# Urban Forest Hurricane Recovery Program

http://treesandhurricanes.ifas.ufl.edu

UF UNIVERSITY of FLORIDA
IFAS Extension

# Developing a preventive pruning program in your community: Mature trees

Dr. Ed Gilman and Amanda Bisson

# Inaction can cause structural problems



Codominant stems with bark inclusions

# Poor structure such as codominant stems often cause branch failure in storms

# Pruning can reduce damage

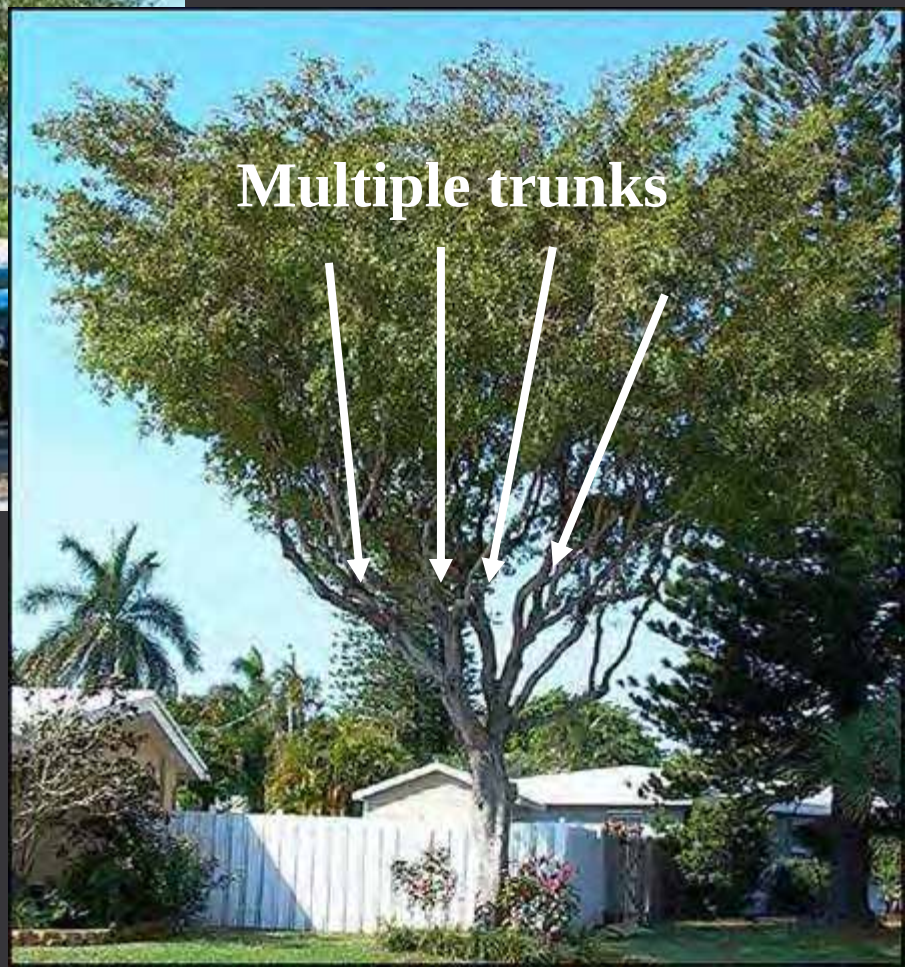
**Not pruned**

A recent study at UF showed that pruning reduces canopy movement when trees are exposed to high winds.

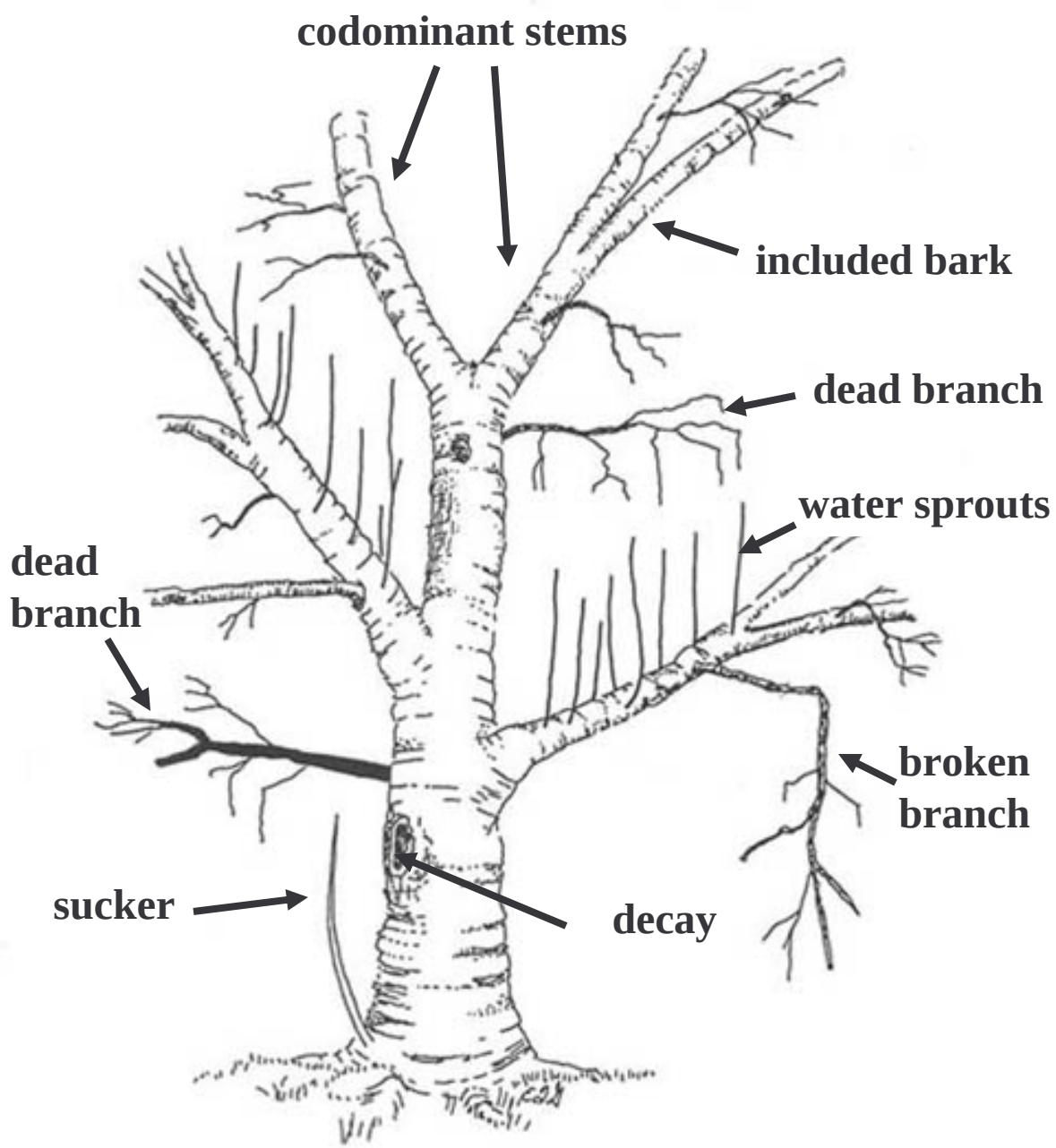
**Reduction pruning**

# Your goal


**Poor management**




**Better management**




# Common mature tree problems

# Preventive Pruning: mature trees

- **<u>Set objectives</u>**
- Determine pruning cycle and dose
- Execute pruning plan
  - make good cuts
  - prioritize trees with high risk structural issues
  - choose appropriate pruning type

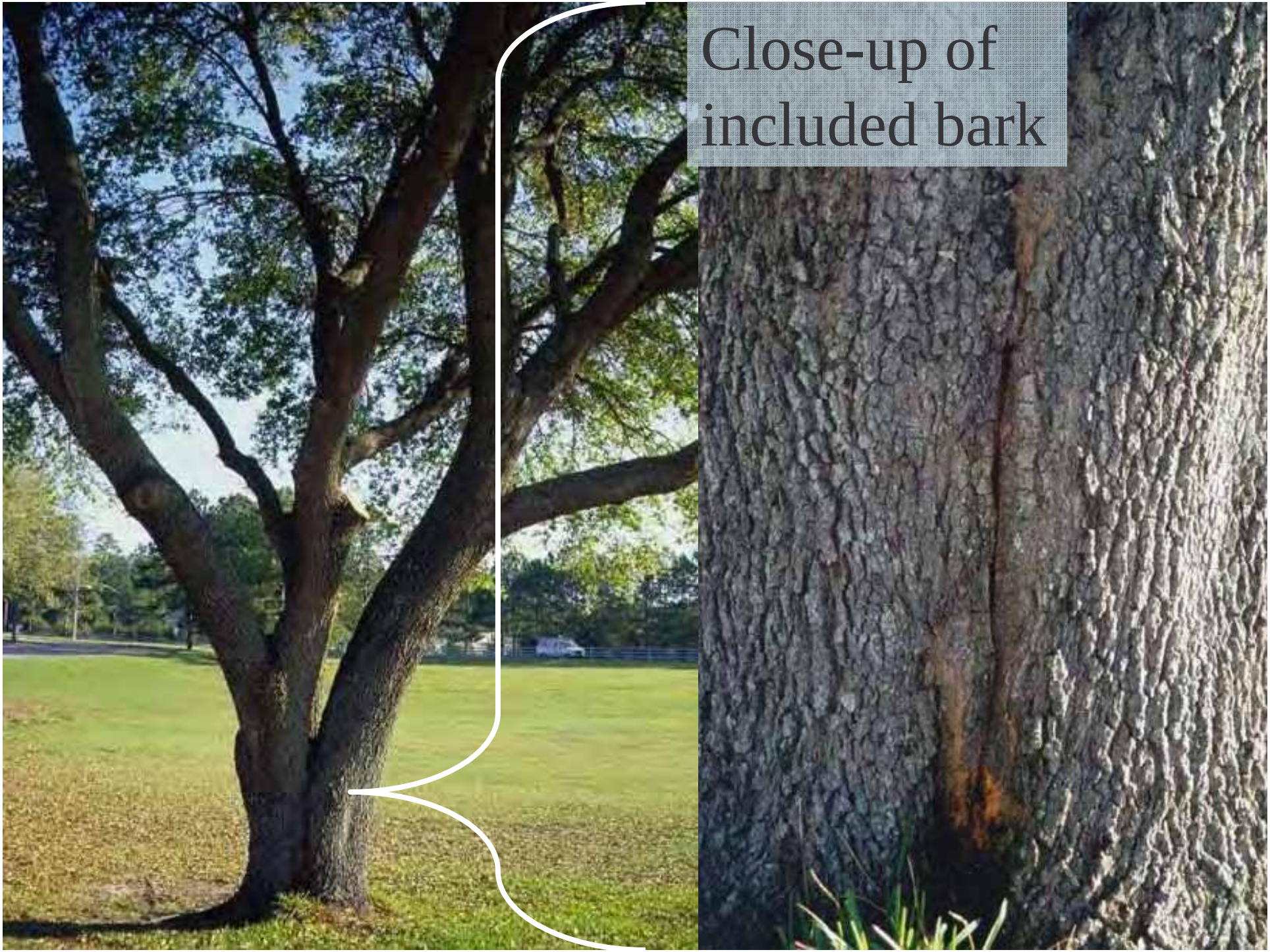
# Pruning objectives:

- Reduce risk of failure – minimize storm damage
- Promote human safety
- Allow for safe passage
- Increase sun penetration to the ground
- Maintain health

# Objective: Reduce risk of failure

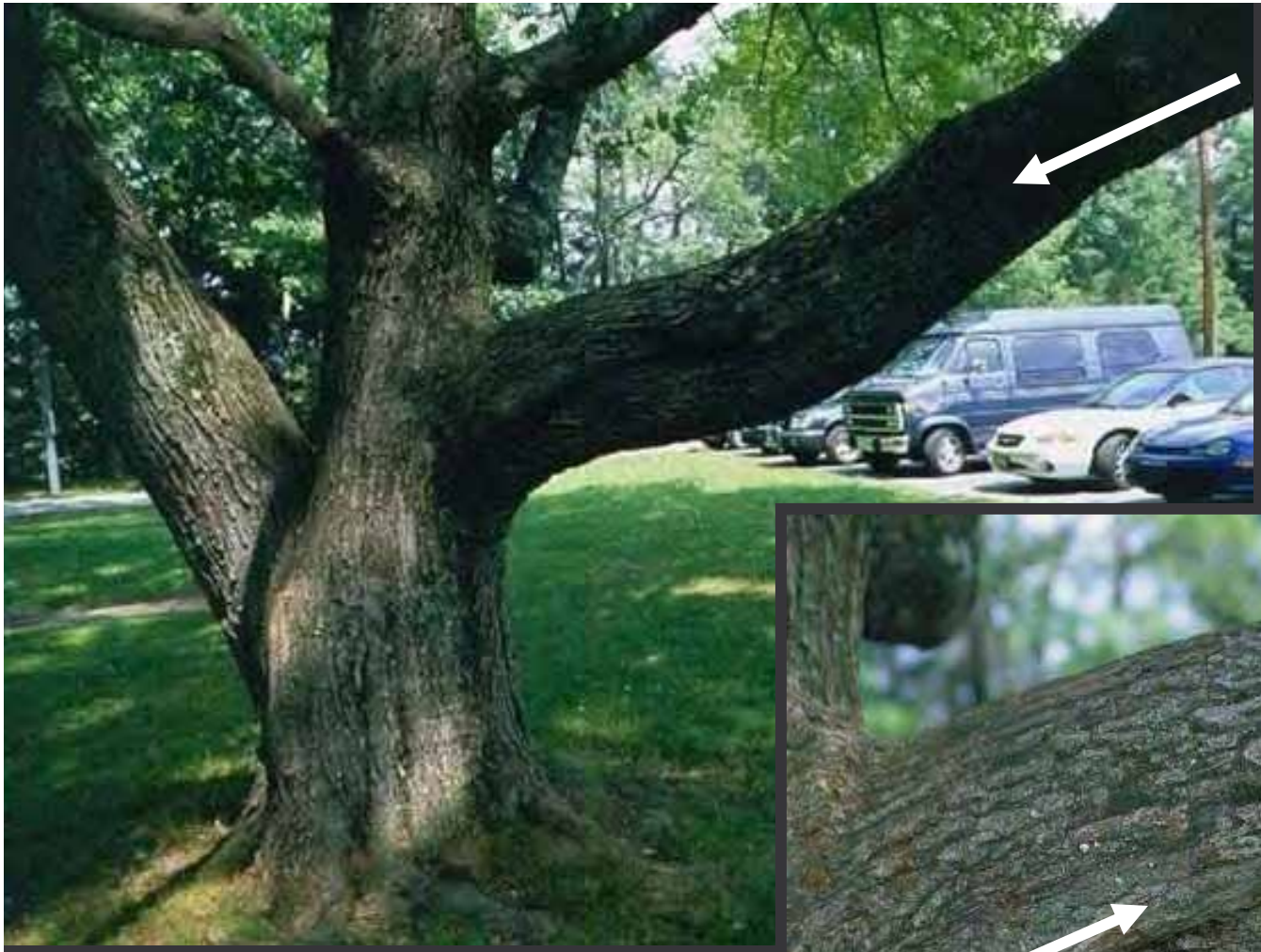
- Identify risks
  - Bark inclusions
  - Cracks
  - Over-extended limbs
  - Leaning trees
  - Root decay
  - Girdling roots
- Reduce conditions that could lead to catastrophic branch or tree loss.


Strong union without a bark inclusion
Collar


Close-up of included bark

# Failure due to bark inclusion

# Cracks are evident and indicate weakness



Reduce branch with crack

**Horizontal crack**

# Broken branch

# Reduction could have prevented this

## Before pruning a leaning tree

## After pruning

# Severed and decayed root systems

# Stem girdling roots may cause trees to topple

Location of girdling roots. Notice that there are few supporting roots on this side of the tree.

# Stem girdling roots

- Roots that circle around the base of the trunk

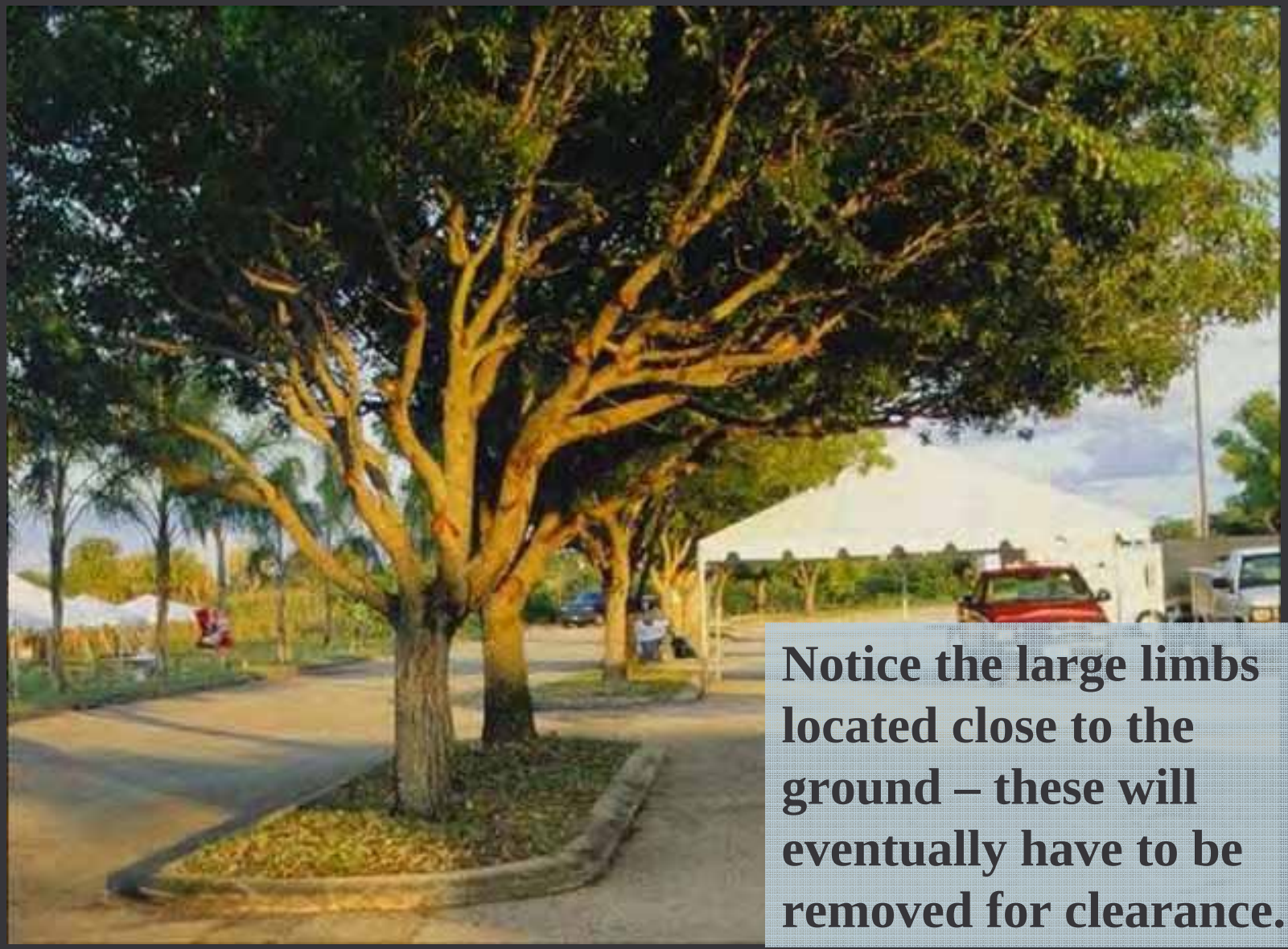
Girdling root


After removing girdling roots

# Objective: Promote human safety

- Avoid expensive damage

# Objective: Allow for safe passage



**Notice the large limbs located close to the ground – these will eventually have to be removed for clearance.**

# Objective: Reduce shade

**After thinning**

**More light here**

**Before thinning**

# Objective: Maintain tree health

# Preventive Pruning: mature trees

- Set objectives
- **<u>Determine pruning cycle and dose</u>**
- Execute pruning plan

