

# CITRUS PRUNING



Pruning techniques for tree health, pest control, fruit production and size control

# Tree Shapes

- Citrus trees are generally pruned to a central leader or a modified central leader shape.
- A full canopy of leaves should be maintained in order to protect the bark of the trunk and scaffold branches from direct sun and potential sunburn.



- Trees can have branches close to the ground (have a full skirt) or can have the lower branches pruned off to expose the trunk.
- When the lower branches have been removed, the tree is said to be skirted or standardized.

# Tree Shapes

- Citrus can also be pruned or shaped into hedges or espaliers.



# Multiple Planting



- Multiple trees are sometimes planted together in one hole to produce what appears to be a single tree with multiple trunks.
- Although each individual tree will produce less fruit, multiple plantings will result in a greater variety of fruit or in an extended period of fruit harvest in the space of a single tree.
- The tree trunks are planted close together and are angled outward at a 30 degree angle from vertical.
- Trees should be selected on rootstocks which will produce trees of similar size and vigor so that one tree does not dominate the planting and overgrow the other trees.

# Tree Size

- The size of a citrus tree is dependant on the citrus variety, on the rootstock and on how the tree is pruned.
- Trees are available on standard, dwarf (semi-dwarf), and true dwarf (flying dragon) rootstocks.
- Standard citrus trees will reach an average mature height of 18-30 feet.
- Dwarf (semi-dwarf) citrus trees will reach an average mature height of 8-15 feet.
- True dwarf (on flying dragon rootstock) citrus trees will reach an average mature height of 4-8 feet.
- A few citrus varieties are genetically small trees such as the Improved Meyer Lemon, the Mexican Lime, the Owari Satsuma Mandarin and several kumquat and kumquat hybrids.
- Pruning can reduce the mature height and width of a citrus tree by an average of 15-40%

