All About The Trees

ARE YOU READY FOR THE NEXT BIG STORM

Weather

Eight Dead, Including Two Children, in Fierce Nor'easter

Two municipal workers, David Boardly, left, and James Ockimey, worked to clear a downed tree in Marple Township, Pa., on Friday. Matt Slocum/Associated Press

By Christina Caron

March 3, 2018

Falmouth receives more than 100 damage reports as blizzard blasts Cape Cod

Updated Mar 13, 2018; Posted Mar 13, 2018

A fallen tree prompted one of many road closures in Falmouth during the blizzard on Tuesday, March 13, 2018. Here, police share a photo of a downed tree on Gifford Street. (Falmouth Police/Twitter)


605
CAPE COD COLLABORATIVE SCHOOLS
OPERATED BY:
CAPE COD COLLABORATIVE
BOURNE, MA

Storm Events

- 2018 – 9 days with events, 8 with property damage
- 2017 – 13 days with events, 9 with property damage
- 2016 – 17 days with events, 13 with property damage
- 2015 – 11 days with events, 7 with property damage
- 2014 – 10 days with events, 6 with property damage

- Data from NOAA Storms Database
- Events: (**Blizzard, Heavy Snow, High Wind, Hurricane (Typhoon), Ice Storm, Strong Wind, Thunderstorm Wind, Tornado, Tropical Depression, Tropical Storm, Winter Storm)**

Trees can be Hazardous

Not all trees pose a risk

Personal injury
Property damage
} Risk

Benefits of Trees

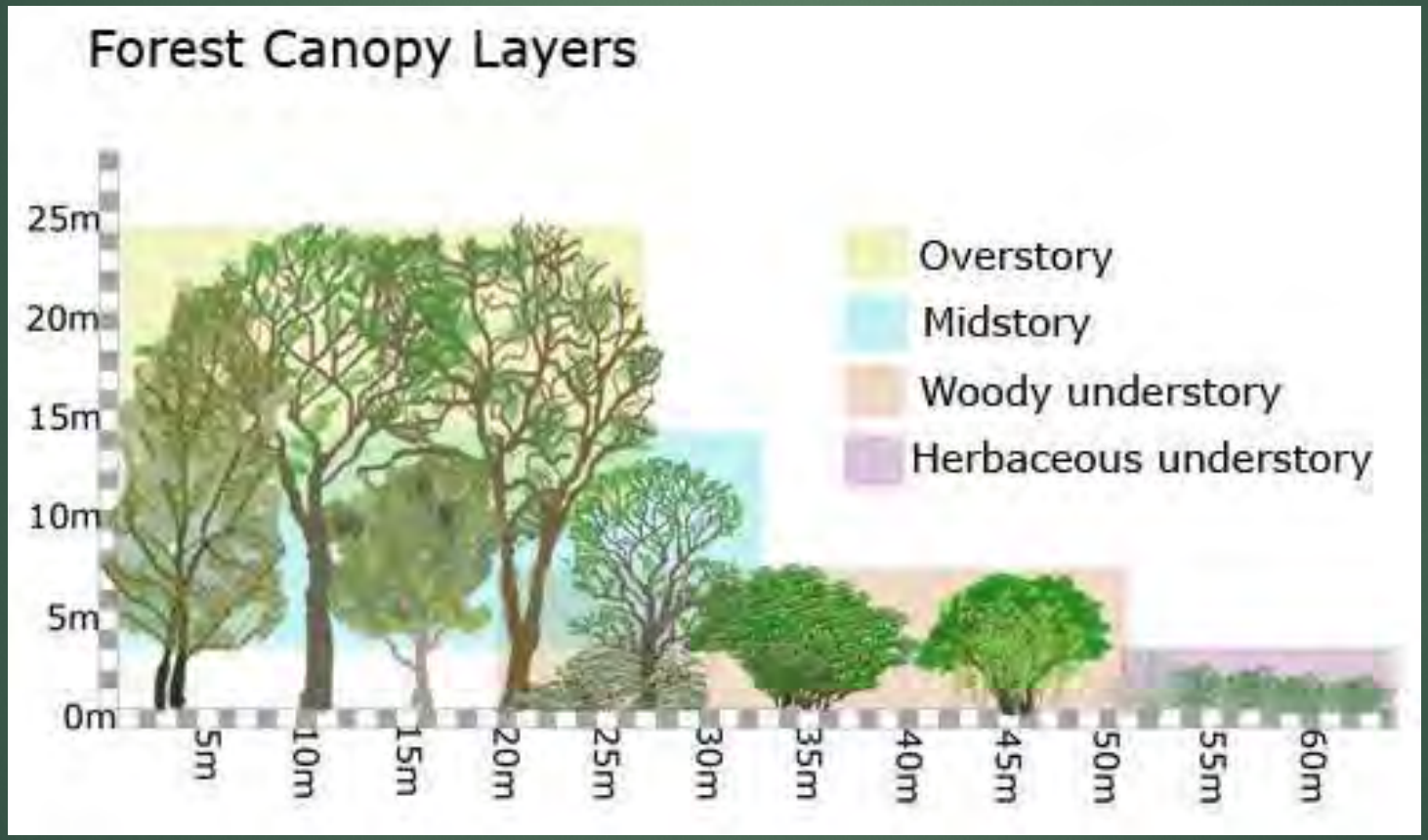
- Property value
- Cooling – shade
- Heating – wind protection
- CO_2
- O_2
- Wildlife

What we know about trees and storms

- The higher the wind speed the more likely trees will fail
- Wind isn't the only factor
  - Precipitation, storm speed
  - Tree canopy density and composition
  - Tree species, age, health and structure
  - Site characteristics (water table, soil, compaction)

Trees in groups survive winds better than trees growing individually

Diversity & Layers




REcolorado

Some species resist wind better than others

Highest wind resistance

- *Cornus florida*, dogwood
- *Ilex opaca*, American holly
- *Taxodium distichum*, baldcypress

Medium – High wind resistance

- *Acer palmatum*, Japanese maple
- *Betula nigra*, river birch
- *Carpinus caroliniana*, Hornbeam
- *Carya glabra*, pignut hickory
- *Cercis canadensis*, red bud
- *Chionanthus virginicus*, fringe tree
- *Liquidambar styraciflua*, Sweetgum
- *Magnolia virginiana*, sweetbay
- *Nyssa sylvatica, tupelo*

Wind & Trees, Lessons learned from Hurricanes – University of Florida

Medium-Low Wind Resistance

- *Acer rubrum*, red maple
- *Acer saccharinum*, silver maple
- *Celtis occidentalis*, hackberry
- *Platanus occidentalis*, sycamore
- *Prunus serotina,* black cherry
- *Quercus alba*, white oak
- *Ulmus americana*, American elm

