Fruit Trees Pruning and Training

Reasons for Pruning

Tree Structure

Forest grown tree

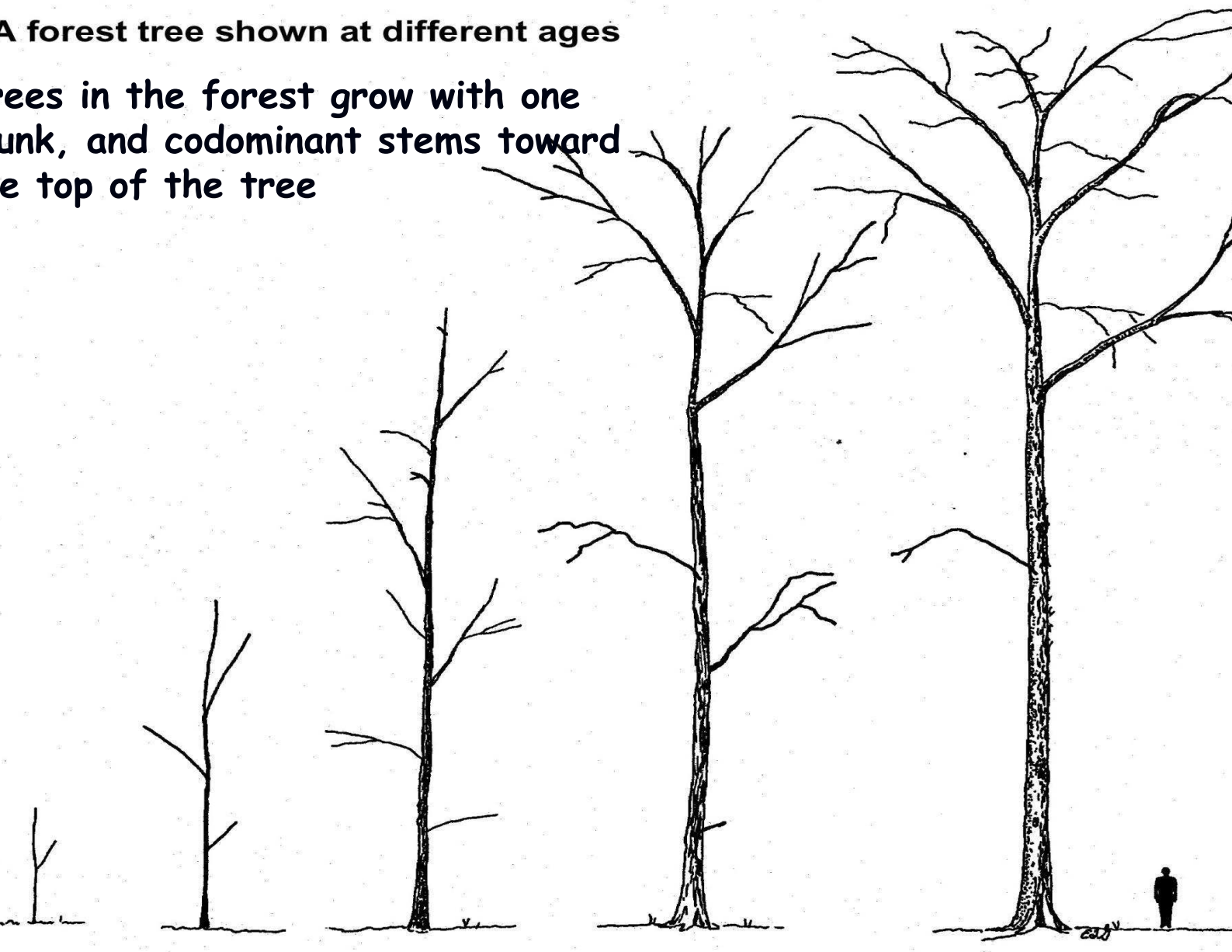
vs.

Open grown tree

- How do they develop on their own?

A forest tree shown at different ages

ees in the forest grow with one
unk, and codominant stems toward
e top of the tree



n the forest have to compete with their neighbors for light. As the forest tree
ranches get shaded out, die, and are eventually shed from the tree leaving a cle
no branches).

Codominant stems form far up into the canopy on most forest trees

Notice on these tuliptrees (*Liriodendro*
how the lower trunks are clear while fu
up in the tree, there are a number of lo
branches competing for the light. Bran
on these trees start at about 80 feet a
trees are about 120 feet tall.

Open grown trees

Canopy develops low on the trunk

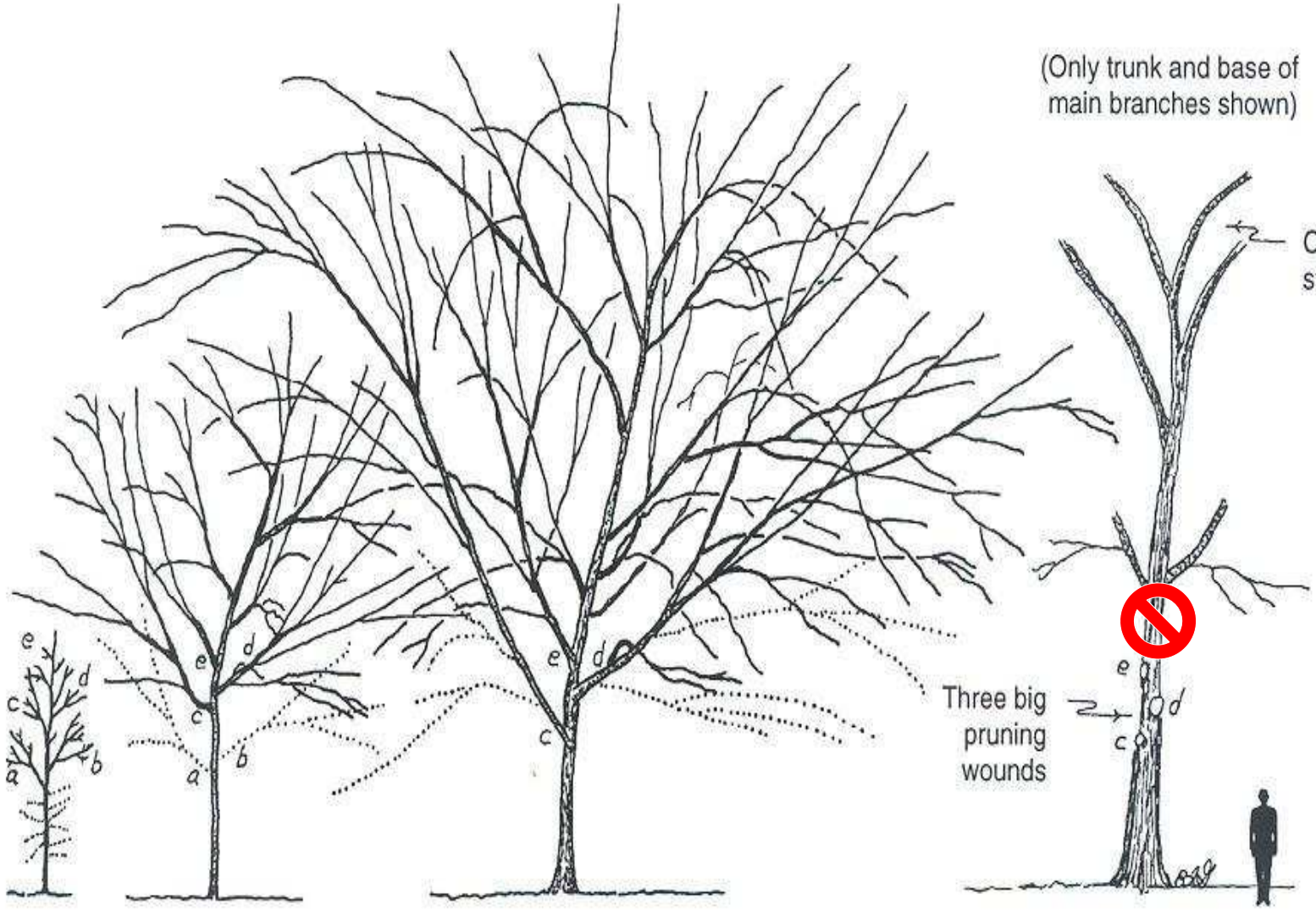
Canopy spreads wide

Tree is often wider than tall

Its party time for all

Its all about access to sunlight

A landscape tree shown at different ages



Finished nursery tree

Young landscape tree

Medium-aged landscape tree

Medium-aged landscape tree a few years later

Reasons for Pruning

- Reduce tree size
- Control tree shape
- Make trees structurally strong

Reasons for Pruning

- Improve light penetratio
  - Flower bud initiation
  - Fruit color
  - Pest control

Reasons for Pruning

Removal of diseased wood

- Fruit rot control

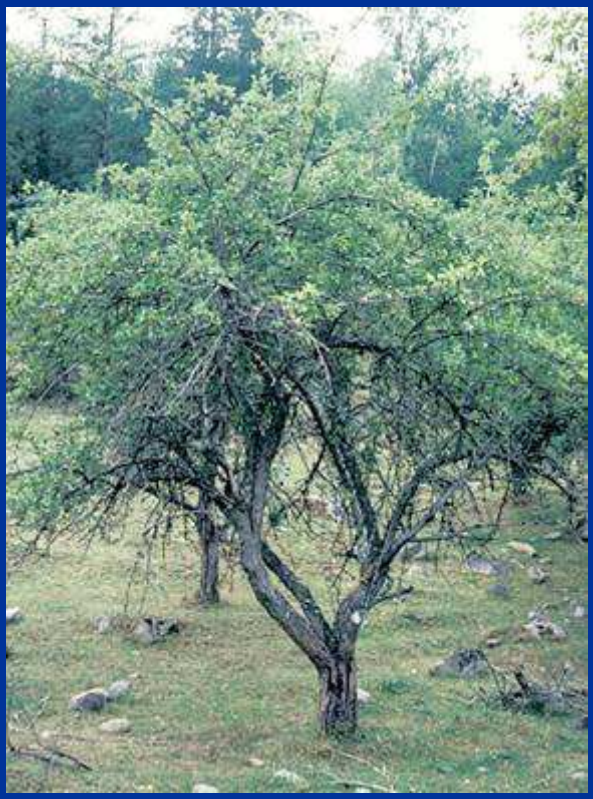
Reasons for Pruning

Partially reduce crop load

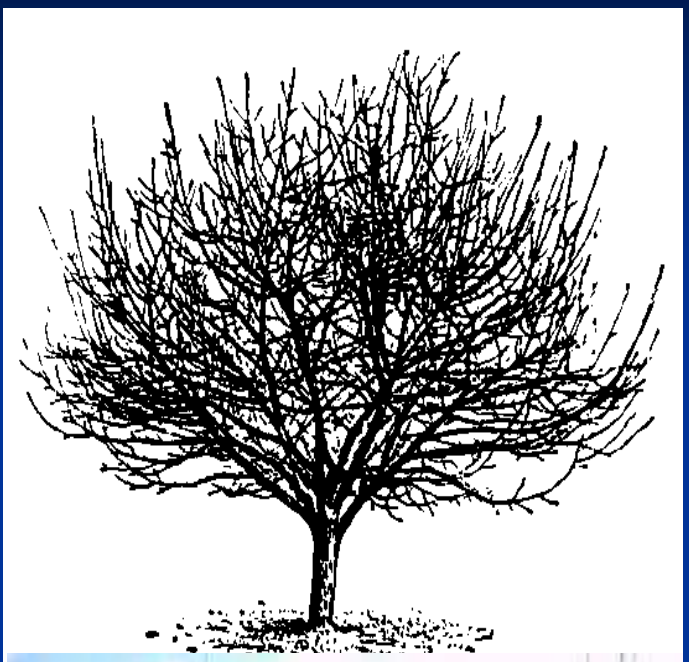
- Facilitate cultural operations

Reasons for Pruning

Keep the crop close to the ground



What happens if you do not prune?