  -make good cuts

  - prioritize trees with high risk structural issues

  -choose appropriate pruning type

# Pruning cycle

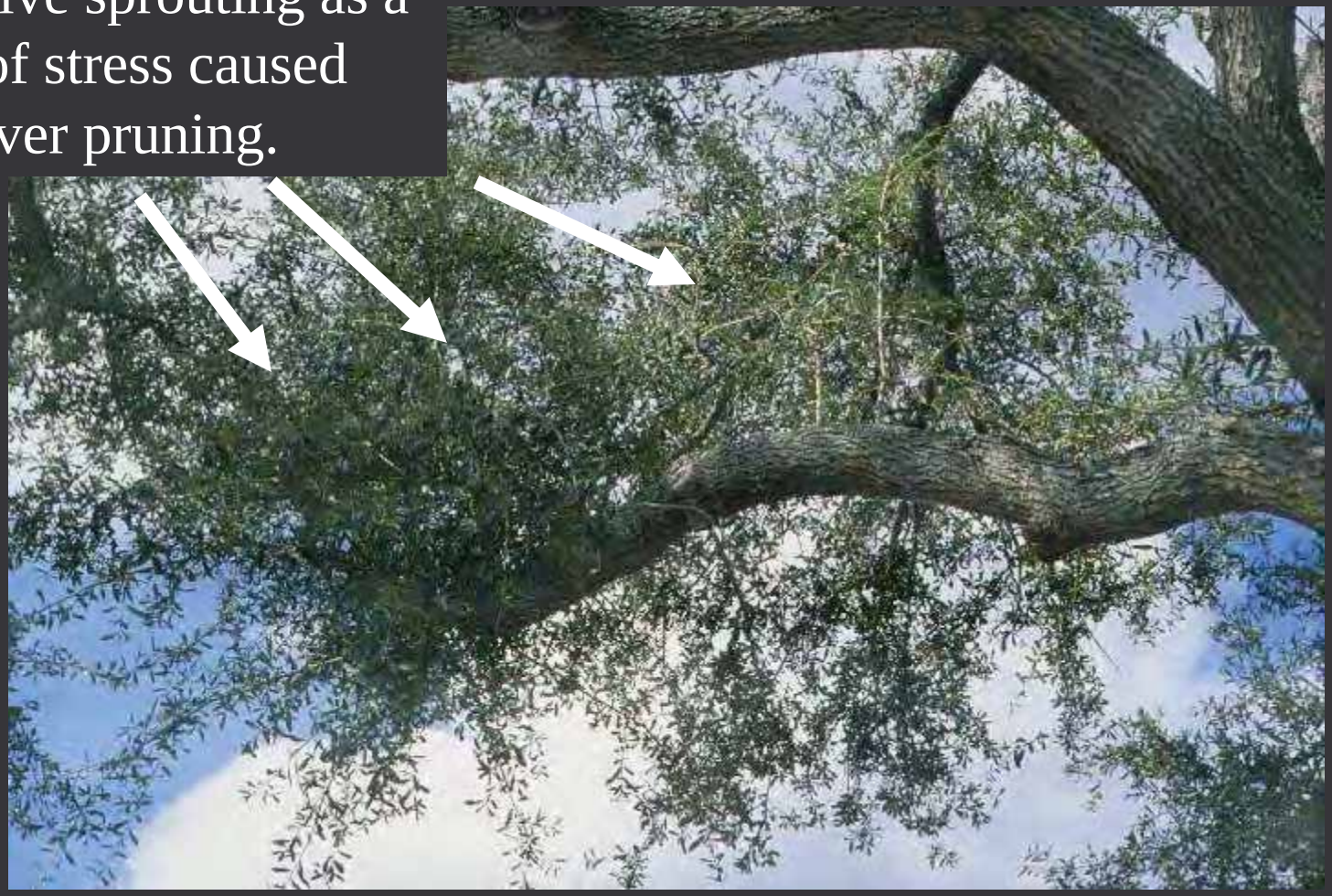
- Pruning cycle is the time period between pruning episodes
- Pruning every 2 years results in trees better prepared for storms than longer cycles
- The sooner you begin pruning the less you will need to remove at each pruning

# Pruning dose

- Old trees can decline as a result of removing too much live tissue.
- Try not to remove more than 10% of the live foliage on a mature tree.
- Remove more than 10% only for a good reason such as a cracked live branch over a house.

# Remove live foliage only for a good reason!

Excessive sprouting as a result of stress caused from over pruning.



# Risks of removing too much tissue

- Forces use of energy by initiating defense mechanisms.
- Removes energy reserves.
- Can cause cracks.
- Can cause sprouting.
- Can cause branch death.
- Can cause tree mortality.
- Reduces energy storage space.

# Preventive Pruning: mature trees

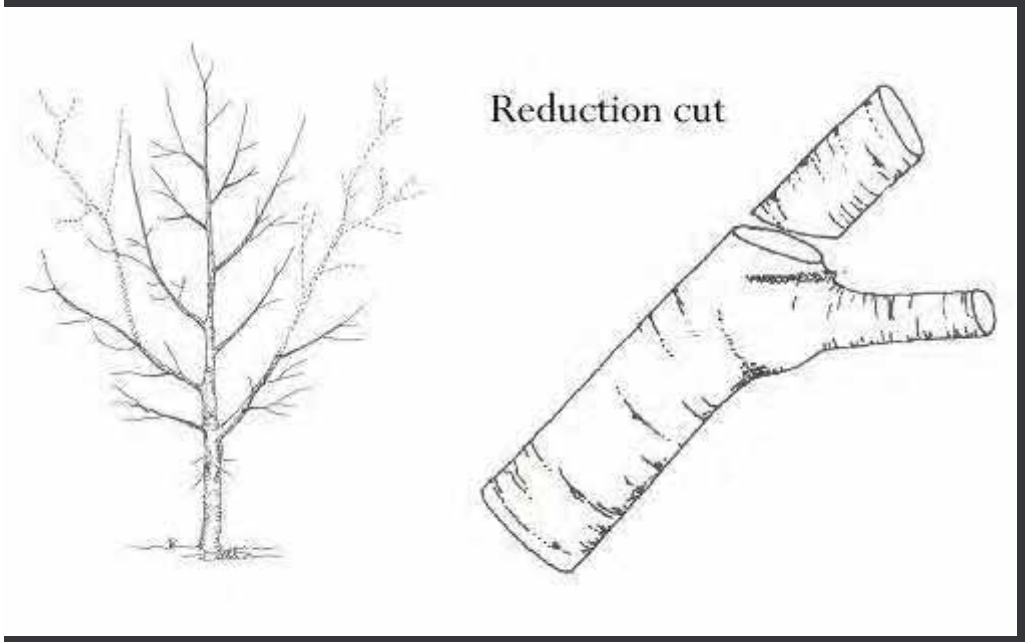
- Set objectives
- Determine pruning cycle and dose
- **<u>Execute pruning plan</u>**

  - make good cuts

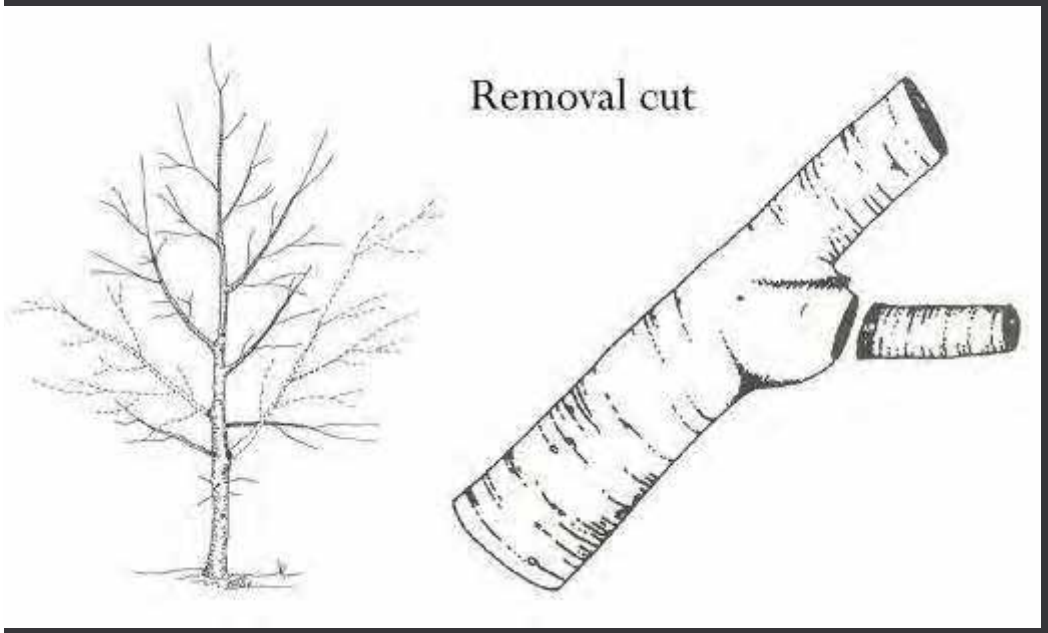
  - prioritize trees with high risk structural issues

  - choose appropriate pruning type

# Types of pruning cuts:

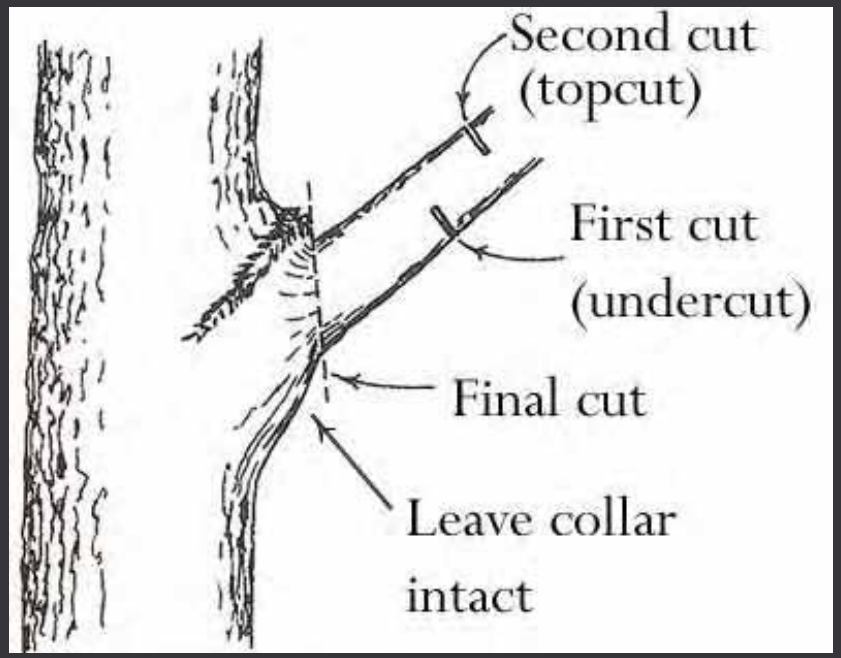



Reduction cut shortens the length of a stem by pruning back to a smaller limb.




Removal cut prunes a branch back to the trunk or parent branch.

# Make good pruning cuts




Step 1

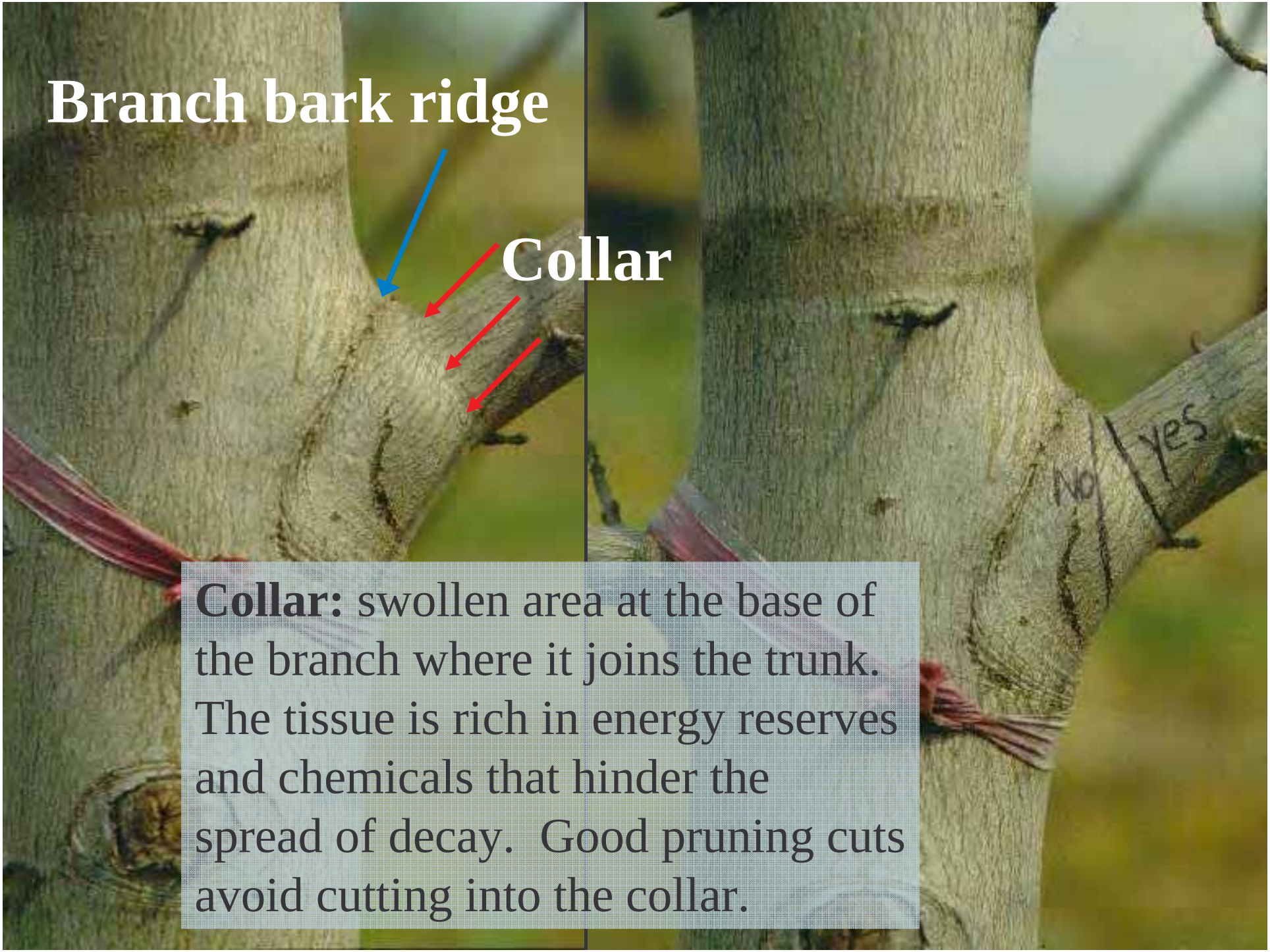
Make an undercut about 12 inches from the trunk.

Step 2

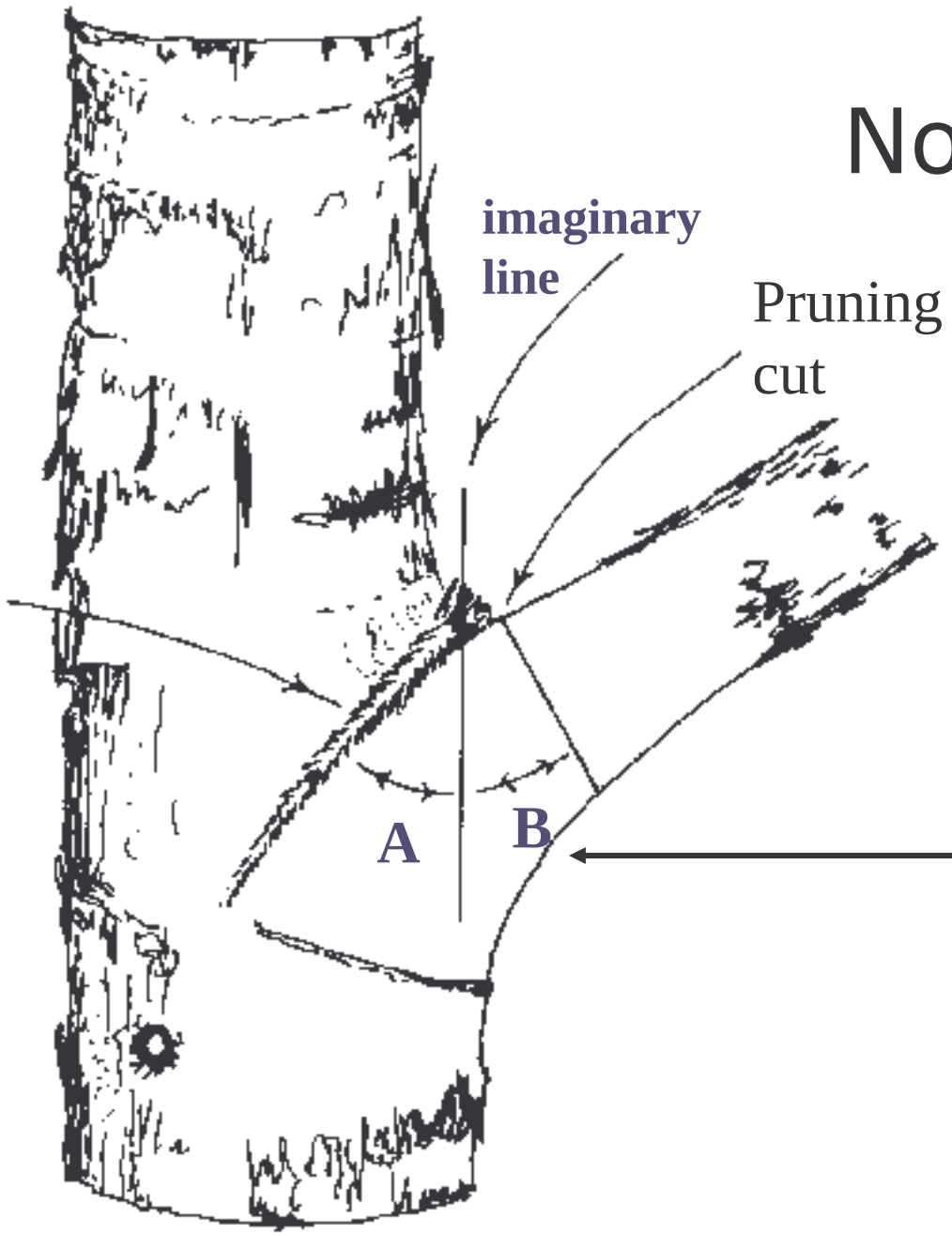
Make a top cut farther out on the limb.

Step 3

Remove the stub with final cut, being careful not to cut flush against the trunk.
Leave the collar intact.




**Collar:** swollen area at the base of the branch where it joins the trunk. The tissue is rich in energy reserves and chemicals that hinder the spread of decay. Good pruning cuts avoid cutting into the collar.