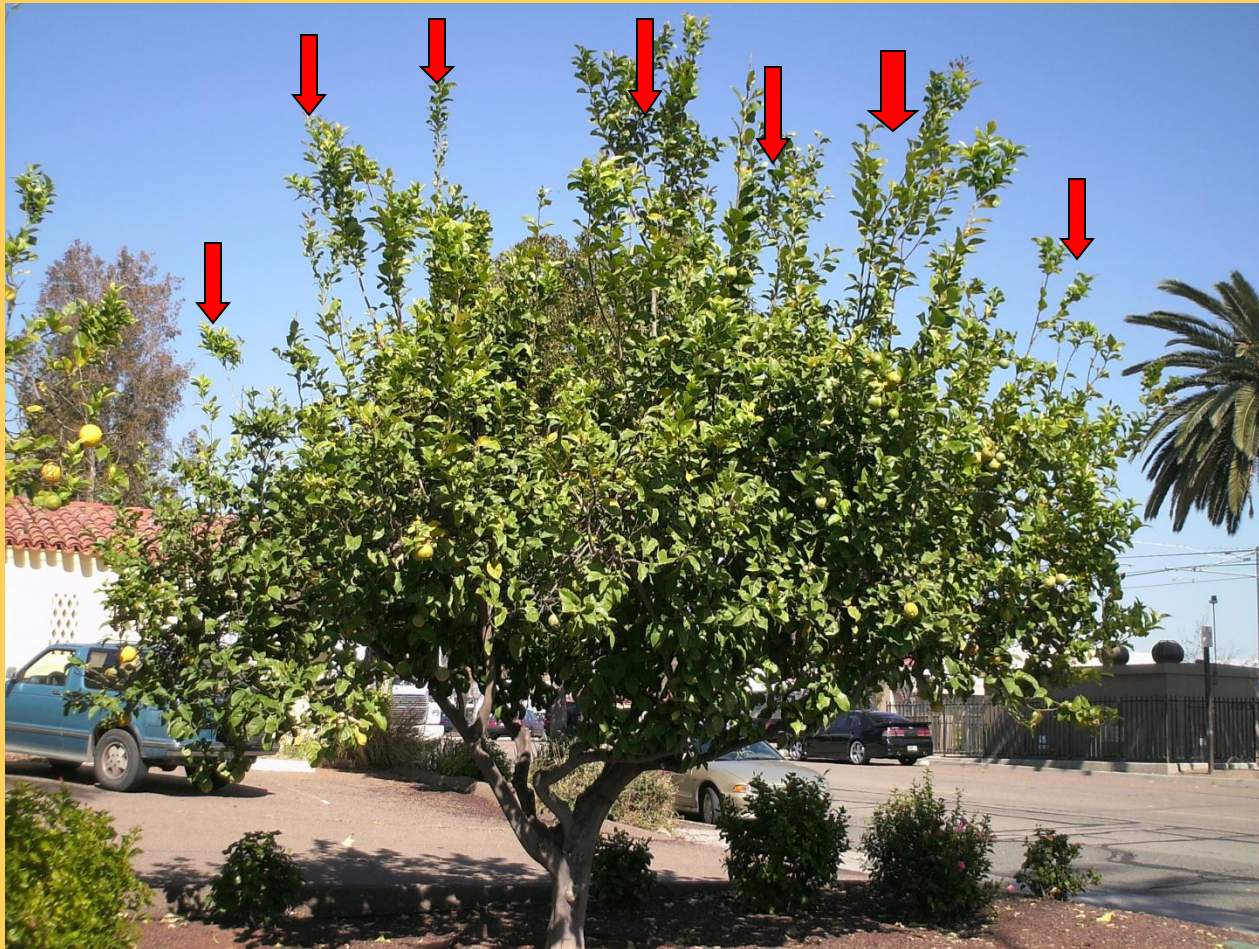
# Understanding Citrus Growth

- Citrus growth occurs in several flushes during each year depending on climate. Two to four growth flushes each year are common.
- The 1<sup>st</sup> growth occurs as straight vertical shoots. No side branches occur on these shoots during this initial growth period. The growth will eventually stop and the tree will enter a resting period.
- Side branching develops on these vertical shoots during the next growth flush. These side branches fill out to produce a rounded canopy.



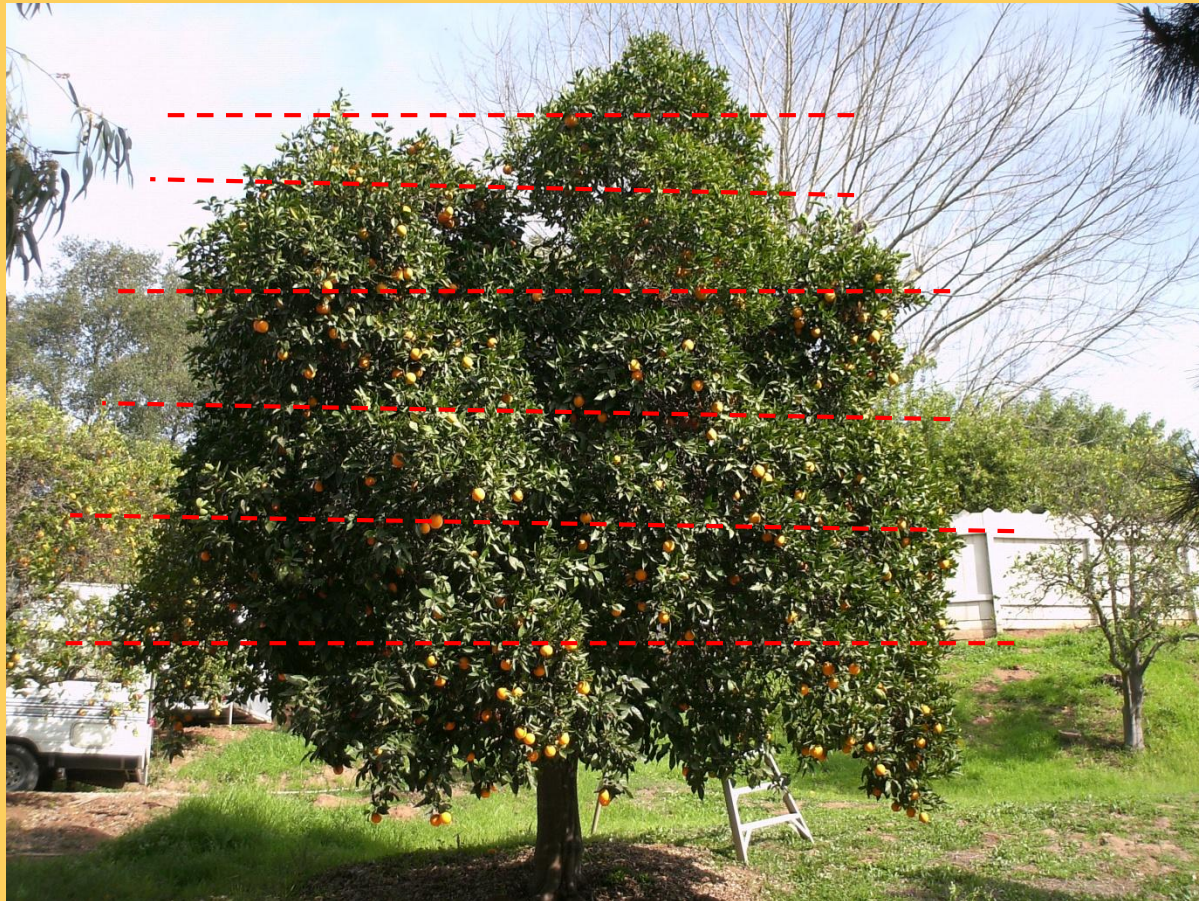
# Understanding Citrus Growth

- During the next growth flush, vertical shoots are again produced which push through the preceding canopy to reach upward and outward.
- These shoots again eventually produce side branches to form a new canopy which is above and beyond the preceding canopy or layer.



# Understanding Citrus Growth

- The result is the development of distinct layers or canopies on citrus trees which are important when pruning trees to control tree size.
- Trees can be reduced in size by drop-crotch pruning back to earlier layers or canopies. This will protect the bark of the tree from damage due to sunburn or sunscald and will avoid the detrimental affects of topping.





