

PRUNING DECIDUOUS FRUIT TREES

Principles for Tree Health
and for Fruit Production

Principles for tree health and for fruit production

Traditional pruning methods have frequently emphasized fruit production while sacrificing tree health and long tree life. Skills needed to prune trees properly take time to learn and training to develop.

It is often easier and often considered more “cost effective” to prune trees without regard to long tree life and to instead replace the trees after a relatively short period of time (10 – 20 years).

Principles for tree health and for fruit production

Recent research on pruning by Richard Harris and Alex Shigo (among others) has taught new principles and given new insights on how plants respond to pruning and how pruning affects tree health.

Using these principles to prune fruit trees can increase tree longevity and fruit production while reducing maintenance costs as well as help to reduce pest and disease problems on our fruit trees!

PRUNING:

- ◆ A pruning cut is a wound that is a possible entry point for decay, diseases or insects.
- ◆ Plants "heal" a wound by a process called compartmentalization. This process surrounds the wounded area both internally and externally with tissue that has greater resistance to decay. The wounded area never grows back together and this wound remains a weakened area for the life of the plant.



PRUNING:

- ◆ Cutting a small branch and making a small wound is always more desirable than cutting a larger branch and making a larger wound. Larger wounds take longer to "heal" (or compartmentalize) and have greater potential for attack by decay organisms, diseases and insects.



Pruning Sealers

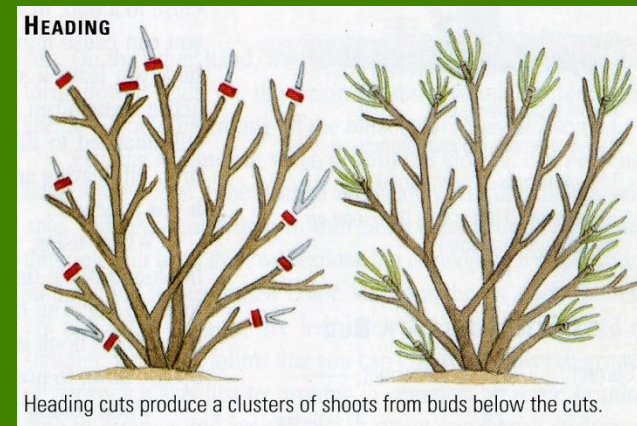
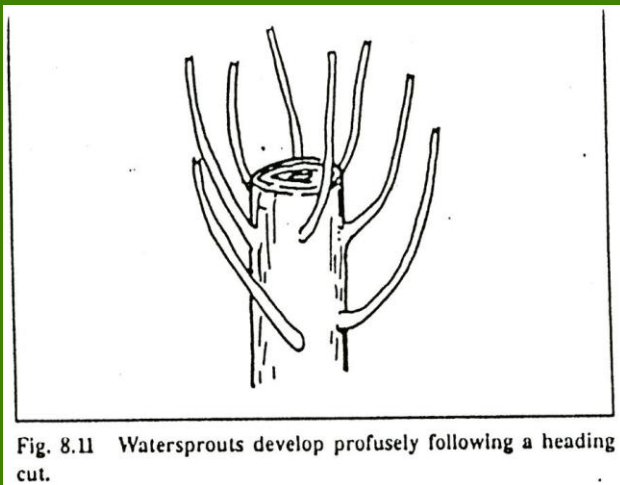
- ◆ Although pruning sealers have commonly been recommended to use on pruning wounds, studies have shown that **these products are not beneficial and should not be used!**
- ◆ At best, they are purely cosmetic and do no good.
- ◆ At worst, they trap disease organisms against the wounded area and encourage disease and decay as well as impair the ability of the tree to grow over the wounded area and compartmentalize the wound!
- ◆ **Do not use these products when pruning your trees!**



Types of cuts:

Heading cuts / Topping cuts:

- ◆ Cuts made to remove a portion of a branch, stem or trunk. Cuts are made without regard to the position of the cut or to lateral branch attachment.
- ◆ Heading cuts usually result in excessive branch development below the cut. These branches are usually poorly attached and frequently break off damaging the branch or trunk they were attached to.



Heading cuts / Topping cuts:

- ◆ Traditional pruning recommendations advocate removing the top 1/3 of most or all branches to control the tree size.
- ◆ This results in excessive sucker growth which results in poor branch structure, overcrowding, greater occurrence of diseases or insects and poor fruit quality.



Never top or head branches or trees!!!

- ◆ Topping or heading has many harmful effects on tree growth and tree health. The results include excessive, poorly attached branch growth, disease and decay, and starvation among others and never results in reducing the size of the tree long term!
- ◆ The only exception is when you are pollarding a tree or creating a hedge.

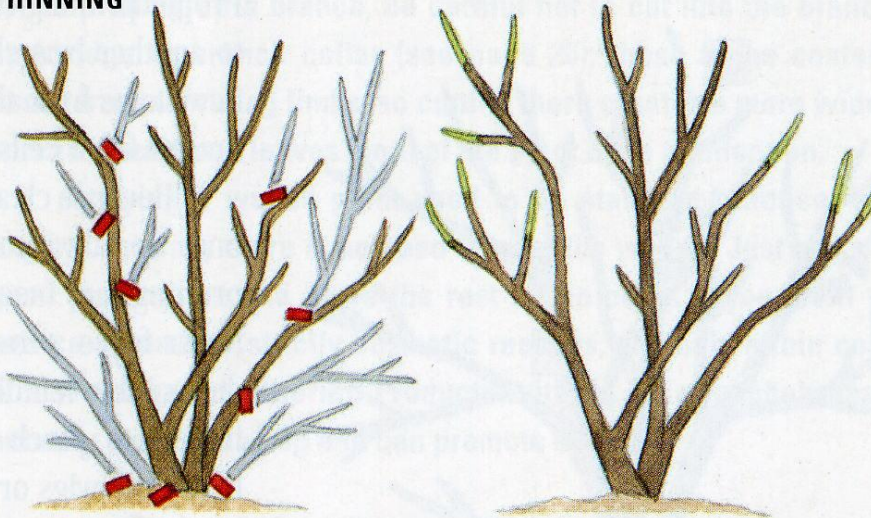


Types of cuts:

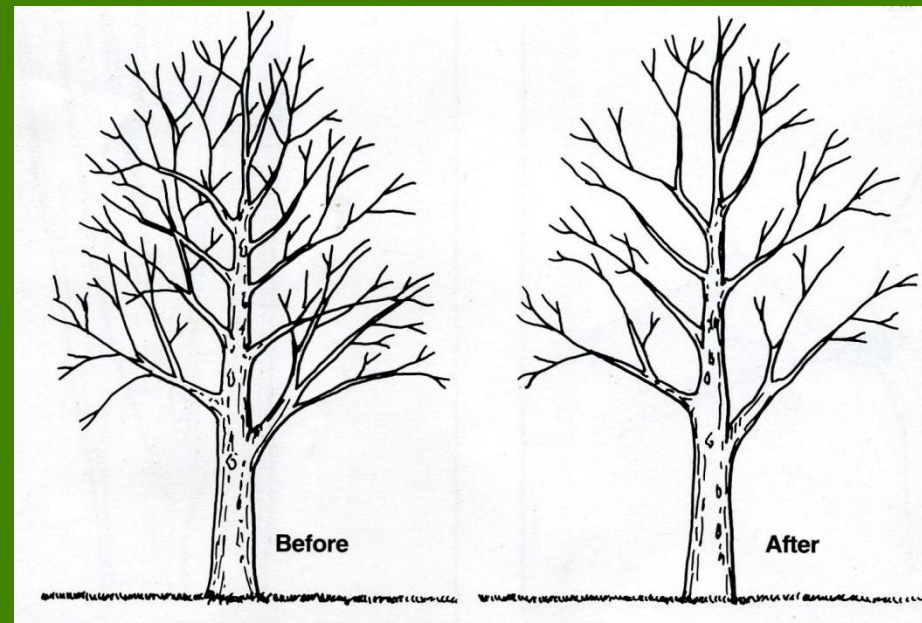
Thinning cuts

- ◆ Thinning cuts - Cuts used to remove an entire branch or stem at the point of origin, or to remove a portion of a branch or stem by cutting back to the crotch of a branch which is at least $\frac{1}{3}$ of the diameter of the branch that is being removed, (drop crotching).