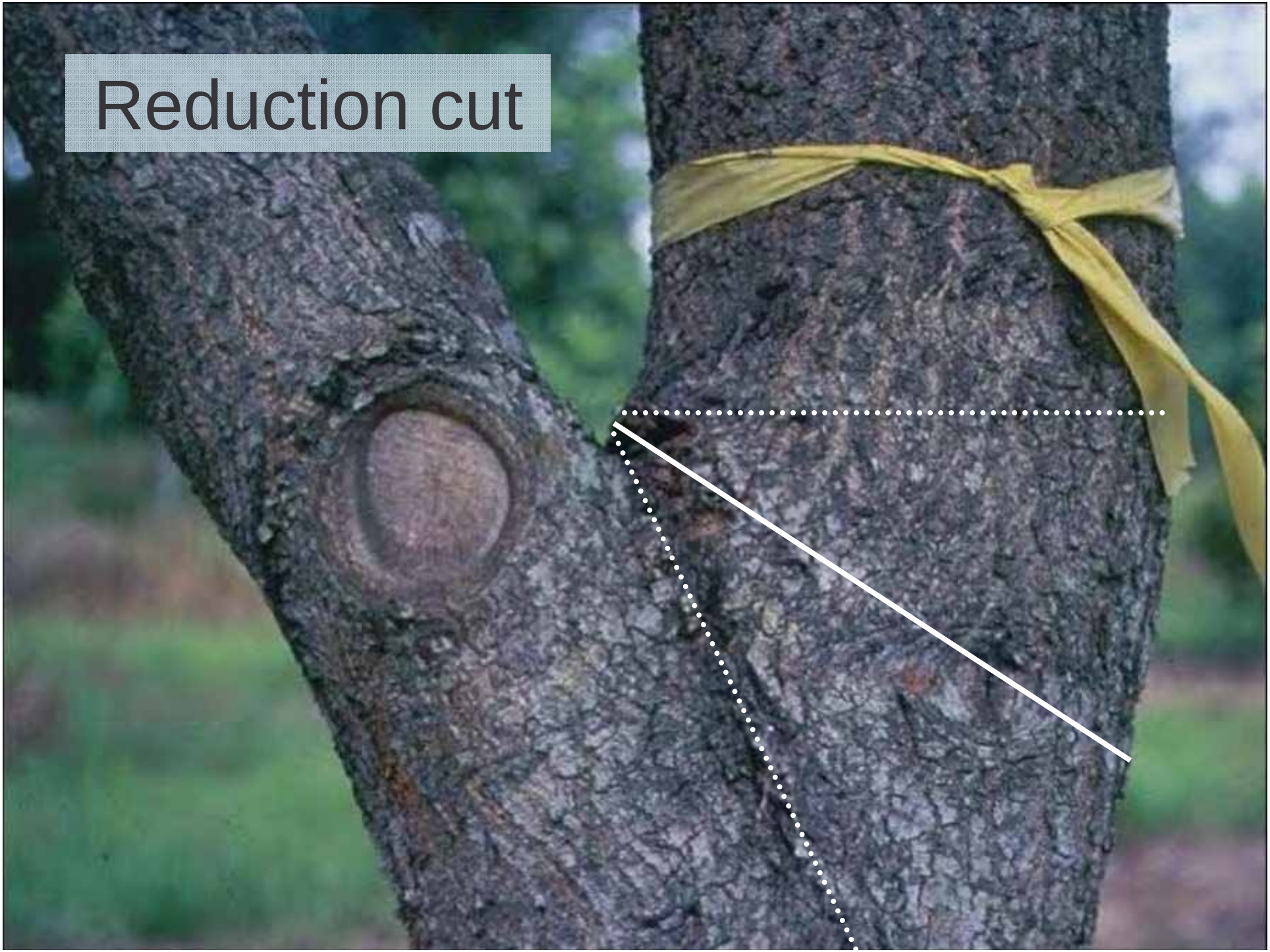

# No collar visible

**Angle 'A' should equal angle 'B'**

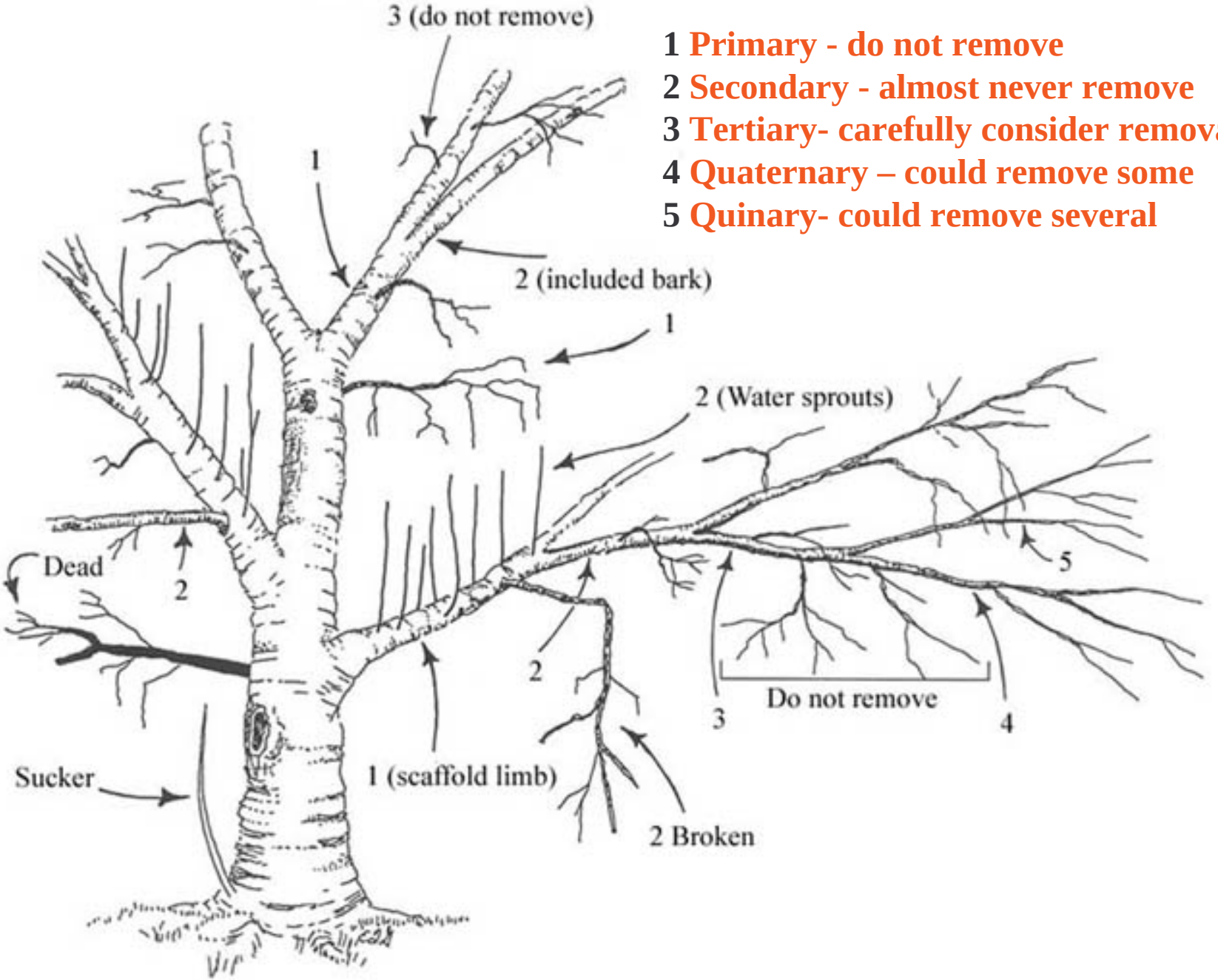
# Bad cut- called a flush cut

Woundwood does not develop evenly

# Reduction cut



# Pruning guidlines for mature and overmature trees




**1 Primary - do not remove**
**2 Secondary - almost never remove**
**3 Tertiary- carefully consider removal**
**4 Quaternary – could remove some**
**5 Quinary- could remove several**