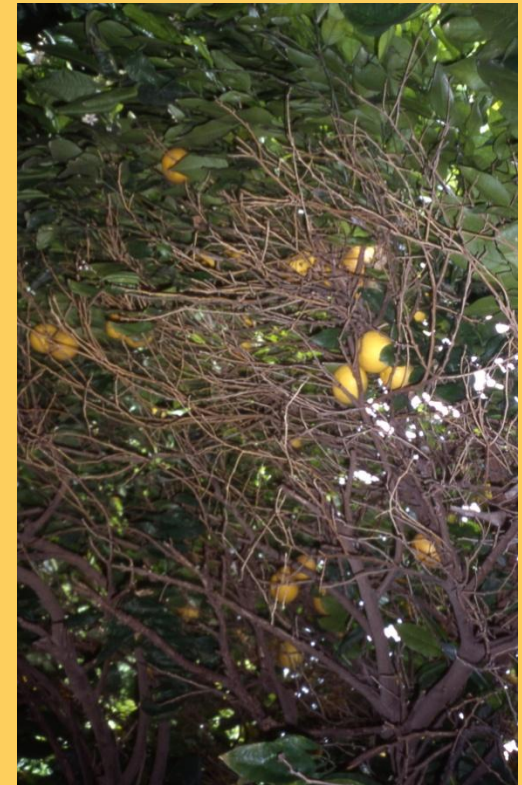
# Understanding Citrus Growth

- As leaves, flowers or fruit form on vertical branches, the weight which develops often pulls these branches into a downward growing position.
- When the apical tip is pulled downward, new vertical shoots develop along the topside of the branch. These vertical branches grow upward until they too are eventually pulled over by the development of leaves, flowers or fruit.



# Understanding Citrus Growth

- Each layer of branches lays on top of the preceding layer and blocks the lower branches from sunlight.
- These lower branches eventually die off. The result is a congestion of dead material on the interior of the tree which is conducive to the development of pests and poor tree health.



# Understanding Citrus Growth

- Most citrus varieties are tip bearers, producing flowers and fruit on new growth which is produced off of one year old growth.
- The weight of developing fruit generally pulls branches down onto lower branches which results in the die off of these lower branches as previously described.



- Fruit clusters should be thinned when fruit are approximately 1 inch in size to prevent branches from breaking and to result in the development of larger, better quality fruit.
- Fruit should be spaced approximately 2-6 inches apart, depending on the variety of citrus and the mature fruit size as well as the size and maturity of the tree.

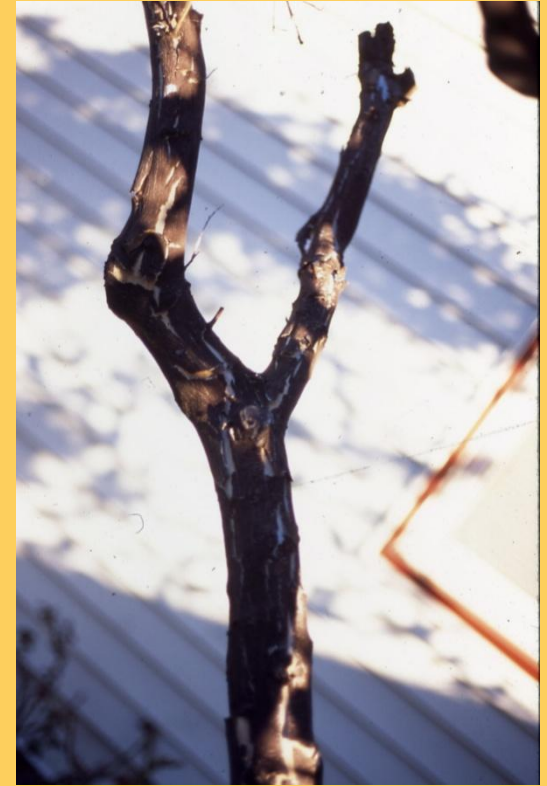
# Sunscald or Sunburn

- Citrus trees will sometimes defoliate due to cold or hot weather, due to over watering or under watering, or just before a growth flush of flowers or foliage.
- Pruning can also remove foliage so that the bark of the tree is exposed to direct sunlight.



# Sunscald or Sunburn

- The thin bark of citrus trees is easily damaged or killed when it is exposed to strong or hot direct sunlight.



- This sun damage may take years to heal over and damaged trees may never fully recover to develop into strong, healthy trees.
- Sunburn can potentially kill young citrus trees.

# Sunscald or Sunburn

- In order to prevent potential sunburn from occurring, it is recommended to whitewash any exposed bark, especially during the hotter months or in areas with high temperatures.



- To whitewash the bark, use white or a light colored water-based interior latex paint which has been thinned with 50% water. This will act as a sunscreen and will protect the bark from sun damage.
- New growth can grow through this whitewash without difficulty.

# Citrus Pruning

- Citrus trees should be pruned for health, for structural strength, to reduced pest problems, to direct or redirect growth, for shape, for fruit production and to control size.
- Most citrus trees benefit from being pruned every two to 5 years.
- Pruning is best done in the early spring or in the early fall. Sufficient time should be given after pruning to allow new growth to develop before the occurrence of very hot or very cold weather which could result in injury to the tree.
- Pruning should be limited to the removal of no more than 15-20% of the foliage at any one time in order to reduce the effects of stress to the tree.
- If sufficient foliage is removed so that the bark of the tree is exposed to direct sunlight, the bark should be whitewashed in order to prevent sunscald or sunburn.