- *Earlier fruiting*
- *Less light penetration*
- *Poor spray coverage*
- *More difficult to manage*

When to Prune

Dormant season

Summer pruning

inching competitive laterals
n young leader
o keep leader growing
trong

Summer pruning apples and pears allows sunlight to ripen the fruit and ensures good cropping the following year

All pruning is dwarfing, but summer pruning reduces growth much more than equivalent pruning during the dormant period

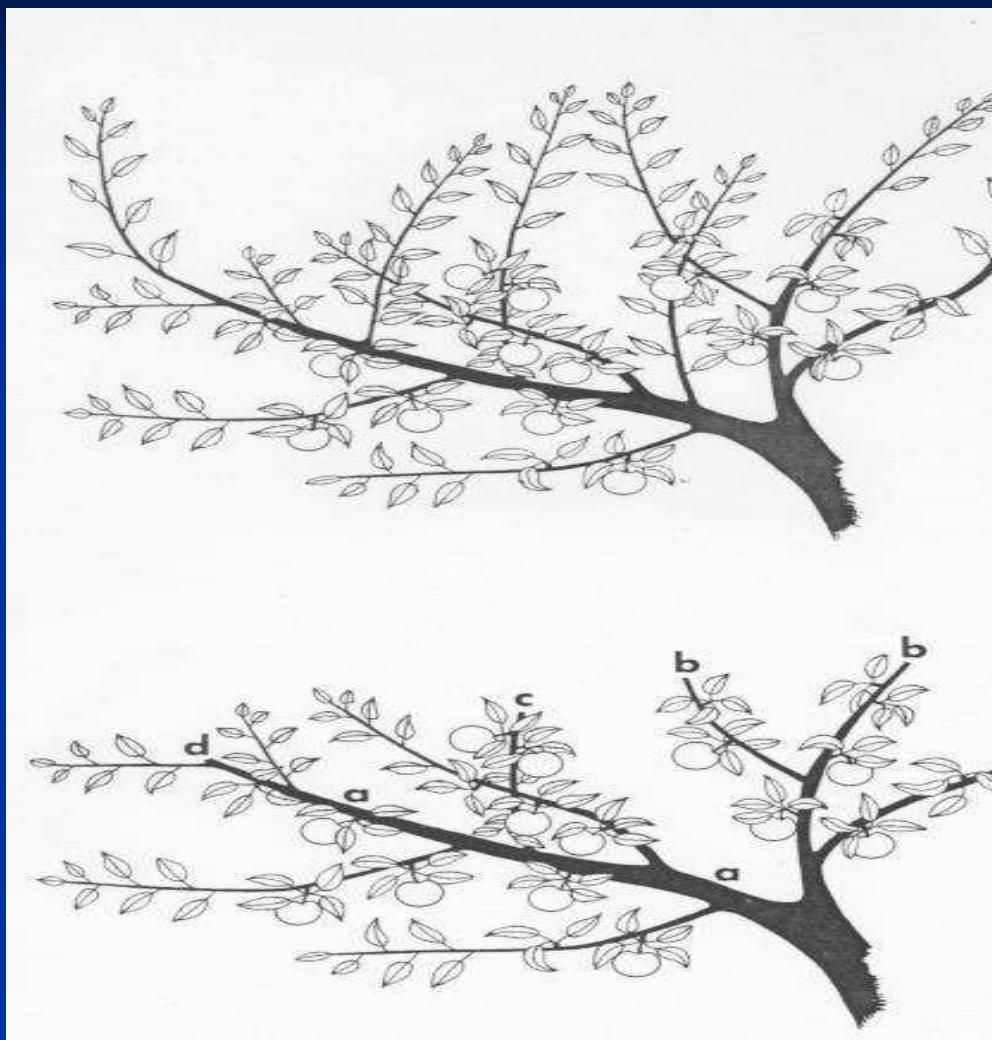
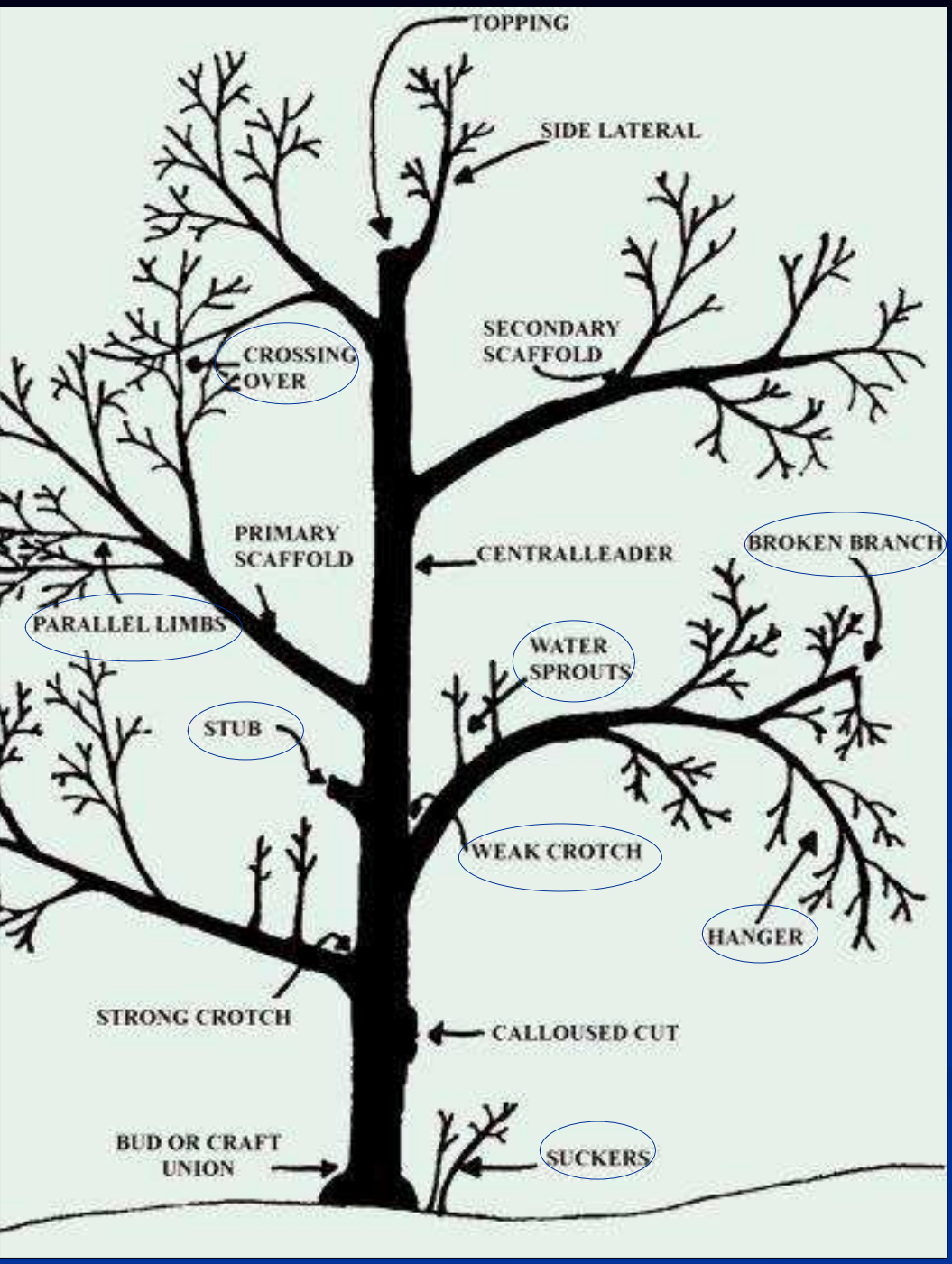
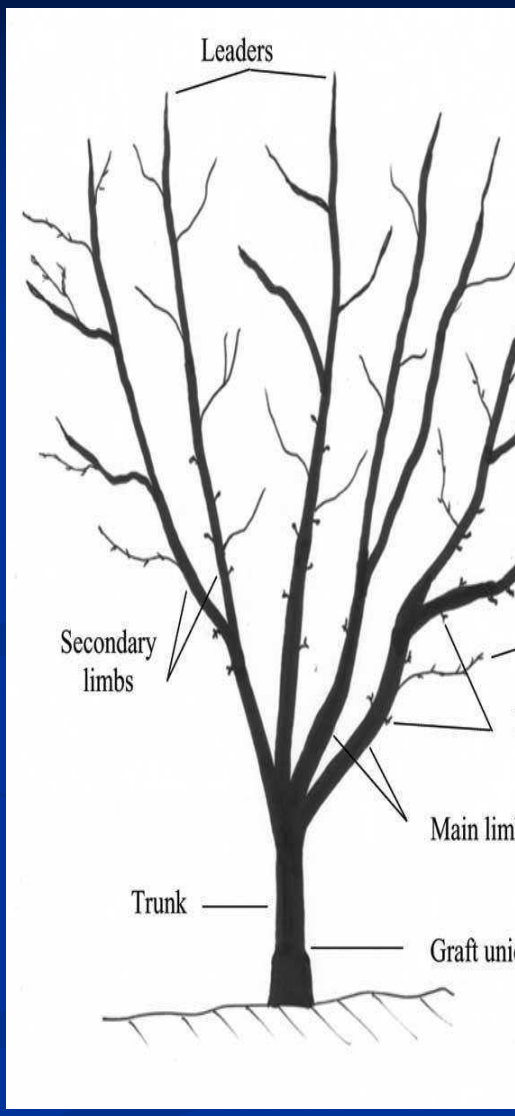
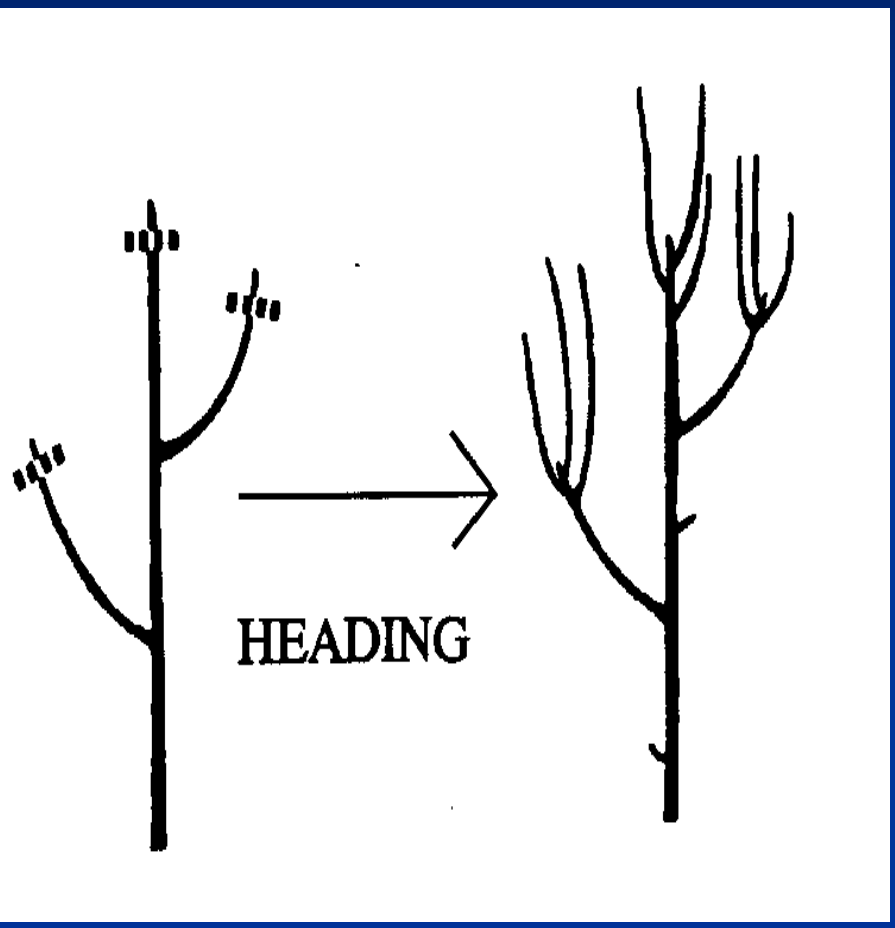


Figure 26. Summer pruning. Top: section of the top of a typical vig
ous tree. Note the upright growth and the shading of the fruits. Bott
proper summer pruning. The vigorous watersprouts have been remo
(a); the current season's growth has been removed from the upr
branches (b); the undesirable upright, but fruiting branch has b
headed back just above the cluster of fruit (c) and will be removed in
dormant pruning; and the upturned branch has been headed back
weak lateral (d).


TOPPING
SIDE LATERAL
SECONDARY SCAFFOLD
CROSSING OVER
PRIMARY SCAFFOLD
CENTRALLEADER
BROKEN BRANCH
PARALLEL LIMBS
WATER SPROUTS
STUB
WEAK CROTCH
HANGER
STRONG CROTCH
CALLOUSED CUT
BUD OR CRAFT UNION
SUCKERS


Leaders
Secondary limbs
Main lim
Trunk
Graft uni

Types of Cuts



- Heading Cut
  - Remove part of the branch
  - Stimulate bud break near cut
  - Stimulate localized branching

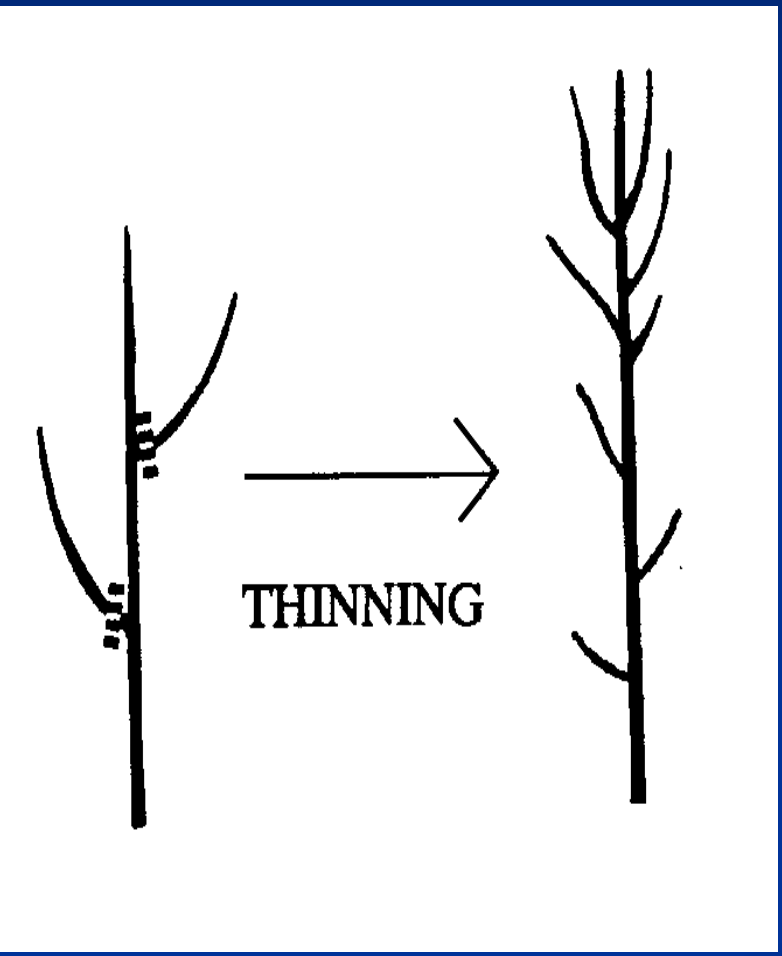
Apex or terminal bud

Hormone moves downward, suppressing lateral buds

Lateral shoots have wide angles and reduced growth

- Inhibits lateral bud break
- Inhibits lateral shoot grow
- Affects branch angle