# Types of preventive pruning: Mature Trees

Structural pruning

Cleaning

Thinning

Raising

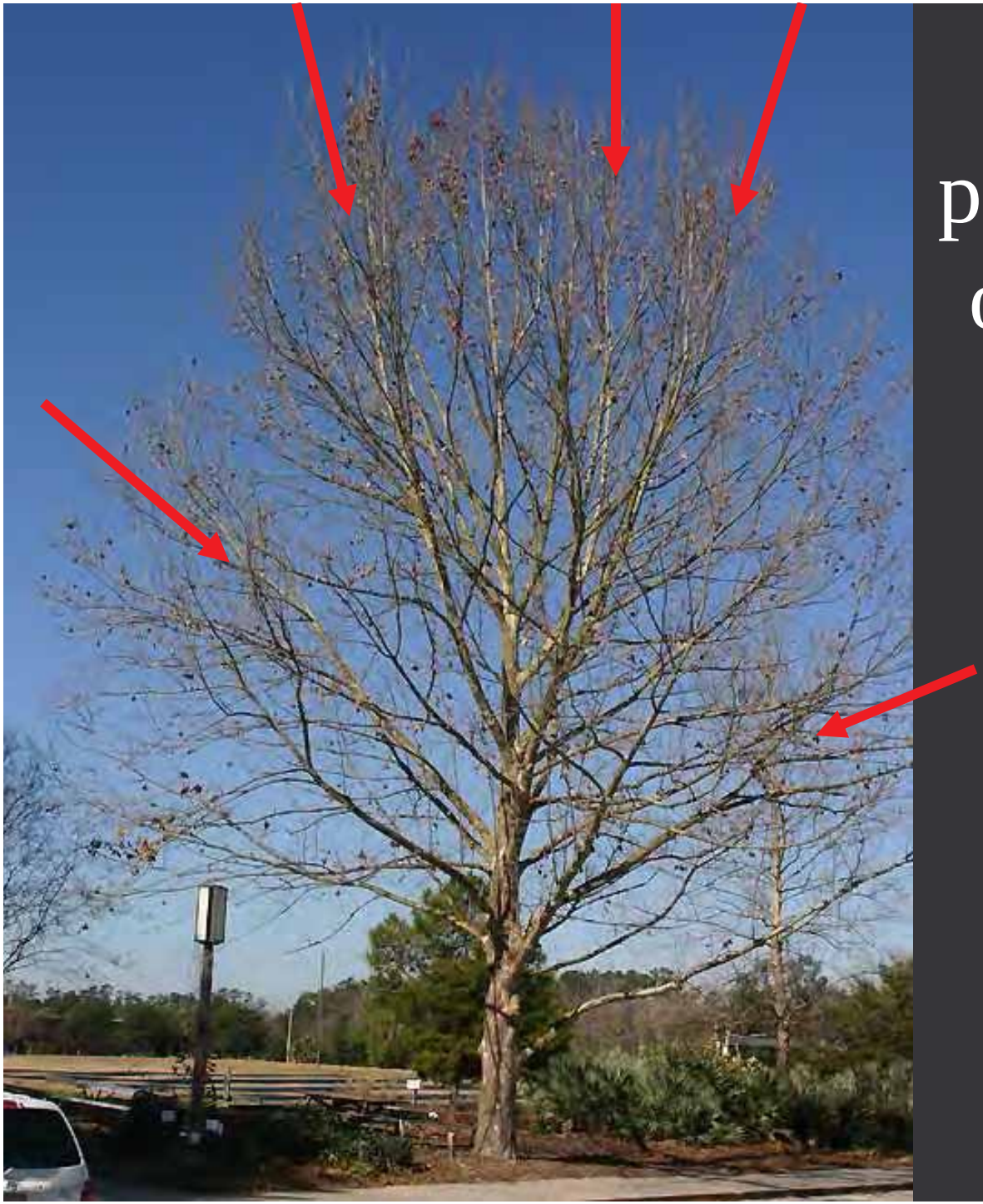
Reducing

Balancing

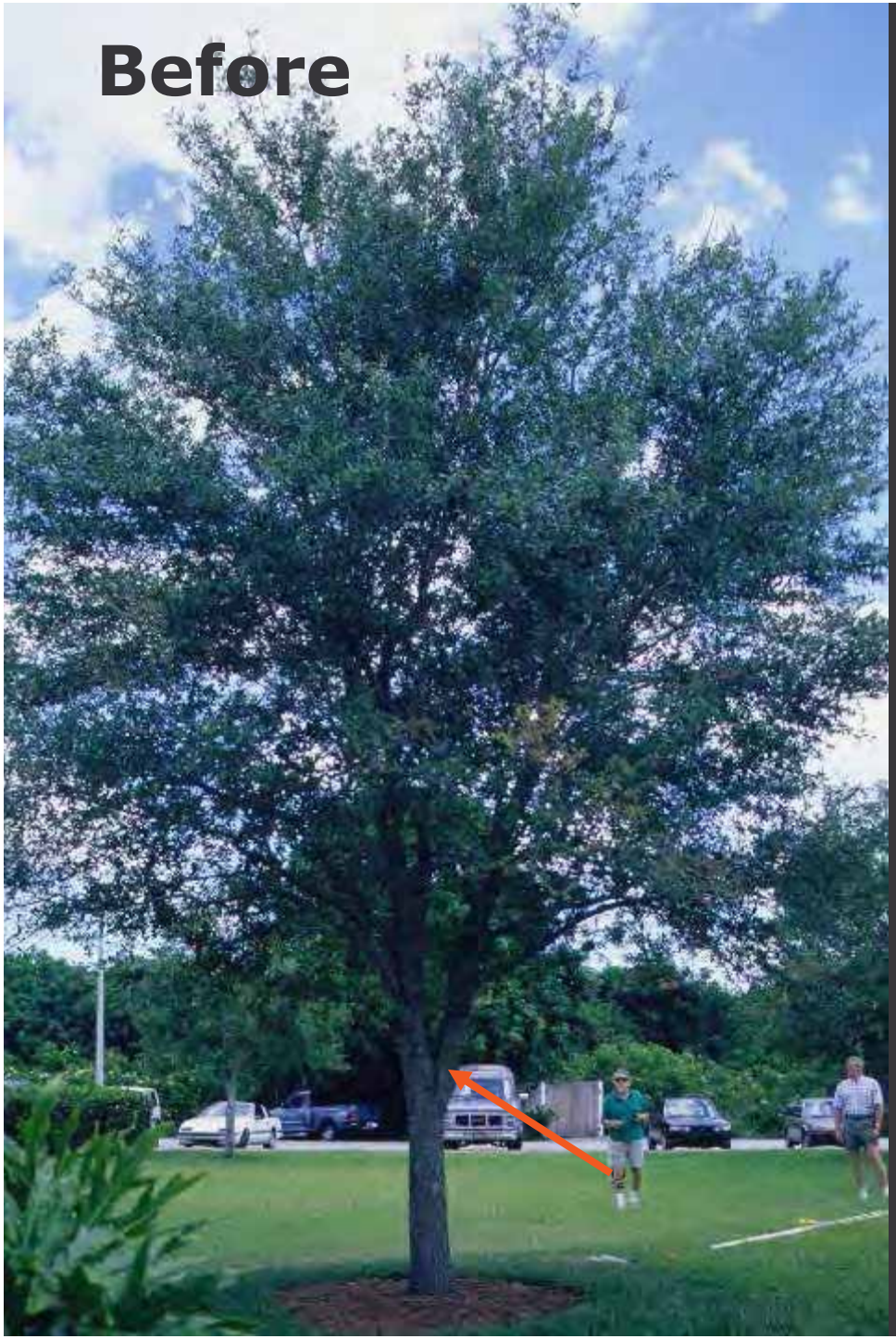
Root pruning

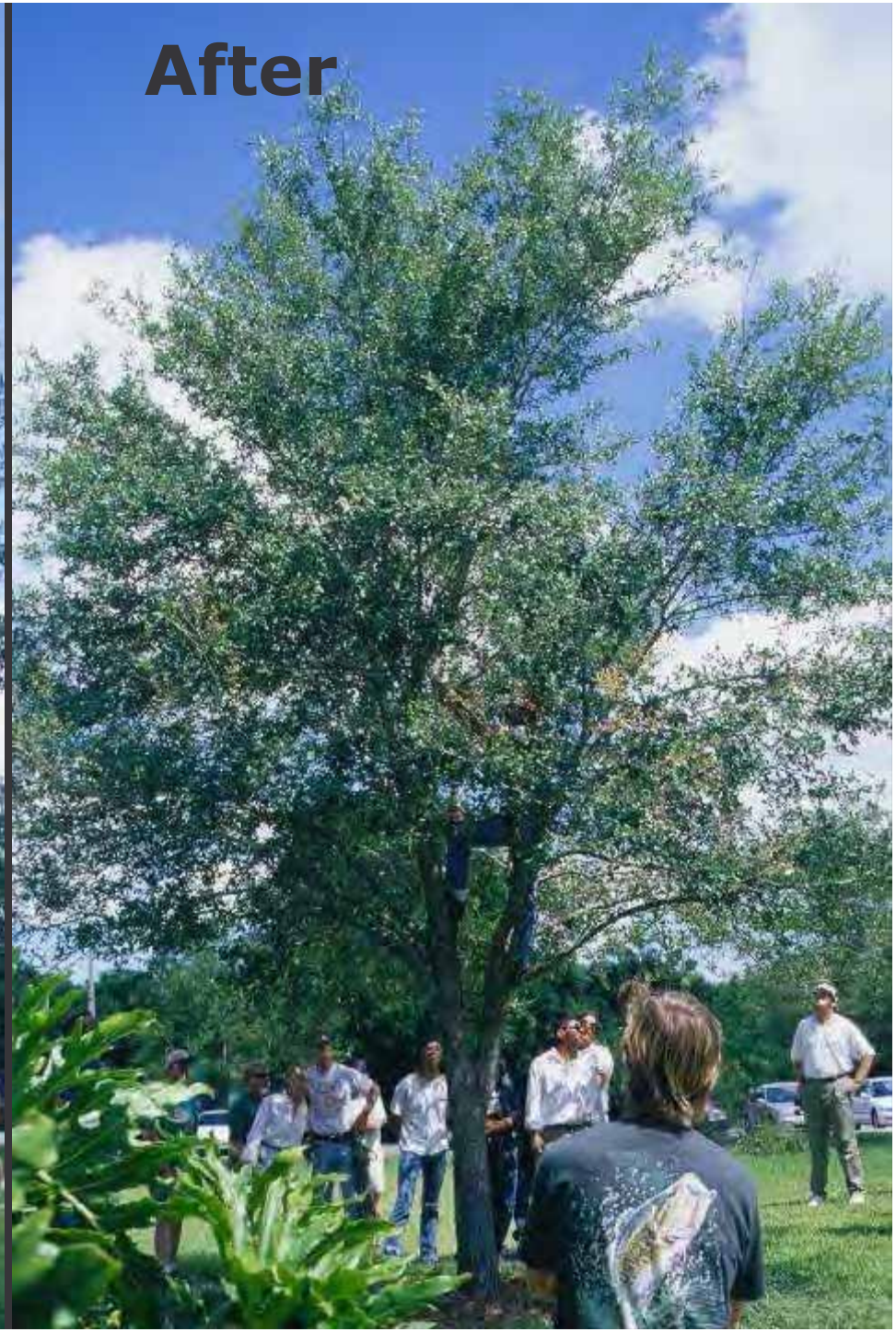
Palm pruning

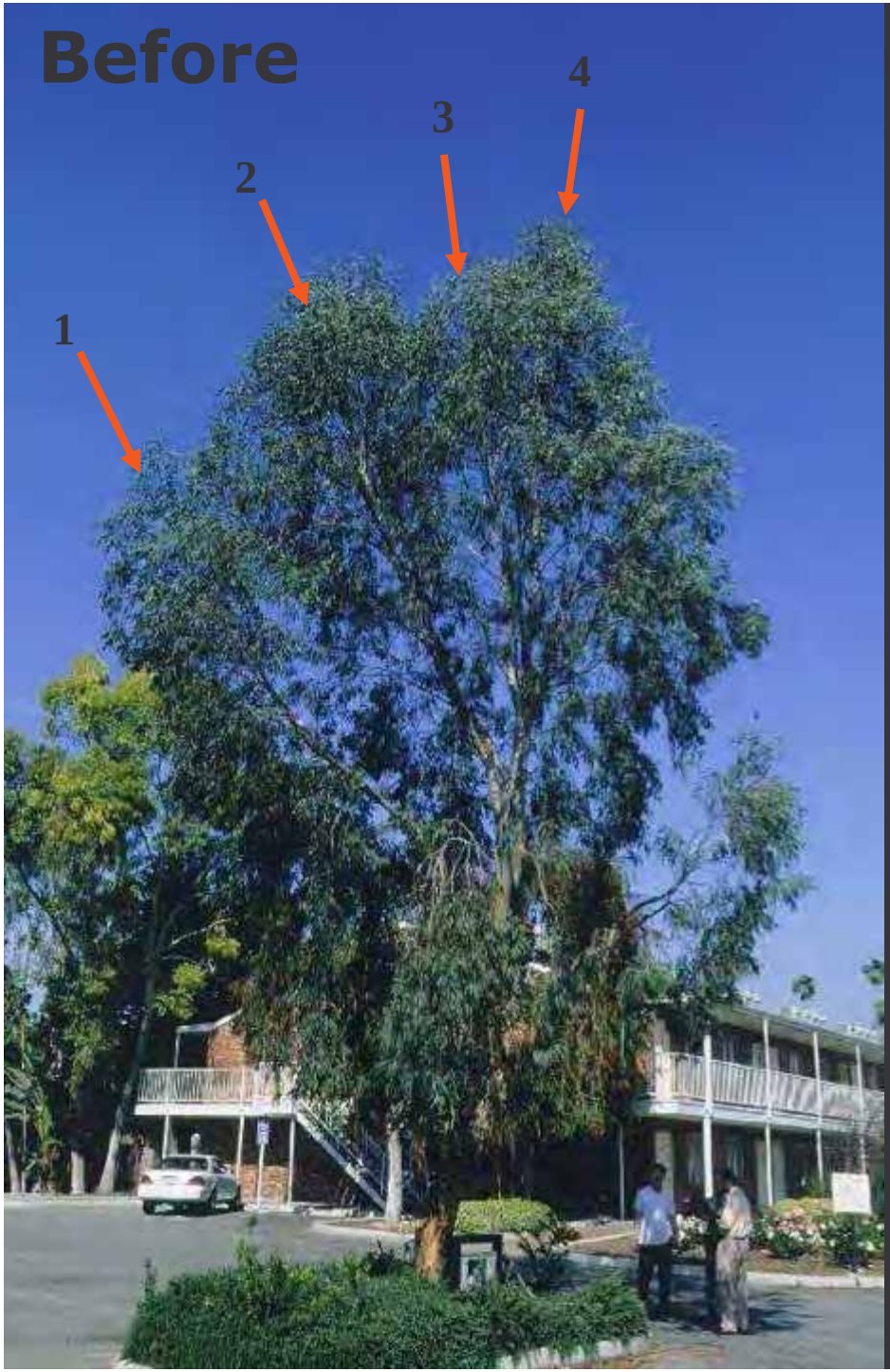
Pruning to restore

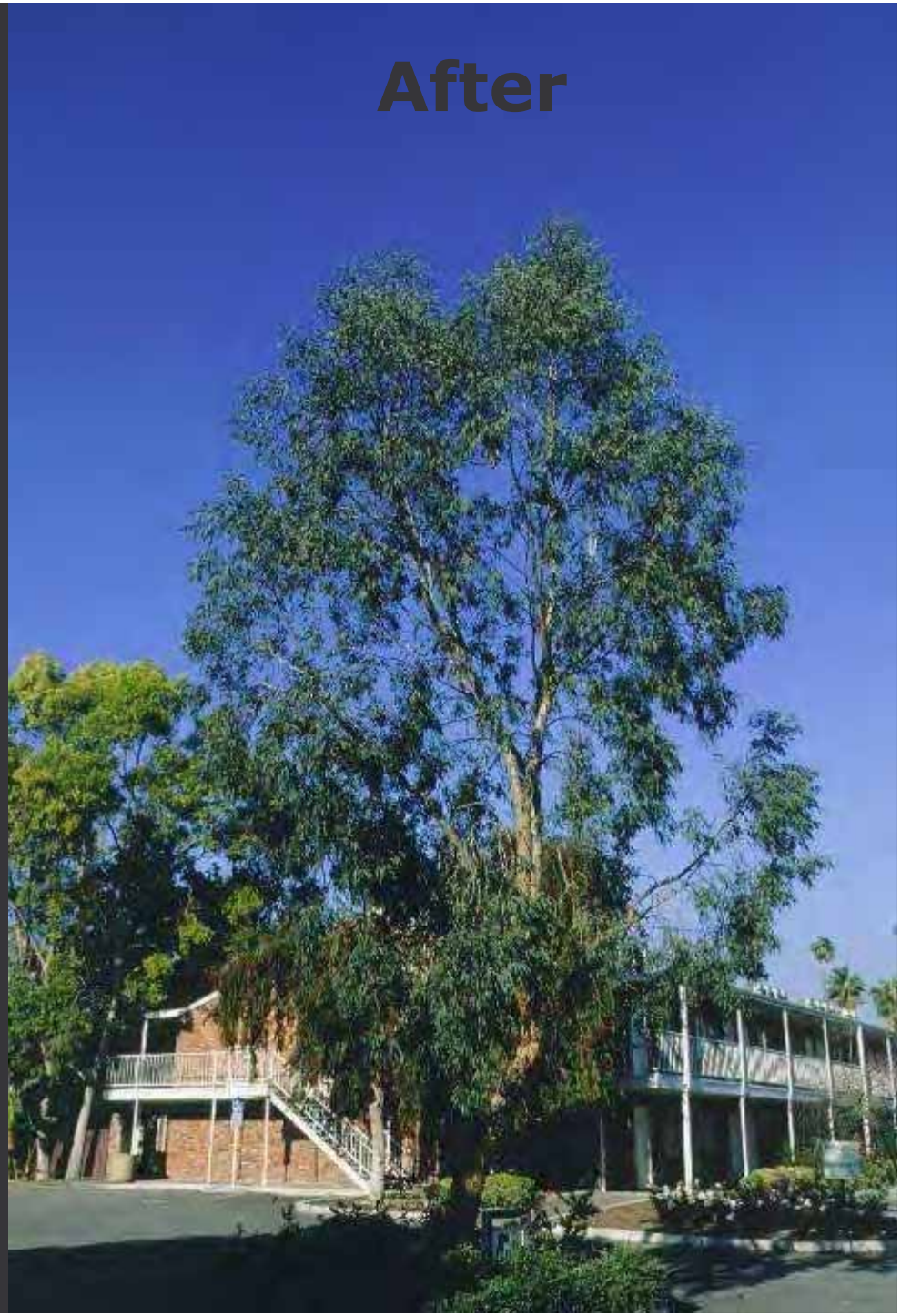


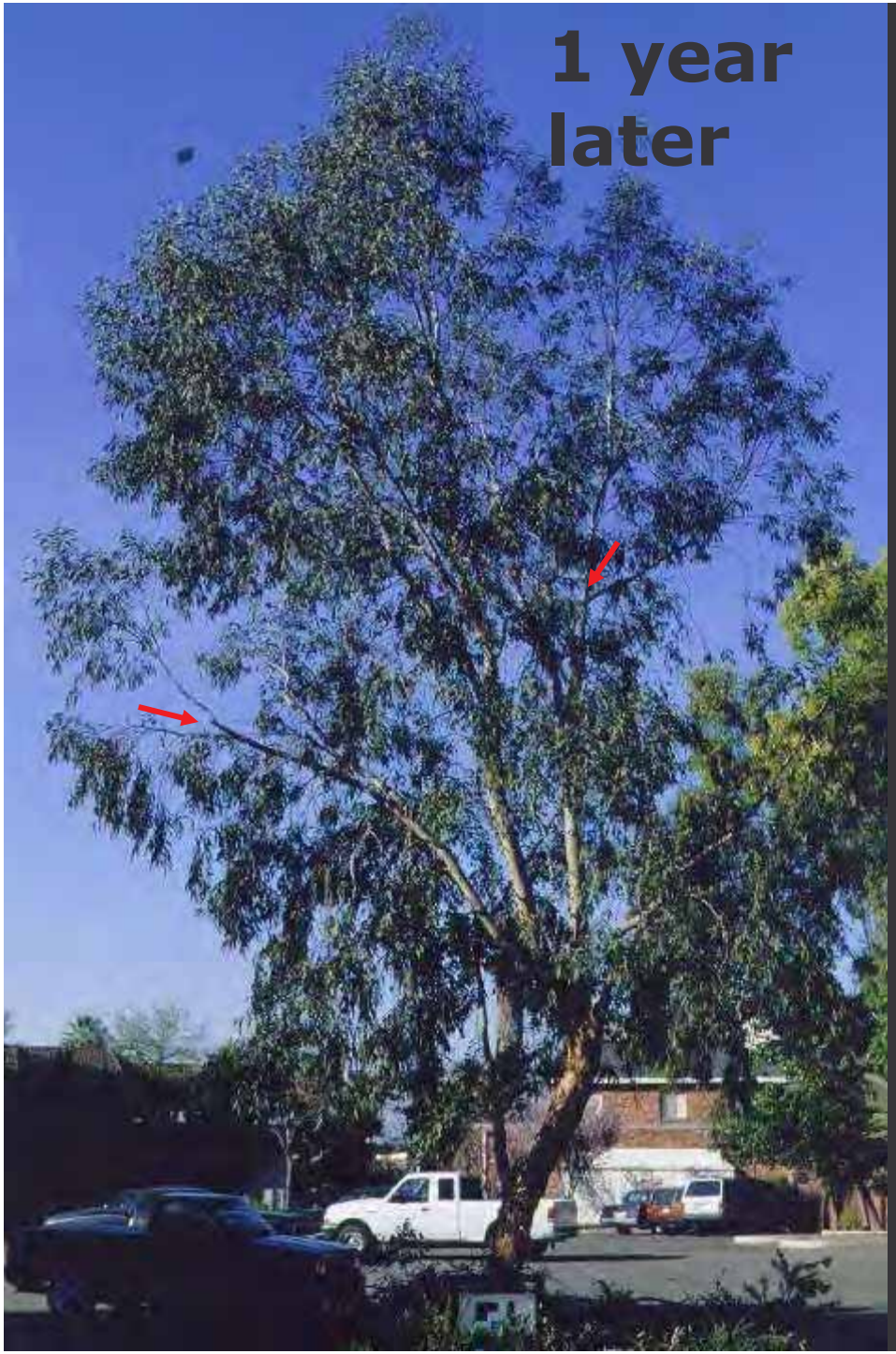
Structural pruning shortens or thins certain stems and branches


Before


After

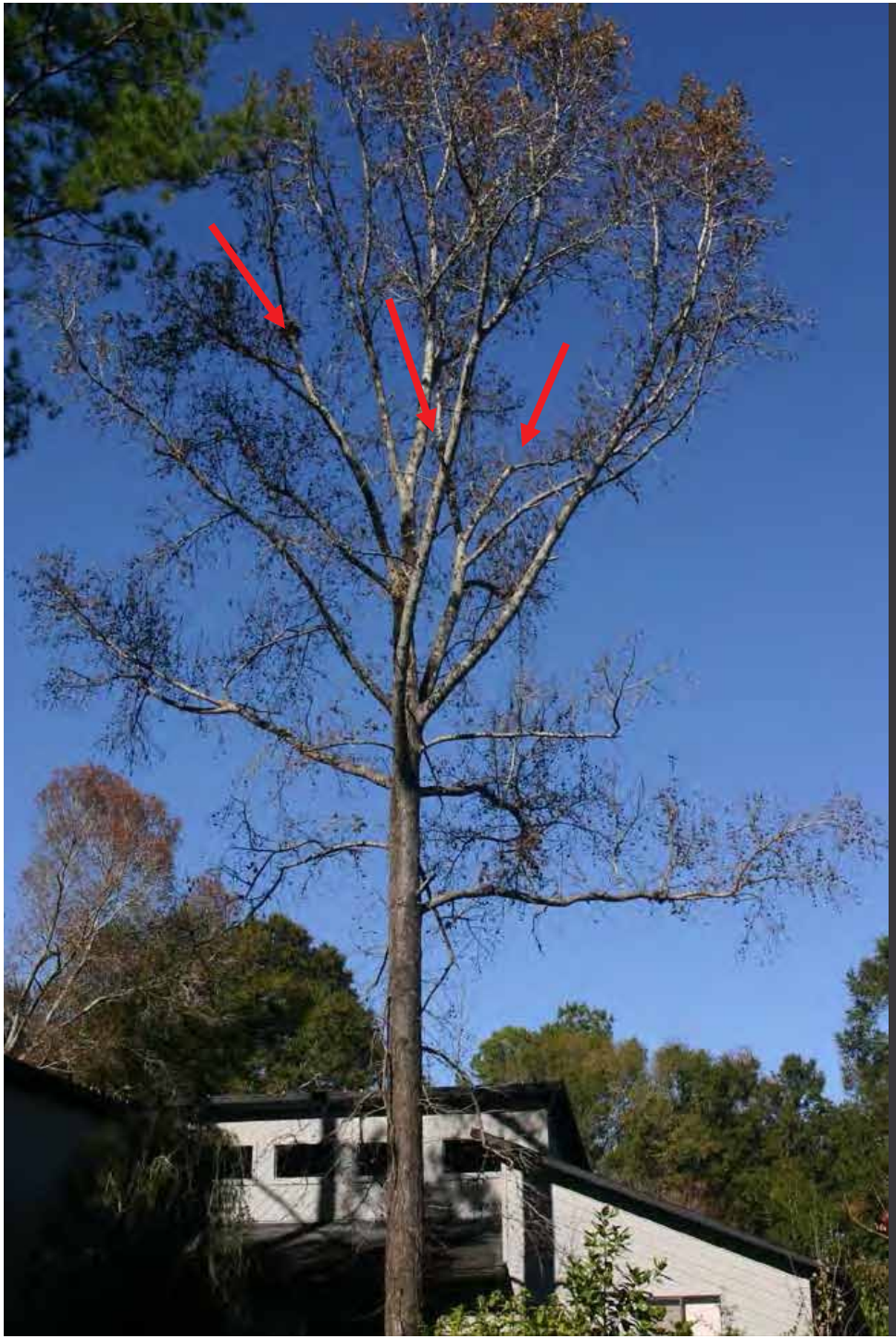

Before
1
2
3
4


After


1 year
later


2 years
later

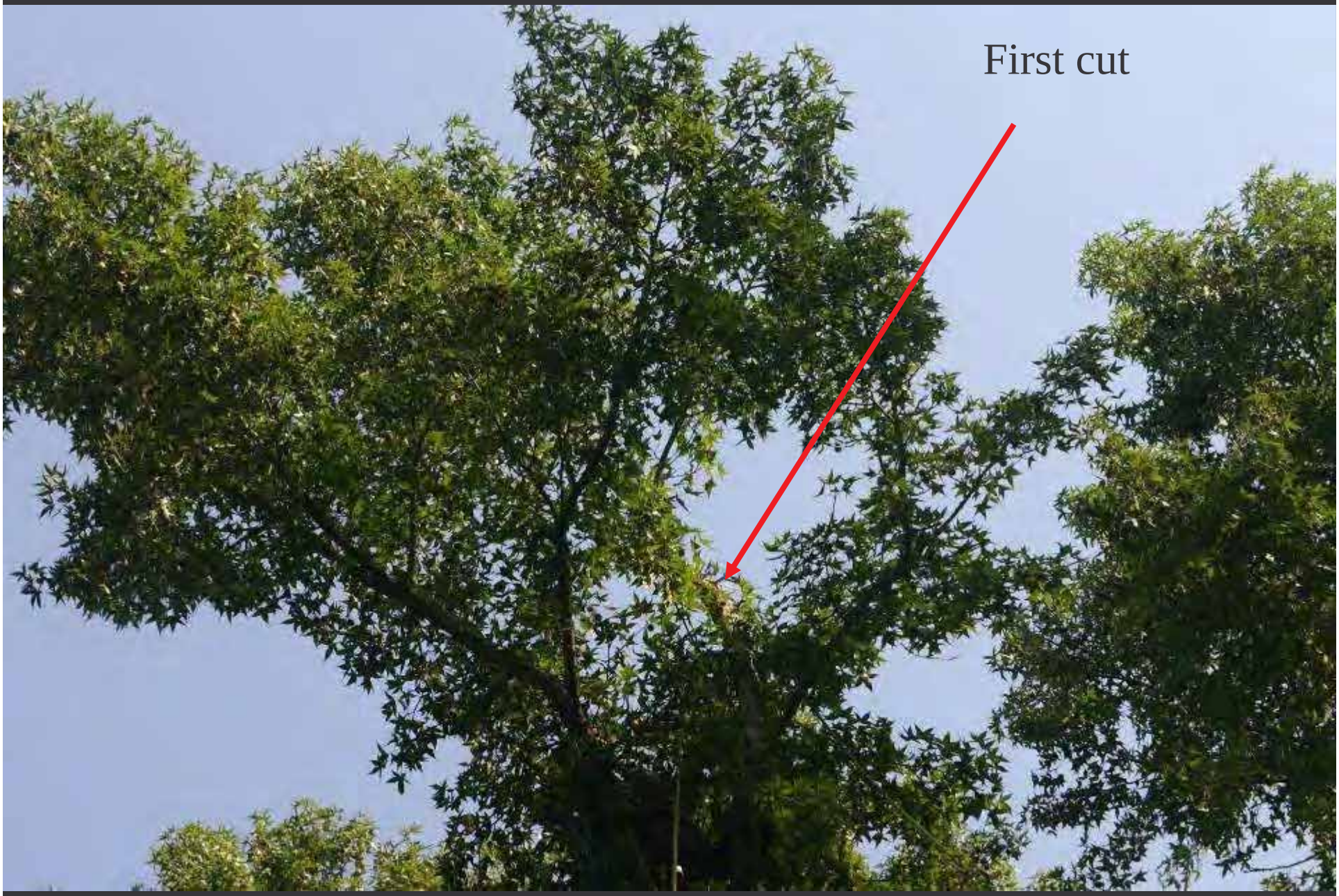
# Preventive structural pruning

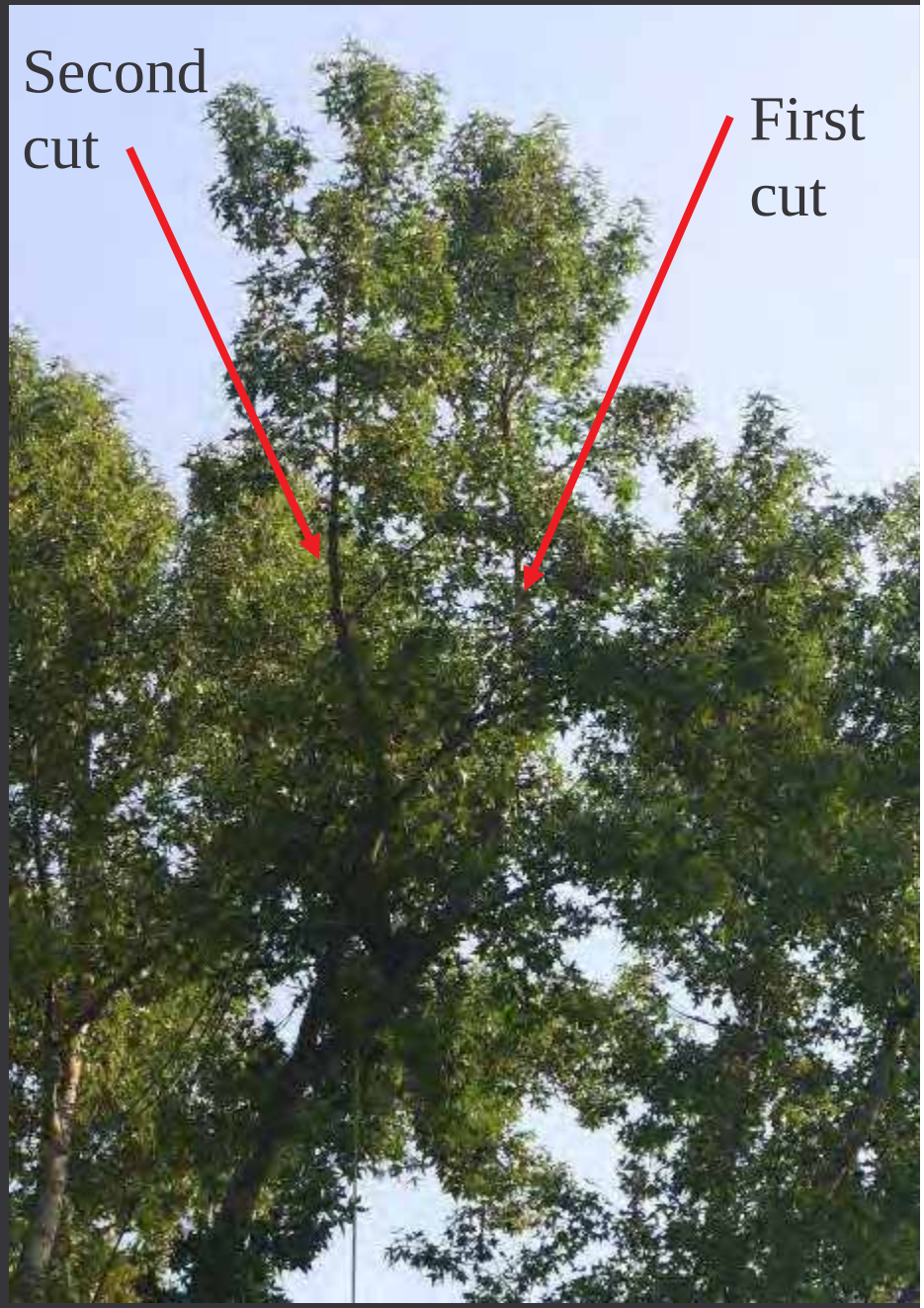
# Three years later

Showing three cuts

# Close-up of sweetgum


First cut

# 3.5 inch stem removed

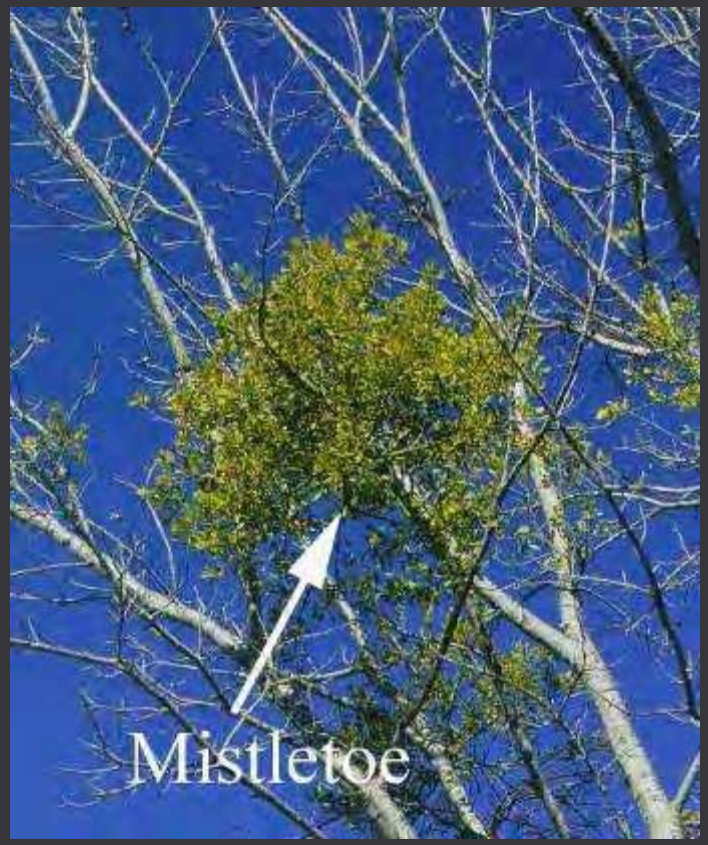

Second
cut
First
cut


After pruning


Before pruning

# Pruning to: Clean

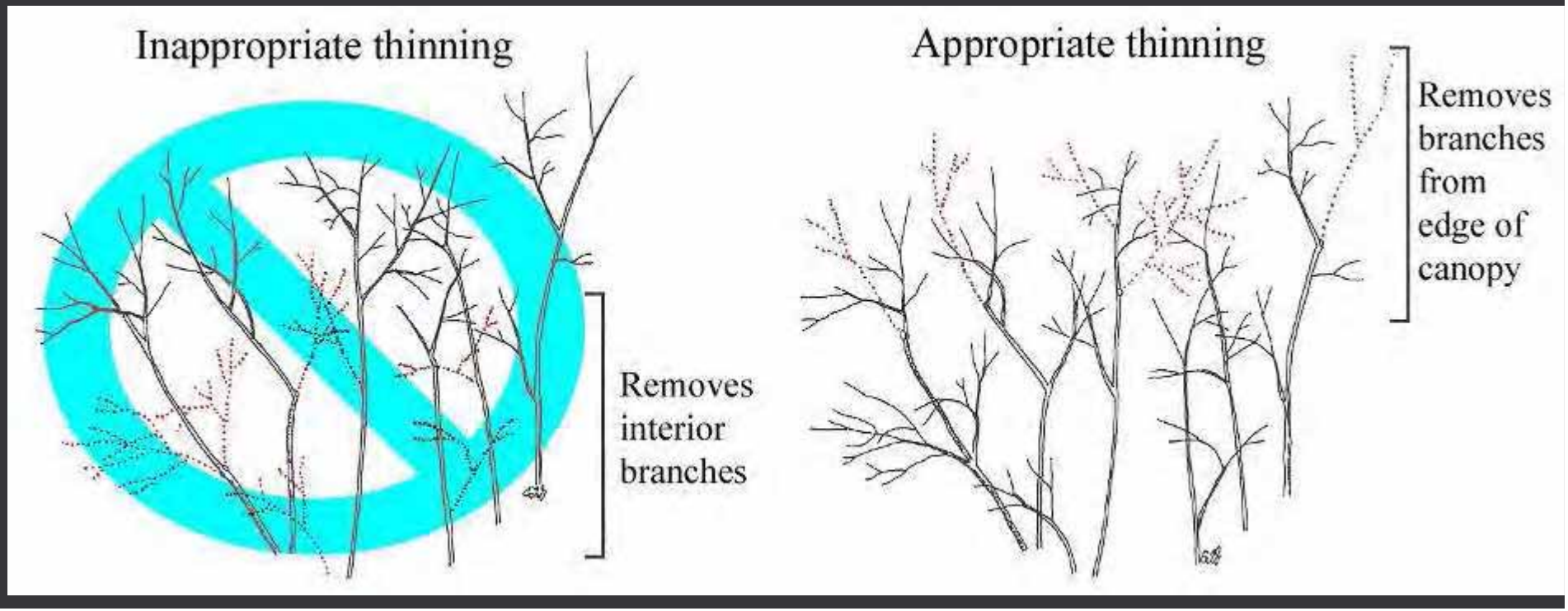
- Removal of dead, broken, rubbing, or diseased branches, and foreign objects.
- Reduces the risk of branches falling from the tree




# Cleaning takes care of these

# Pruning to: Thin

- The selective removal of small live branches to reduce crown density .
- Increases light and air penetration.
- Reduces the risk of storm damage.