# Citrus Pruning

- Citrus trees are generally pruned to a central leader or a modified central leader shape.
- A full canopy of leaves should be maintained in order to protect the bark of the trunk and scaffold branches from direct sun and potential sunburn.
- 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.





# REASONS TO PRUNE

## Health:

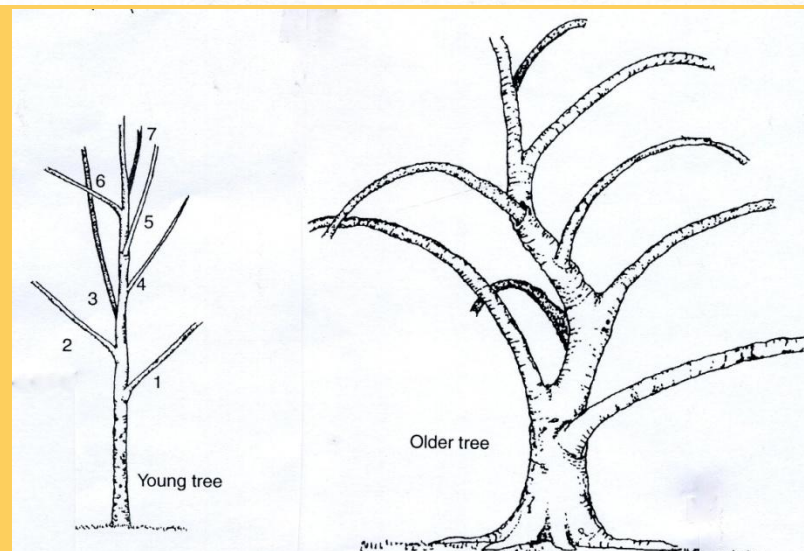
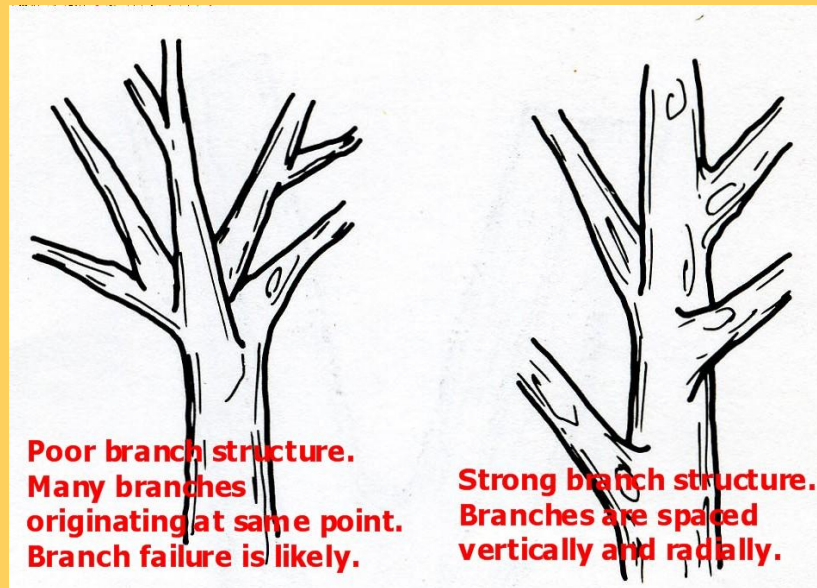
- Prune off the four D's:  
Dead,  
Damaged,  
Diseased and  
Dysfunctional branches.
- One of the primary reasons to prune citrus is to remove the dead or dying interior branches that result from the layering of the outer canopy on top of the lower previous canopy.