Types of Cuts

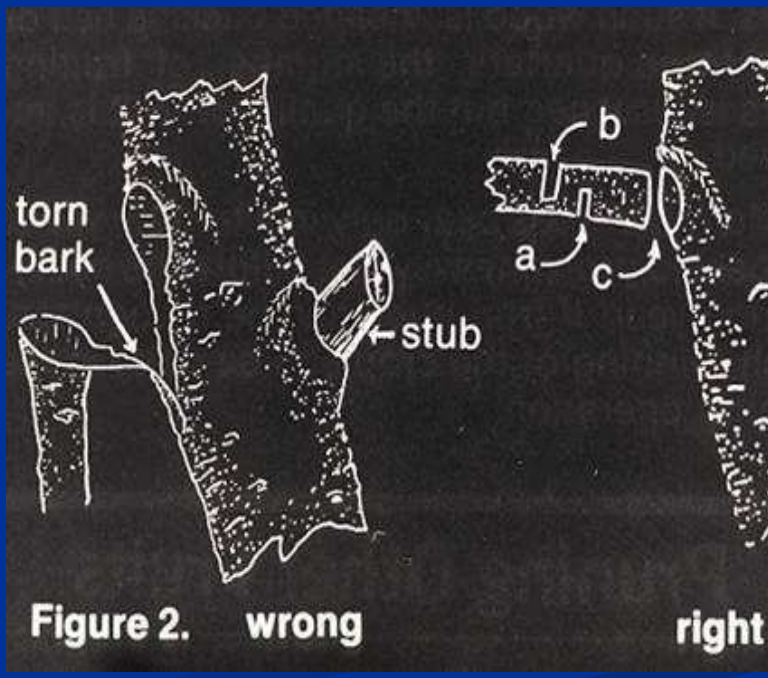


- Remove branch at point o origin
- Least invigorating cut
- Promote light penetration into canopy

Avoid Leaving Branch Stubs

Pruning

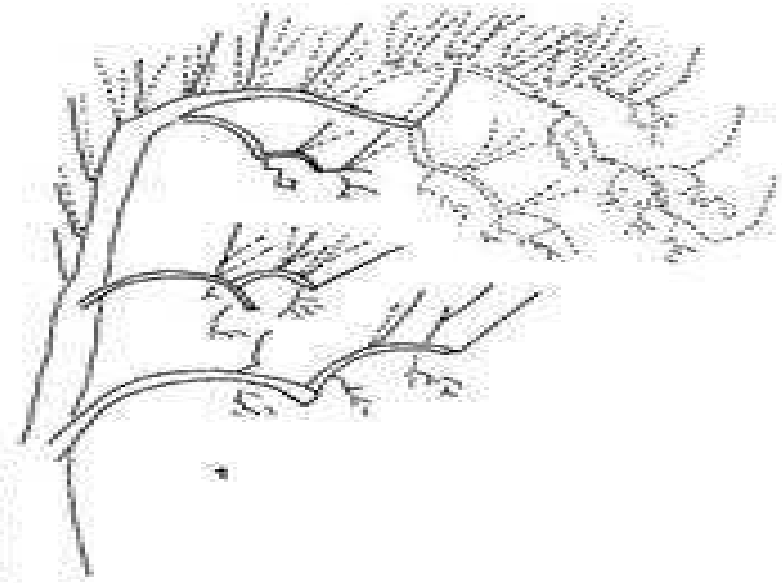
Pruning



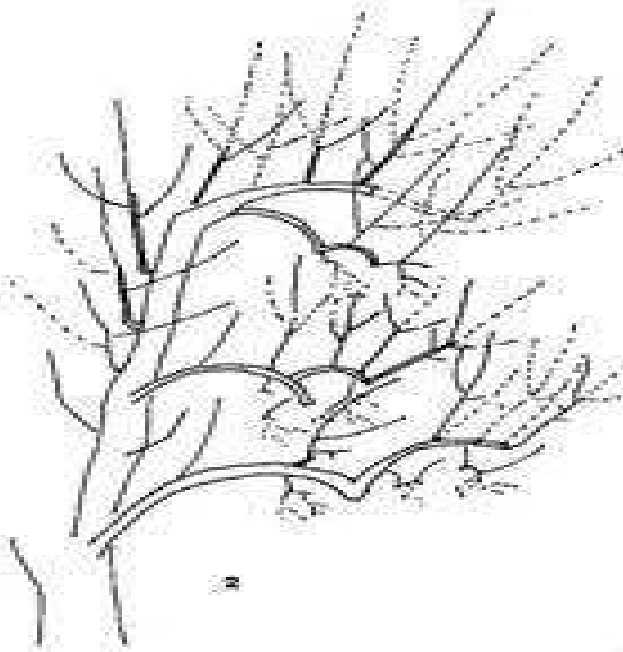
Pruning Neglected Apple Trees

Pruning Neglected Trees

- Remove dead wood
- Reduce tree height
- Cut out 3-4 large branches
- Cut back to outward growing branches

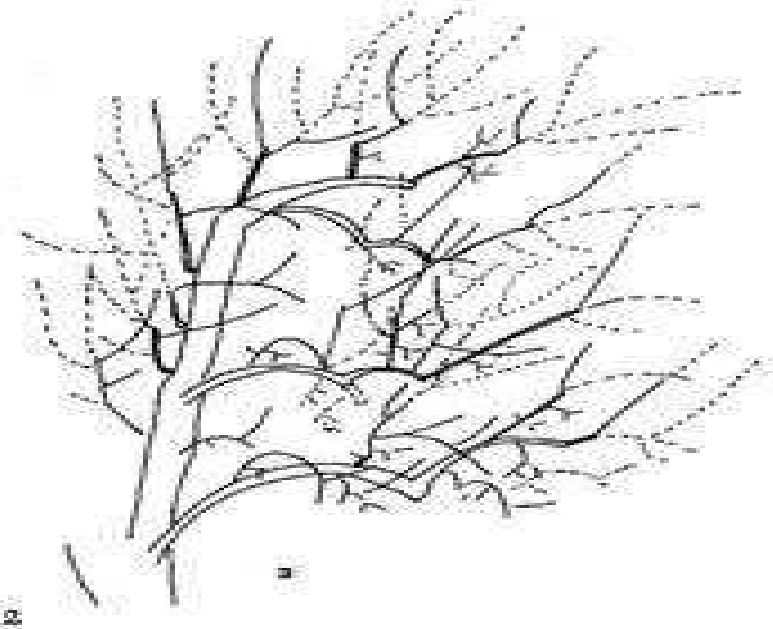


1

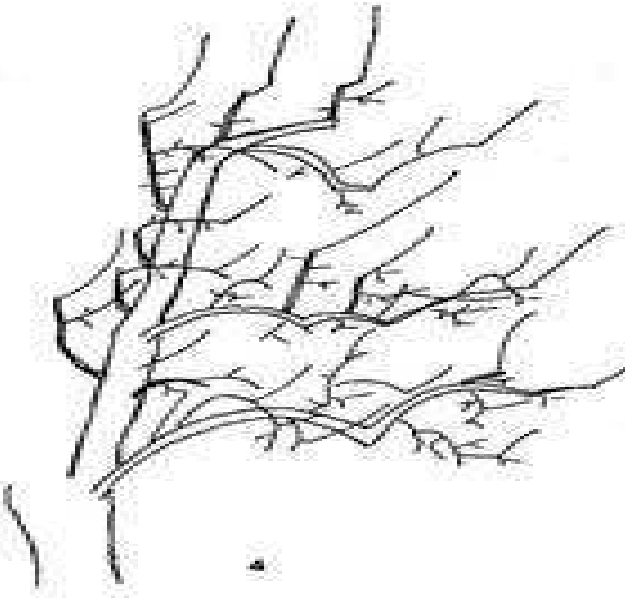


2

The pruning of "umbrella-shaped trees" can be reversed gradually if they are not too old. Yield will decline temporarily during the conversion.

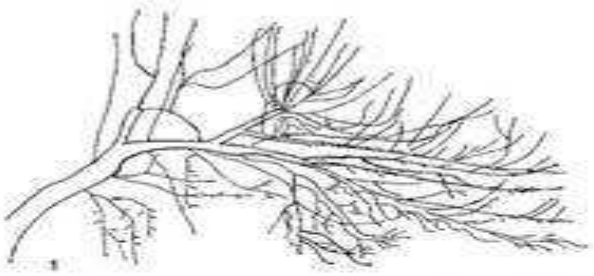


3



4

Pruning Neglected Trees

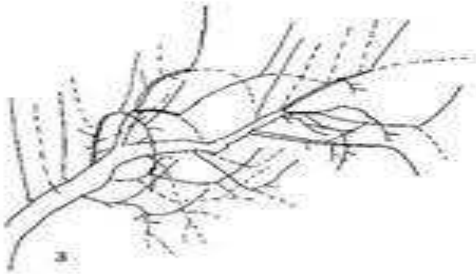


1

The top limbs in an old "umbrella tree" have many suckers that shade the lower portion of the tree.

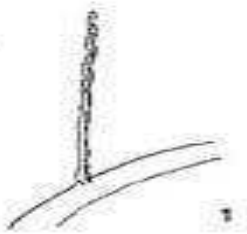
2

Thin the suckers and do not head those left. Remove most of the downward hanging fruiting wood in order to allow light onto the lower limbs and to prevent further spread.



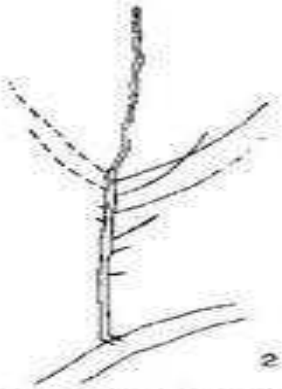
3

The unheaded suckers will fruit and bend over in the third year.



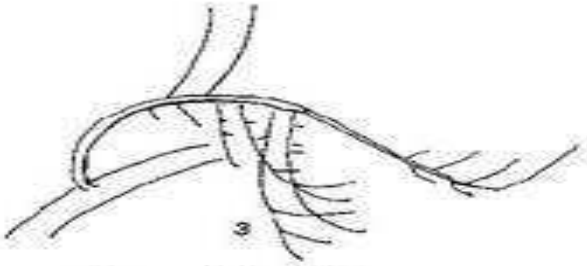
1

One-year apple shoot with no flower buds, left unheaded.



2

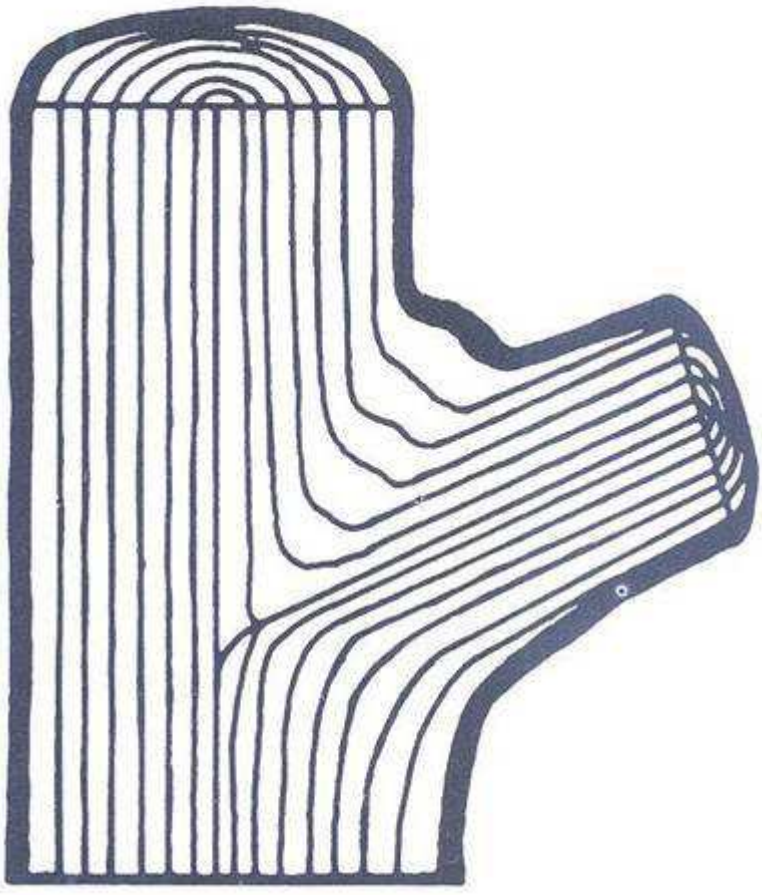
Same shoot after second season, with flower buds.