THINNING



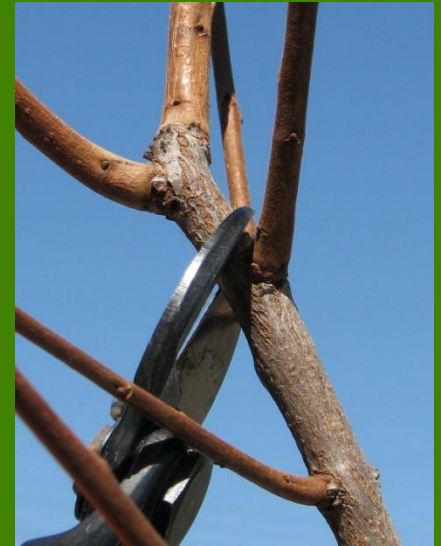
Thinning cuts open up a plant and cause the least amount of regrowth.



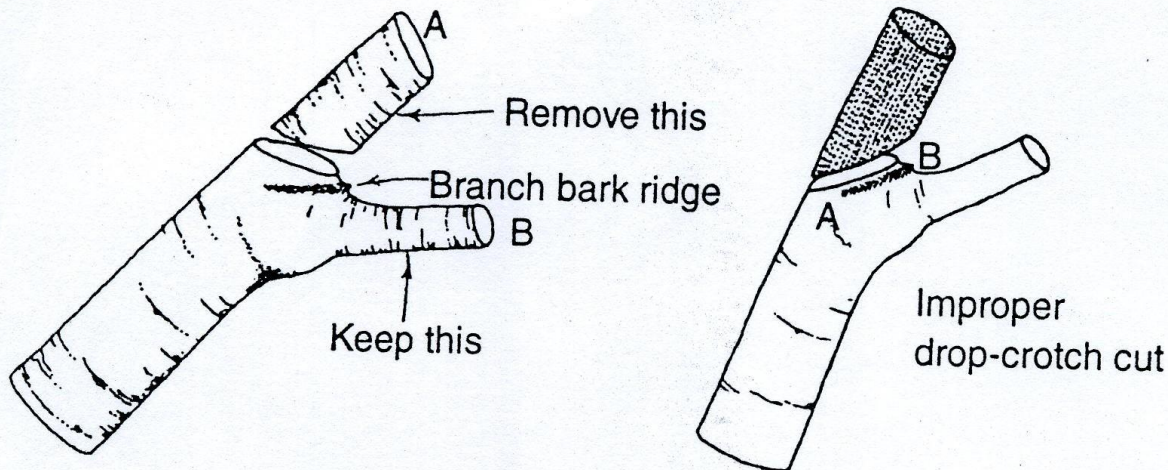
Types of cuts:

Drop Crotch cuts

◆ Drop crotch pruning is a type of thinning cut and is a recommended method for reducing the size of a plant in both height and width.

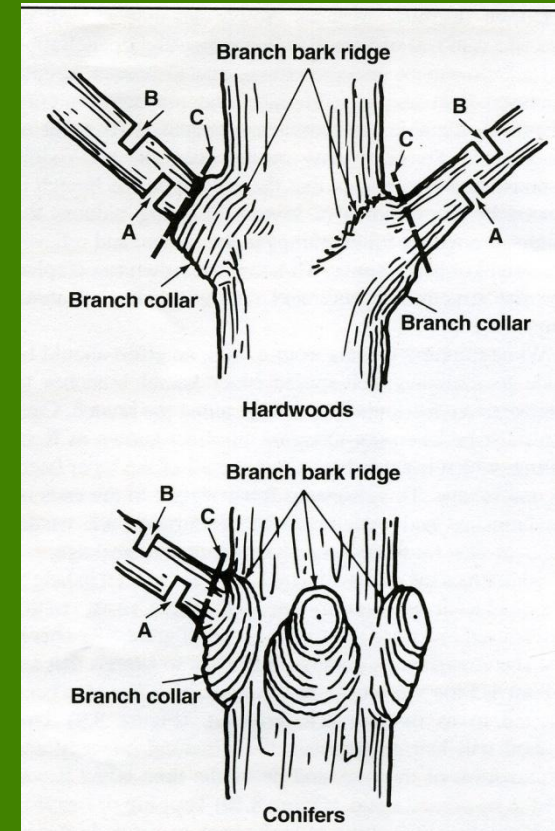
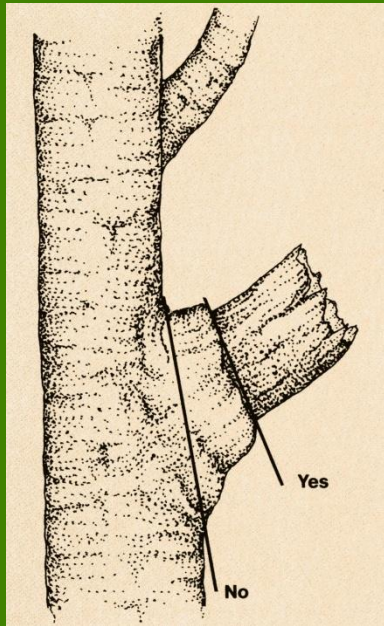


Drop-crotch cut



Making proper cuts:

- ◆ When making thinning cuts, remove the branch at the top of the collar or shoulder of the remaining branch.
- ◆ This will trigger a "wound response" which initiates compartmentalization and callus tissue formation at the wound site.



Making Cuts with Bypass Hand Pruners and Loppers

- ◆ Place the cutting blade at the top of the collar to make a correct cut.



- ◆ Placing the cutting blade on the outside of the cut will leave a stub above the remaining branch collar.



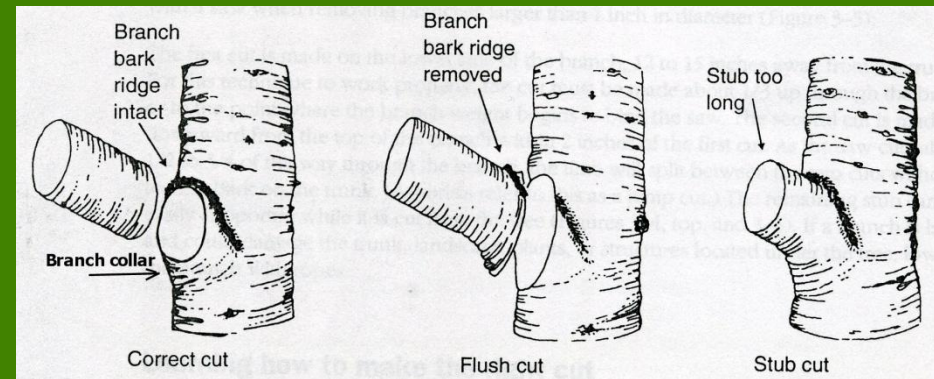
Making proper cuts:

- ◆ Never leave stubs...

The cut will not compartmentalize, and decay and disease will enter the wound.

- ◆ Never make flush cuts.

This makes a larger wound which takes longer to compartmentalize and also removes the collar or shoulder which is helpful in triggering the wound response.



- ◆ Never make ripped or torn cuts.

- ◆ When removing a larger branch, follow the three cut process to prevent damage to the bark.