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

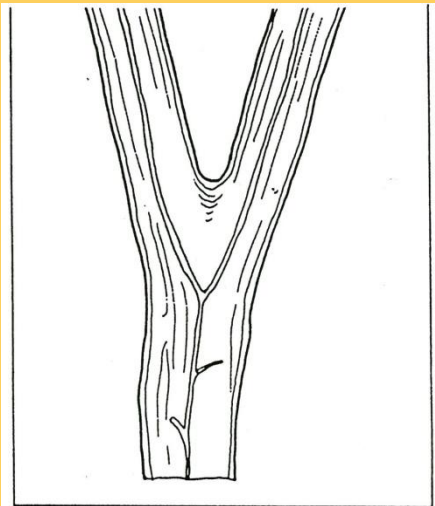
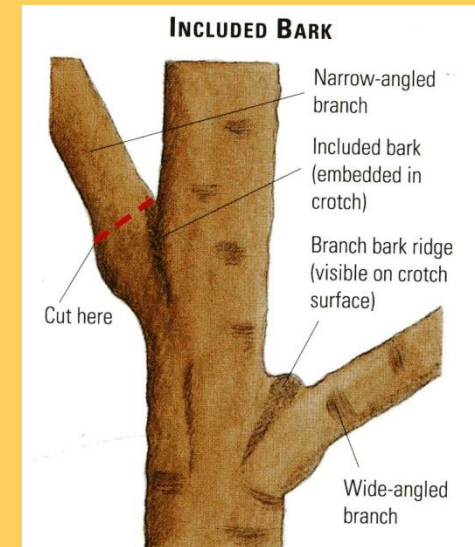
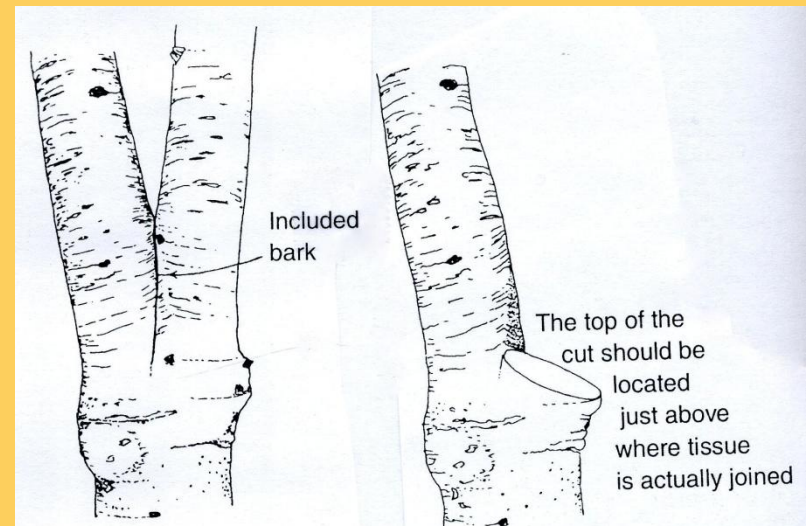
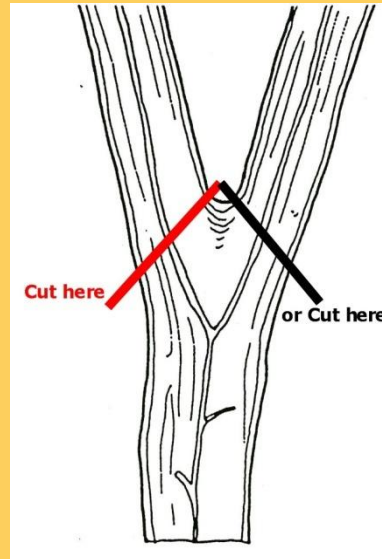


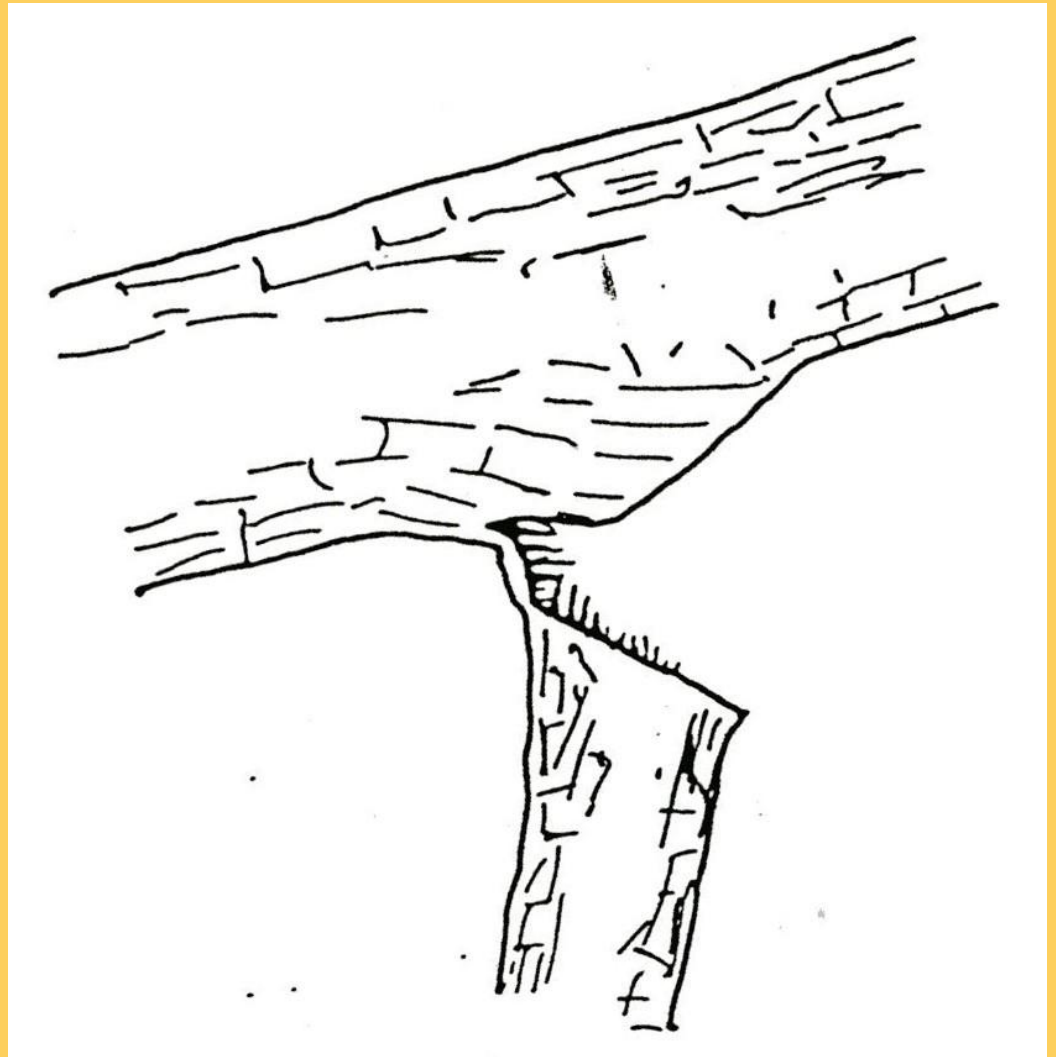
Fig. 8.4 Codominant stems. The nearly equal diameter of the two stems can make them more prone to failure.