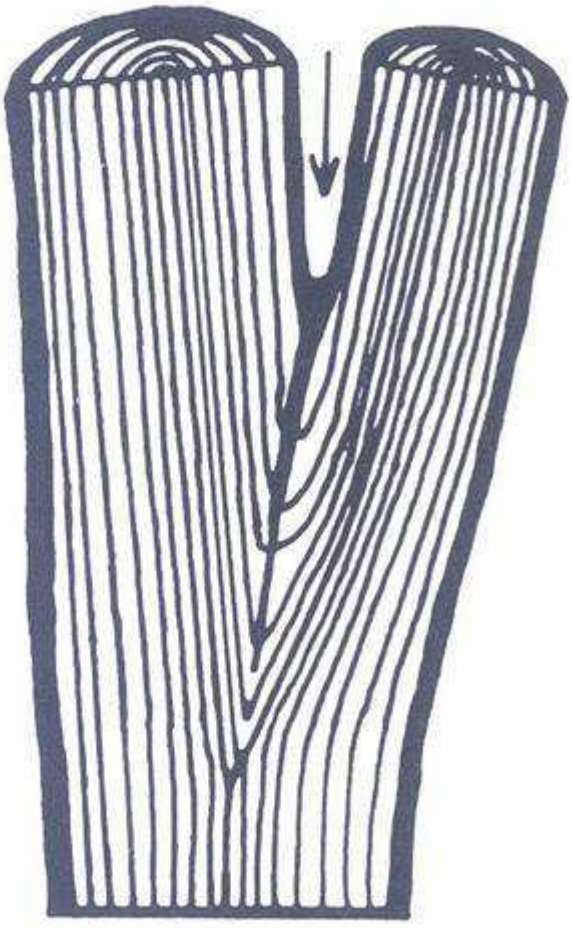
3

Same after fruiting in third season.