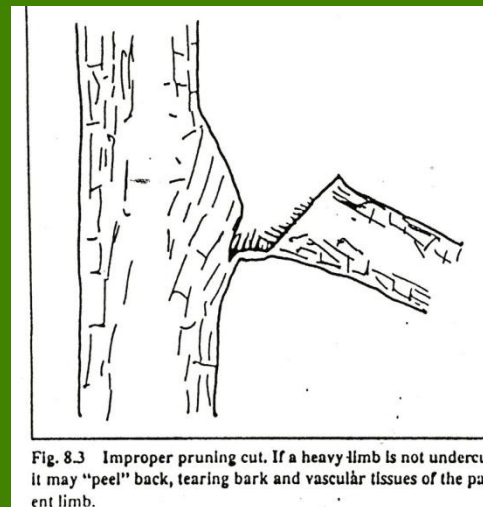
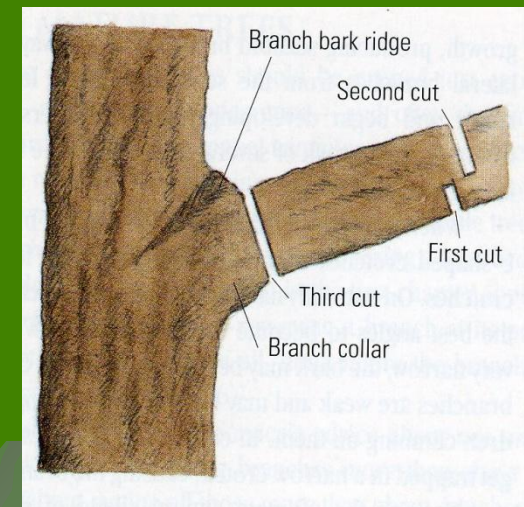
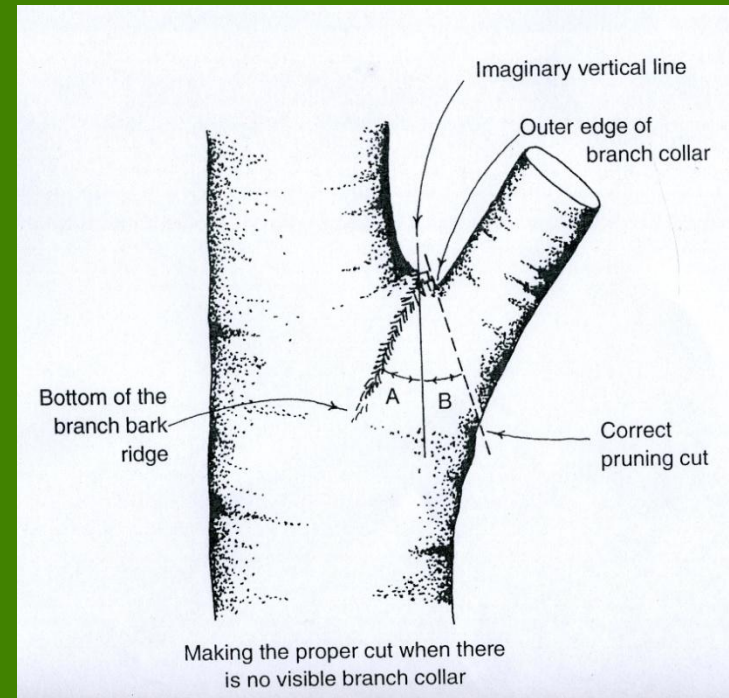
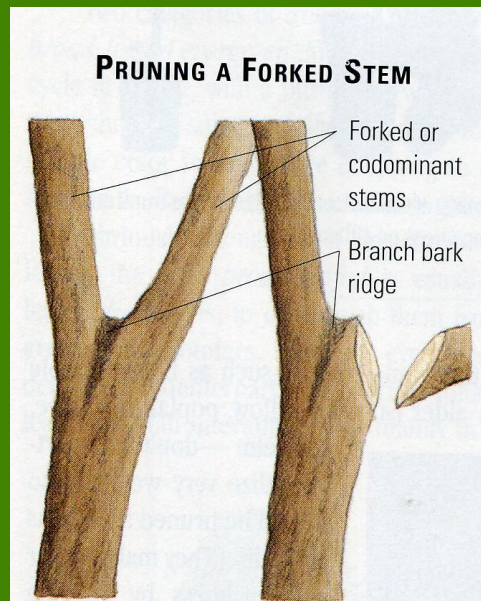
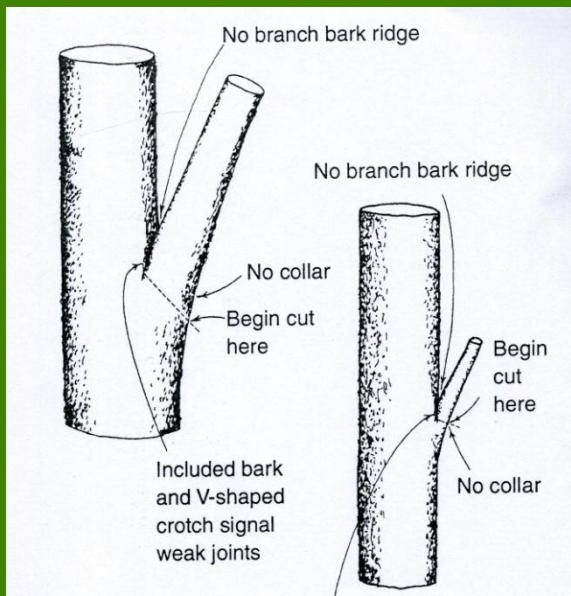


Fig. 8.3 Improper pruning cut. If a heavy limb is not undercut, it may "peel" back, tearing bark and vascular tissues of the parent limb.



Making proper cuts:

- ◆ If no visible collar or shoulder is present, or visible, prune at a mirrored angle to the branch bark ridge.



Training

- ◆ Training branches to grow in specific directions is often a viable option to pruning. This can take advantage of growth which has already developed instead of pruning off already grown branches and waiting for new branches to grow.



- ◆ Using training techniques can avoid the wounds made by pruning and therefore reduce the problems associated with those wounds.

Training

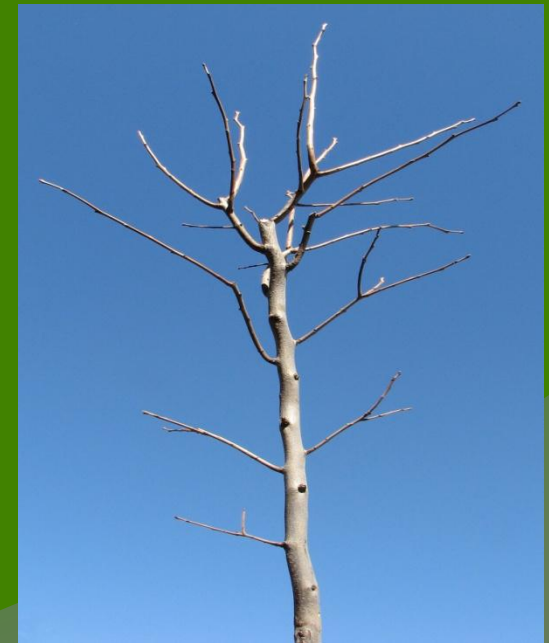
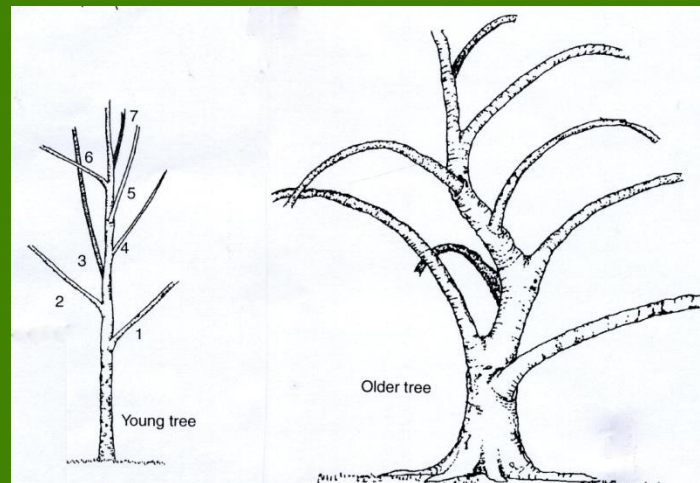
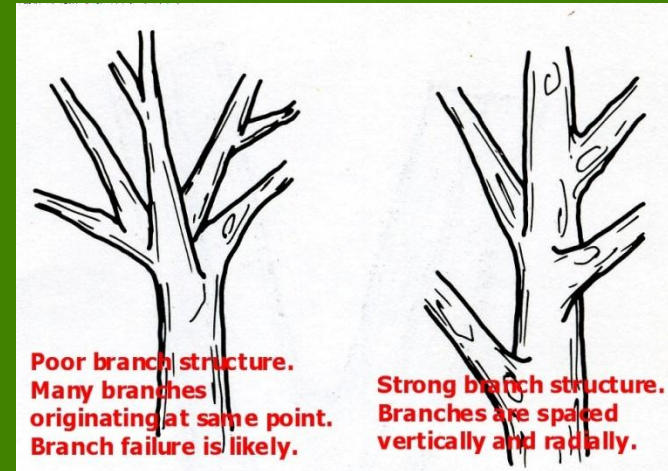
- ◆ Training should be done when branches are young and flexible enough to bend into shape without breaking or splitting the branch or trunk. Weights, guy wires, stakes or spreaders can be used to train branches.
- ◆ If ties are used, the tie material should be at least 1" wide wherever it comes into contact with the bark of the tree to prevent damage to the bark.