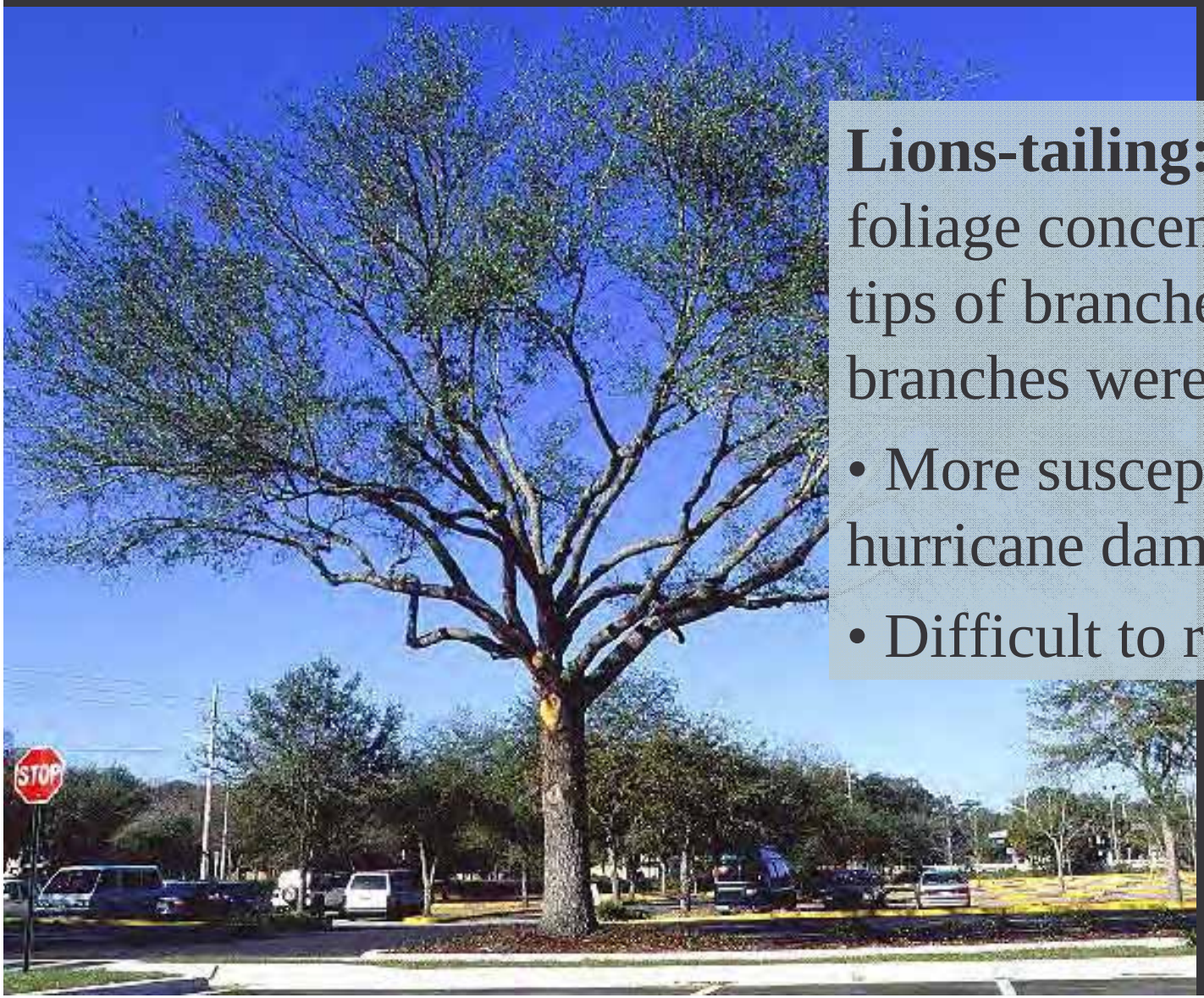


# How to thin a canopy

# Dense canopy

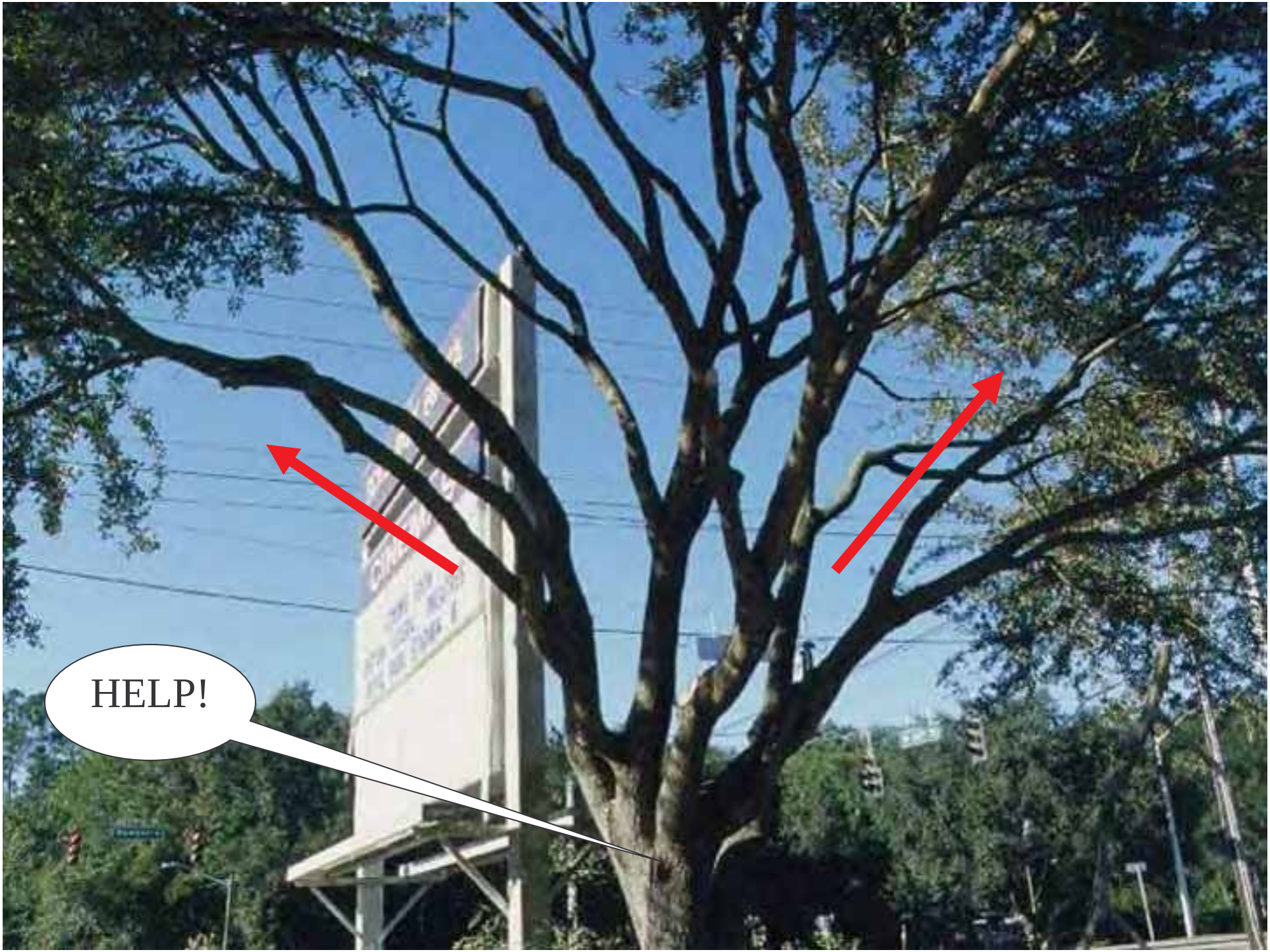
# Thinning removes entire branches back well into the canopy

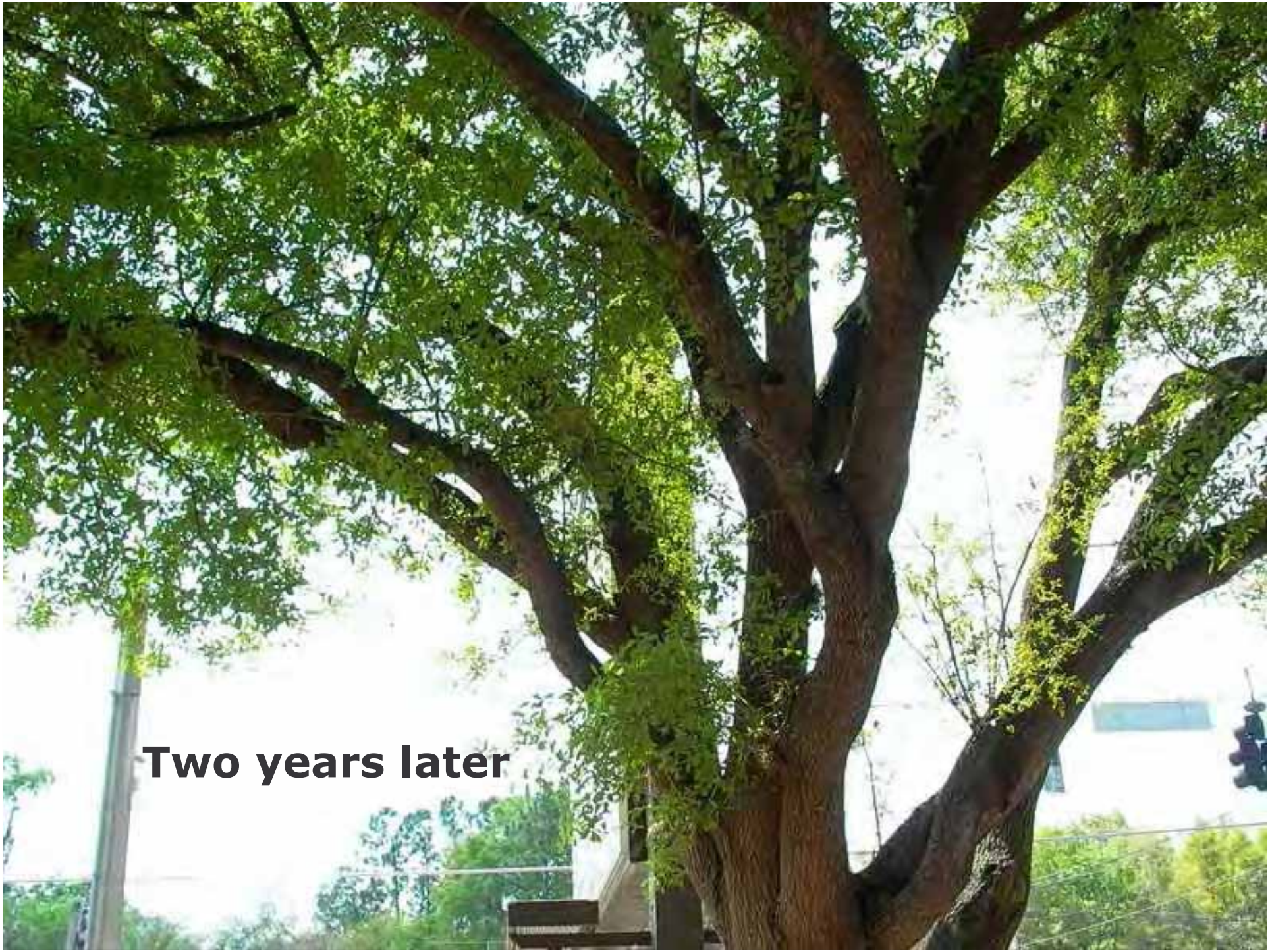
# Inappropriate thinning




**Lions-tailing:** trees with foliage concentrated at the tips of branches because inner branches were removed.

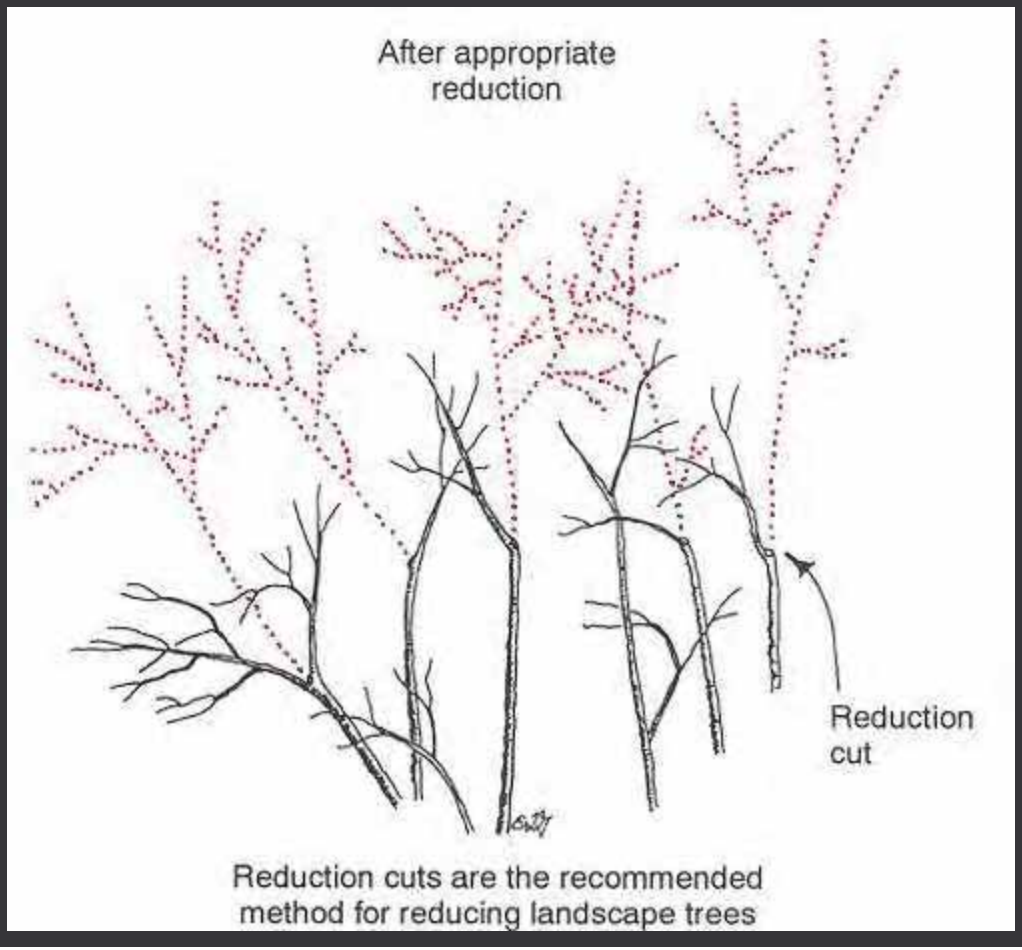
- More susceptible to hurricane damage
- Difficult to restore


HELP!

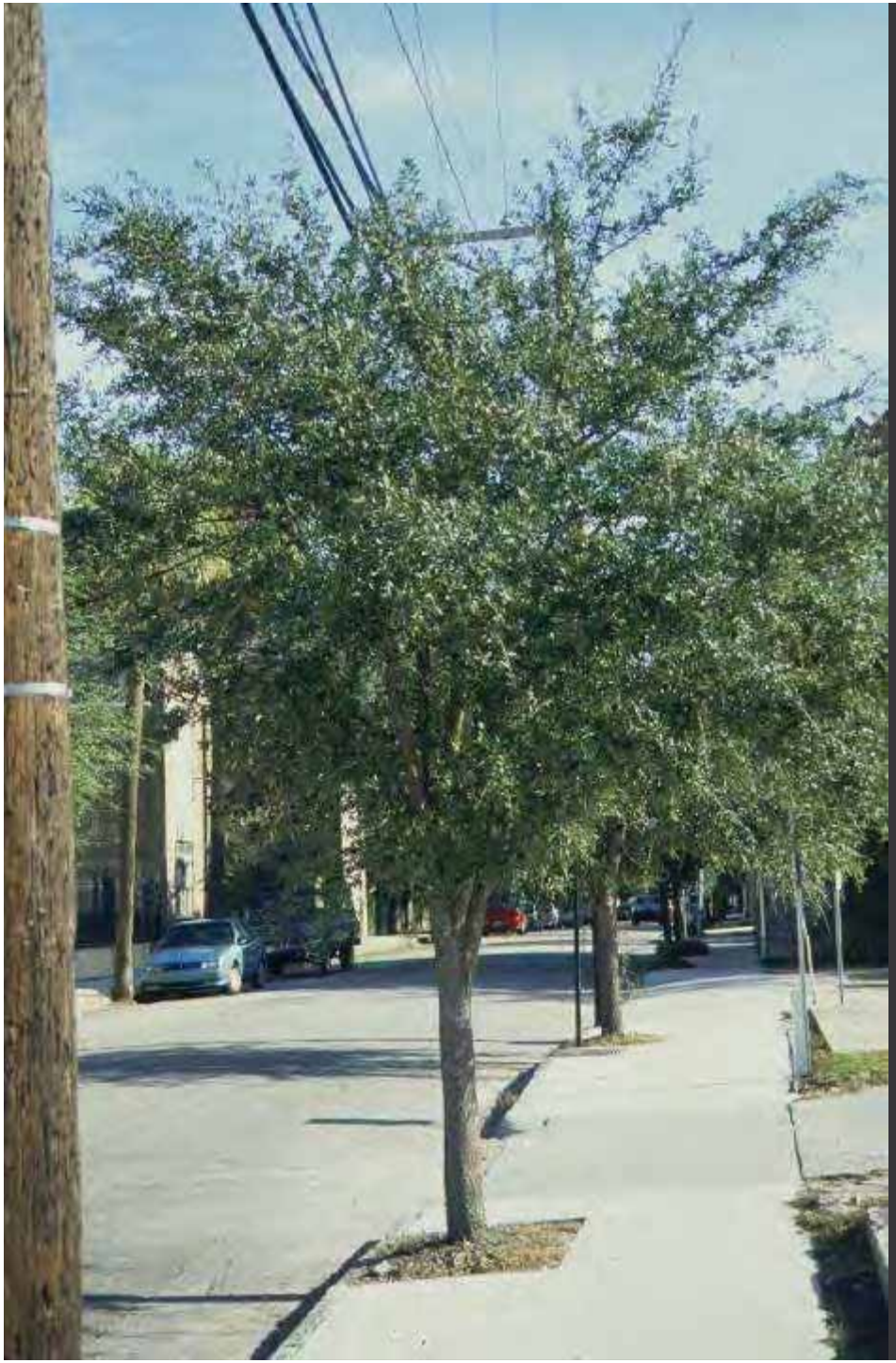

Two years later

# Pruning to: Reduce

- The selective removal of branches and stems to decrease the height and/or spread of a tree