Lowest Wind Resistance

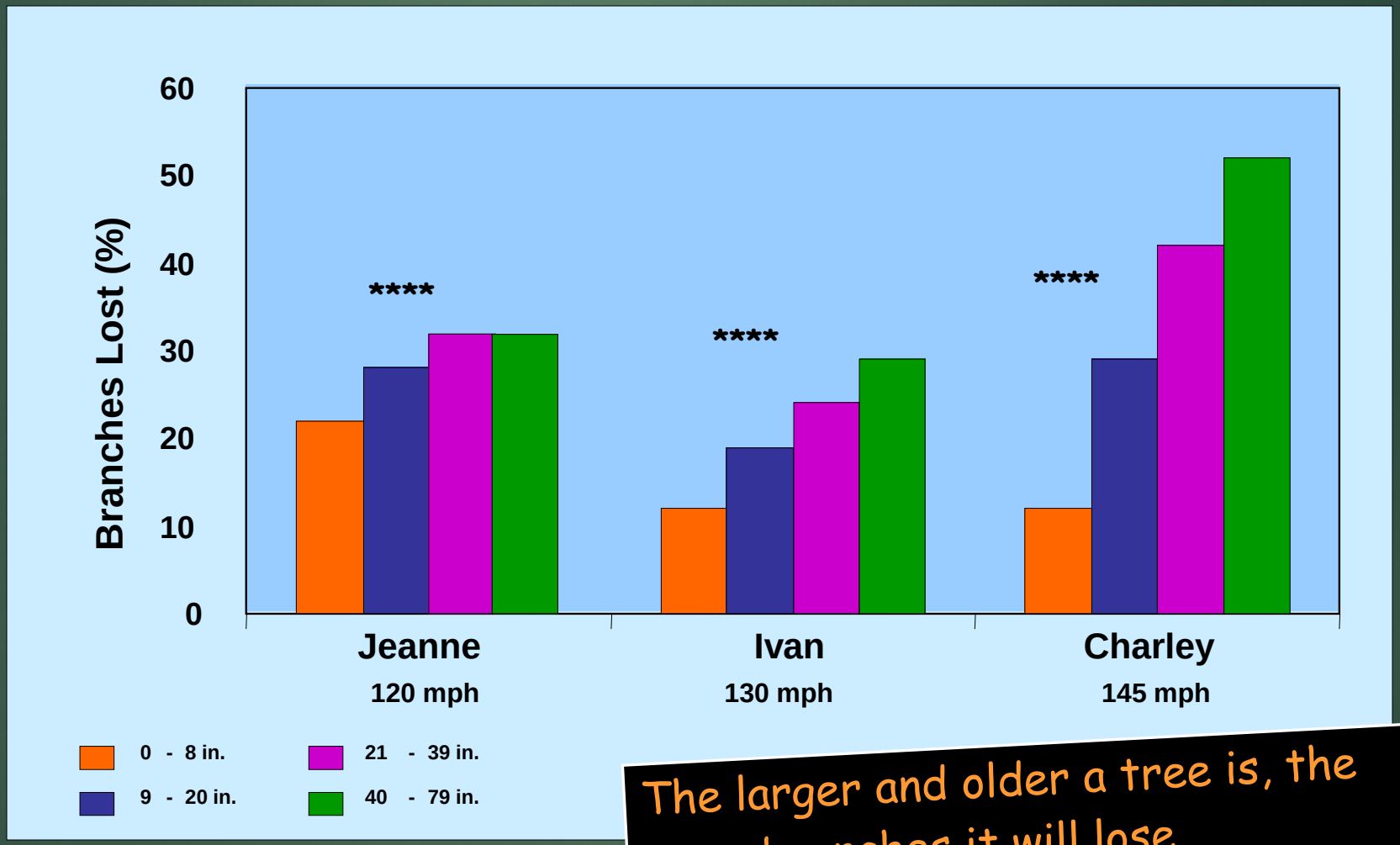
- *Liriodendron tulipifera*, tulip poplar
- *Pyrus calleryana*, Bradford pear
- *X Cupressocyparis leylandii*, Leyland cypress

Wind & Trees, Lessons learned from Hurricanes – University of Florida

Older Trees are more likely to fail

- Beware of over-mature trees
  - Trees have lifespans
    - As trees approach their life expectancy they often become more vulnerable to decay

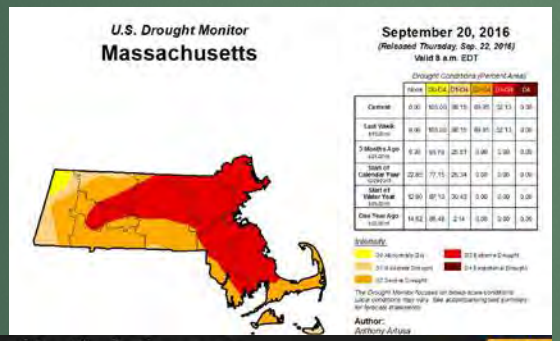
Older trees are more likely to fail in hurricanes



The larger and older a tree is, the more branches it will lose.

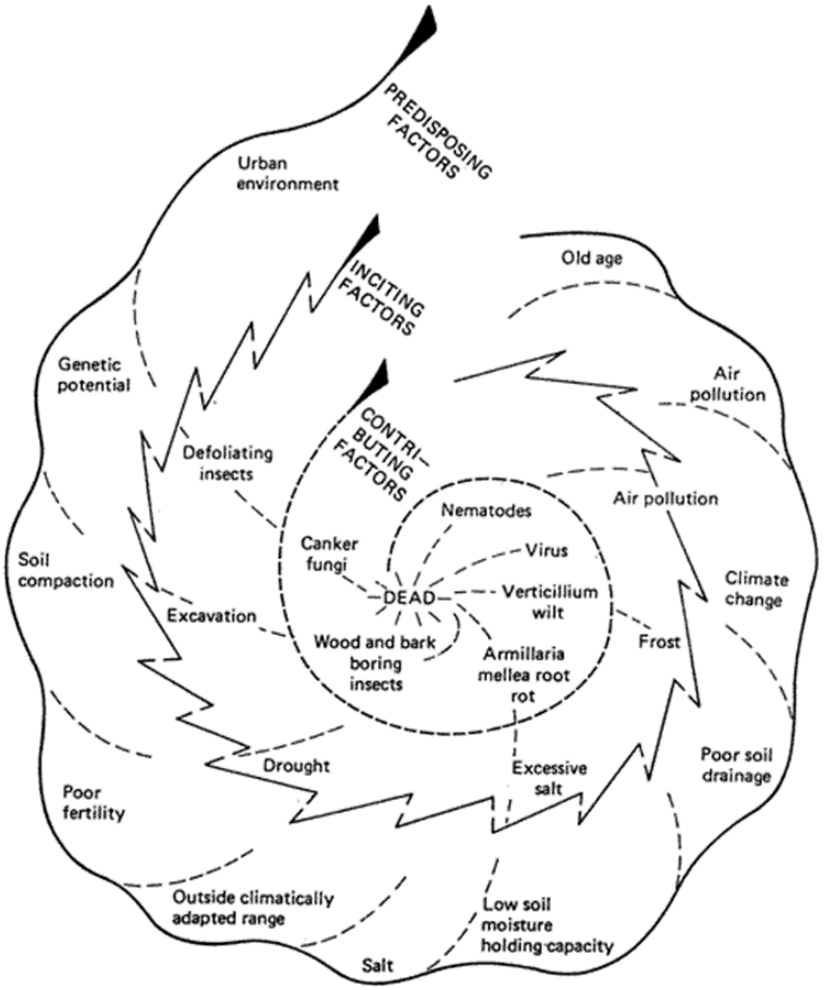
Unhealthy Trees are Predisposed to Damage