REASONS TO PRUNE

Structural Strength:

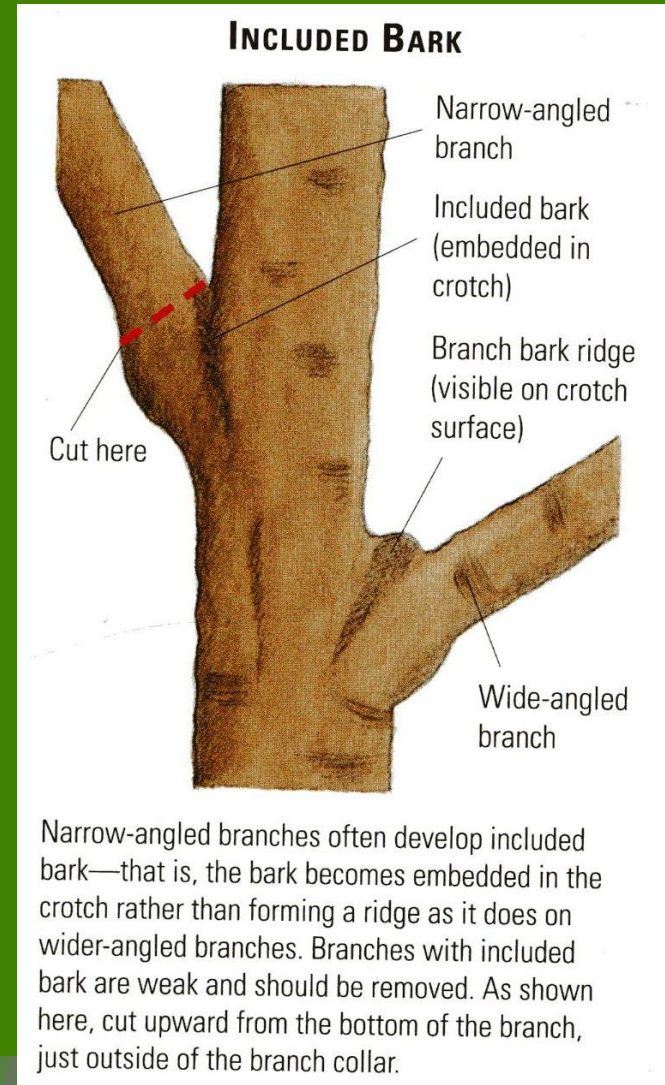
- ◆ Pruning for structural strength is especially important on fruit trees. Heavy crops of fruit can easily break branches, severely damaging main scaffold limbs or splitting trunks. Basic guidelines for structural pruning are as follows:
- ◆ Train scaffold branches to be spaced along the trunk both vertically and radially when trees are young.



REASONS TO PRUNE

Structural Strength:

- ◆ Increase the crotch angle of branches to greater than 30 degrees by spreading branches apart or by pruning off one of the branches.



REASONS TO PRUNE

Structural Strength:

- Remove co-dominant leaders by removing or reducing one of the branches.

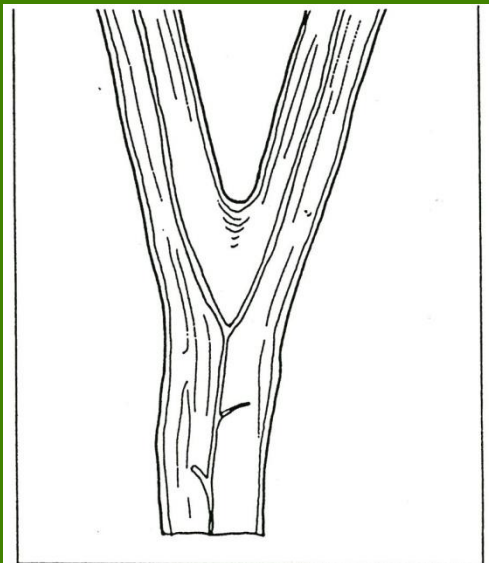
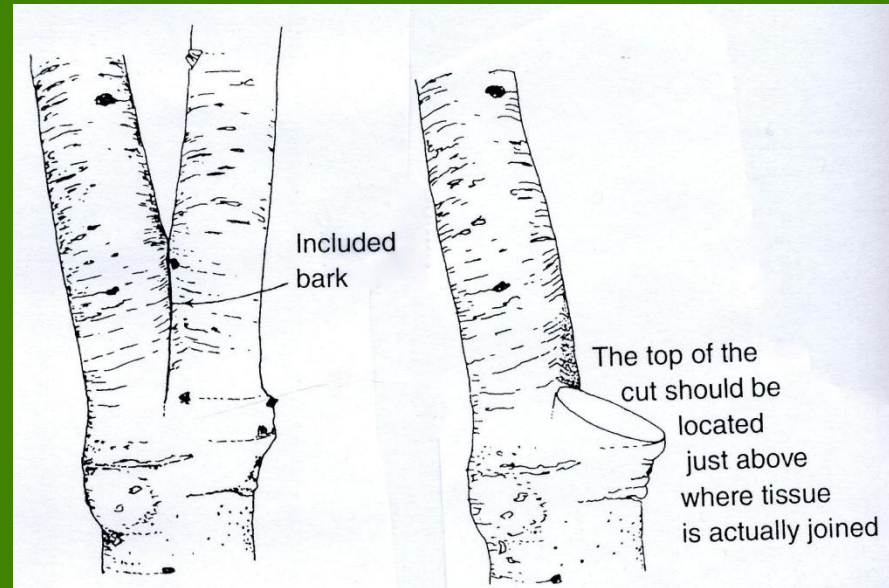
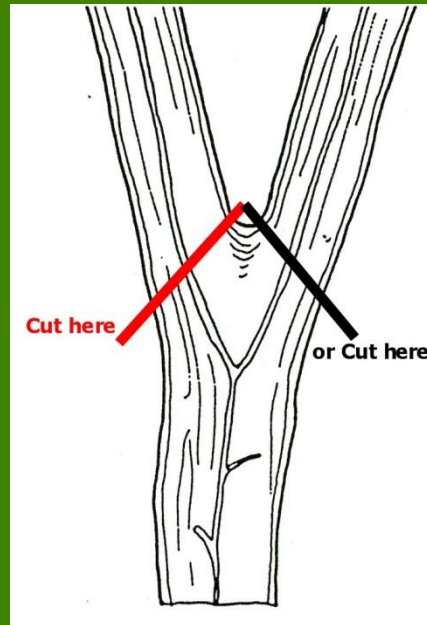


Fig. 8.4 Codominant stems. The nearly equal diameter of the two stems can make them more prone to failure.

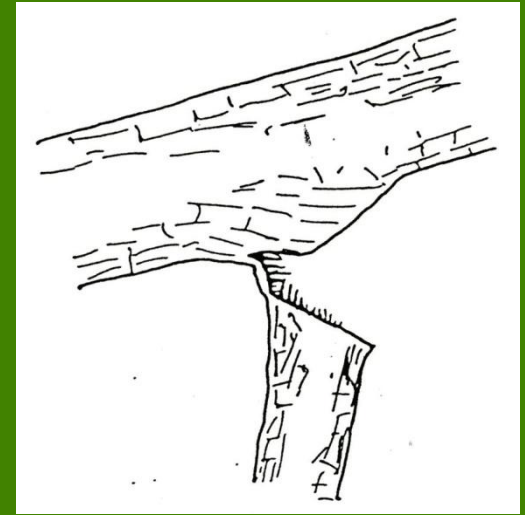


- Occasionally one of the branches can be redirected into a lateral branch by spreading the branch. This redirected branch will no longer be co-dominant. The crotch angle should be spread to 30 degrees or larger.