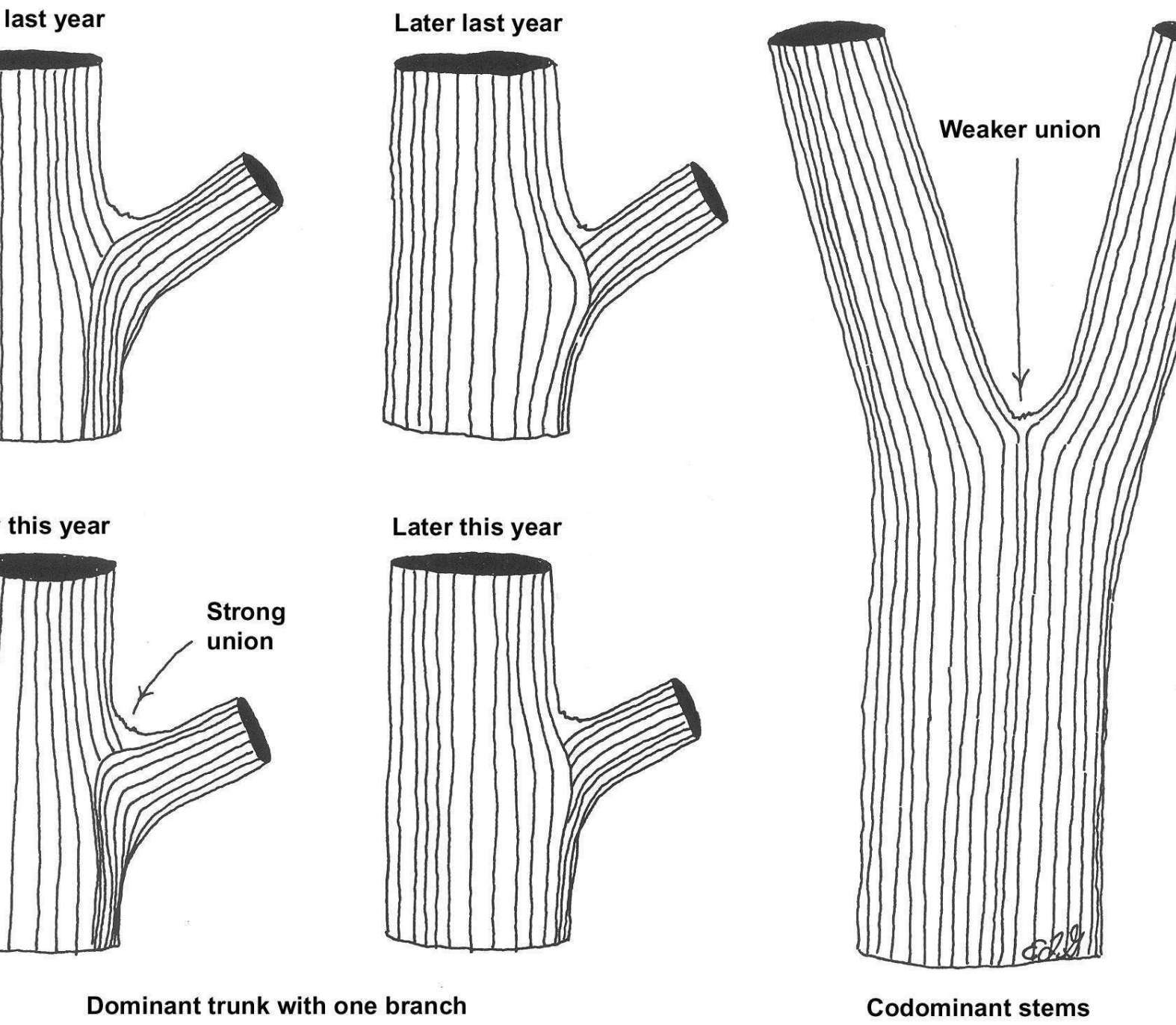
Remove Narrow Branch Angles



Strong

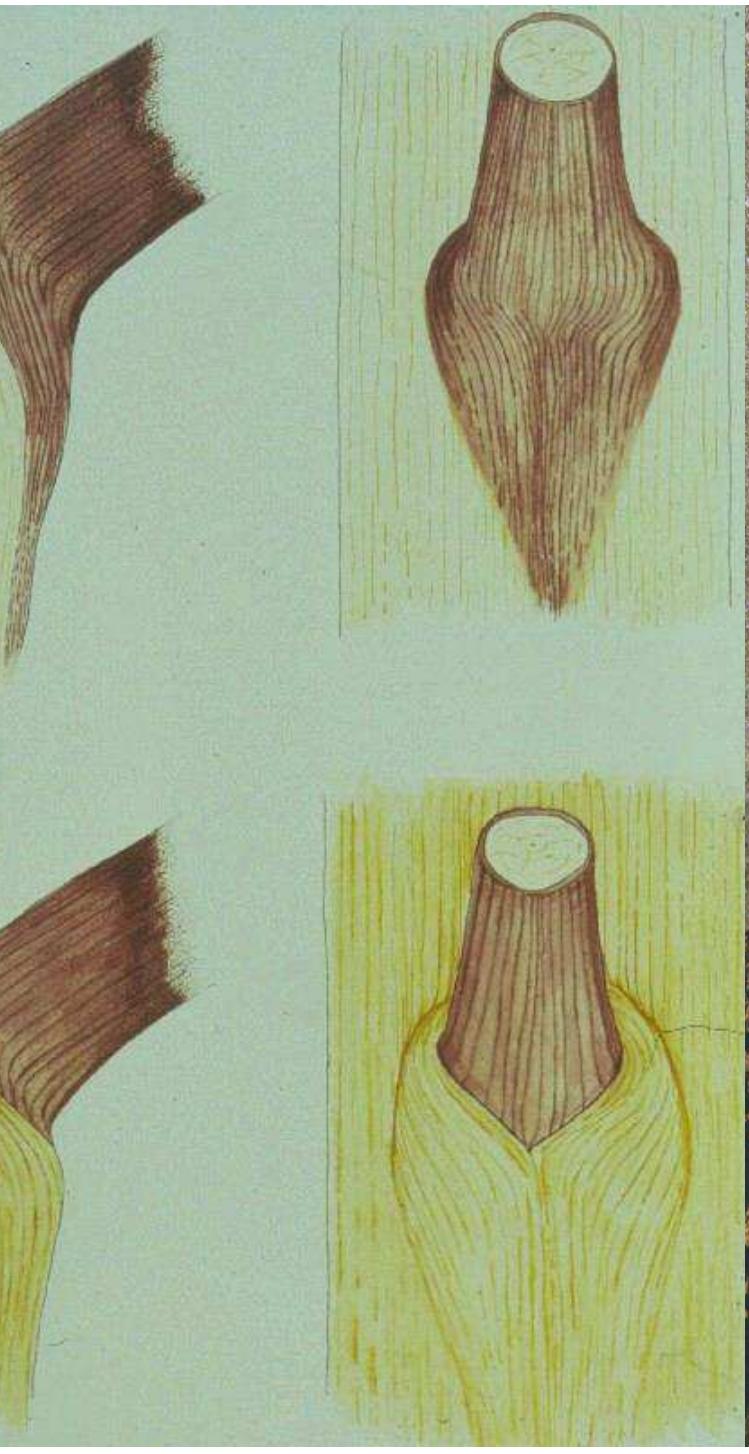


Weak



Dominant trunk with one branch

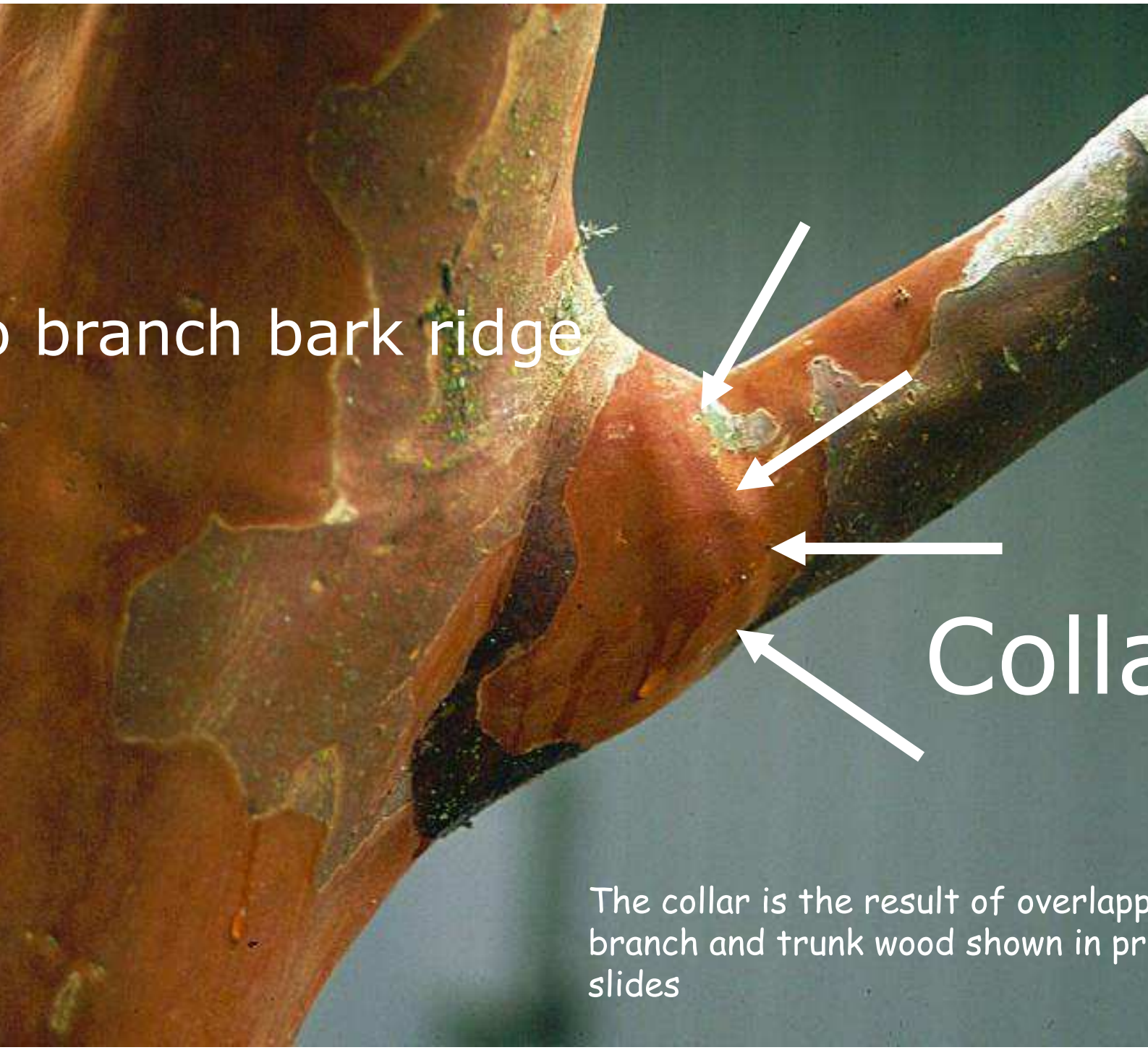
Codominant stems

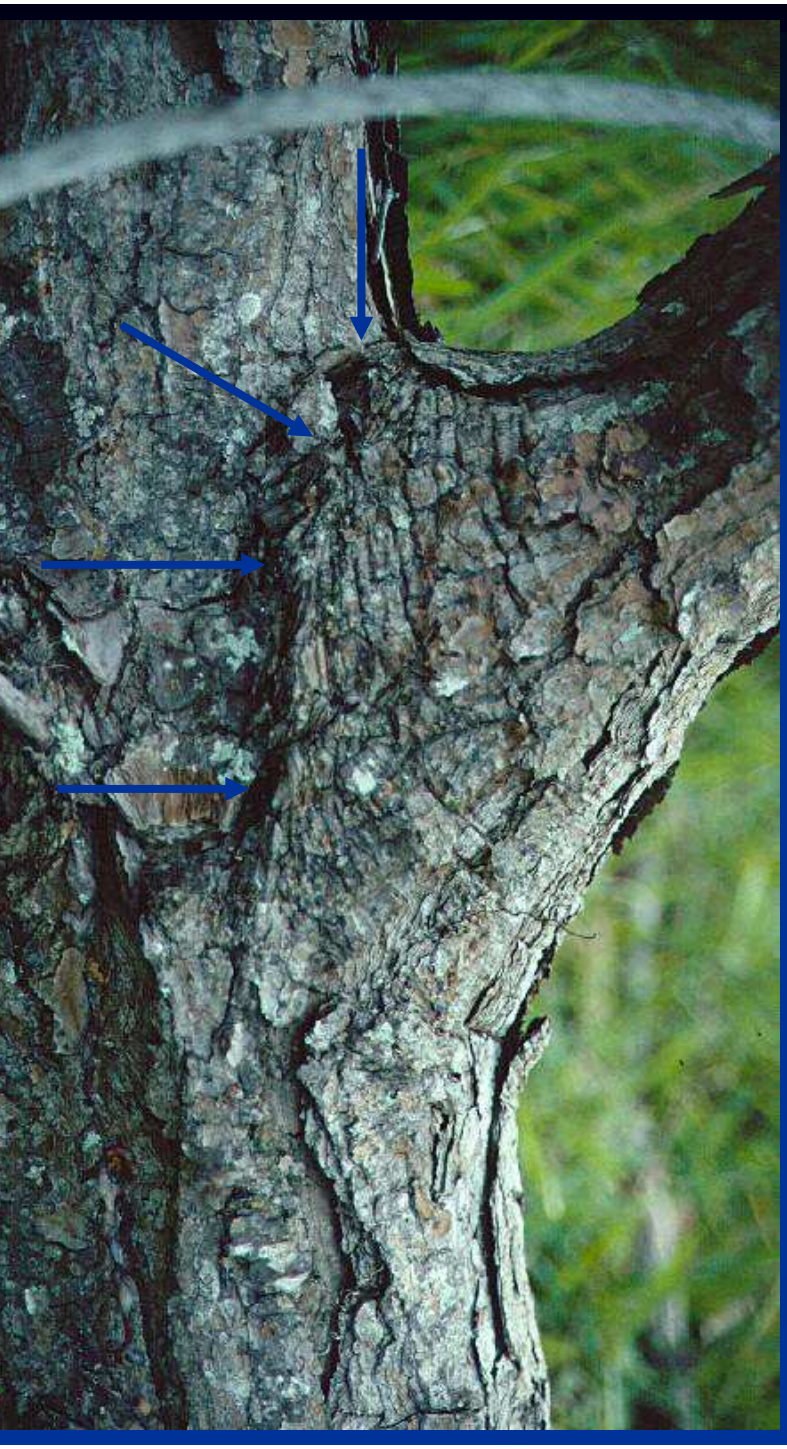


Branch bark ridge present

Some branch unions have a prominent branch bark ridge

ifferent from the formation
phant ears because the
g occurs only at the surface
re is always room to the
e. Unlike a bark inclusion,
is no pressure pushing the
from the trunk.


branch bark ridge
Colla
The collar is the result of overlapp
branch and trunk wood shown in pr
slides



Pine unio

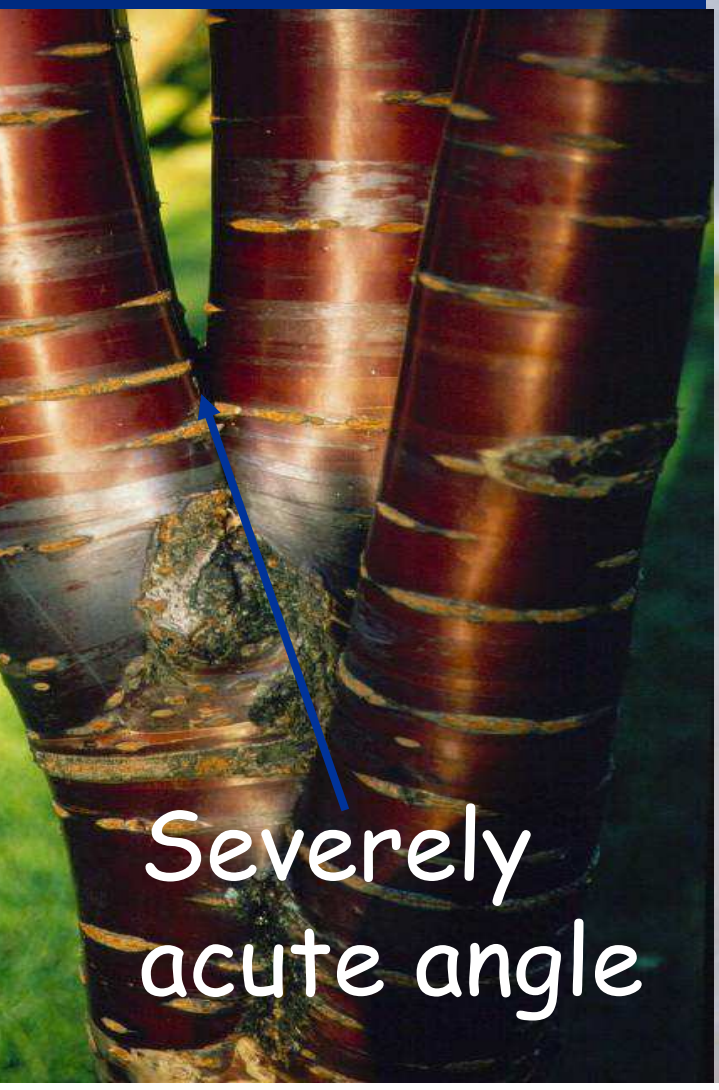
- Collar is visible as a swelling at the base o the branch
- Branch bark ridge (arrows) is visible as dark, rough bark regi on the top and sides the union

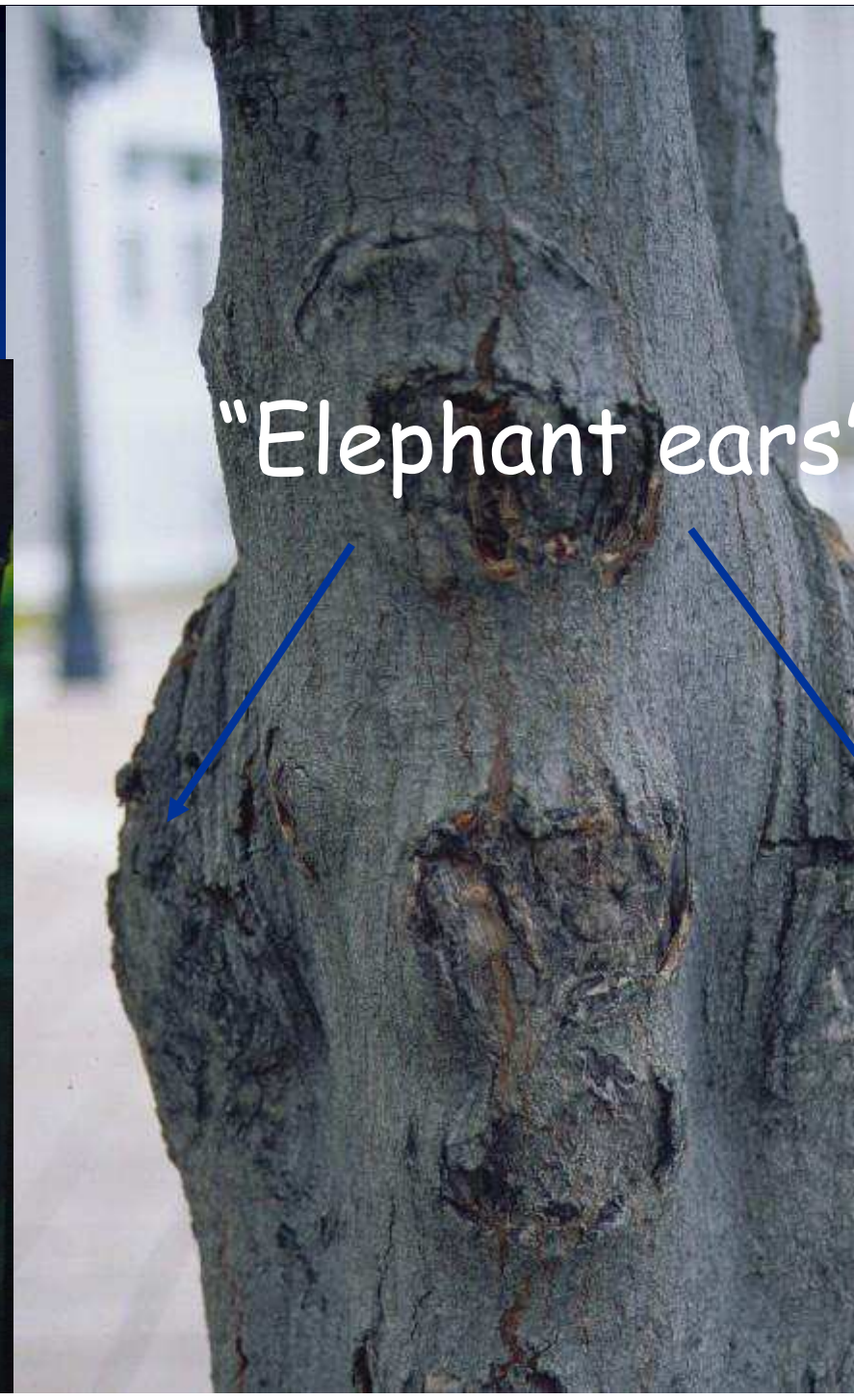
Wood orientation at union

el the bark
om the
ion

ote how
unk wood
ows out
to the
se of the
anch
otted line
edge of
unk wood)

ese are weak





rk, that developed when the stems re smaller and had space between em, is now trapped inside the union tween the stems. This doesn't happen en the angle between stems is large ough to allow the stems to develop dependent of each other.

Included bark beginning to form

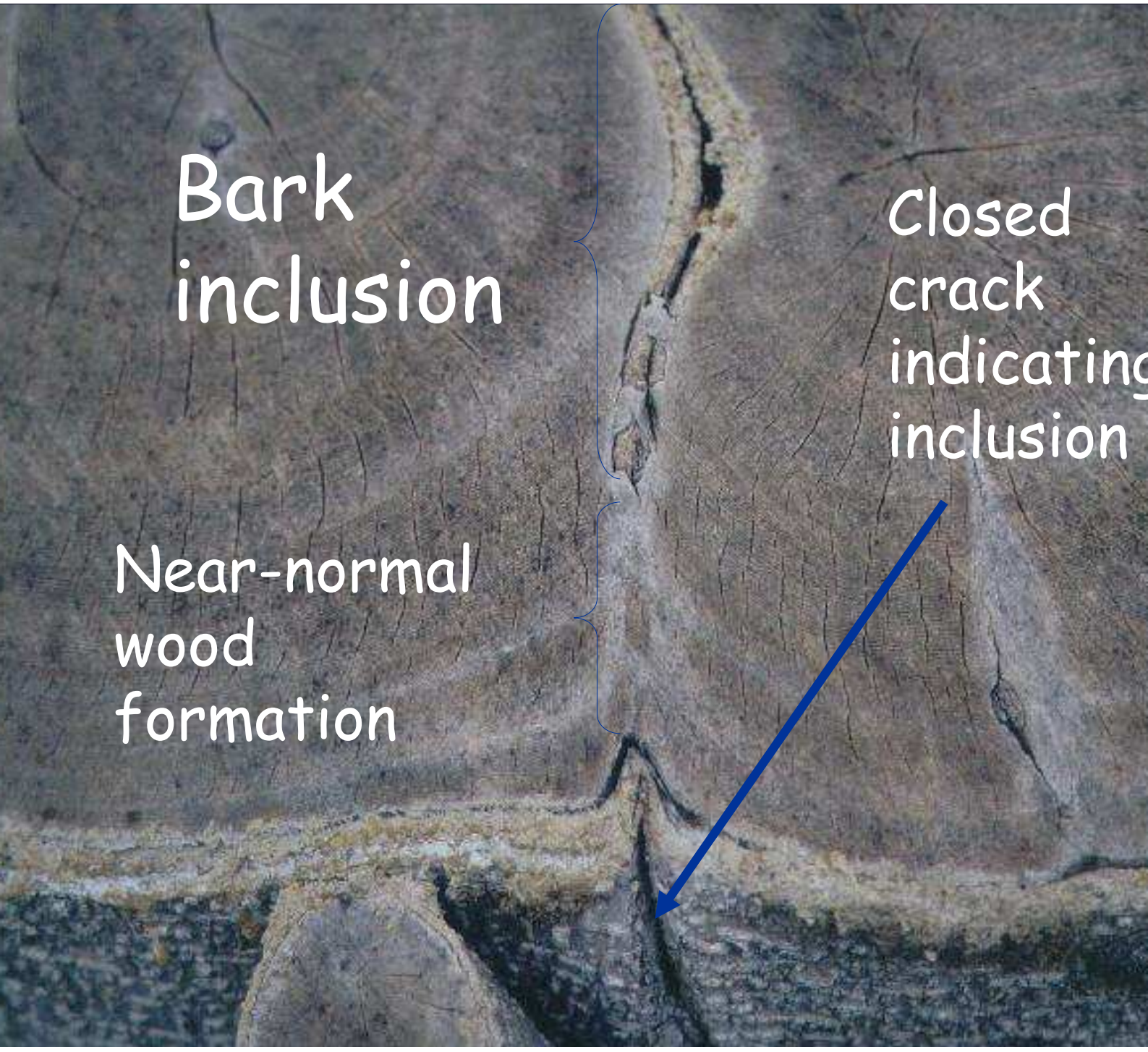
rk inclusion

. the branch angle.