- Winter Moth
- Gypsy Moth
- Black oak gall wasp
- Drought
- Soils

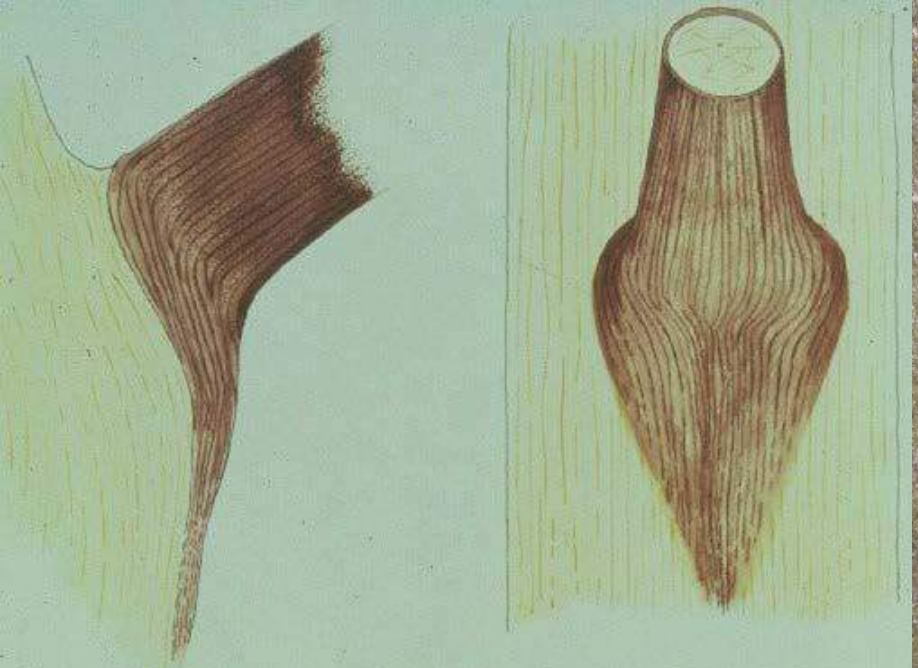


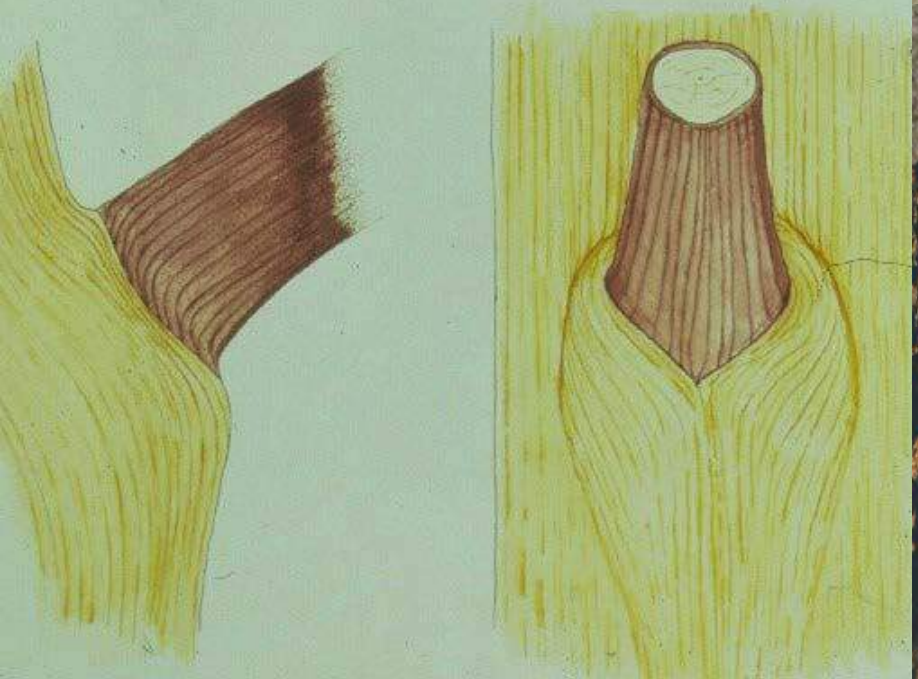

Hartford Courant

Huge Number Of Dead, Dying Trees In Connecticut At Increased Risk Of Falling Due To Years Of Drought, Insects