REASONS TO PRUNE

Structural Strength:

- ◆ Prune off branches which are attached to the bottom side of attached branches. (Unless this is going to become the new terminal end of the branch.)
- ◆ If these branches break, ripping or tearing of the bark of the supporting branch often results.



REASONS TO PRUNE

Health:

- ◆ Prune off the four D's: Dead, Damaged, Diseased and Dysfunctional branches.
- ◆ Dysfunctional branches are branches which are pointing towards the ground or are crossing or rubbing other branches.



REASONS TO PRUNE

Fruit or Flowers:

- ◆ Prune to leave flowering and fruiting wood for specific fruit types. (Fruiting spurs, last season's growth/ one year old wood, or current season's growth.)
- ◆ Thin branches and fruiting wood to allow adequate light penetration and air circulation for proper fruit development for each fruit tree type.



FRUITING HABITS OF COMMON DECIDUOUS FRUIT AND NUTS

Current-Season's Shoots

- ◆ Che
- ◆ Fig — second crop
- ◆ Mulberry
- ◆ Persimmon
- ◆ Quince
- ◆ Walnut

Previous-Season's Shoots

- ◆ Fig — first crop
- ◆ Filbert
- ◆ Nectarine
- ◆ Peach
- ◆ Pistachio
- ◆ Quince

Previous-Season's Spurs and Shoots

- ◆ Apple — minor
- ◆ Cherry, sour
- ◆ Pear — minor
- ◆ Pomegranate

Long-lived Spurs

- ◆ Almond
- ◆ Apple
- ◆ Apricot and Aprium— short-lived spur
- ◆ Cherry, sour
- ◆ Cherry, sweet
- ◆ Pear
- ◆ Pecan
- ◆ Plum,
- ◆ Plumcot
- ◆ Pluot
- ◆ Pomegranate

Current-Season's Shoots



Fig



Avocado



Citrus



Surinam Cherry

Previous-Season's Shoots



Peach and
Nectarine



Pomegranate



Fig



Mulberry



Loquat

Fruiting Spurs - Apricot



Fruiting Spurs - Plum



Fruiting Spurs - Cherry



Fruiting Spurs -Apple



Fruiting Spurs - Pear



Managing Fruiting Spurs



- As time progresses, fruiting spurs and fruiting wood becomes excessively crowded. This often results in small, poor quality fruit and broken limbs.



- Thin out spurs and fruiting branches to improve light penetration and air circulation, reduce overcrowded fruit, reduce the risk of broken branches and to improve the quality of the remaining fruit.



REASONS TO PRUNE

Shape:

- ◆ Prune trees to specific shapes for best fruit production.
- ◆ Open vase or modified open vase for trees in the genus *Prunus*.
- ◆ Central leader or modified central leader for all others.



REASONS TO PRUNE

Shape:

- ◆ Many fruit trees can also be pruned or shaped for specific function in the landscape such as shade or patio trees, hedges, screens or espaliers.



REASONS TO PRUNE

Direct or redirect growth

- ◆ Manage the growth in the tree so that one branch or side of the tree does not overgrow the other portions of the tree and so that the tree keeps a balanced shape.
- ◆ Prune to a terminal branch to direct growth in that direction.
- ◆ As branches bend downward from the weight of fruit, foliage, or wood, they often need to be pruned back into an upright growing position.



REASONS TO PRUNE

Direct or redirect growth

- ◆ As branches bend downward, redirect growth upwards using drop-crotch pruning techniques to a side or top, upright growing branch.



REASONS TO PRUNE

Size:

- ◆ Fruit trees which are pruned to their maximum size will produce the greatest amount of fruit. These trees are pruned into central leader or modified open vase shapes.

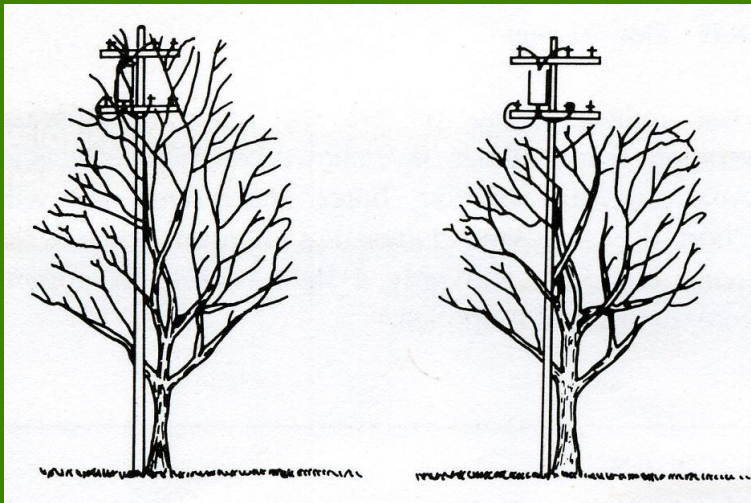
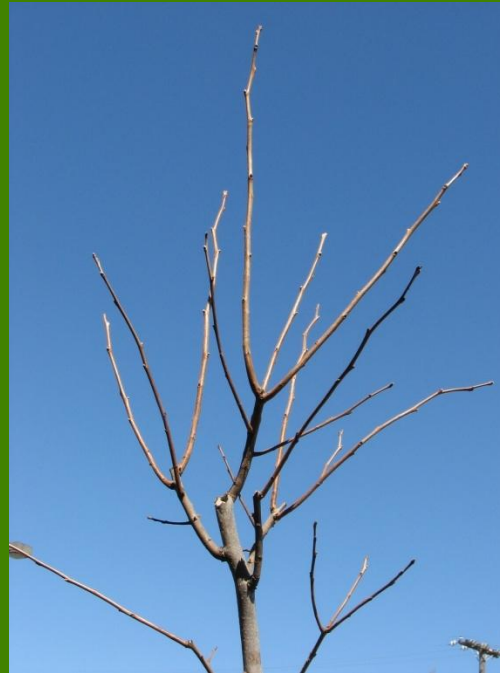


- ◆ To keep fruit trees smaller for ease of picking the fruit, to get more trees into an area, or because of space limitations, prune to modified central leader or open vase shapes.



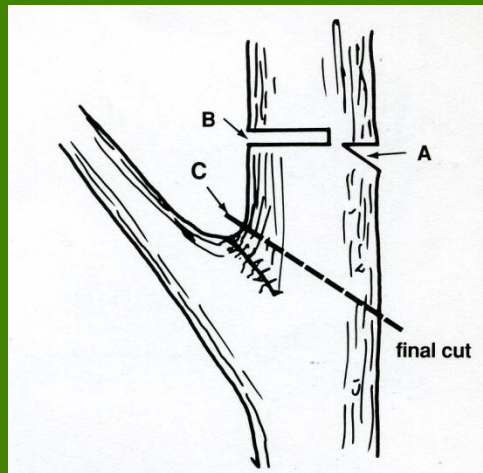
Never top or head branches or trees!!!

- ◆ Reduce the height or width of a tree, or the length of a branch with thinning cuts by the pruning technique known as drop-crotching.



Drop Crotch Pruning

- ◆ Drop crotch pruning is to prune a branch by dropping back from the apical tip to a lower lateral branch. This lateral branch should be at least $\frac{1}{3}$ the diameter of the branch which is being removed.
- ◆ A pruning cut is then made at the top of the collar of the lateral branch.



Drop Crotch Pruning

- ◆ Each branch is pruned individually, reducing the height or width of the entire tree to a lateral branch. The remaining lateral branch should not be topped.
- ◆ The apical growing tip of the lateral branch takes over the dominant role as the new apical leader and suppresses the development of branches below the pruning cut.



Managing Suckers: (Root Suckers)

- ◆ Most deciduous fruit trees are grafted.
- ◆ All growth arising below the graft or from the root system should be removed to prevent the root stock from dominating and dwarfing out or killing the desired grafted tree.



Managing Water Sprouts:

- ◆ Water sprouts are vigorously growing upright shoots arising from above the graft union on grafted trees.
- ◆ In some cases, water sprouts can be trained to form strong branches and may be beneficial.
- ◆ If water sprouts are excessively crowded, have narrow crotch angles, are crossing or rubbing, or are causing poor branch or tree structure, they should be removed.