. that the two stems did not
t with each other as they grew
er

. that the decay and discoloration
sults of the stems pressing and
g against each other

Notice that the narrow branch ang
perfect environment for microorga
because it is an area that stays mo
warm, and dark.

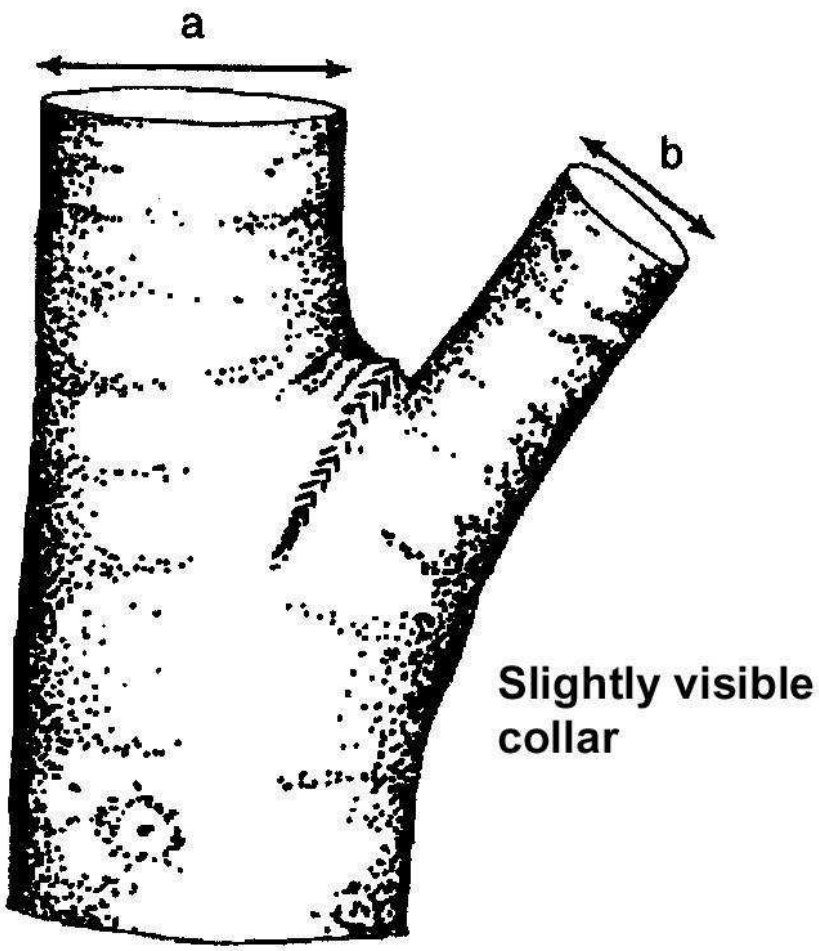

Bark inclusion
Closed crack indicating inclusion
Near-normal wood formation


Bark inclusion
Closure crack indicatin
inclusion


Bark inclusion
(Not a codominant stem!)

