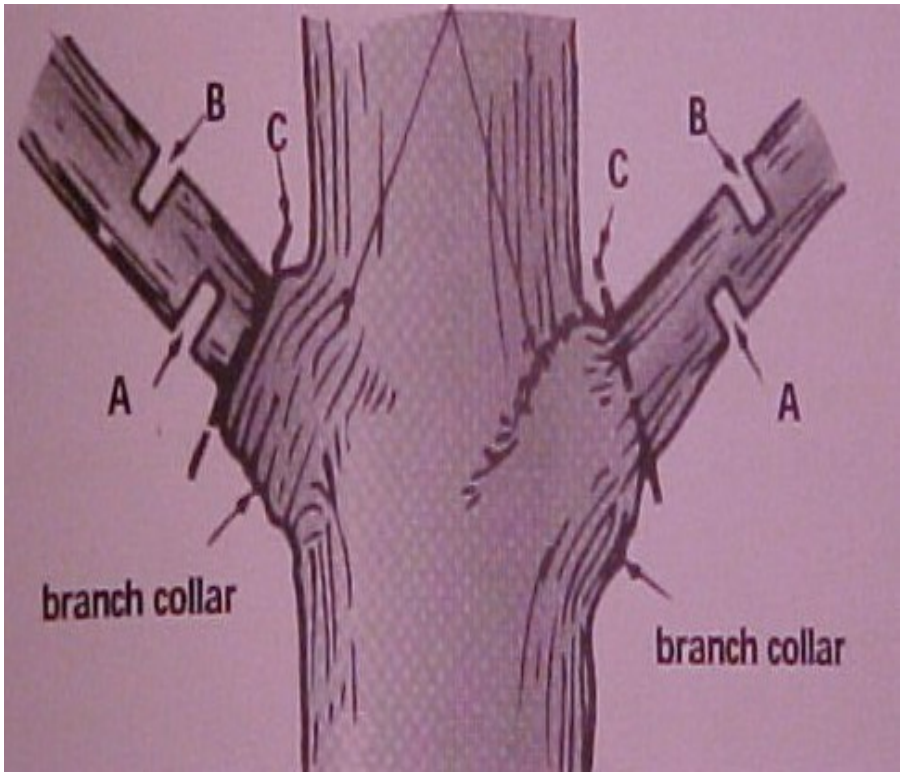
- Flush cuts remove the protective branch collar and expose the trunk wood.

Pruning Back to Trunk……

- Stubbed cuts leave unprotected tissue that easily becomes subject to decay or disease.

Pruning Larger Branches:

- For branches larger than 1” diameter use the three cut method to prevent tearing bark and to control the cut.