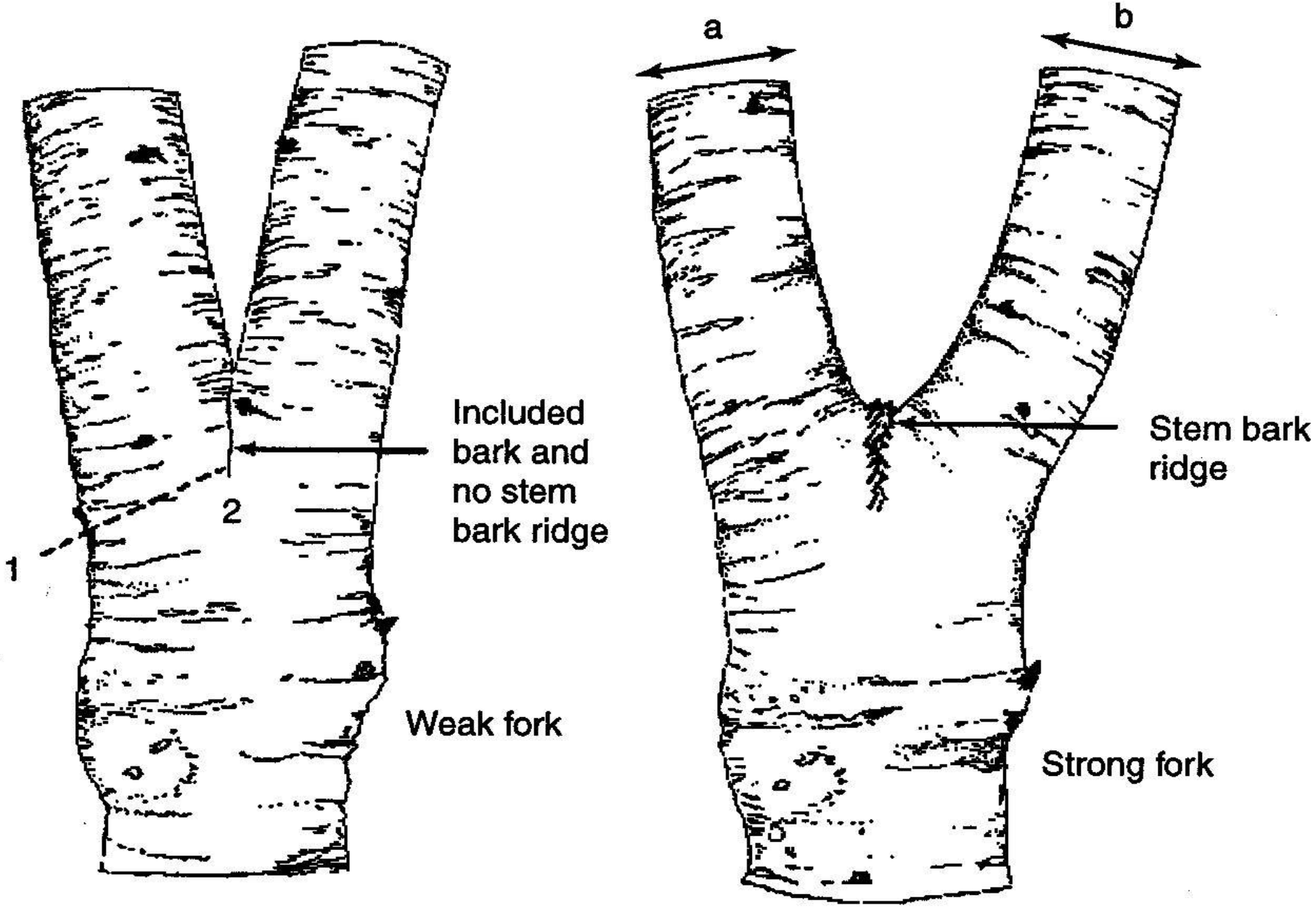


Trees with Poor Structure are more Vulnerable to Damage





Two codominant stems



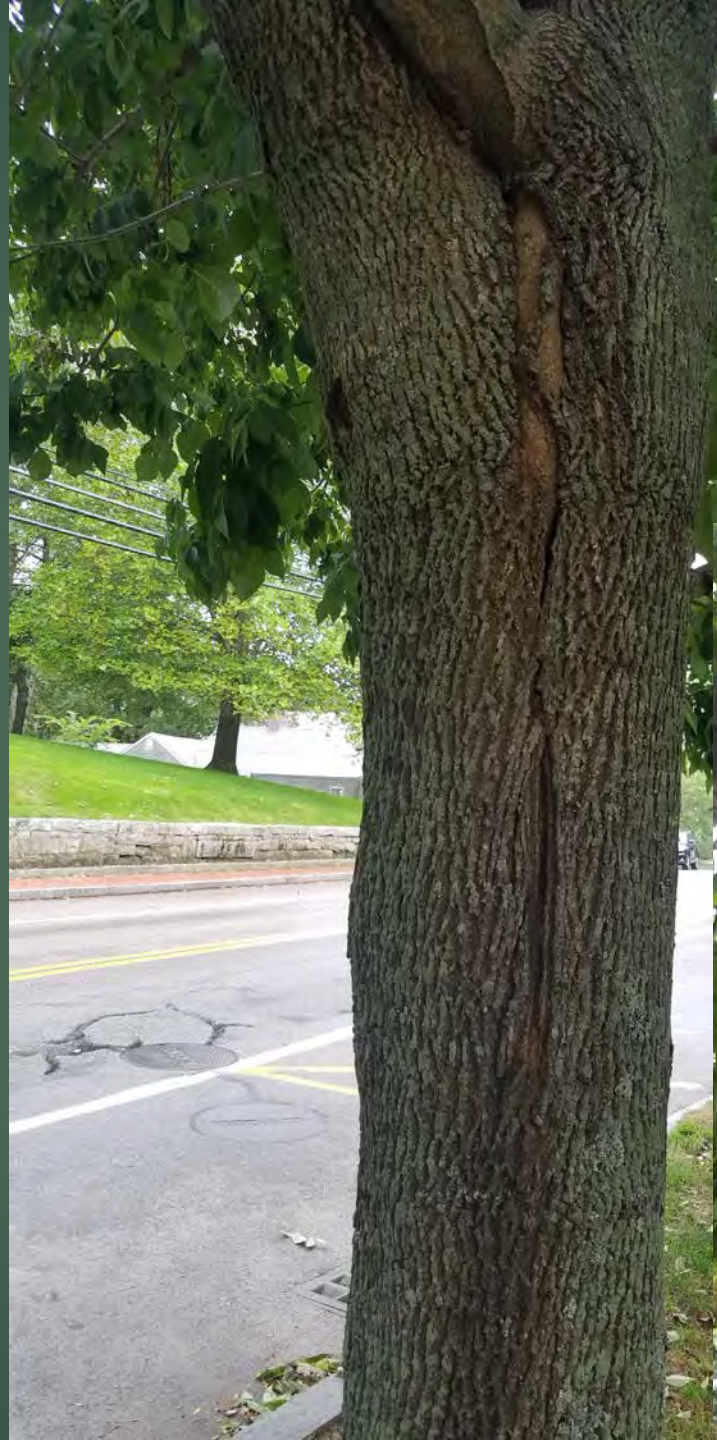
Why are they a problem?