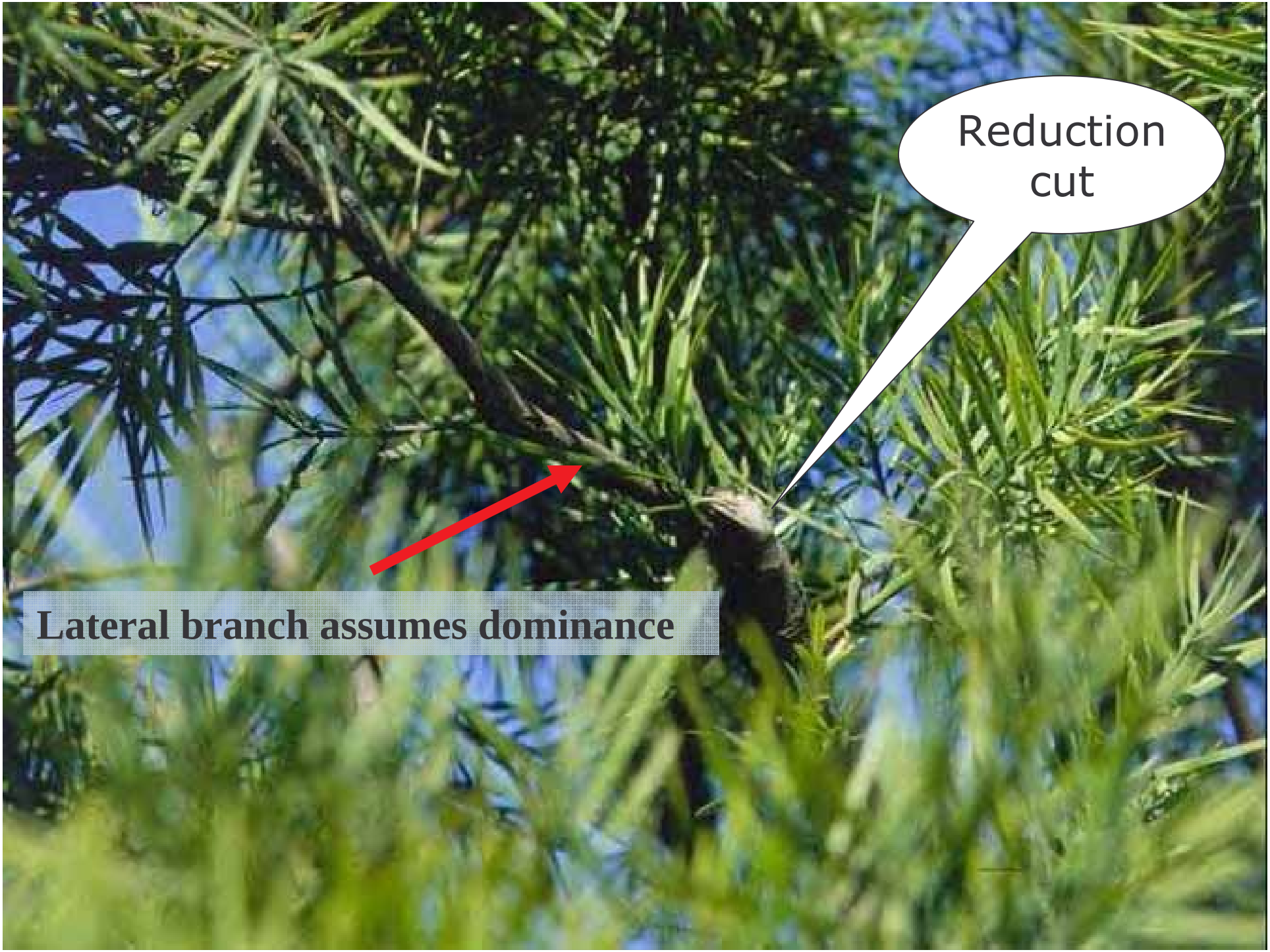

Reduction cuts are the recommended method for reducing landscape trees

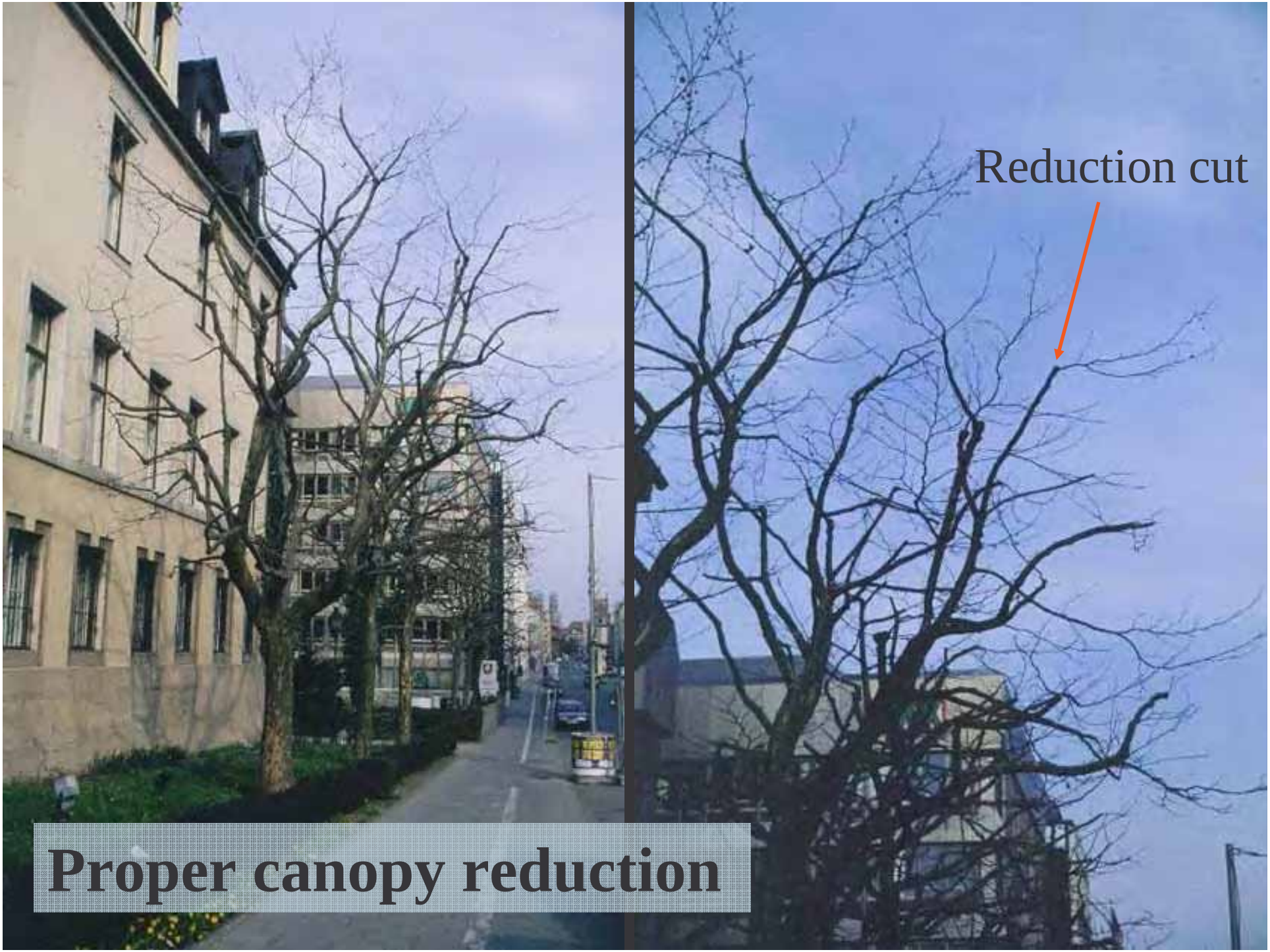


# Reduction

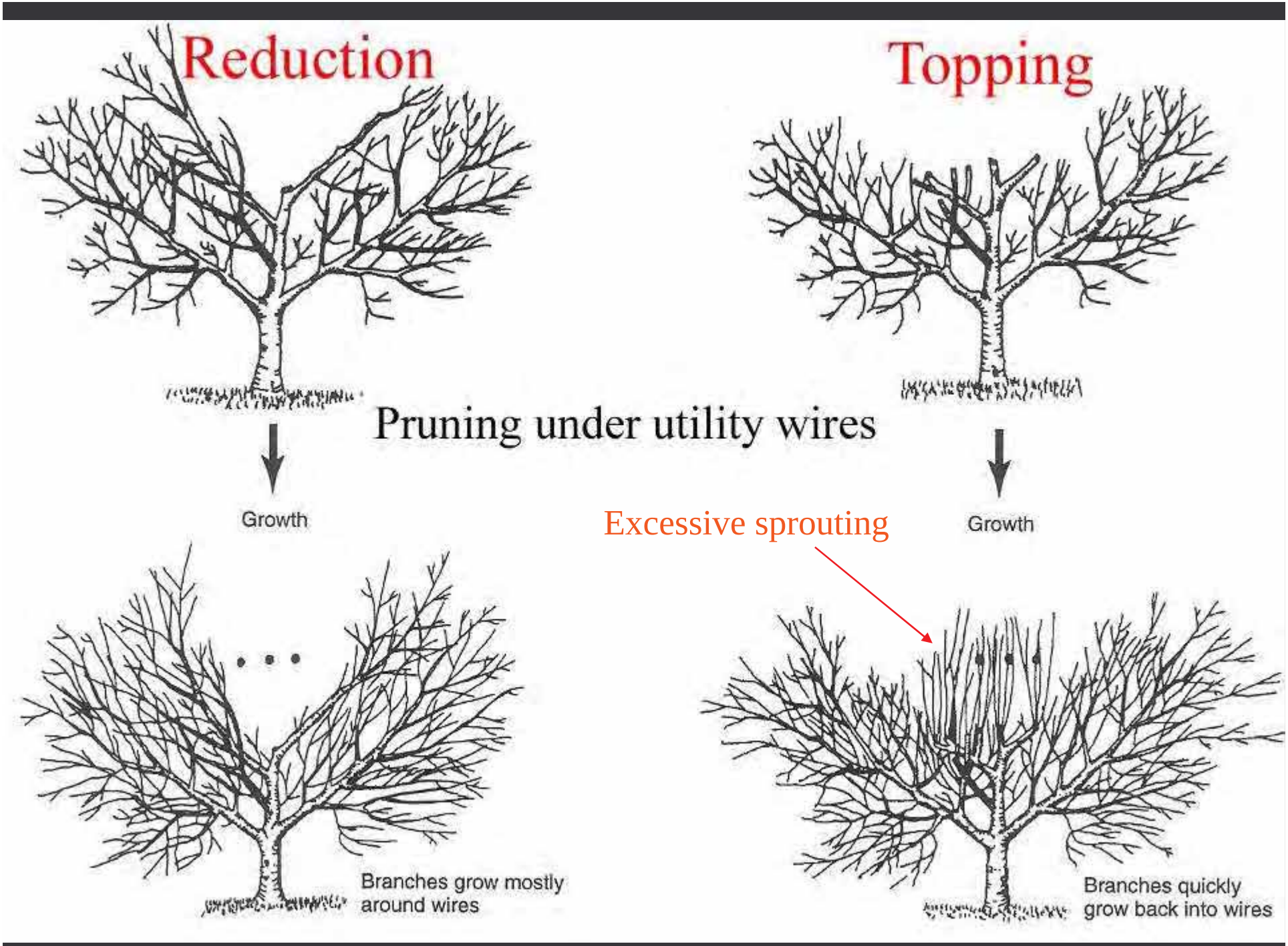
- May be necessary to direct growth
- A better option is to plant a smaller tree

**Think right tree right place!**


Reduction cut
Lateral branch assumes dominance




# Proper canopy reduction


Reduction
Topping
Pruning under utility wires
Growth
Excessive sprouting
Growth
Branches grow mostly around wires
Branches quickly grow back into wires

# Reduction Pruning
## Proper vs. Improper (Topping)

**Proper reduction**

- **reduces size while maintaining form**
- **minimizes re-growth**
- **cuts barely noticeable**
- **branch tips visible in outer canopy**

**Improper reduction**

- **drastic form change**
- **sprouting**
- **cuts very noticeable**
- **branch tips not visible in outer canopy**
- **compromises structure**
- **promotes defects and decay**

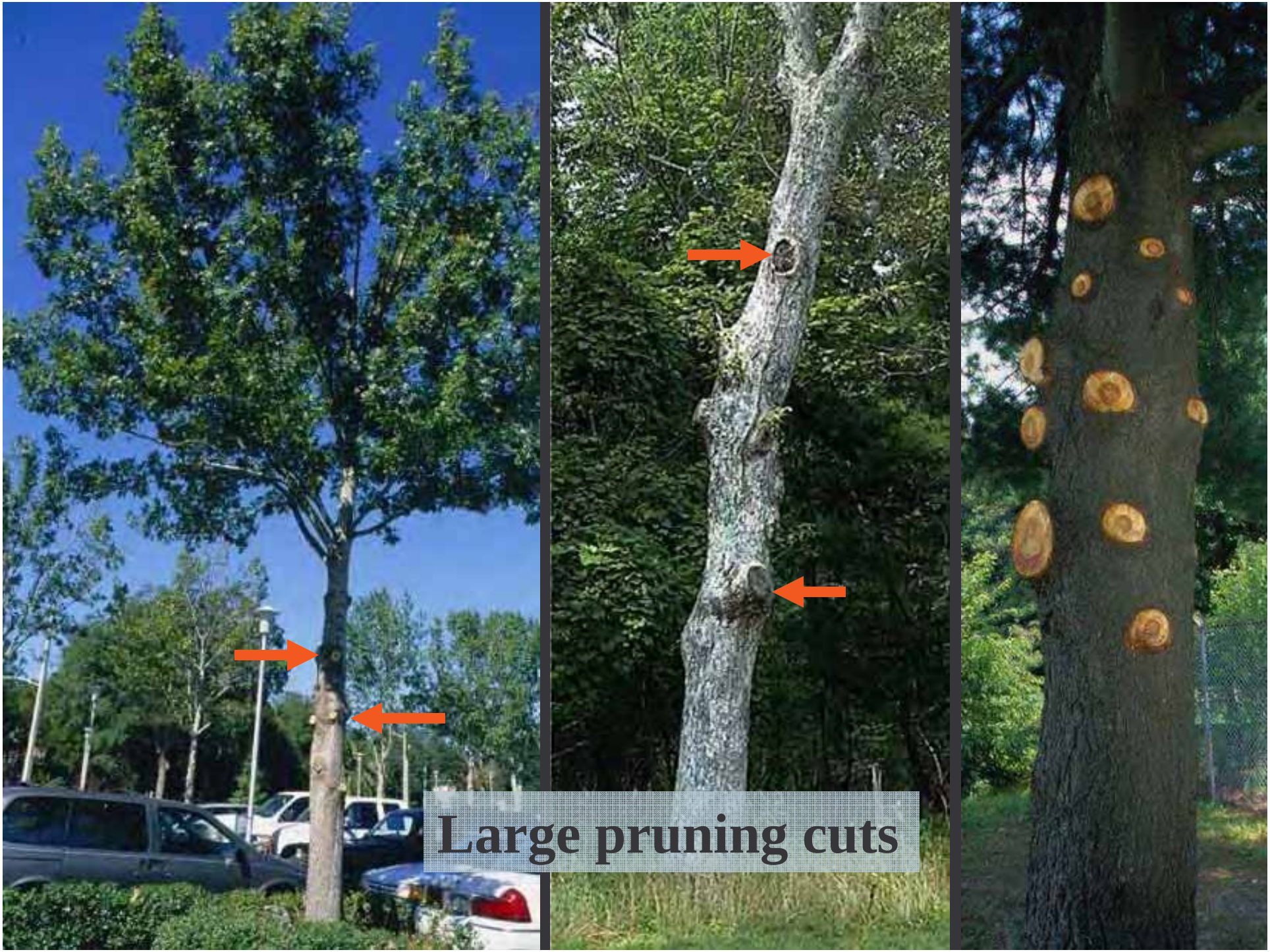

Topping trees promotes bad structure!

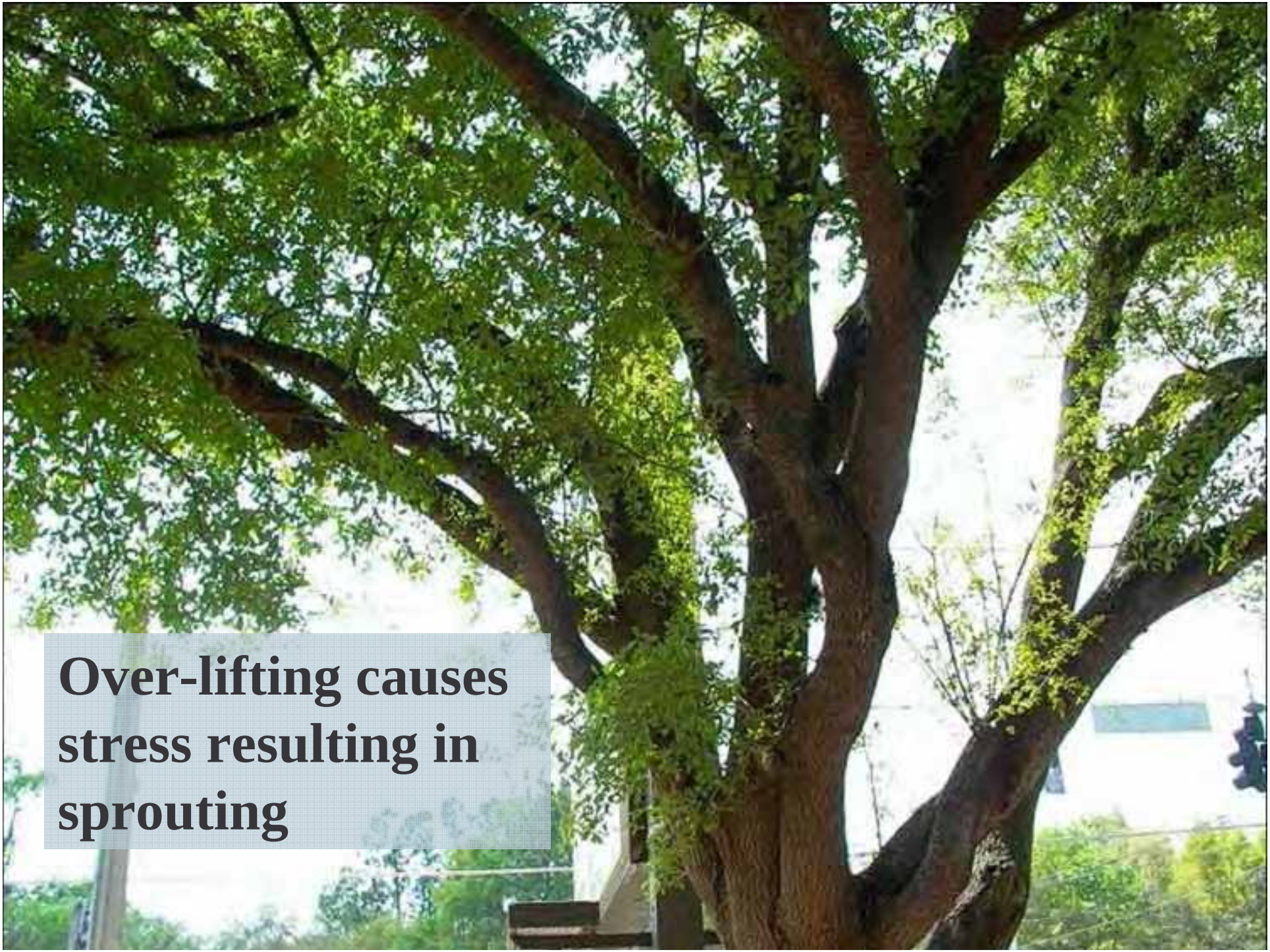
# Not all tree species can be reduced

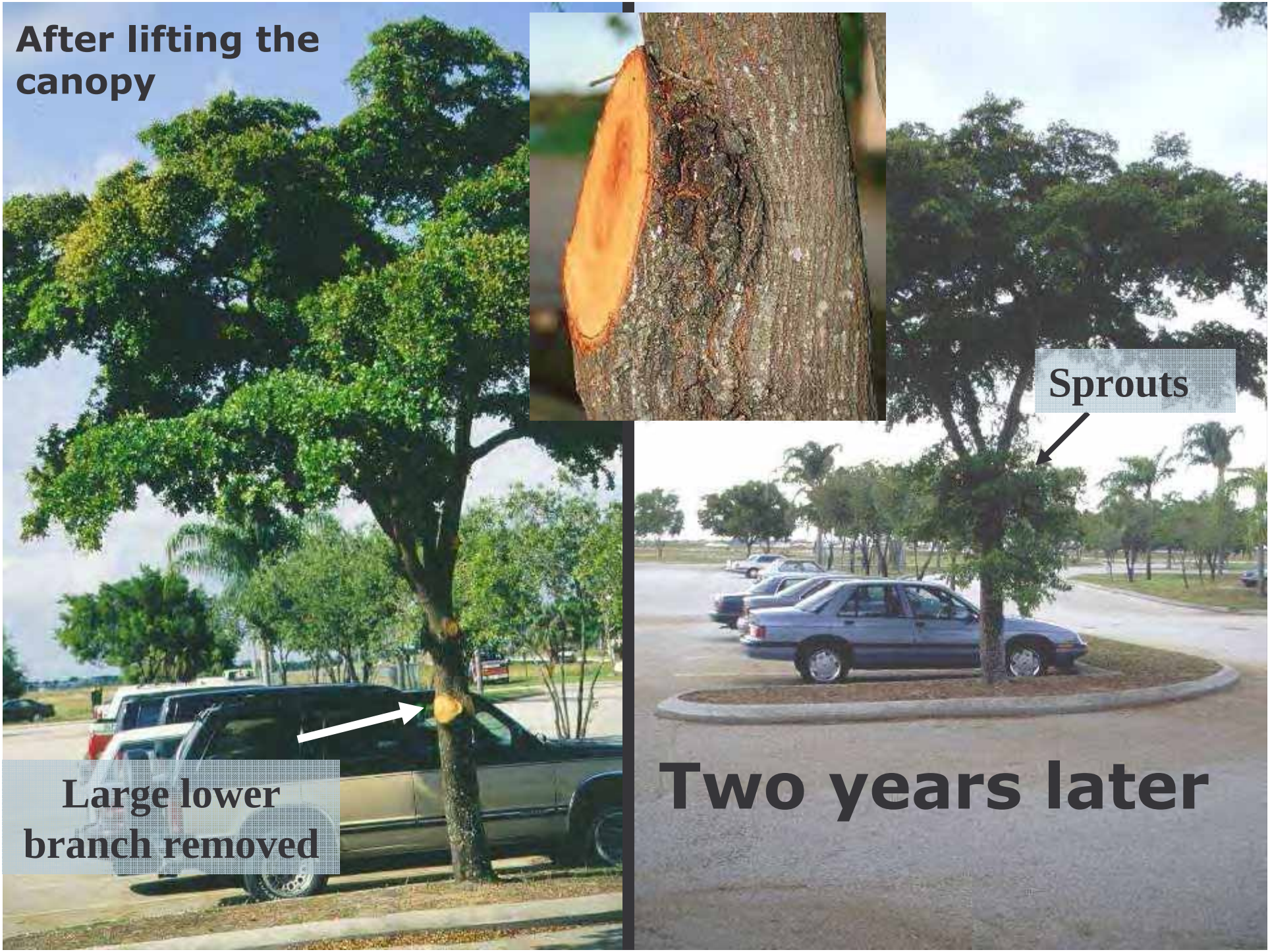
- Consider species and plant health before reducing the canopy
- More decay can enter the tree following reduction than following removal cuts