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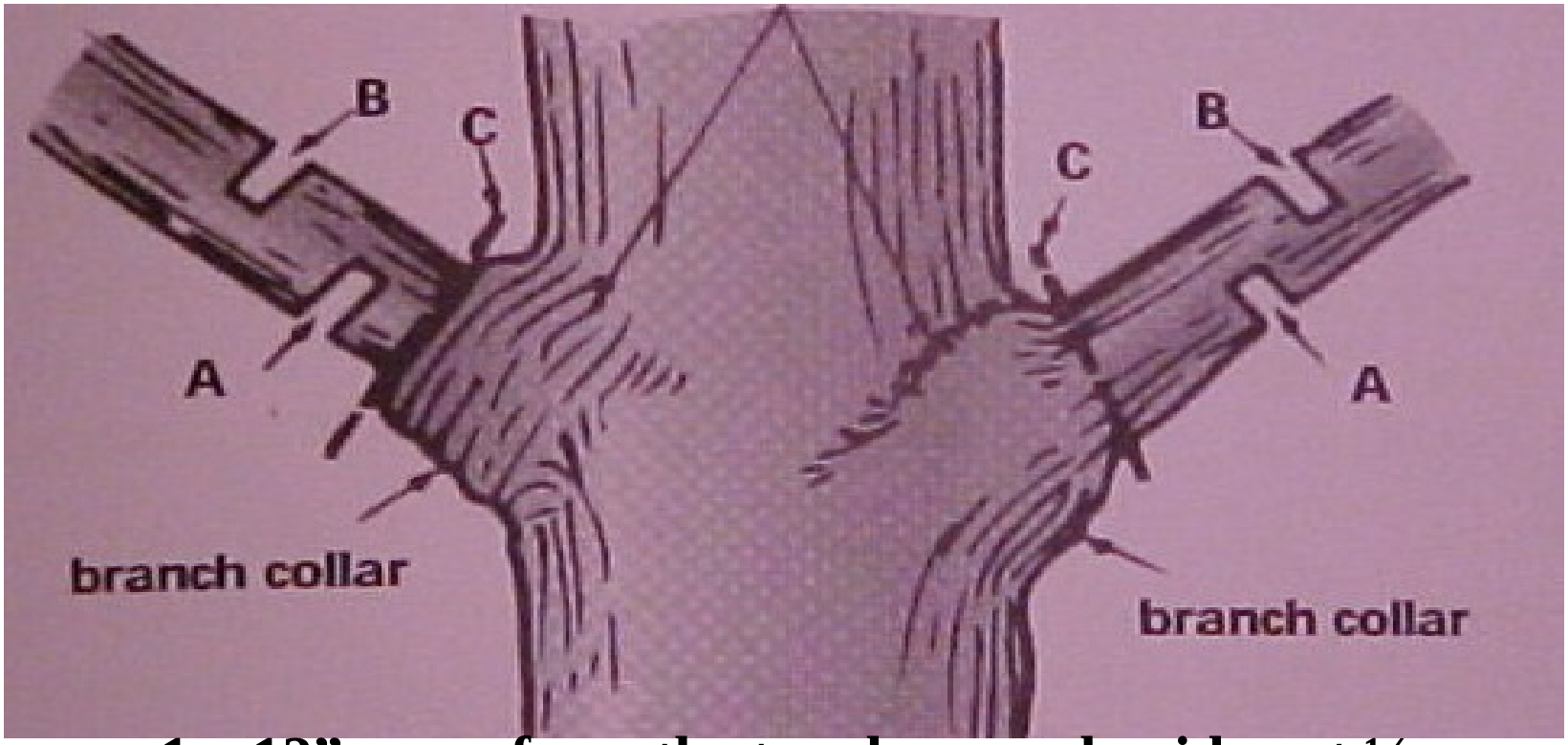
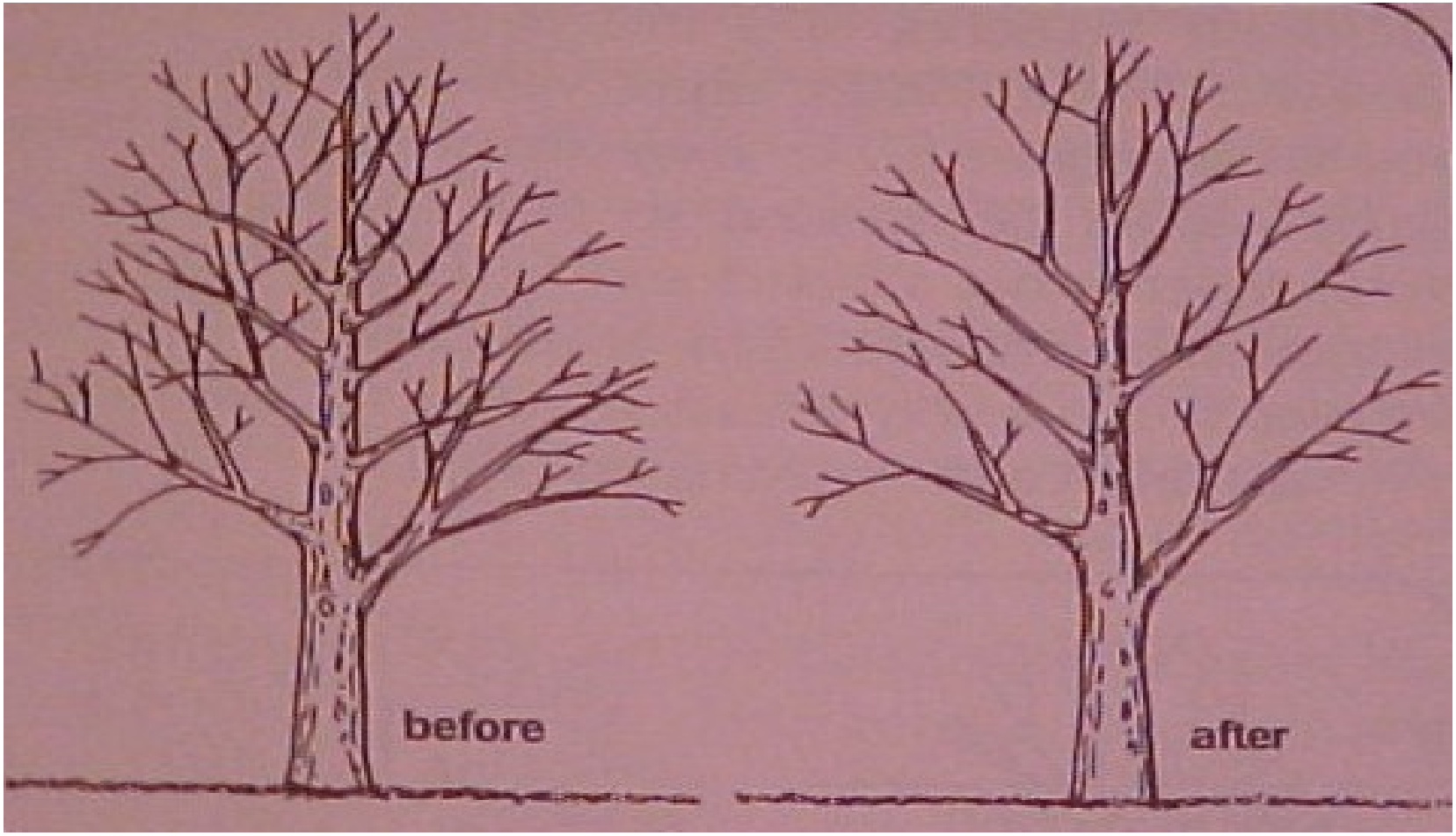
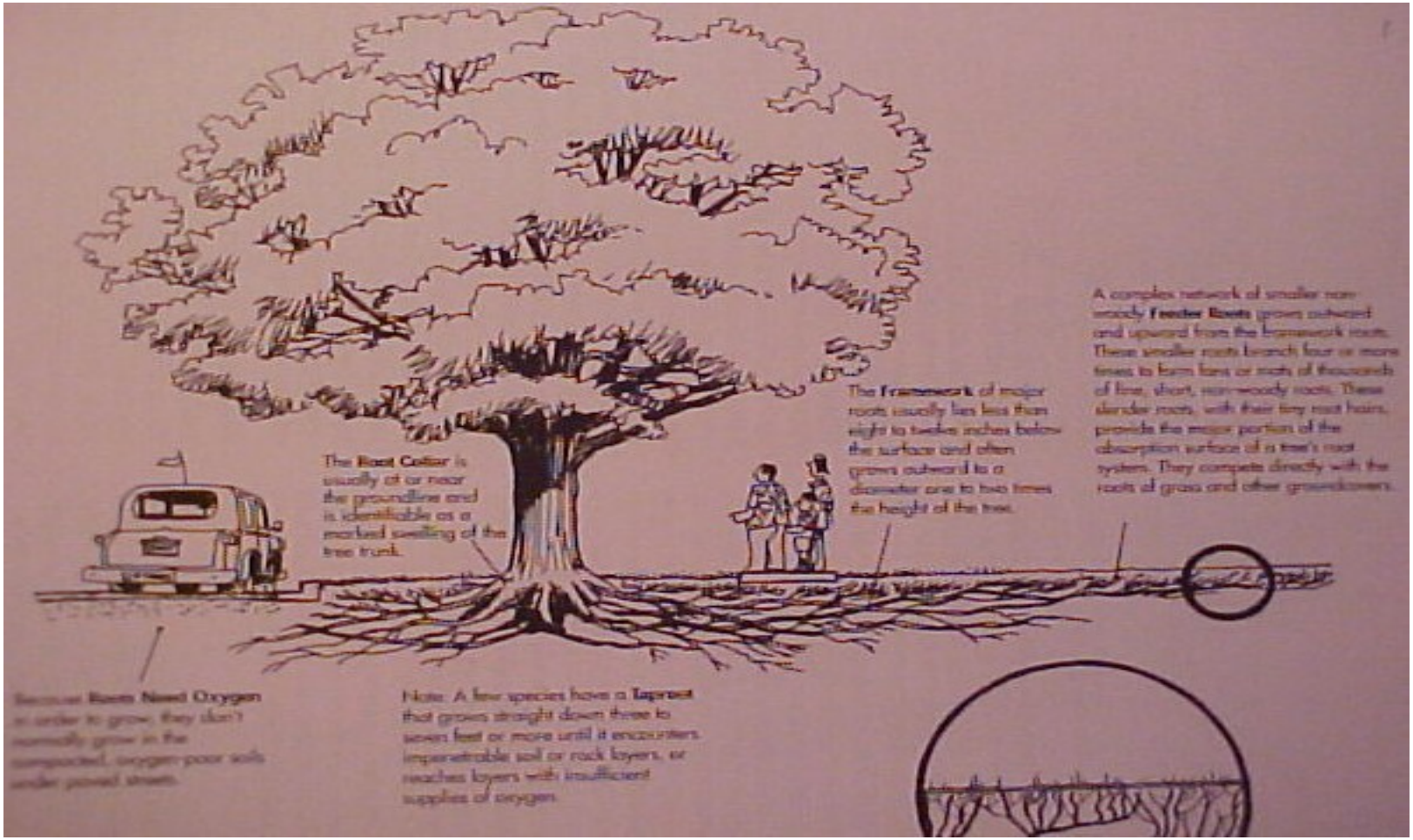


1. **12” away from the trunk on underside cut ½ way through the branch.**
2. **1inch beyond cut 1 cut thru the limb from top side down.**
3. **Final cut outside the branch collar.**

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.

Pests and Pathogens

- Good preventive maintenance for insects and diseases is improving the site and environmental factors to help trees be more vigorous.

The use of Pruning paint and sealer

- Pruning paint is no longer used to “protect” the tree, as it sealed water and diseases into the tree.

- 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.