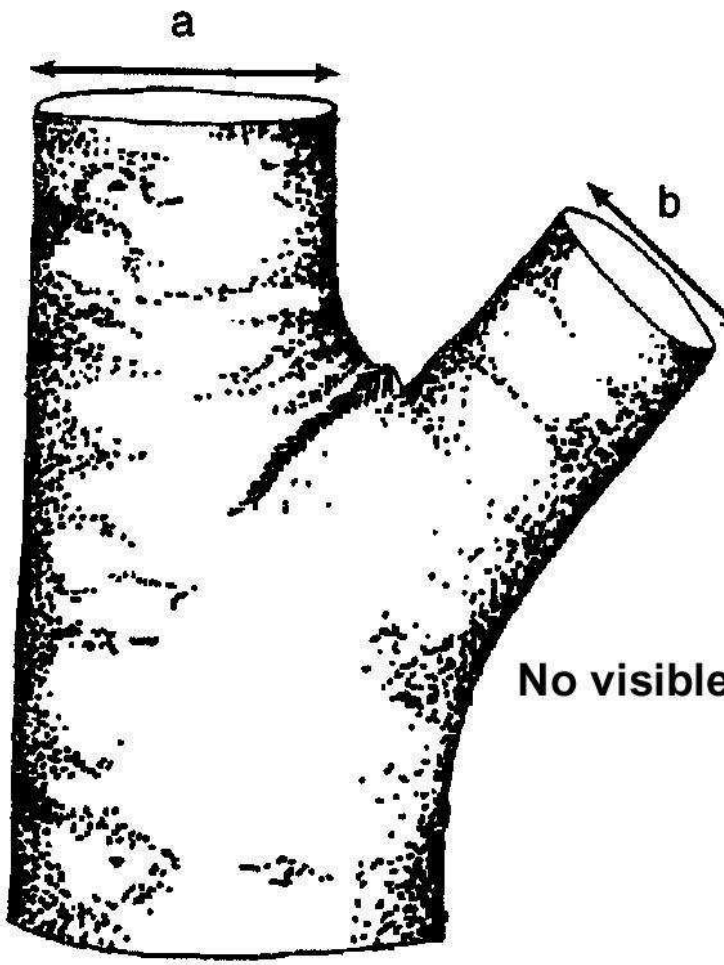

Close-up of closure

Desirable branch size



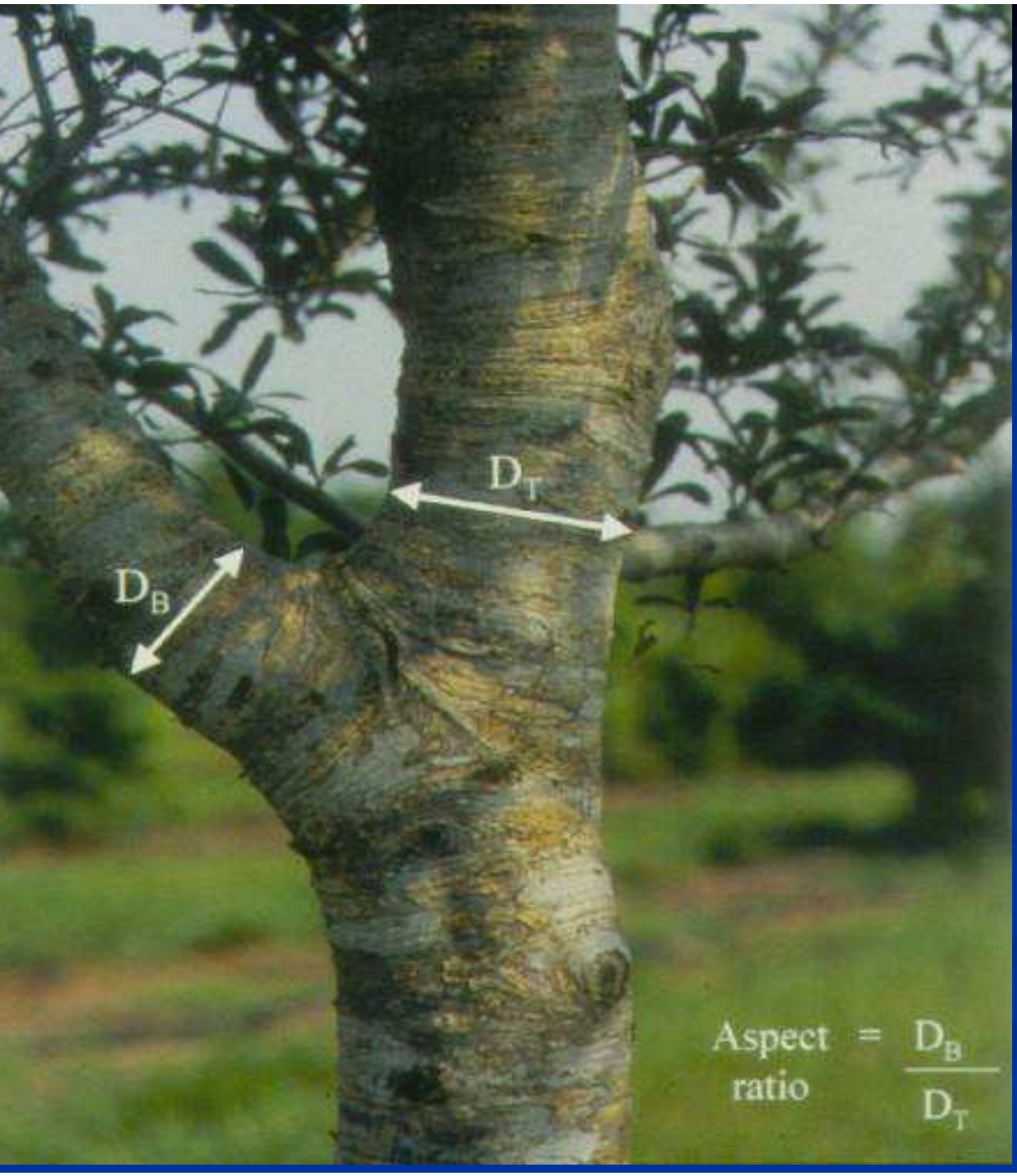
Slightly visible collar

st preferred branch size:
b < .5a

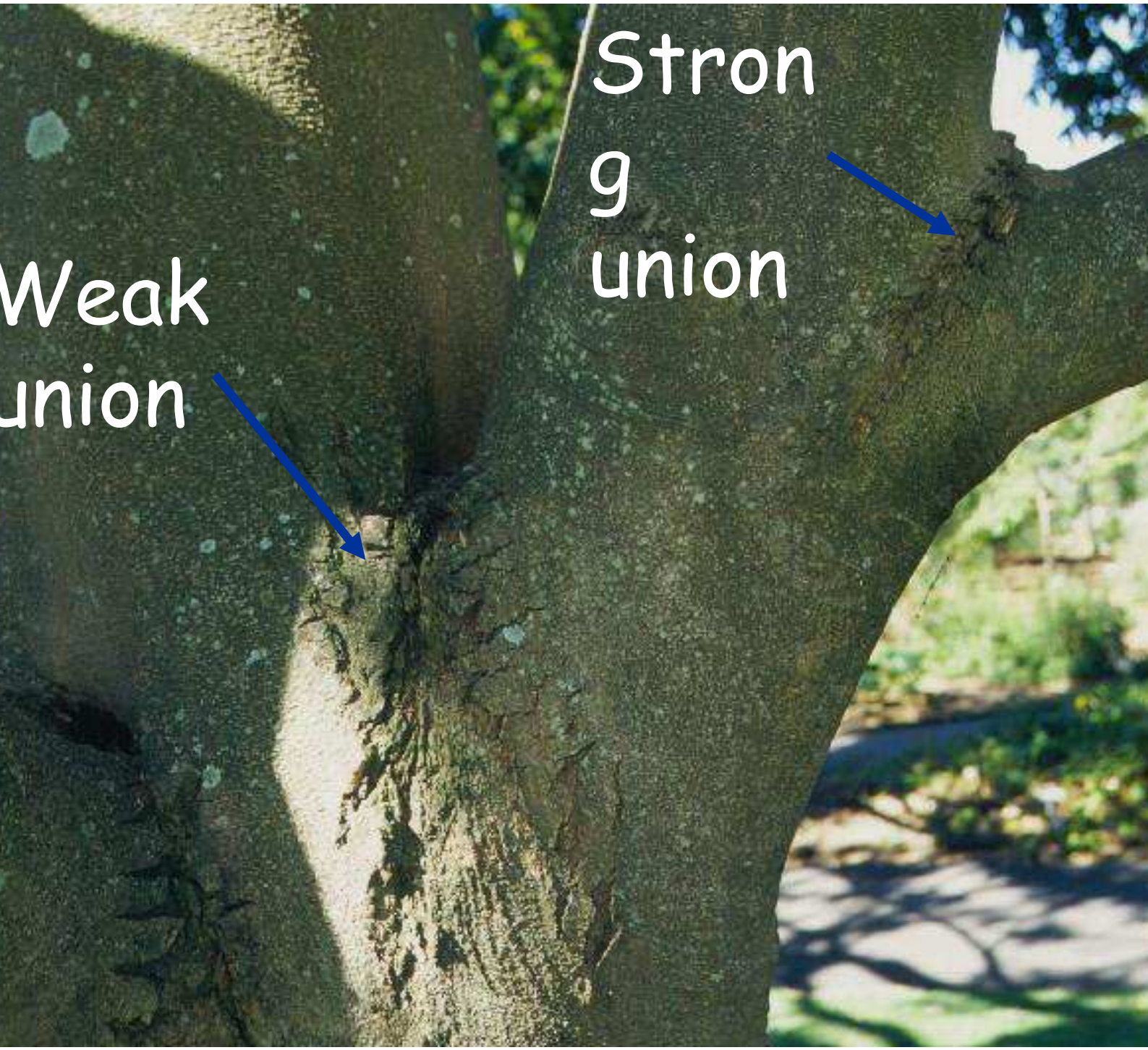


No visible

Preferred branch size:
b = .5 to .75a

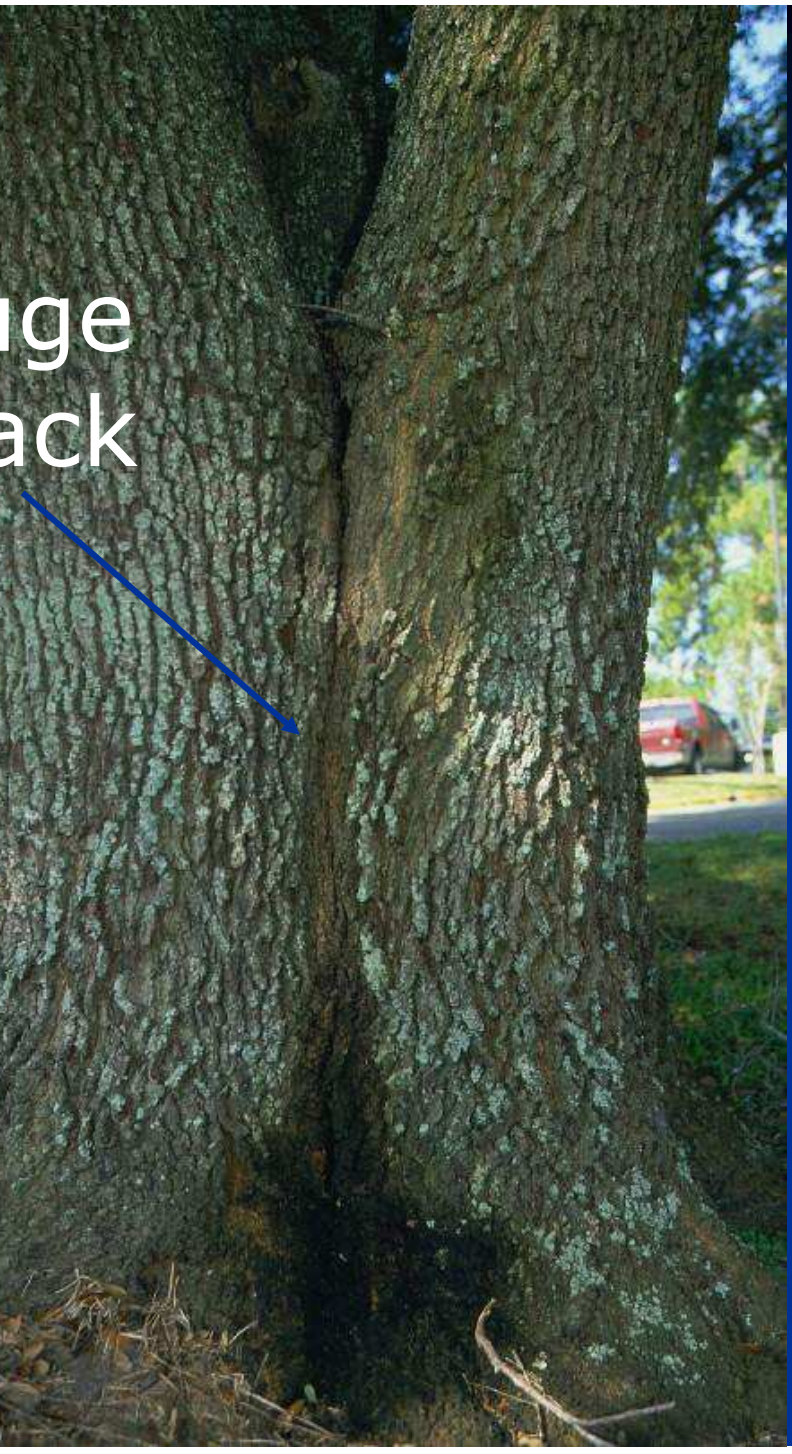


The mo
desirable b
aspect ra
less than 0
was
demonstra
the prev
slide.


Stron
g
union
Weak
union

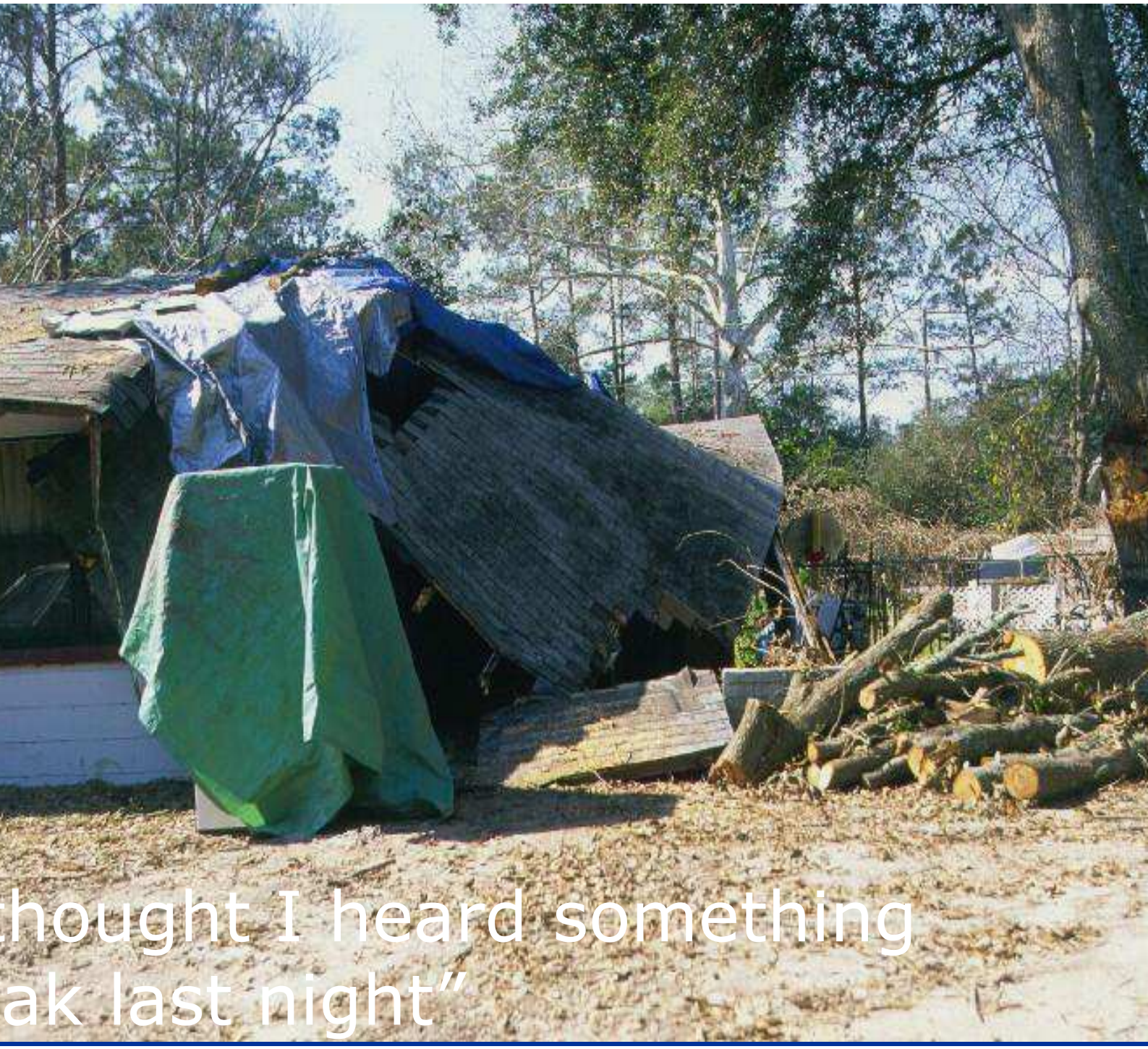
Appears to be a nice tree


Close-up of ba
of tree



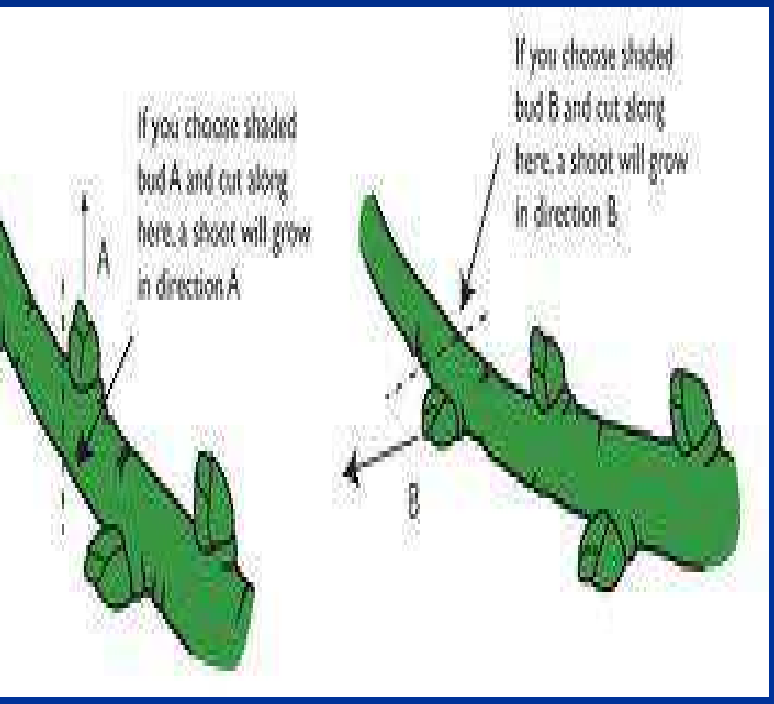
Same tree fiv
years later

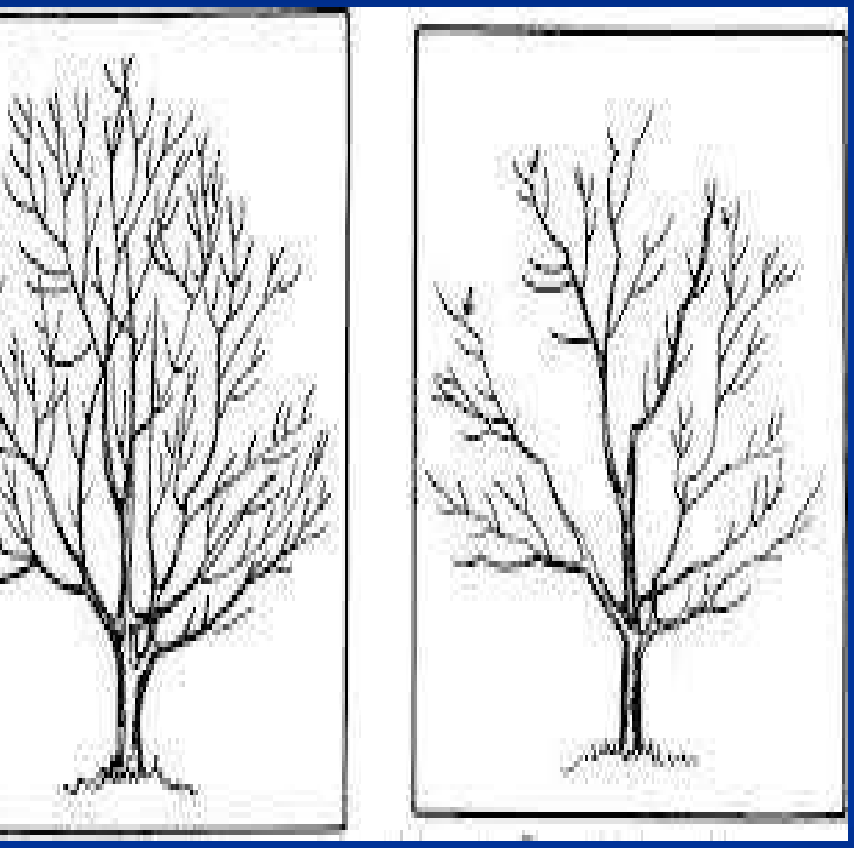

"Fall down g
boom tree"
an
on this
of the

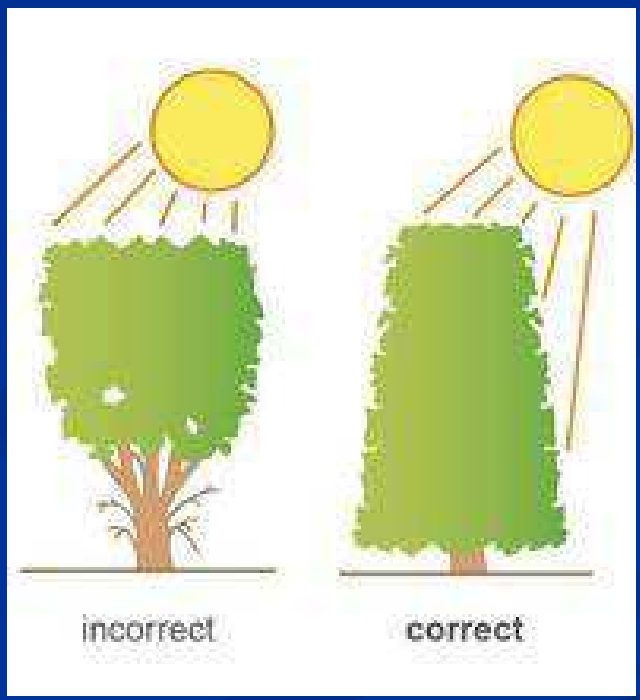

thought I heard something
ak last night”

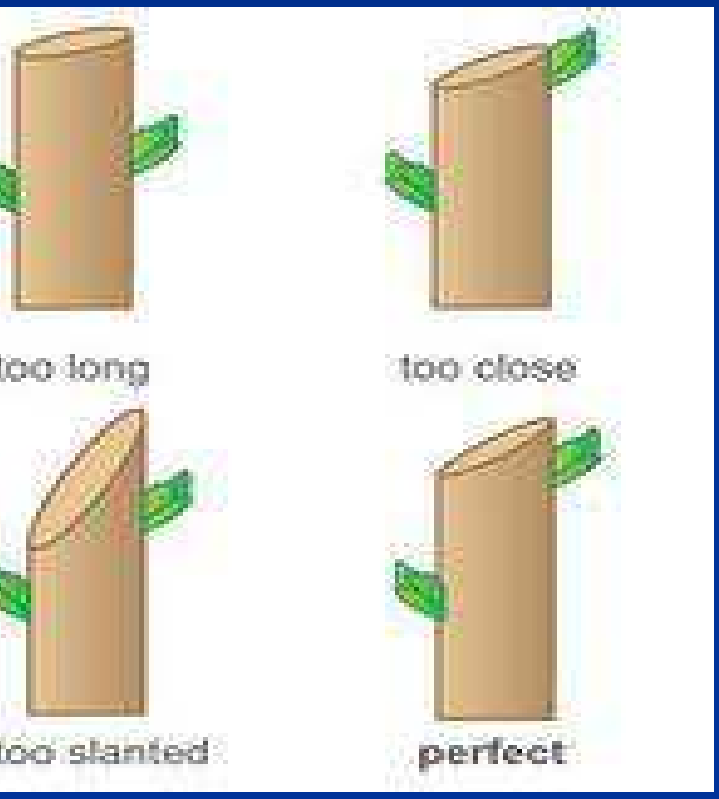

Good structure
Scaffold branches spaced radially;
directly above another.