# 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.
- Although citrus wood is very strong, remove bottom branches to reduce the risk of limbs breaking and tearing off of a supporting branch.



# REASONS TO PRUNE:

## Reduce Pest Problems

- Improving air circulation and light penetration throughout the canopy of the tree by selectively removing dead and dying branches, removing the lower layers of non-productive branches and by removing overcrowded interior growth will greatly reduce pest problems such as mites, thrips, whitefly, scale and mealybug.



# REASONS TO PRUNE

## Reduce Pest Problems

- Skirting trees so that lower branches do not touch the ground will greatly help in being able to control ants and the insects that they “farm” as well as snails and rodents.



# REASONS TO PRUNE

## Direct or redirect growth

- As branches bend downward from the weight of fruit, foliage, or wood, they often need to be pruned back into an upright growing position. Use drop-crotching pruning techniques to a side or top branch to redirect growth.
- Prune to a terminal branch to direct growth in that direction.
- 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 upright balanced shape.



# REASONS TO PRUNE

## Size

- To control tree size, citrus trees should be pruned using thinning cuts and drop-crotch pruning techniques.
- Removing branches at the point of attachment to a supporting branch at the top of the branch collar can reduce the size of a tree by removing the outer layer of canopy.





# Never top or head branches or trees!!!

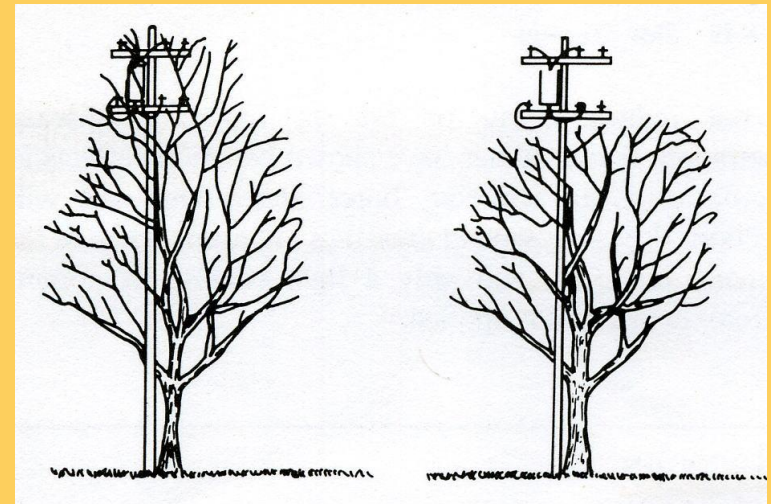


The development of an excessive amount of “watersprouts” is the result of topping or heading a branch. →



Sunburn, starvation, weak branch attachment, overcrowded branches, increased pest problems, and other serious problems are often caused by topping!