# Pruning to: Raise

- The selective removal of branches to provide vertical clearance
- Best done over a period of years, not all at once

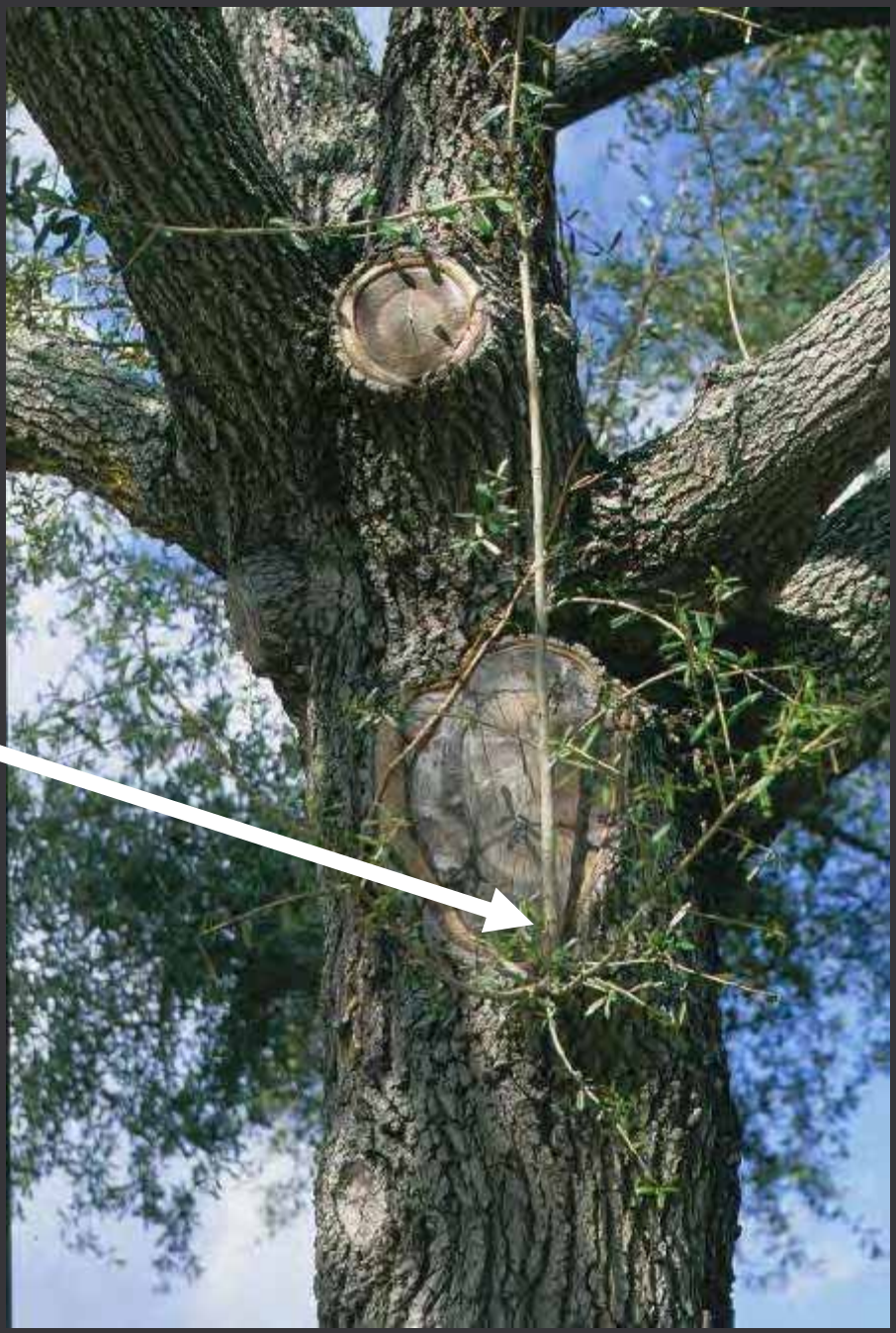

Large pruning cuts


Over-lifting causes stress resulting in sprouting

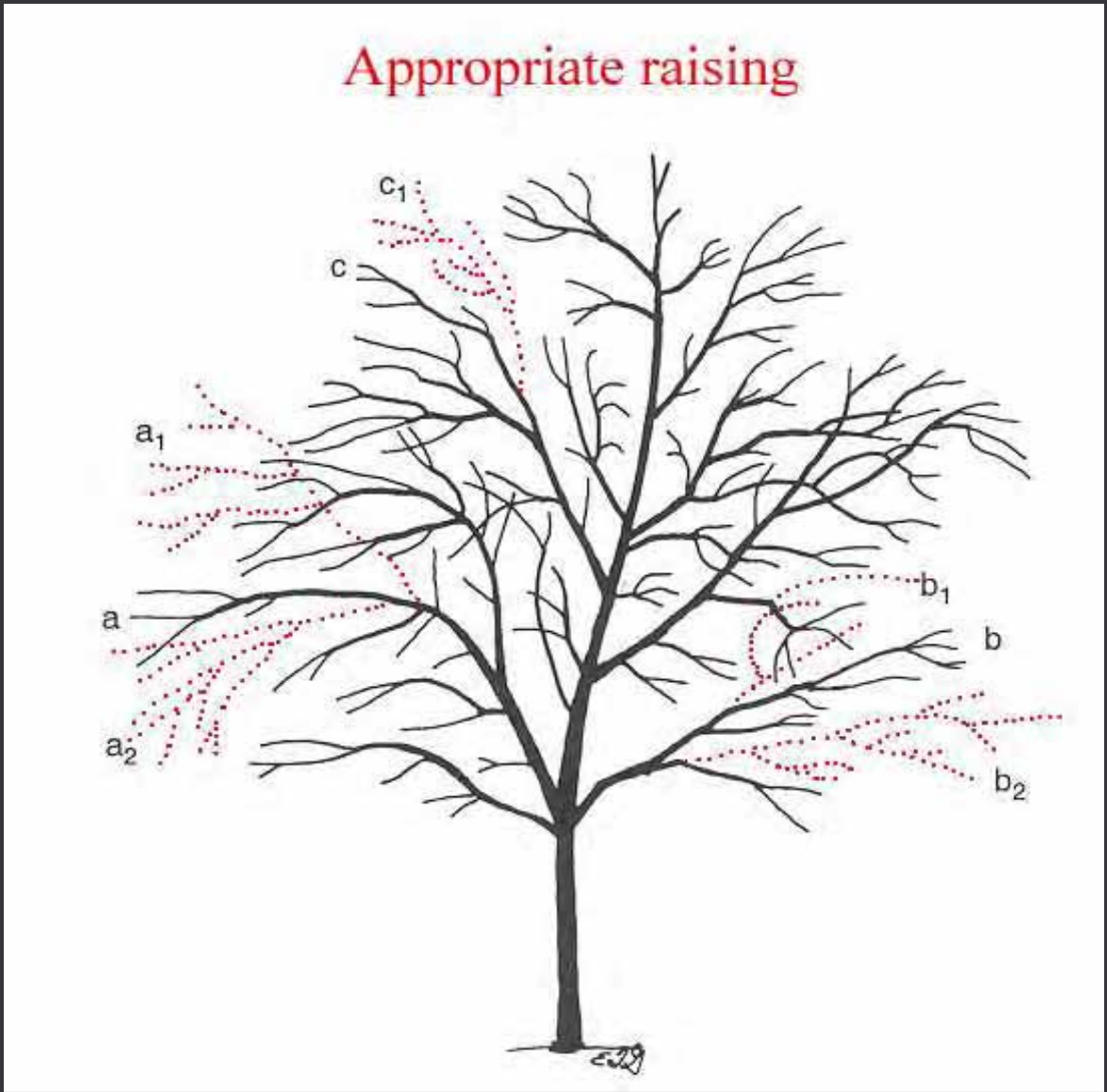

After lifting the canopy
Large lower branch removed
Sprouts
Two years later

Big cuts can result in decay and cracks.

Sprouts develop from large pruning cuts

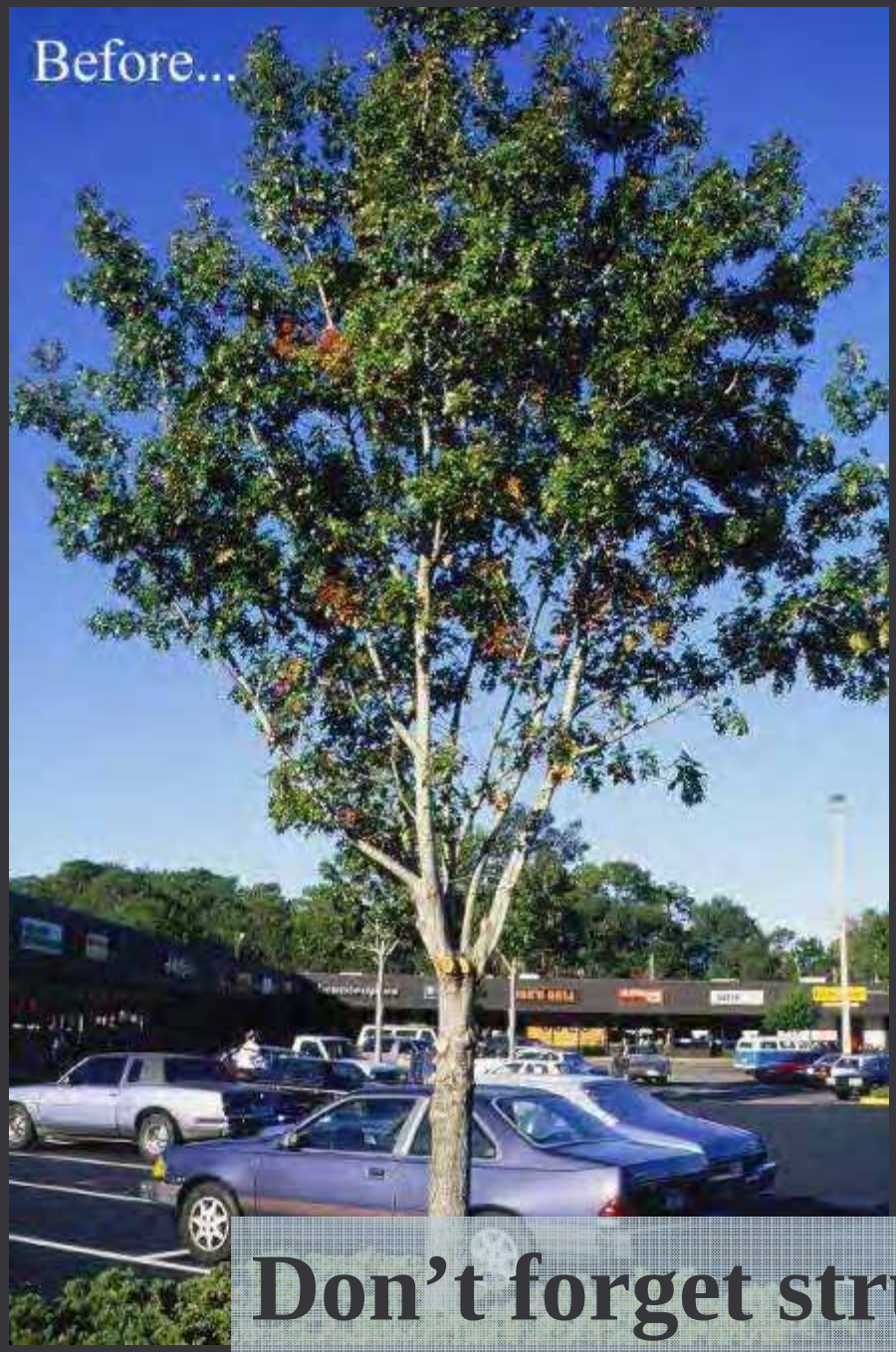


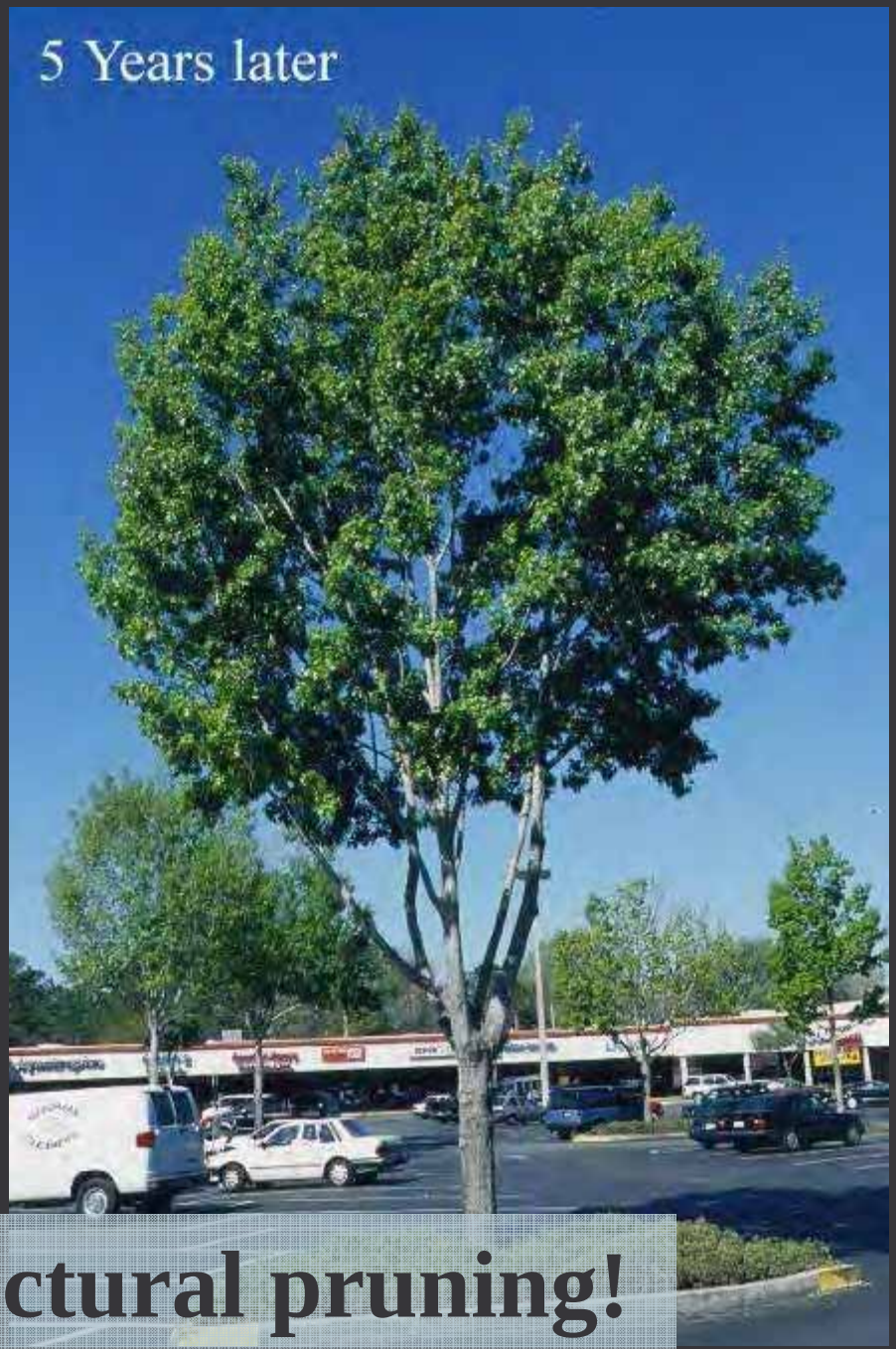
# Clearance can be achieved by shortening low branches rather than removing them.



# Raising: a stepwise process

- Thin/reduce/remove the largest branches in the lower part of the tree.
- Leave smaller branches intact for one year.
- If necessary remove branches back to trunk one to several years later.
- Do not forget to correct any structural pruning needs.