Stems too close together
CITY C PERMIT REQUIRED


If you choose shaded bud A and cut along here, a shoot will grow in direction A
A
If you choose shaded bud B and cut along here, a shoot will grow in direction B
B

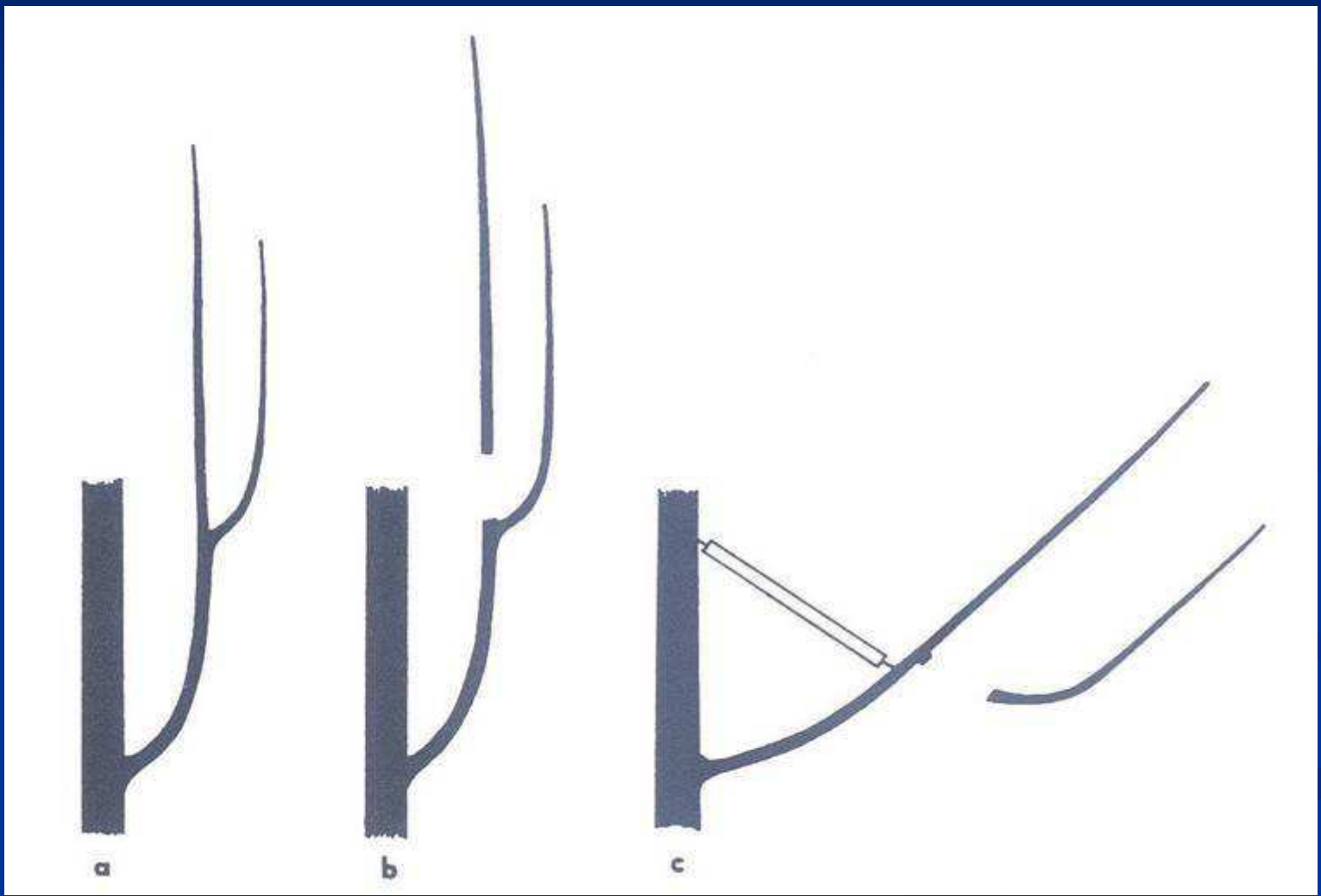



incorrect
correct

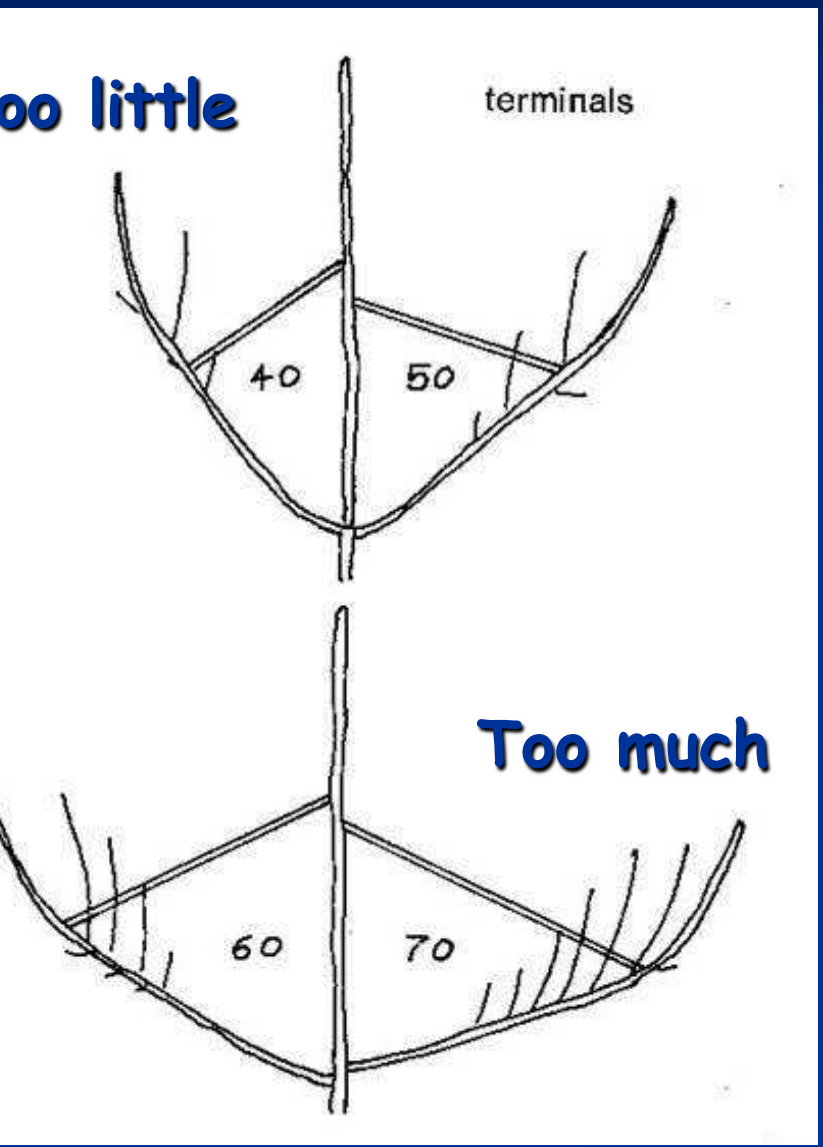

too long
too close
too slanted
perfect


A

Branch Spreading



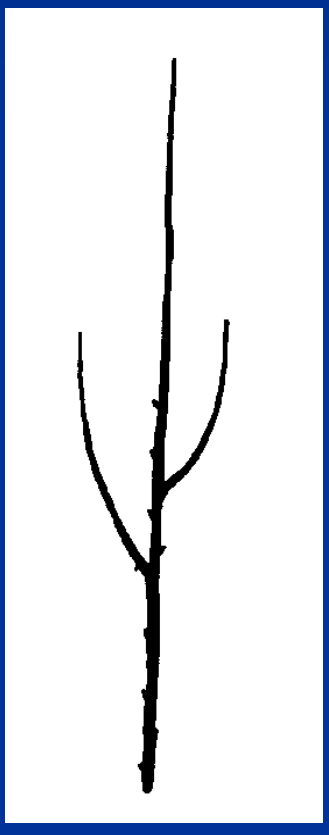
Branch Spreading



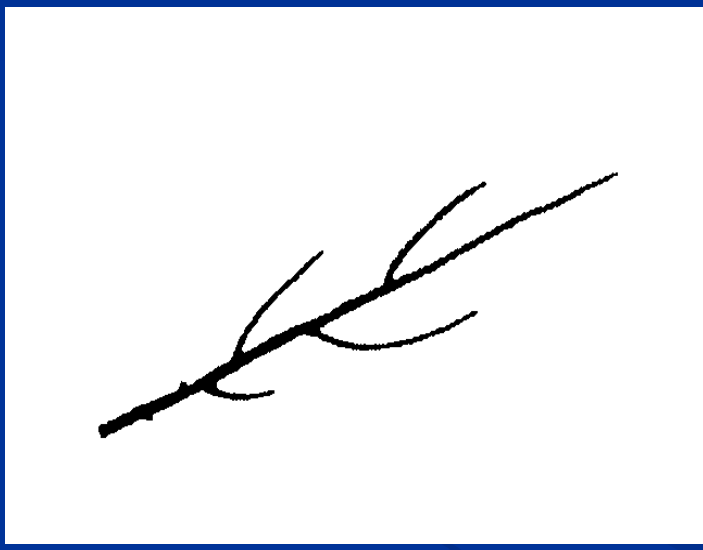
- Opens tree up for sunlight and spray penetration
- Reduces shoot and limb vigor
- Encourages flowering

Bend Branch Towards Horizonta

Decreases amount of auxin moving from tip



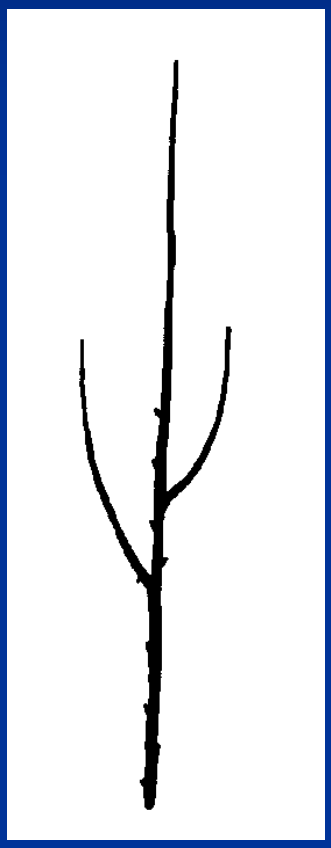
Bend to a 45 to
60 degree angle



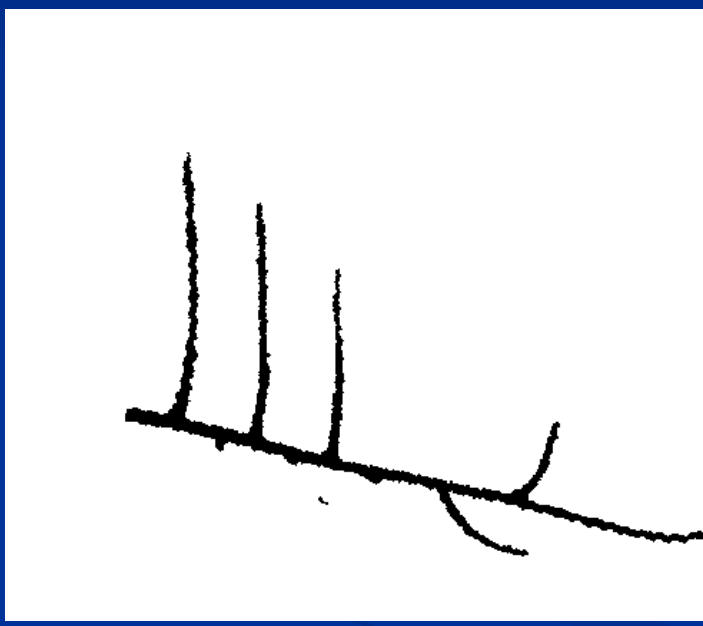
Increase lateral brand
Decrease terminal gro

Bend Branch Towards Horizontal

Decreases amount of auxin moving from tip



Bend below the horizontal



Increase lateral branching
Buds at highest point brea
Decrease terminal growth

Apple Limb Spreading