Included bark beginning to form


Bark inclusion
Decay and discoloration from self wounding

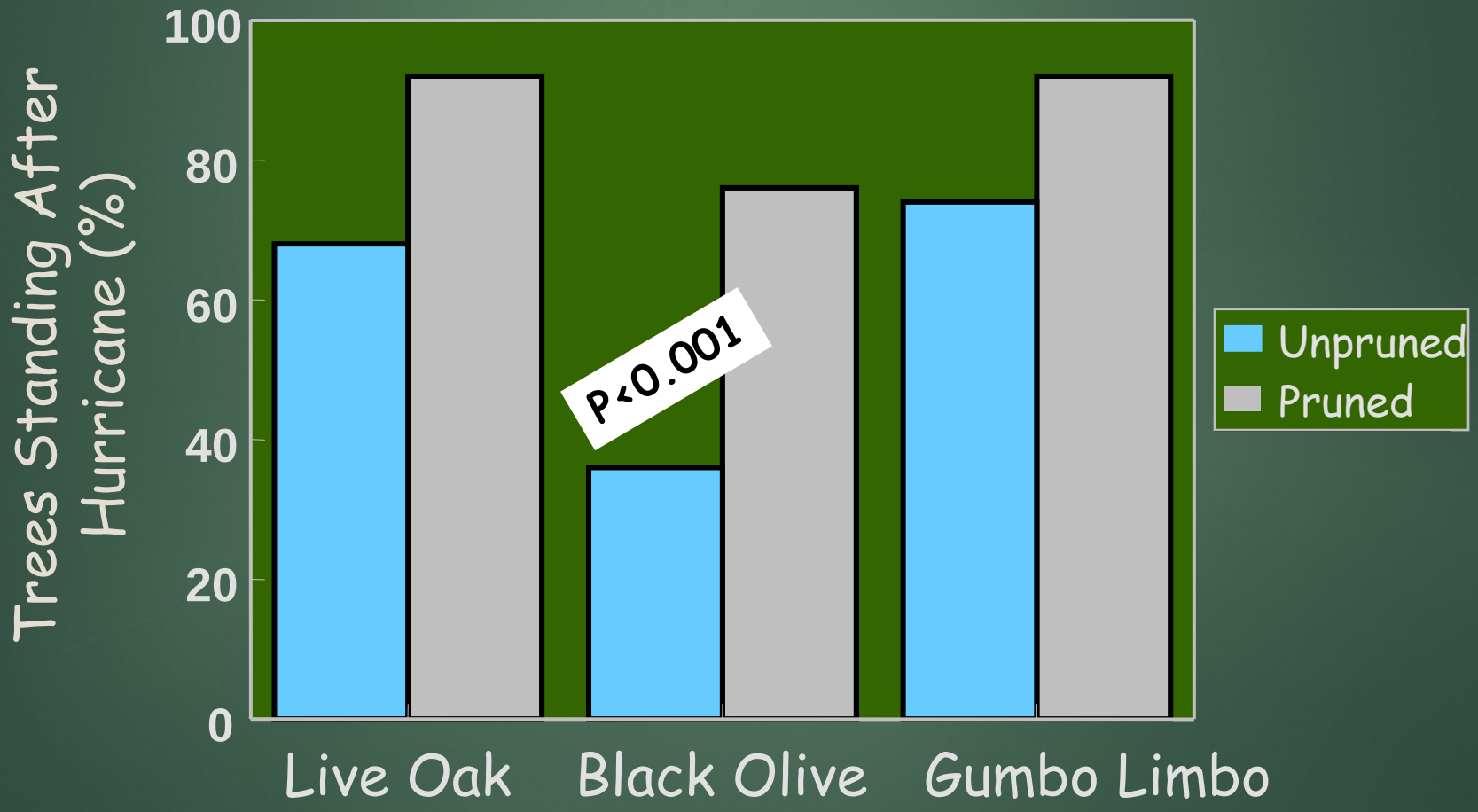
These are weak


Elephant Ears



Don’t forget hazard risk is based on probability of personal injury or property damage.

Well-pruned trees survive better than unpruned trees



Pruning treatment	Before testing	During testing
No pruning		 Lower trunk angle at 120mph = 27 Upper trunk angle at 120mph = 46
Reducing	 Crown was reduced in height using a reduction cut.	 Lower trunk angle at 120mph = 10 Upper trunk angle at 120mph = 17

Thinning		Crown was thinned by removing primary branches back to trunk.		Lower trunk angle at 120mph = 12 Upper trunk angle at 120mph = 23
Raising		Crown was raised be removing lowest branches.		Lower trunk angle at 120mph = 10 Upper trunk angle at 120mph = 31

Training Young Trees

- Select the central leader
- Identify permanent scaffold branches
- Remove or subordinate competing and aggressive branches
- Leave as much foliage as possible (1/3 rule)

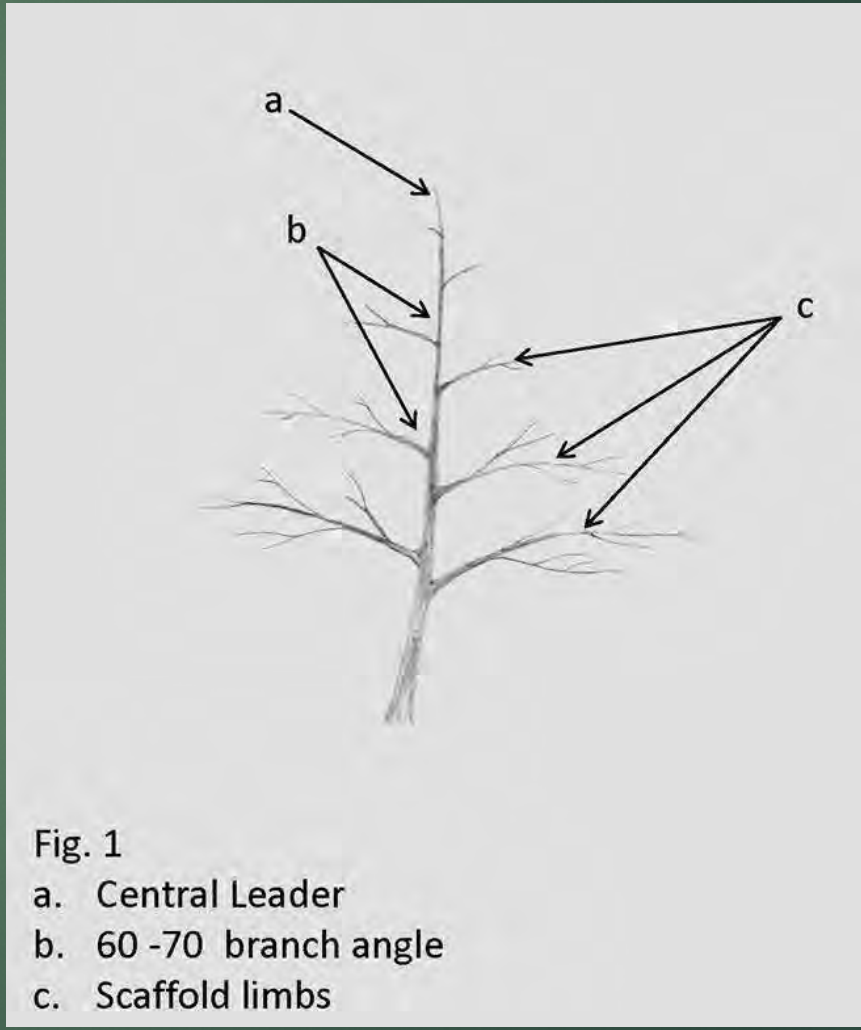
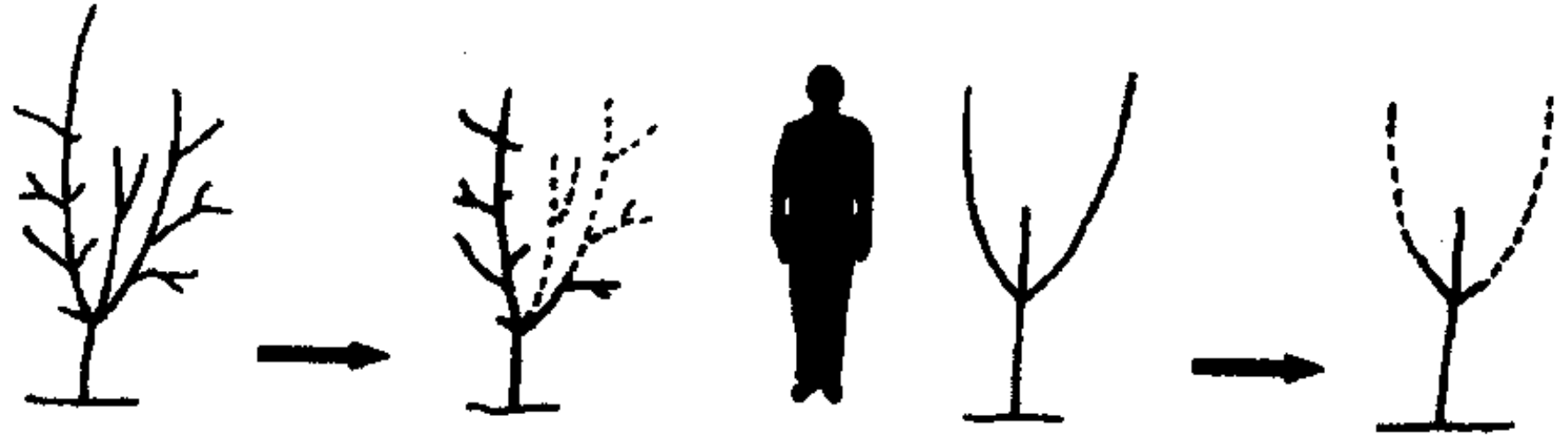
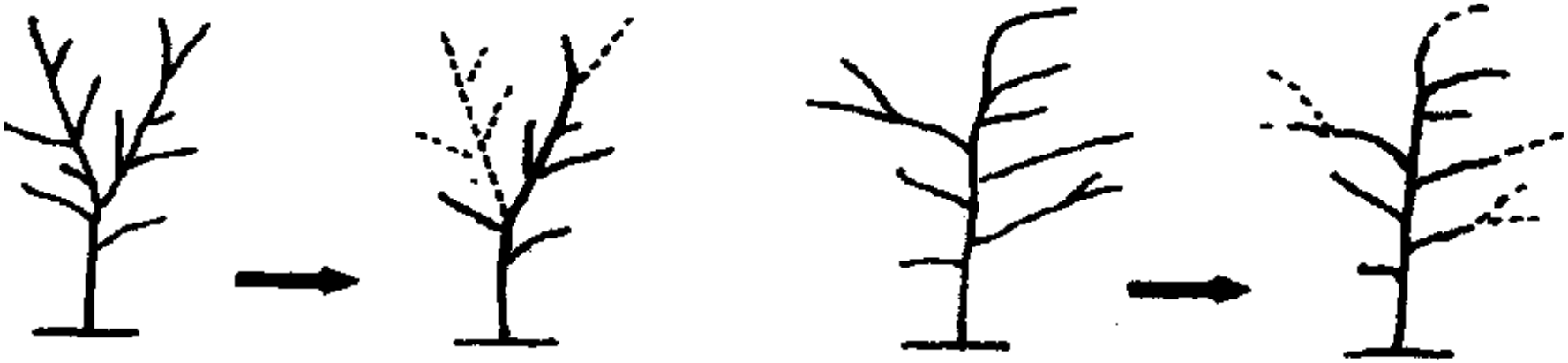