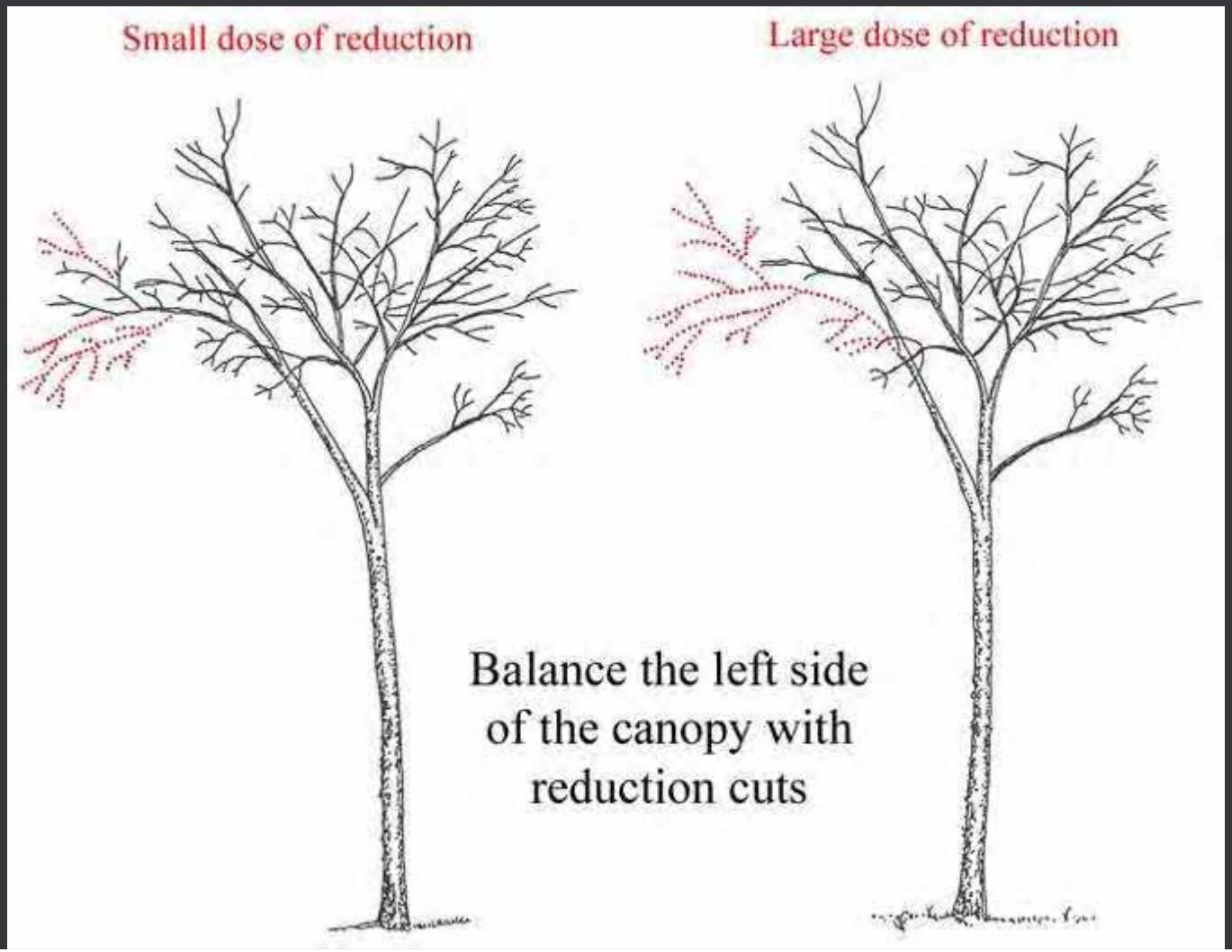


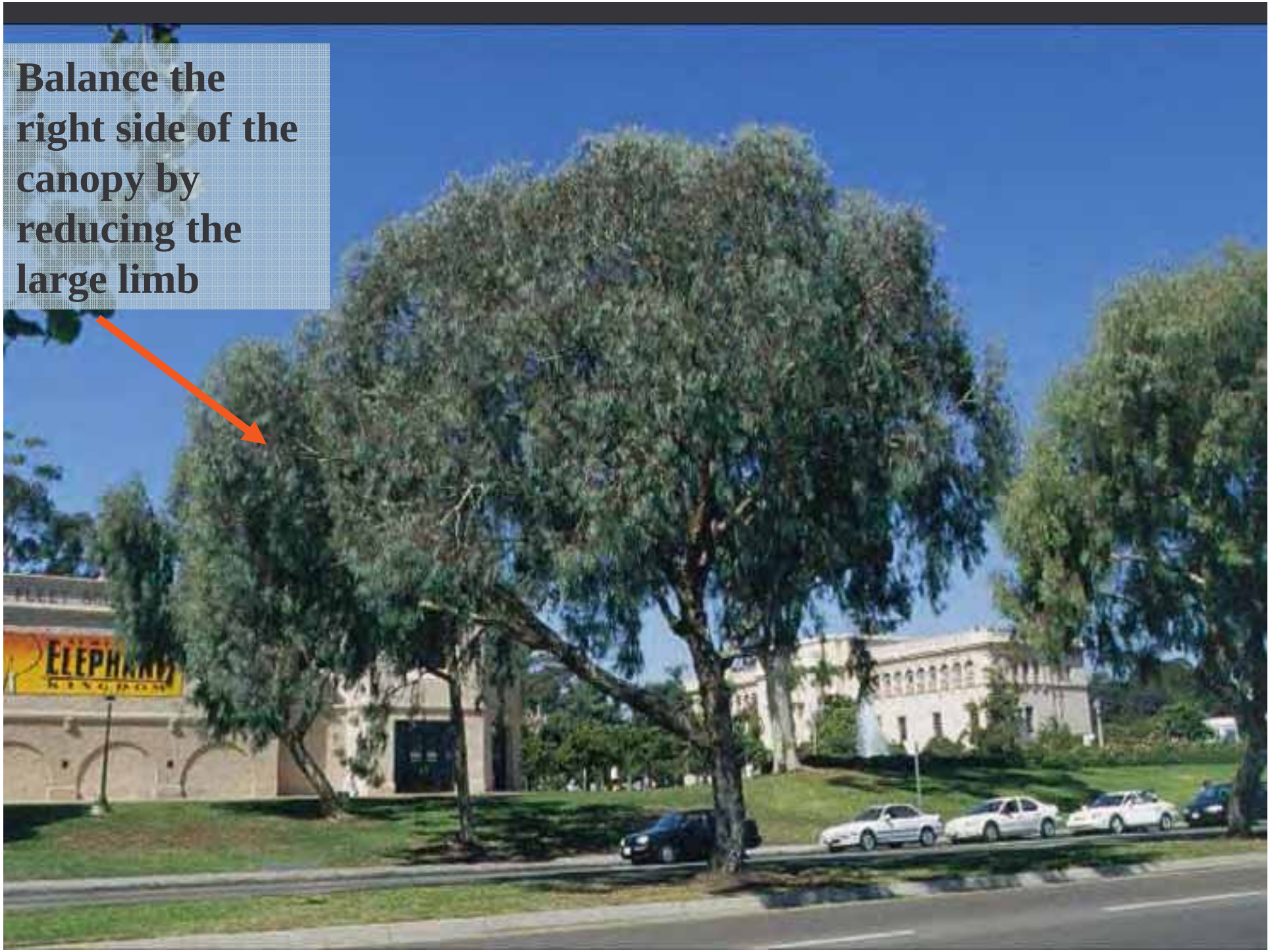

**Don’t forget structural pruning!**

# Pruning to: Balance

- Removes live branches to redistribute wind and gravity loads in the canopy.



# Unbalanced canopy

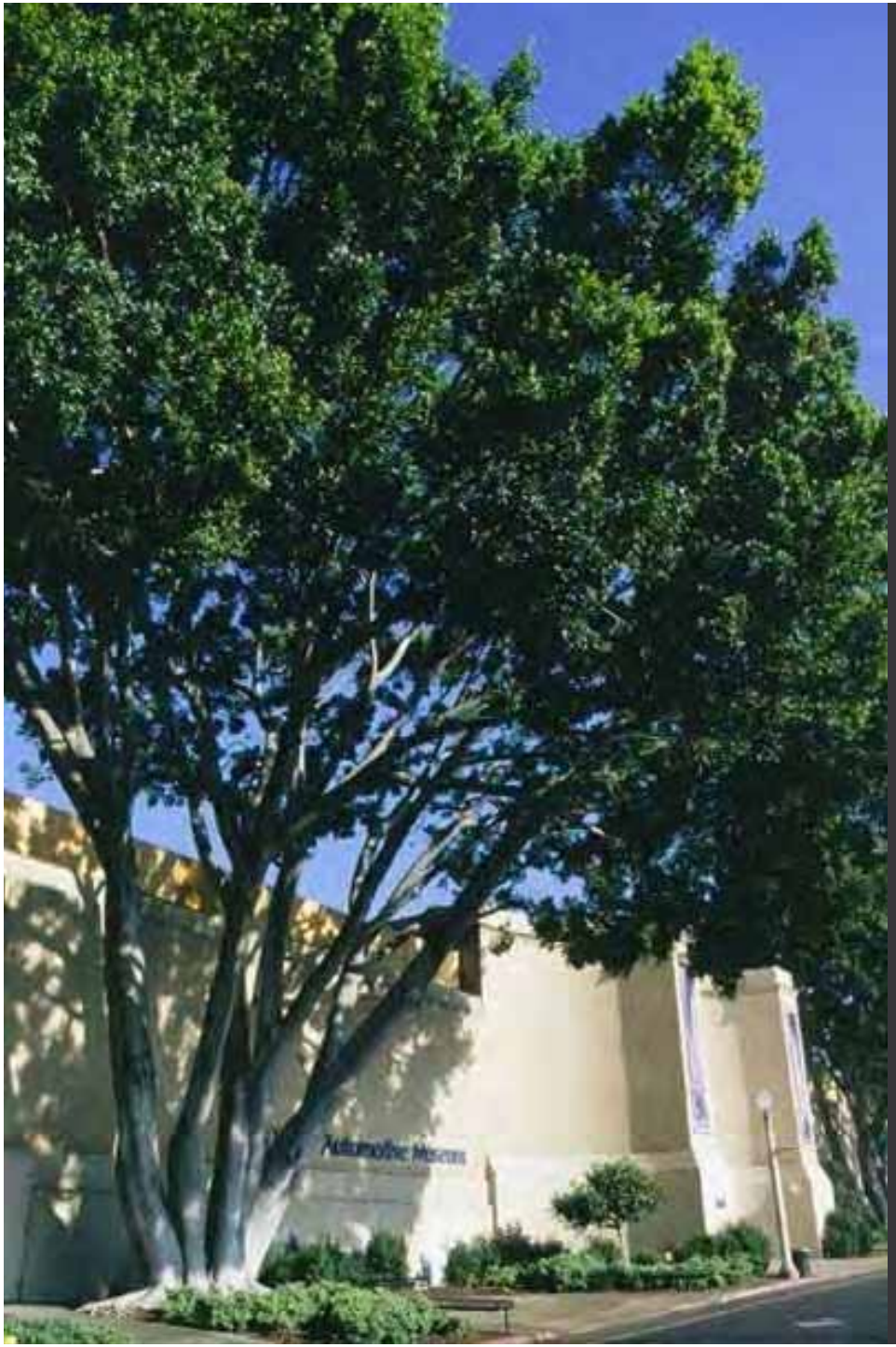

Balance the right side of the canopy by reducing the large limb

Excessive end weight

**after**

**before**

Large pruning cut

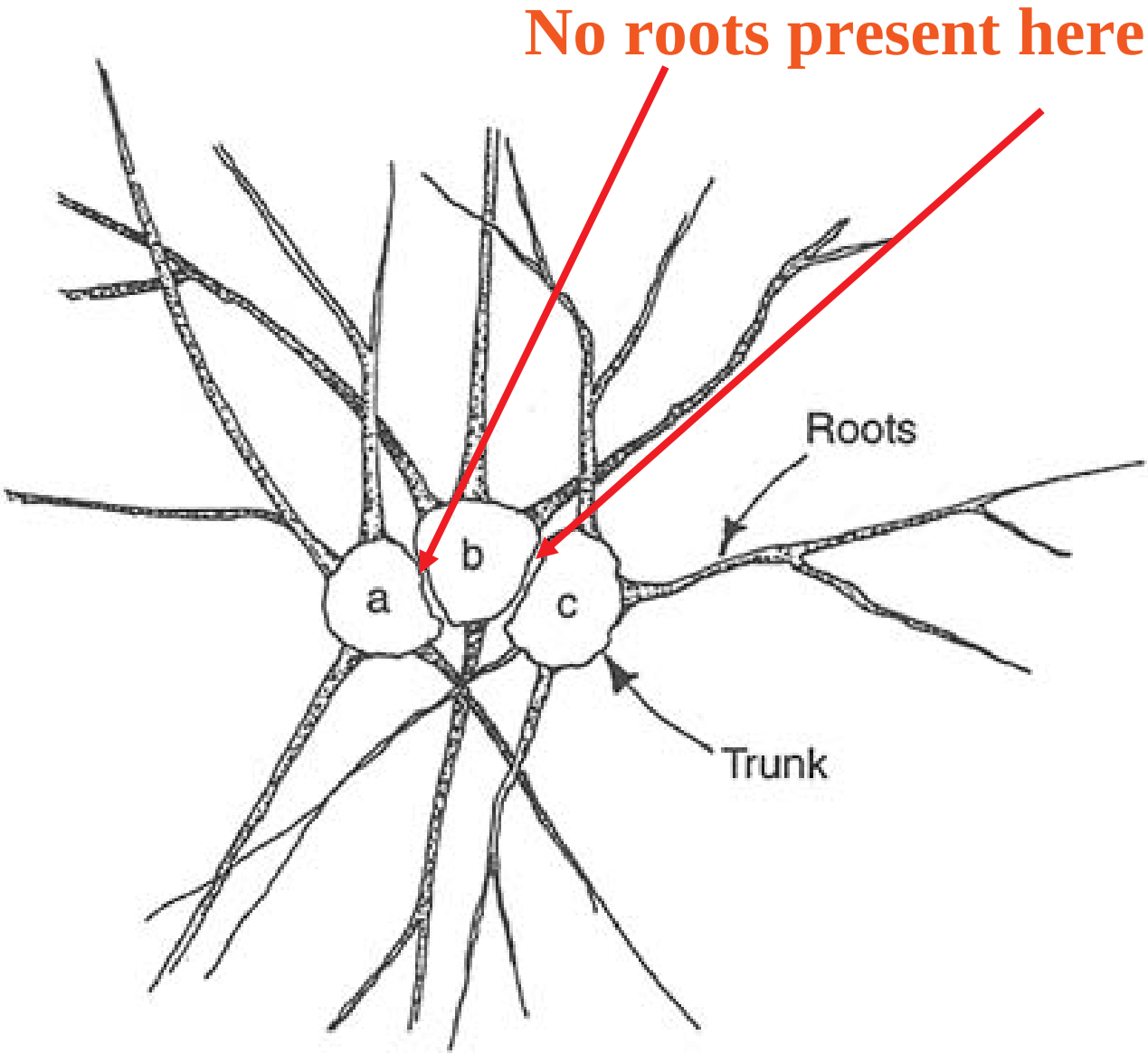


Clumped trees can fall over without treatment

Yikes!!

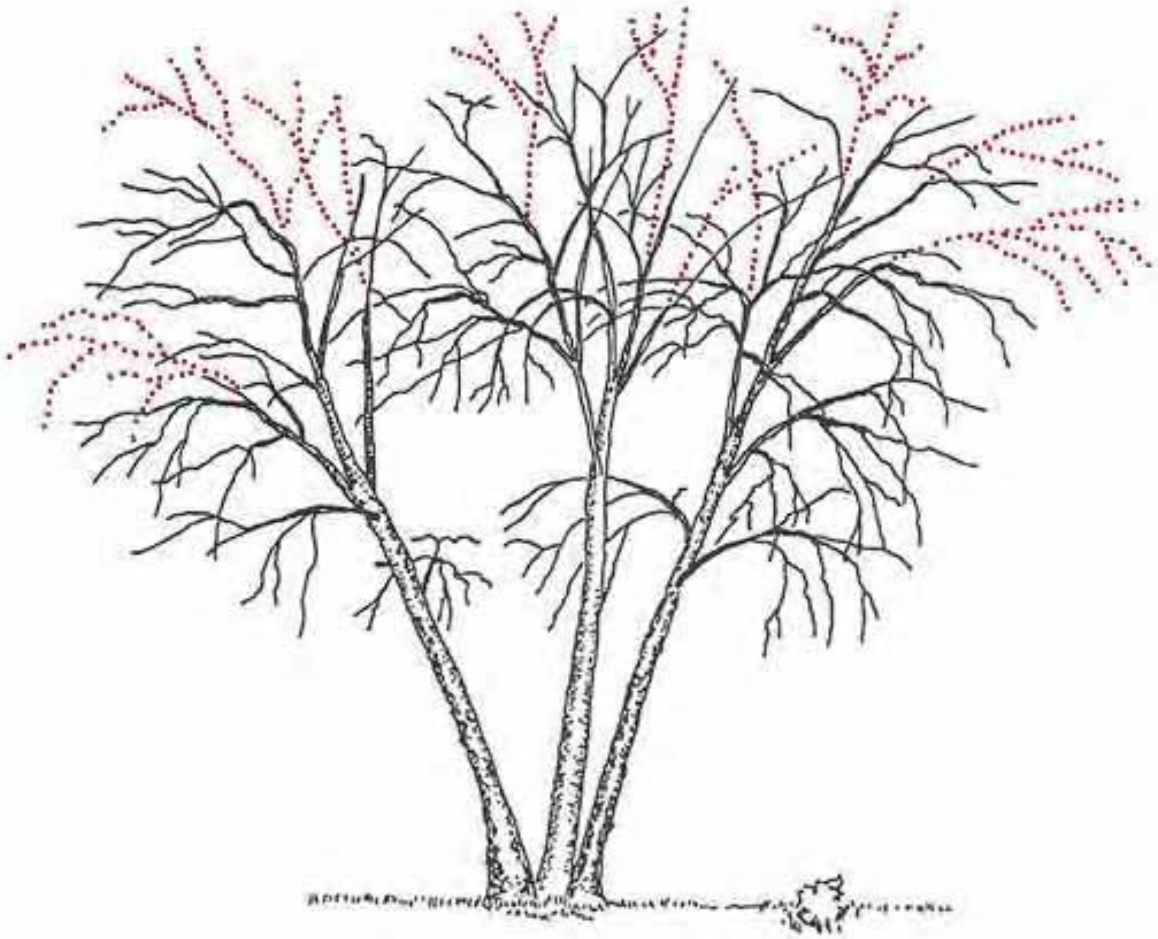

One side of this clumped
tree broke off at the base

Poor root distribution on clumped trees



# Balance canopies of clumped trees to prevent them from falling over

**Reduce branched indicated with dotted lines**



# Pruning to: Correct root problems

Airspades show you what’s underground and may help uncover girdling roots

# Pruning to: Restore

# Palm Pruning

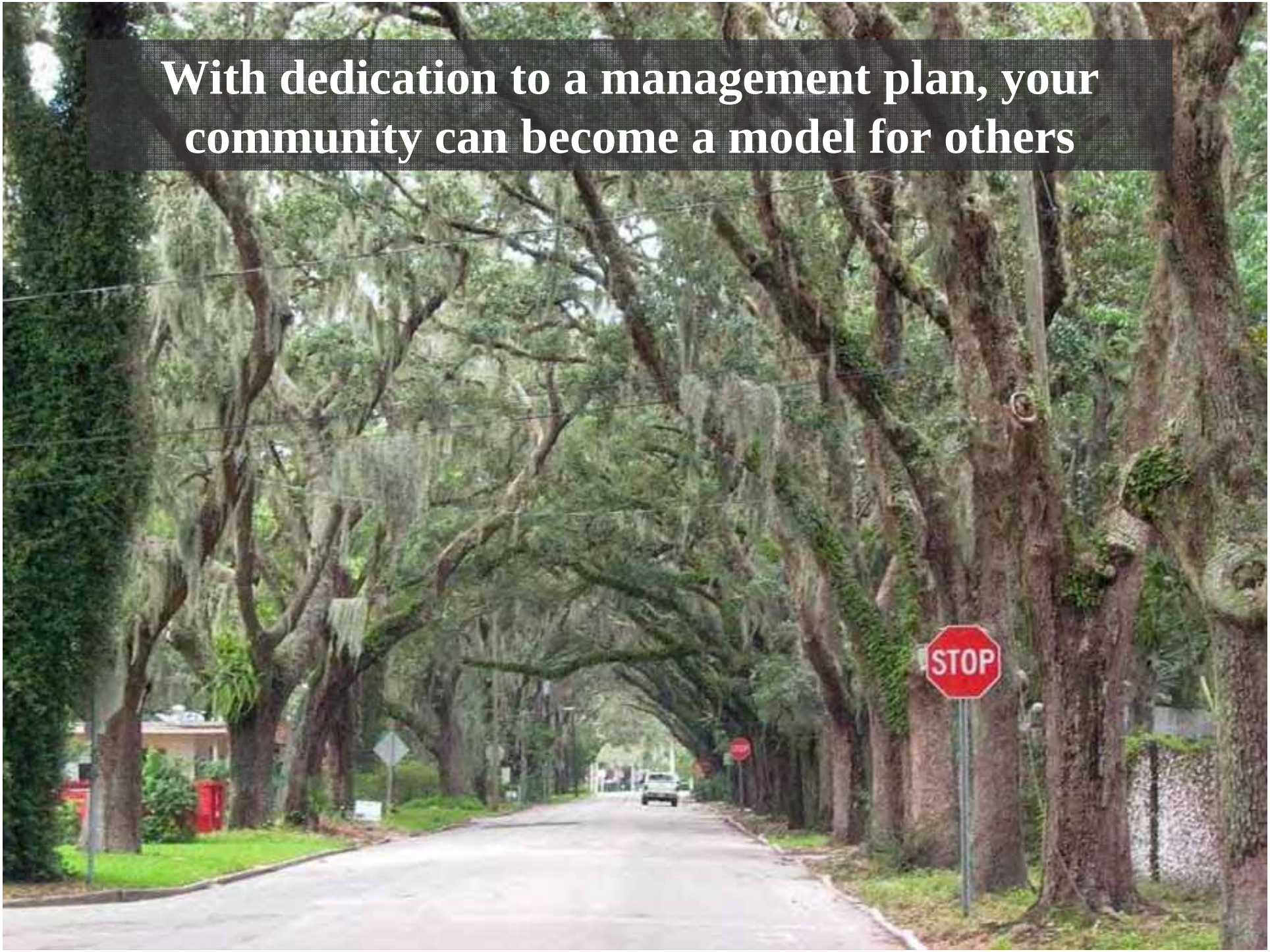
- Retain all green fronds

# Coconut palms


# Remember your goals and objectives…

**Produce a structurally sound tree**

- Reduce risk of failure
- Promote human safety
- Allow for safe passage
- Reduce shade and wind resistance
- Maintain tree health and vigor


With dedication to a management plan, your community can become a model for others
STOP