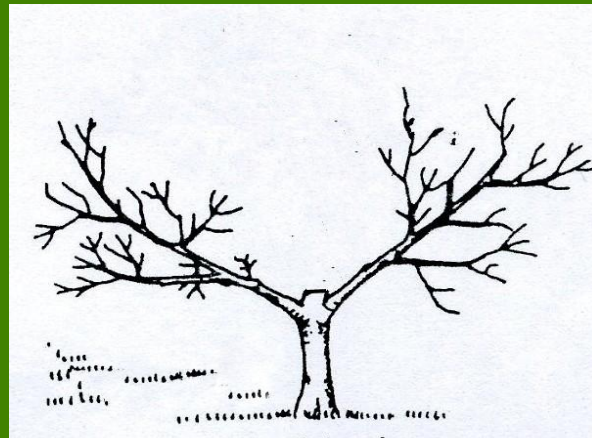
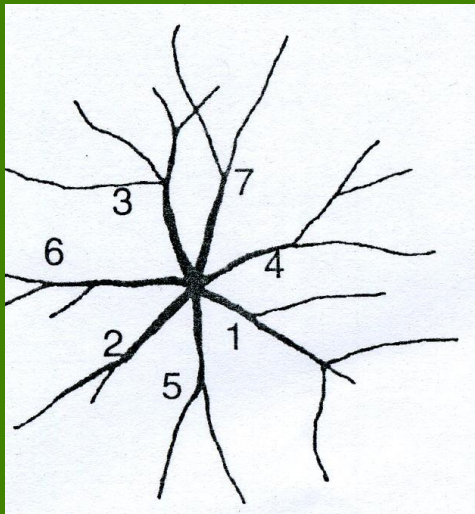
Timing:

- ◆ Improper timing can predispose plants to attack by insects, diseases, or damage from sunburn or sunscald.
- ◆ Most pruning should be done during the winter months on deciduous fruit trees when the trees are dormant and when insect populations are suppressed by the winter cold.
- ◆ In some cases, lighter summer pruning can be beneficial for keeping trees smaller, however many bark boring insects are promoted by summer pruning. If these insects are common in your area, keep summer pruning activities to a minimum.

PRUNING STYLES

Open Vase and Modified Open Vase

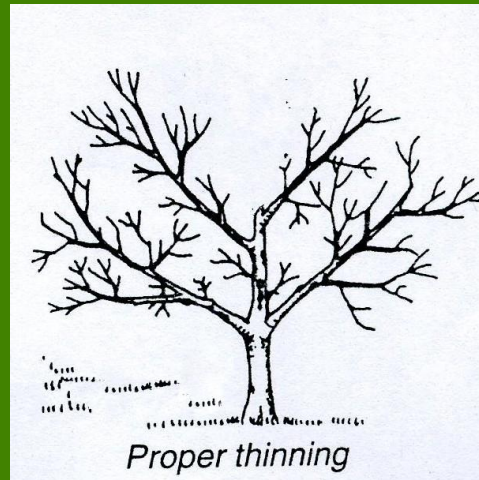
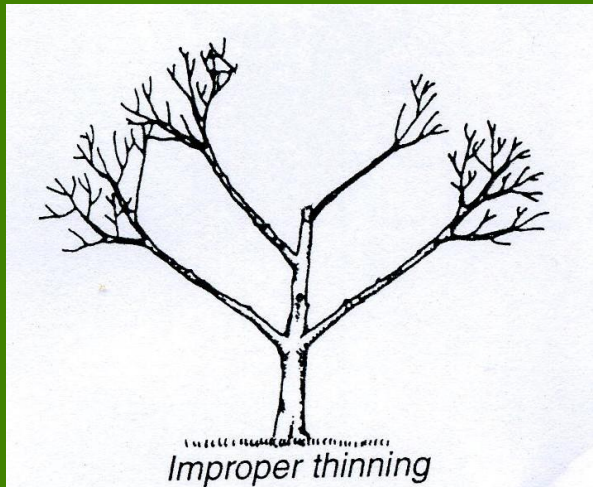
- ◆ Open vase and modified open vase pruning styles are used to maximize fruit production and fruit quality for fruit trees in the genus *Prunus* (peach, nectarine, plum, apricot and their interspecific hybrids; also almond).
- ◆ The open vase style resembles a bowl. Scaffold branches and secondary scaffold branches make up the sides of the bowl. All branches that grow towards the center of the bowl are removed to allow light and air to reach the interior of the tree.



PRUNING STYLES

Open Vase and Modified Open Vase

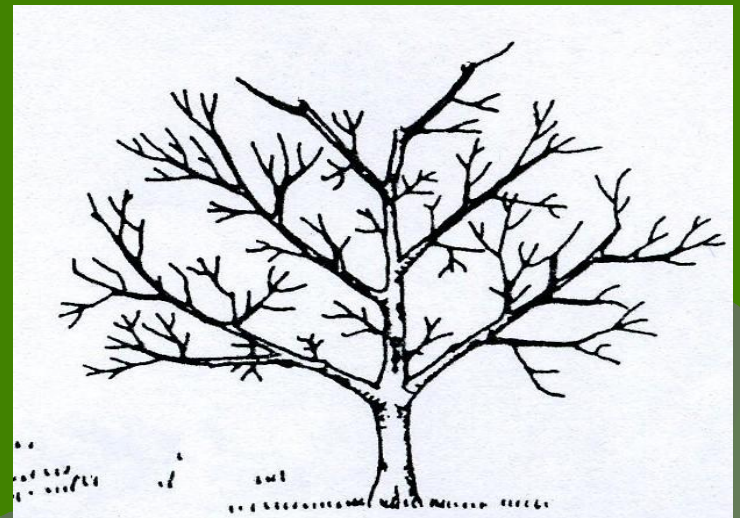
- ◆ Low growing or small branches should be left as long as they do not congest this open interior of the "bowl". These branches assist in increasing branch diameter (caliper) and strength as well as help to protect the bark from sunburn.
- ◆ If these branches are fruiting branches, leaving these branches will help bring fruit lower and therefore fruit will be easier to harvest.



PRUNING STYLES

Modified Open Vase

- ◆ The modified open vase pruning style differs from the open vase style by having more than one level or layer. Each level or layer is made up of a smaller "bowl" above and within the larger, lower bowl.
- ◆ Sufficient distance must be maintained between these layers to allow for good air circulation and good light penetration to the lower layer or layers.
- ◆ Large trees can have up to 3 layers, so that the overall appearance of the tree resembles candelabra. This results in a larger tree and greater fruit production than the open vase style.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

- ◆ Open vase shaped and modified open vase shaped trees will need to have an average of 40%=60% of growth removed on a yearly basis. Good pruning practices will help to reduce the amount of growth removed each year so that 20-40% branch removal is common.



Step 1:

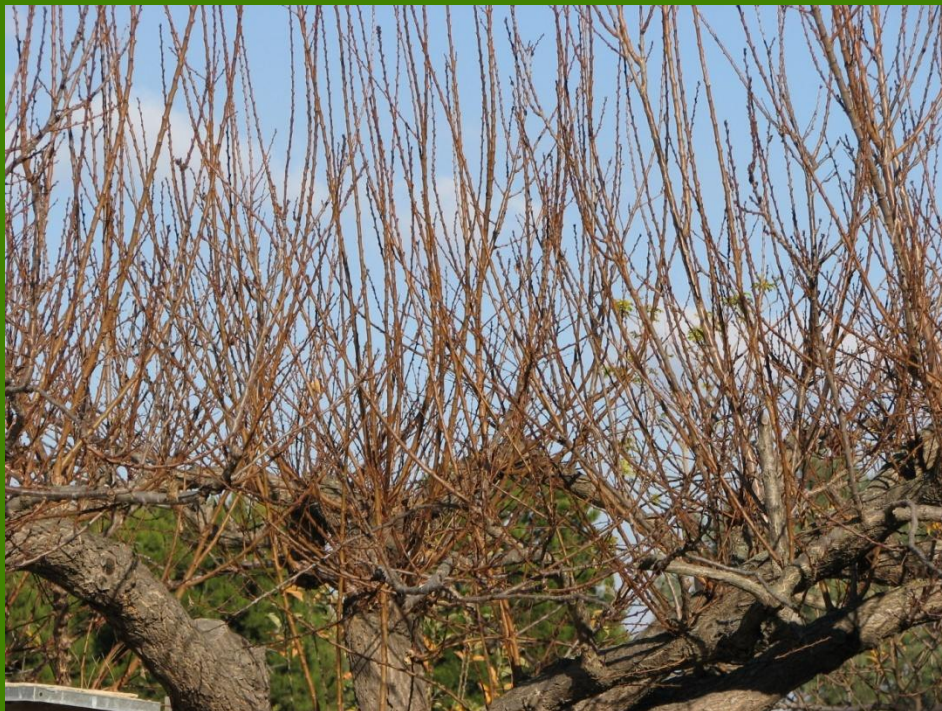
- ◆ Remove all suckers



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 2:

- ◆ Look at the entire tree and determine which branches need to be removed or redirected to open the center "bowl" or vase.
- ◆ Use pruning or training techniques to open the center of the tree.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

After the center has been opened up, ignore the overall tree until the final steps of the pruning process!