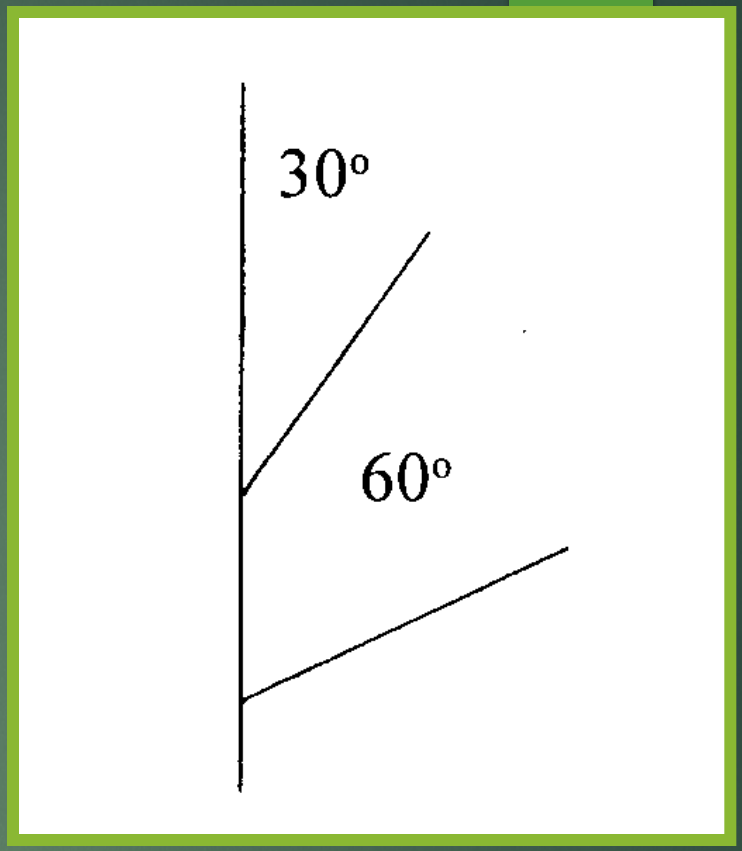
Fig. 1
a. Central Leader
b. 60 -70 branch angle
c. Scaffold limbs





Narrow crotches are weak and prone to splitting

60 and 70 degree branch angles have greater strength / less storm damage



Waiting too long to correct a problem may result in a disfigured tree.

Photo: David Seavey

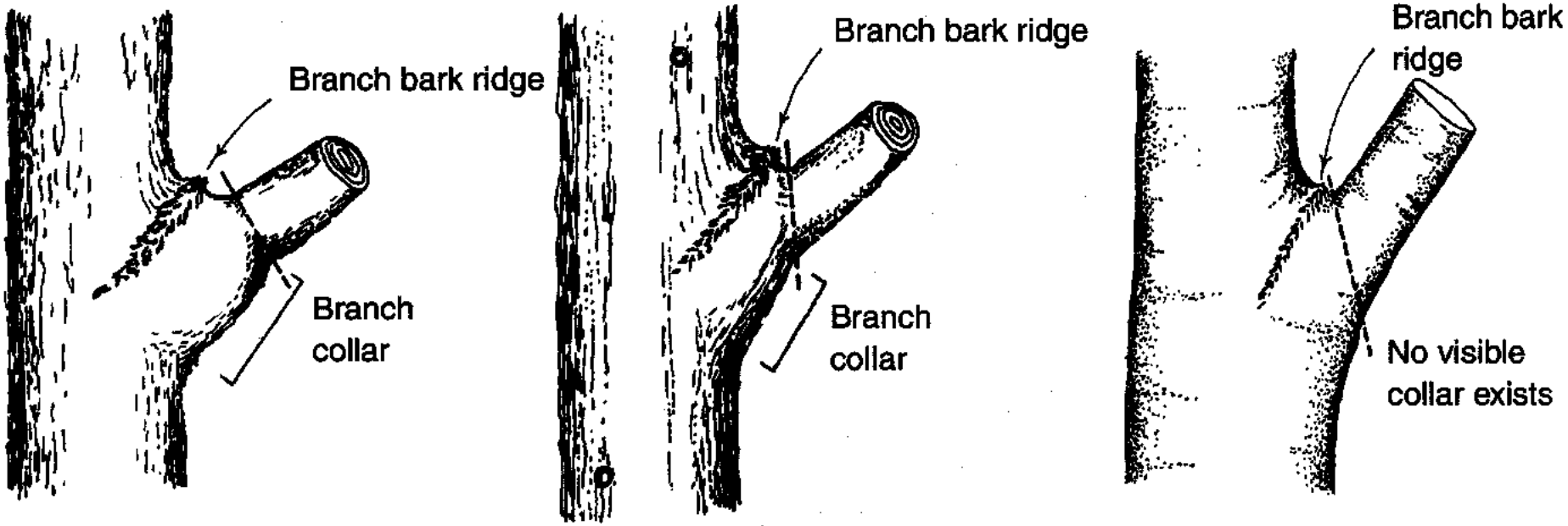
Closely spaced scaffolds restrict growth of central leader