- **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.**



# 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!

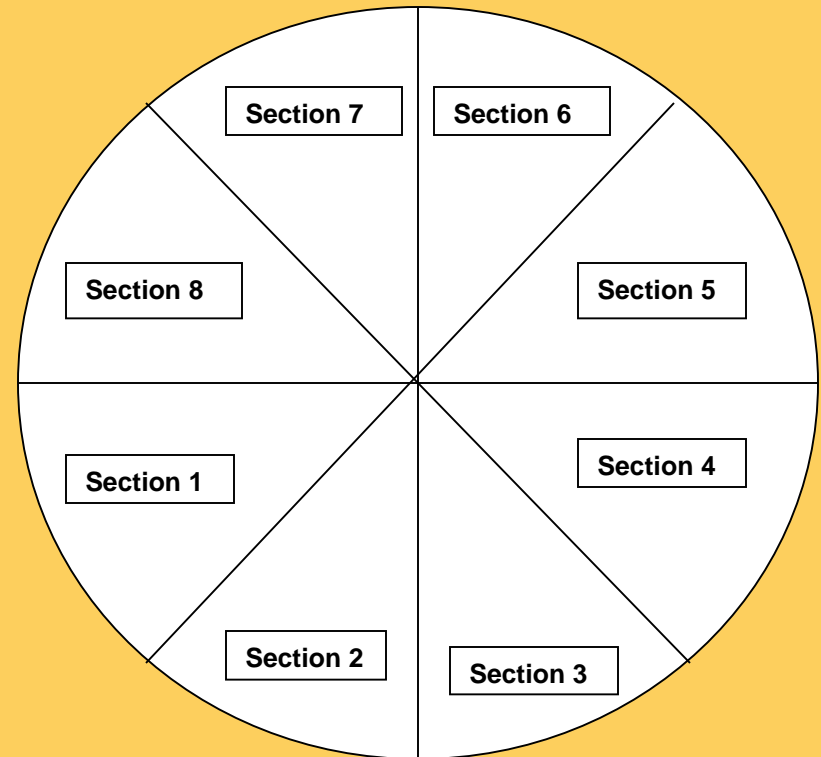
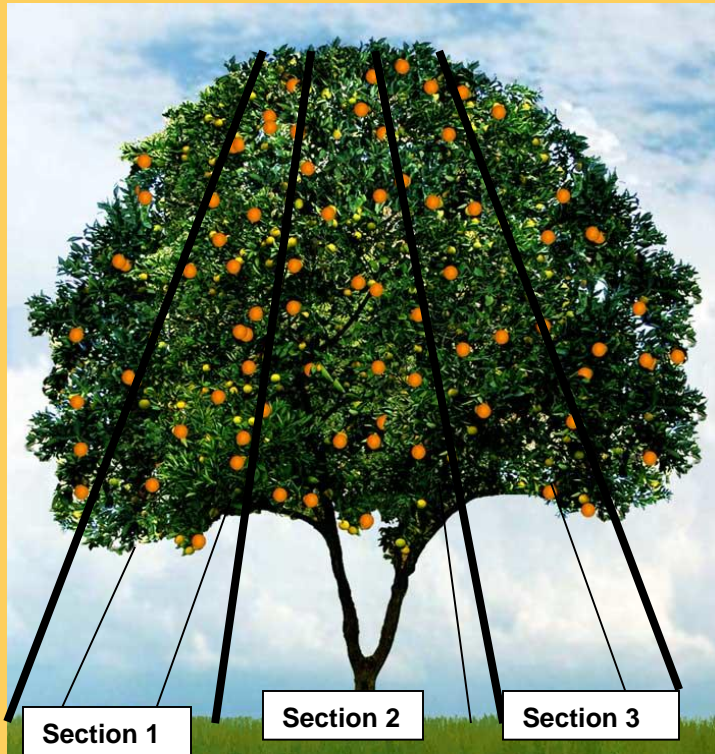


- The only exception is when you are creating a hedge. Although the effects of this type of pruning are still detrimental, cost factors or the desire to fulfill a landscape function may outweigh the negative effects.



# A Systematic Approach to Pruning Citrus

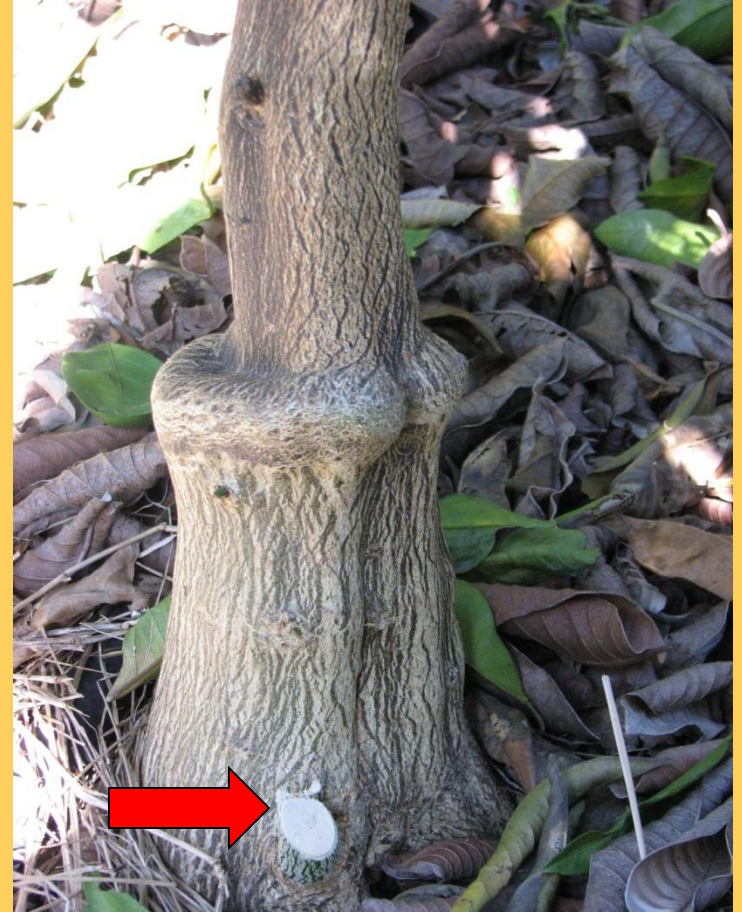
- **Work from the inside of the tree!** The goal is to remove dead and dying branches and to space out the layers of living branches in order to increase air circulation and filtered light penetration into the interior of the tree.
- **Begin by dividing the tree into imaginary sections that divide the tree into pie-like sections.** Each section should be made up of only the branches that can be reached **without moving around the tree**. Prune each section one at a time and **focus only on the branches that are within the section of the tree that you are working on.**



# A Systematic Approach to Pruning Citrus

## Step 1: Start at the Ground

- Remove Suckers (Root Suckers):  
Most citrus 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.