- ◆ Start pruning each scaffold limb one at a time, beginning with the lowest scaffold limb first.
- ◆ Start at the tree trunk and work your way towards the end of the branch.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

- ◆ Prune each branch for health, structural strength, flower and fruit production and to thin out crowded branches.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

- ◆ If branches are growing vertically and are crossing limbs which are growing above them, drop-crotch or remove the limb to prevent overcrowding and crossing branches.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

- ◆ After being properly pruned, the overall appearance of the scaffold branch will often be feather-like, with side branches and fruiting wood mainly attached to the top and sides of this branch.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

- ◆ Small branches and fruiting spurs may be attached to the bottom of the scaffold, provided they are not too crowded.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 3:

- ◆ As the scaffold branch matures, the ends of the branch will develop into a shape that resembles an outstretched arm and hand, with the “fingers” of the hand pointing upward and the “palm” of the hand directed towards the center of the tree.
- ◆ Branches should be spaced along the scaffold limb, alternating from side to side. The “fingers” and hand should form an open “cup” at the end of each limb.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 4:

- ◆ Move to the next scaffold branch and repeat the procedure outlined in step 3. Again start at the base of the branch and work outwards to the tip of the scaffold limb. Remember to focus on only the scaffold limb that you are currently pruning.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 5:

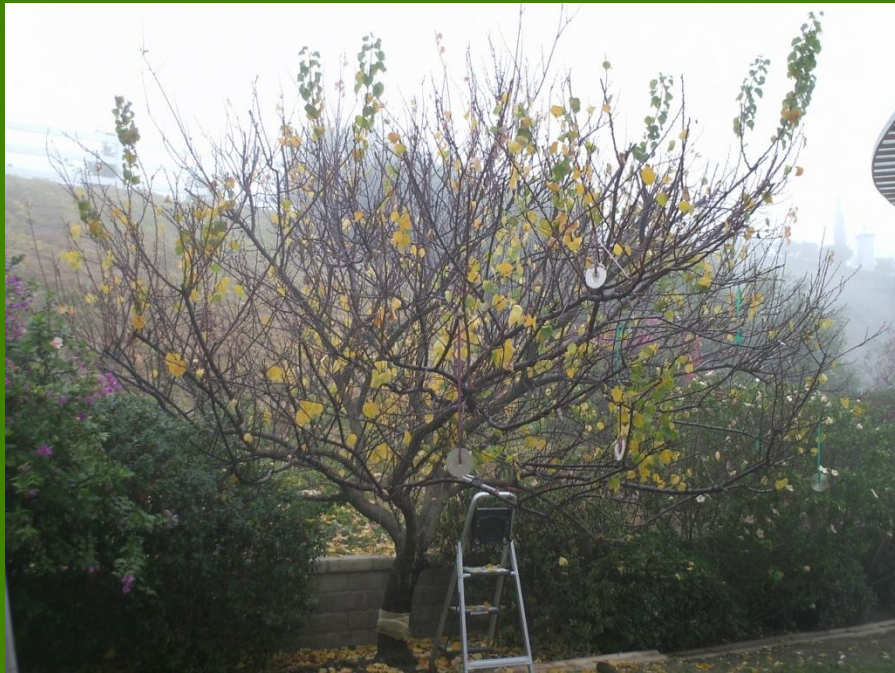
- ◆ Continue working your way around the tree, pruning one scaffold limb at a time.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 5:

- ◆ If there is more than one layer of branches, as in a tree pruned to a modified open vase shape, move up to the next layer and continue the procedure outlined in steps 3 and 4.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 5:

- ◆ Leave sufficient distance between each layer to allow for adequate light to reach the lower layer.
- ◆ Actual distance between layers is variable and will depend on location, exposure, tree age and size, branch density, and species. Experience will help in determining what is sufficient distance between layers.



A Systematic Method to Prune Open Vase and Modified Open Vase Trees.

Step 6:

- ◆ When you have finished pruning each scaffold limb, one at a time, stand back and examine the tree as a whole unit.
- ◆ Look for excessively crowded branches, crossing branches, or branches growing towards the center of the vase.
- ◆ Remove or redirect these branches if necessary.



Peaches and Nectarines

- ◆ These trees produce flowers and fruit on last year's growth, 1 year old wood. This fruiting wood is replaced each year. An average of 40-60% of the branches is removed each season.
- ◆ Fruiting wood is easily identified. Branches have smooth, shiny, green or green and brown bark. Branches have well developed buds but no side branches.



Peaches and Nectarines

- ◆ Branches are frequently pulled downward by the weight of the fruit and develop into 'hangers' which are beneficial to picking the fruit.



Pruning Peaches and Nectarines



Pruning Peaches and Nectarines



Pruning Peaches and Nectarines



Plums and Apricots

- ◆ These trees produce flowers and fruit on fruiting spurs. Fruiting spurs are long lived on plums (up to 10 years) but are short lived on apricots (3-5 years).
- ◆ Fruiting spurs develop on branches that are 2 years old and older. These older branches have brown, rough bark and smaller side branches.
- ◆ The side branches may be vegetative, which will produce leaves and more branches or they may be fruiting spurs which will produce flowers and fruit. Vegetative branches will produce fruiting spurs after they become 2 years old and older.



Plums and Apricots

- ◆ Fruiting spurs can be identified as smaller branches with very short internode spacing between the buds (average 1/4"). Vegetative branches are usually larger and more vigorous, with more distance between the buds (usually 1/2-3/4" or more).



- ◆ As fruiting spurs age and get larger they may resemble "thorns" or become club-like in appearance.



Plums and Apricots

- ◆ Apricot spurs usually die off after 3-5 years and need to be replaced. Prune to remove about 1/3 to 1/5 of the older fruiting spurs each year after the 4th-6th year.



Pruning Plums and Apricots



Pruning Plums and Apricots



Pruning Plums and Apricots



Pruning Plums and Apricots



Pruning Plums and Apricots



Pruning Plums and Apricots



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ Central leader and modified central leader pruning styles are used to maximize fruit production and fruit quality for all fruit trees **except** those in the genus *Prunus*. This style of pruning keeps branches in the center of the tree.



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ Each scaffold branch and its attached branches and limbs should occupy their own space in the tree.
- ◆ Branches should not cross, touch, rub or be excessively crowded.
- ◆ Adequate spacing should be maintained between branches to allow sufficient light and air to penetrate through the tree so that fruiting wood is produced and so that insect and disease problems are reduced.



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ Without proper pruning, branches become excessively crowded. Light penetration for fruiting wood is restricted and pests and diseases are promoted.



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ Trees should have sufficient branches remaining after pruning so that the bark of the trunk and scaffold branches is protected from strong, direct sunlight when the tree is full of leaves to prevent damage from sunburn or sunscald.
- ◆ Central leader shaped and modified central leader shaped trees will need to have an average of 20%-40% of growth removed on a yearly basis.
- ◆ Good pruning practices will help to reduce the amount of growth removed each year so that 10-20% branch removal is common.



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ A tree pruned into a central leader shape resembles the shape of a Christmas tree. Pruned to this shape, the tree will be the tallest and will produce the greatest amount of fruit.