Remove branches that touch or are on top of one another

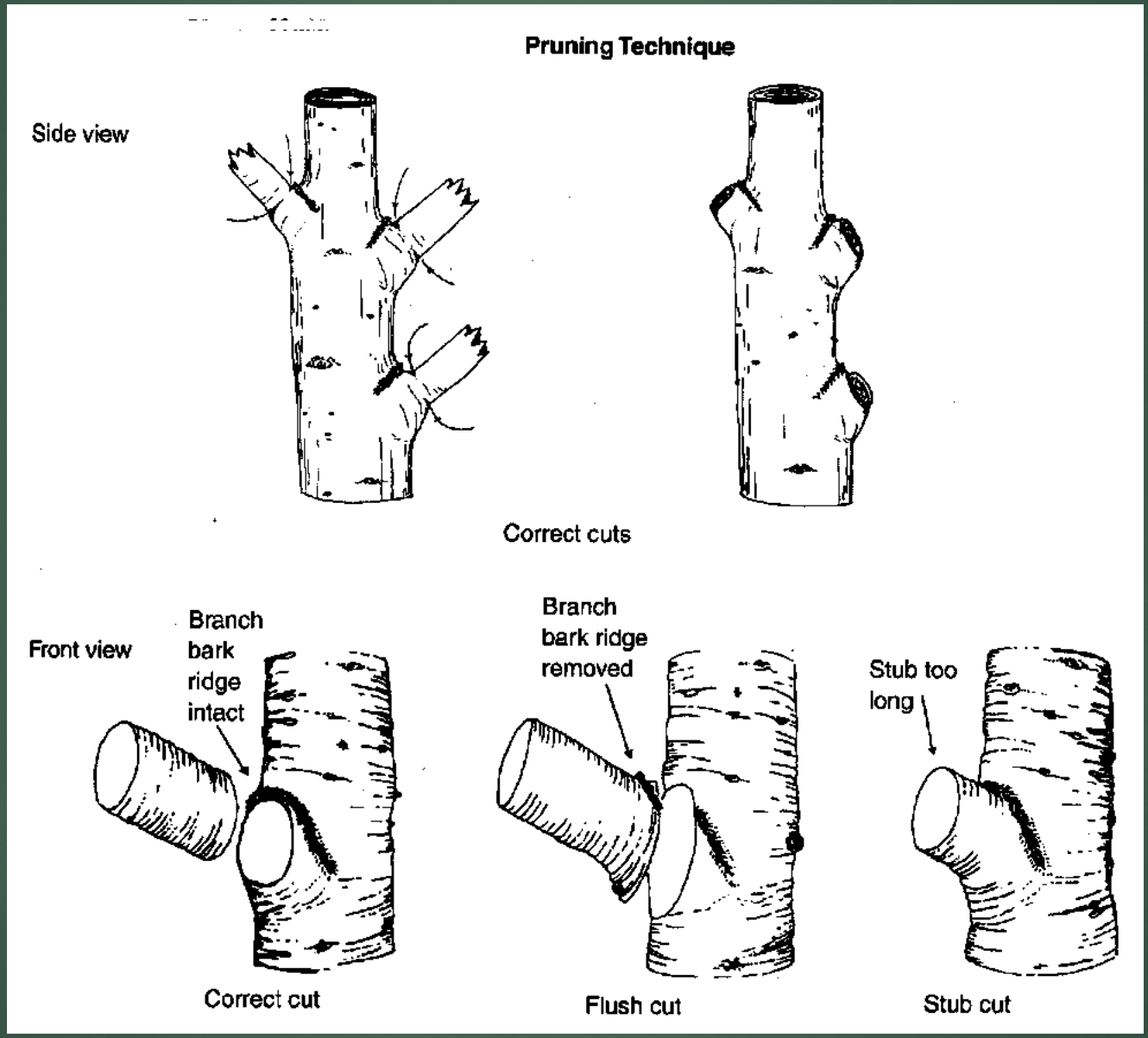
Leave branches equally spaced along the trunk

Photo: David Seavey

Branch Attachment



Proper Pruning Cuts

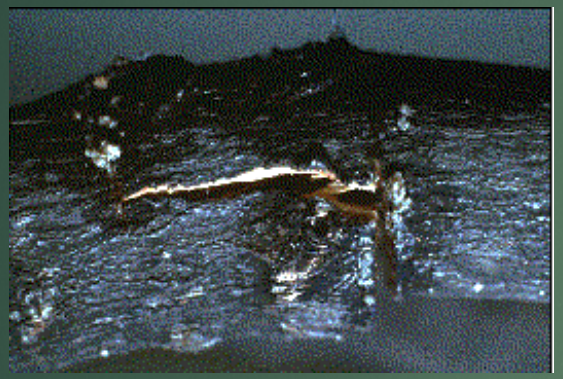


Proper Pruning Cuts

Callus or woundwood develops in a smooth circular pattern if pruning cuts were made properly.

Oval shaped or irregular callus indicates injury to the trunk or parent branch.