PRUNING STYLES

Central Leader and Modified Central Leader

- ◆ The modified central leader pruning style differs from the central leader by having a more rounded top. The dominant leader of the central leader tree is suppressed with drop-crotch pruning or training techniques and secondary leaders are allowed to develop. Each outer leader becomes progressively shorter as they move outward from the center of the tree.
- ◆ These secondary leaders divide the growing energy or dominance between several growing points and the overall effect is a lower growing tree with a more rounded shape.
- ◆ The secondary leaders must be spaced along the trunk both radially and vertically to produce a tree with strong branching structure. Trees should never be topped!



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

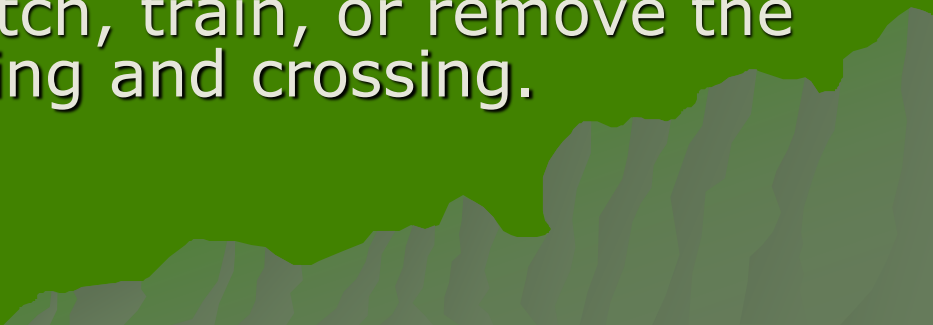
Step 1:

- ◆ Remove all suckers.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 2:

- ◆ Start pruning each scaffold limb one at a time, beginning with the lowest scaffold limb first. Start at the tree trunk and work your way towards the end of the branch.
 - ◆ Prune for health, structural strength, and flower and fruit production and to thin out crowded branches.
 - ◆ If branches are growing vertically and are crossing limbs which are growing above them or are crowding nearby branches, drop-crotch, train, or remove the limb to prevent overcrowding and crossing.
- 

A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 2:

- ◆ If branches are growing vertically and are crossing limbs which are growing above them or are crowding nearby branches, drop-crotch, train, or remove the limb to prevent overcrowding and crossing.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 2:

- ◆ After being properly pruned, the overall appearance of the scaffold branch will often be feather-like where the branch is horizontal, with side branches and fruiting wood mainly attached to the top and sides of this branch. Small branches and fruiting spurs may be attached to the bottom of the scaffold, provided they are not too crowded.
- ◆ Where the branches are more vertical, side branches should be spaced along the branch in a spiraled arrangement with internode distance between branches. Adequate thinning of branches should be done to allow for air circulation and some light penetration.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 3:

- ◆ Move to the next scaffold branch and repeat the procedure outlined in step 2. Again start at the base of the branch and work outwards to the tip of the scaffold limb. Remember to focus on only the scaffold limb that you are currently pruning.
- ◆ Continue working your way around the tree, pruning one scaffold limb at a time.
- ◆ After moving around the tree by working on the lowest scaffold branches, continue up to the next higher scaffold branches and again work your way around the tree pruning each branch one at a time.

A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 4:

- ◆ Repeat steps # 2-3 until you have finally reached the central leader of the tree.
- ◆ Branch height should descend progressively lower from the central growing point, downward as the branches move further out from the center.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 5:

- ◆ If you are pruning to a modified Central leader shape, drop-crotch the highest, central leader to a lower lateral and round out the overall tree shape by drop-crotching the taller branches.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 5:

- ◆ Pruning to a modified Central leader shape will reduce the height and overall size of the tree, making it easier to pick the fruit and allowing the tree to fit into smaller areas.



A Systematic Method to Prune Central Leader and Modified Central Leader Trees:

Step 6:

- ◆ Stand back and examine the entire tree. Look for any crowded or crossing branches and drop-crotch, train, or remove these branches. Balance the overall tree shape by thinning, drop-crotching or training any scraggly branches.



Modified Central Leader Apple



Modified Central Leader Apple



Modified Central Leader Pear



Modified Central Leader Pear



Modified Central Leader Persimmon



Modified Central Leader Persimmon



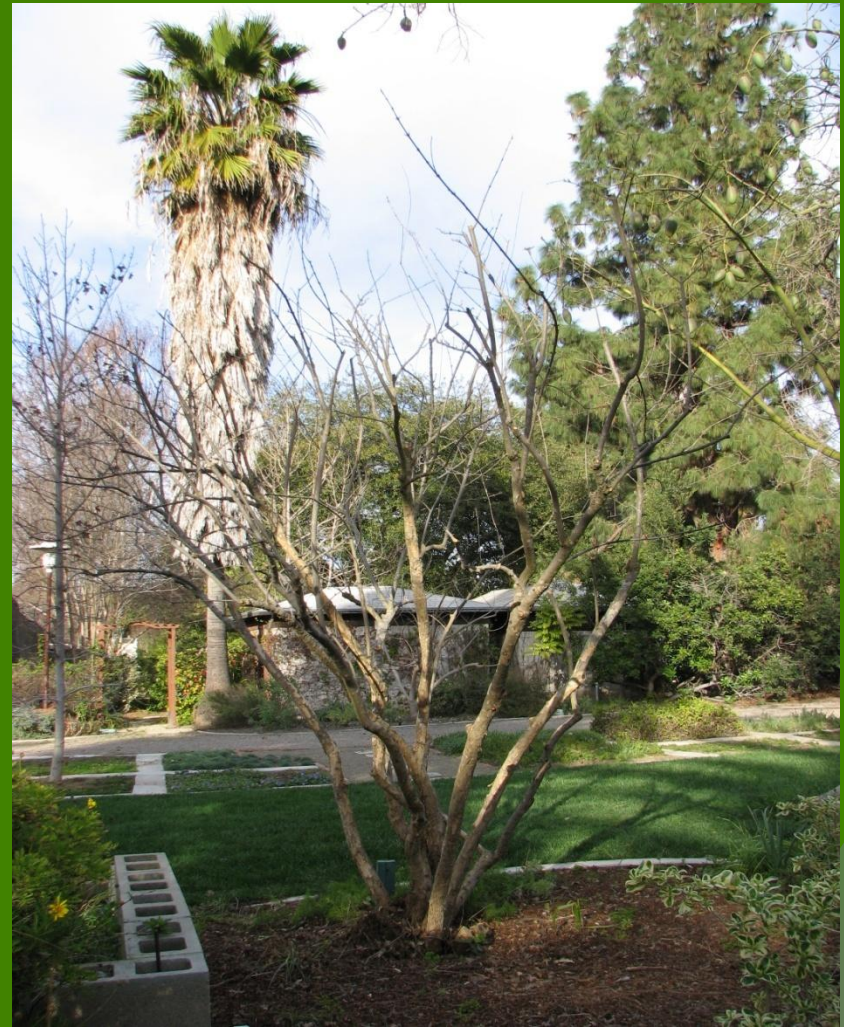
Modified Central Leader Fig



Modified Central Leader Fig



Modified Central Leader Pomegranate



Modified Central Leader Pomegranate



Modified Central Leader Mulberry



Dormant Spraying

- ◆ Dormant Spraying helps to control over wintering insects on fruit trees and diseases such as peach leaf curl, shot hole fungus and brown rot on stone fruit.
- ◆ Sprays should be applied between December and February when the trees are most dormant.
- ◆ For the best control, spray two to three times approximately two weeks apart.
- ◆ Avoid applying dormant sprays if rain is expected within 48 hours of spraying.
- ◆ The most effective spray for controlling diseases is just before bud break as the buds are swelling but before they have opened.
- ◆ If bud break has occurred and the buds are open and showing color, it is too late to dormant spray.
- ◆ Two products are usually combined and applied as a dormant spray treatment. One to control over wintering insects and the other to control dormant diseases.

Dormant Spraying

- ◆ Oil sprays are used to suffocate over wintering insects.



- ◆ Dormant sprays do not control boring insects such as shot hole borer and peach tree borer!

Dormant Spraying

- ◆ Fungicides are used to control dormant diseases.
- ◆ Fungicides containing lime sulfur (calcium polysulfide) are very effective.
- ◆ Lime sulfur smells like rotten eggs and can stain concrete and stucco.
- ◆ Copper based sprays or fungicides using synthetic chemicals are also available for dormant disease control.



- ◆ **Do not apply lime sulfur sprays to apricots or apricot hybrids!**

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