Large Branch Removal



First cut on underside;
one foot from trunk

Second cut on top;
slightly past underside cut

Branch weight is reduced

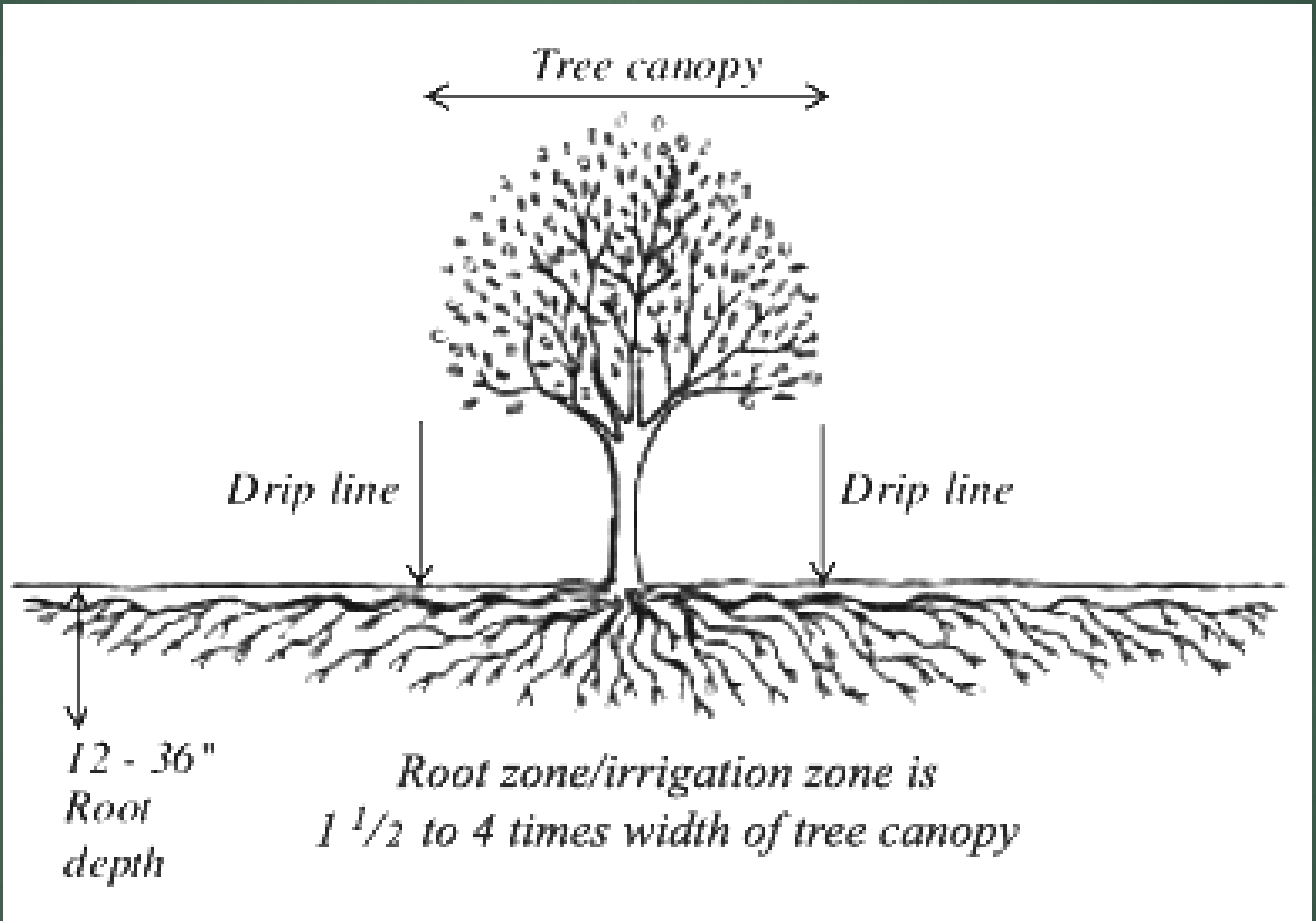
Final Step - Make a bottom cut at the outside edge of the branch collar.

Photos: David Seavey

Trees with more rooting space survive better

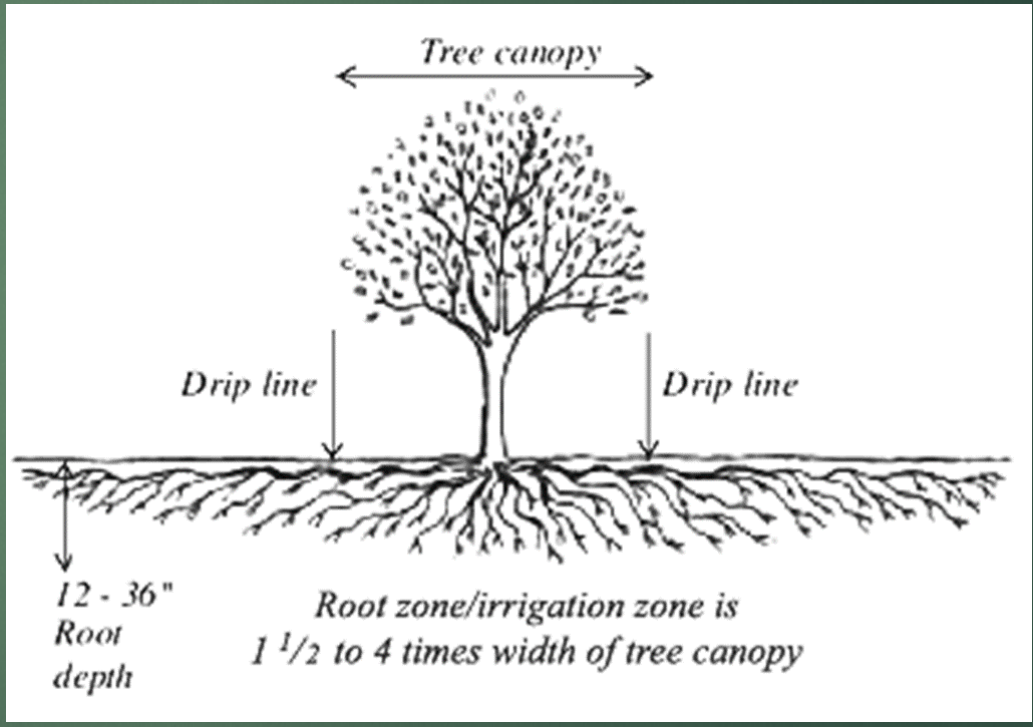
Photo Credit: Chuck Lippi

Photo Credit: Brent Marable


Tree canopy
Drip line
Drip line
12 - 36"
Root
depth
Root zone/irrigation zone is
1 1/2 to 4 times width of tree canopy

Root Space

- Minimum
  - Small Trees (< 30') – 10' x 10'
  - Medium Trees (30 - 70') – 20' x 20'
  - Large Trees (>70') – 30' x 30'



Soil Depth

Roots cut during construction

Step one

Step two

Step three

Photo credit: Andy Kittsley

Recommendations

- When a tree fails, plant a new tree
- Plant Trees in groups of 5 or more
  - Plant with diversity in mind
- Plant Wind Resistance Trees
- Give trees enough rooting space for the mature size of the tree
- Evaluate above and below ground considerations for space based on mature size of tree
- Consider life span when managing trees
  - Remove over mature trees
- Remove hazard trees
  - Poor Structure, Decay

Hire a Certified Arborist

- International Society of Arboriculture
  - https://www.isa-arbor.com/
- Massachusetts Arboriculture Association
  - https://massarbor.org/

Trees near utilities

- https://www.eversource.com

Questions??

- Russell Norton
  - rnorton@barnstablecounty.org

Credits

- Content including pictures, research, and data from the University of Florida
- Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida

- https://hort.ifas.ufl.edu/woody/index.shtml