- **Start pruning the first section of the tree, beginning with the lowest scaffold limb. Prune each scaffold limb one at a time.**

# A Systematic Approach to Pruning Citrus

## Step 2:

- **Start pruning the first section of the tree, beginning with the lowest scaffold limb.**
- Prune each scaffold limb one at a time. Start at the tree trunk and work your way towards the end of the branch.
- Prune for health, structural strength, pest control and flower and fruit production as well as to thin out crowded branches.



# A Systematic Approach to Pruning Citrus

## Step 2:

- Do not remove all interior branches which results in a condition known as “lion tailing”.
- These interior branches help to increase the girth of the scaffold branches that they are attached to as well as protect the bark from sunburn or sunscald.
- These interior branches can also give options for drop-crotch pruning if you wish to reduce the size of the tree.



# A Systematic Approach to Pruning Citrus

## Step 3:

- 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.
- Remove lower branches which are being covered by upper layers of branches that have laid over the top of them. These lower branches are unproductive and will eventually die due to lack of sunlight.



# A Systematic Approach to Pruning Citrus

## Step 4: Direct or Redirect growth

- When branches are pulled downward by the weight of foliage or fruit, it will often be necessary to redirect the growth and development of the branch into an upright position. Use drop crotch pruning techniques to prune to a lateral, upright branch and to redirect growth into an upwards growing position.
- By reducing the weight of the foliage and fruit that is pulling the branch downward, the remaining branches will “spring” into a more upright growing position. This will help to increase the spacing between the layers of branches which will in turn increase the air circulation and light penetration into the tree





# A Systematic Approach to Pruning Citrus

## Step 4:

- 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 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.
- **The result of your pruning should be a stronger branch with a more upright growth pattern.**



# A Systematic Approach to Pruning Citrus

## Step 5:

- After pruning the lowest scaffold branch, **move vertically upward** pruning the next scaffold branch that is directly above the one that you just pruned by repeating steps 2-4. **Do not move radially around the tree!** Prune one scaffold branch at a time.
- Continue moving vertically upwards pruning one scaffold branch at a time moving **upward** to the next branch as each lower branch is completed until you have reached the top center of the tree in the section that you are working on.
- **Focus only on the section of the tree you are working on. Do not jump from branch to branch when pruning.** This will make the task of deciding which branches to cut more difficult and will make the job of pruning your tree more confusing.



# A Systematic Approach to Pruning Citrus

## Step 5:

- Each layer of branches which is made up of the scaffold branch and all of its attached branches should occupy its own section of the tree. Branches should not lie on top of each other causing overcrowding and die off of the underlying branches. The layers of branches should be adequately spaced so as to allow filtered sunlight and air circulation into the interior of the tree.



# A Systematic Approach to Pruning Citrus

## Step 6:

- **Reposition yourself to the next section of the tree, focusing only on the portion of the tree that is within reach.** Repeat the procedures outlined in steps 2 - 5. Again, start at the lowest scaffold branch and begin at the base of the branch. Remember to focus on only the scaffold limb and section of the tree that you are currently pruning.
- **Do not jump from section to section radially around the tree when pruning.** This will also make the task of deciding which branches to cut more difficult and will make the job of pruning your tree more confusing.



# A Systematic Approach to Pruning Citrus

## Step 7:

- Repeat steps # 2-6 until you have finally worked your way completely around the tree pruning each branch one at a time.
- Branch height should descend progressively lower from the central growing point, downward as the branches move further out from the center.



# A Systematic Approach to Pruning Citrus

## Step 8:

- 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.



# A Systematic Approach to Pruning Citrus

- After being pruned, the tree should have good air circulation throughout the canopy without direct, strong sunlight reaching the bark of the trunk or scaffold branches. Dappled or filtered sunlight should reach the ground through the canopy of the tree.
- 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. The overall shape of the tree should be symmetrical and generally balanced.



# A Systematic Approach to Pruning Citrus

- After 6 months, this citrus tree has grown new foliage and is back in full production.
- The tree is smaller in size and has fewer pest problems due to improved air circulation through the foliage.





# A Systematic Approach to Pruning Citrus

- 1 year after being pruned a new canopy is developing through the previous canopy.
- Removing these “watersprouts” with thinning cuts at the point of attachment where they arise from beneath the preceding canopy can maintain this tree at it’s pruned size.
- Additional pruning for size reduction can now be preformed if a smaller tree is desired.



# A Systematic Approach to Pruning Citrus



# A Systematic Approach to Pruning Citrus



# A Systematic Approach to Pruning Citrus

## Size and Width Reduction :

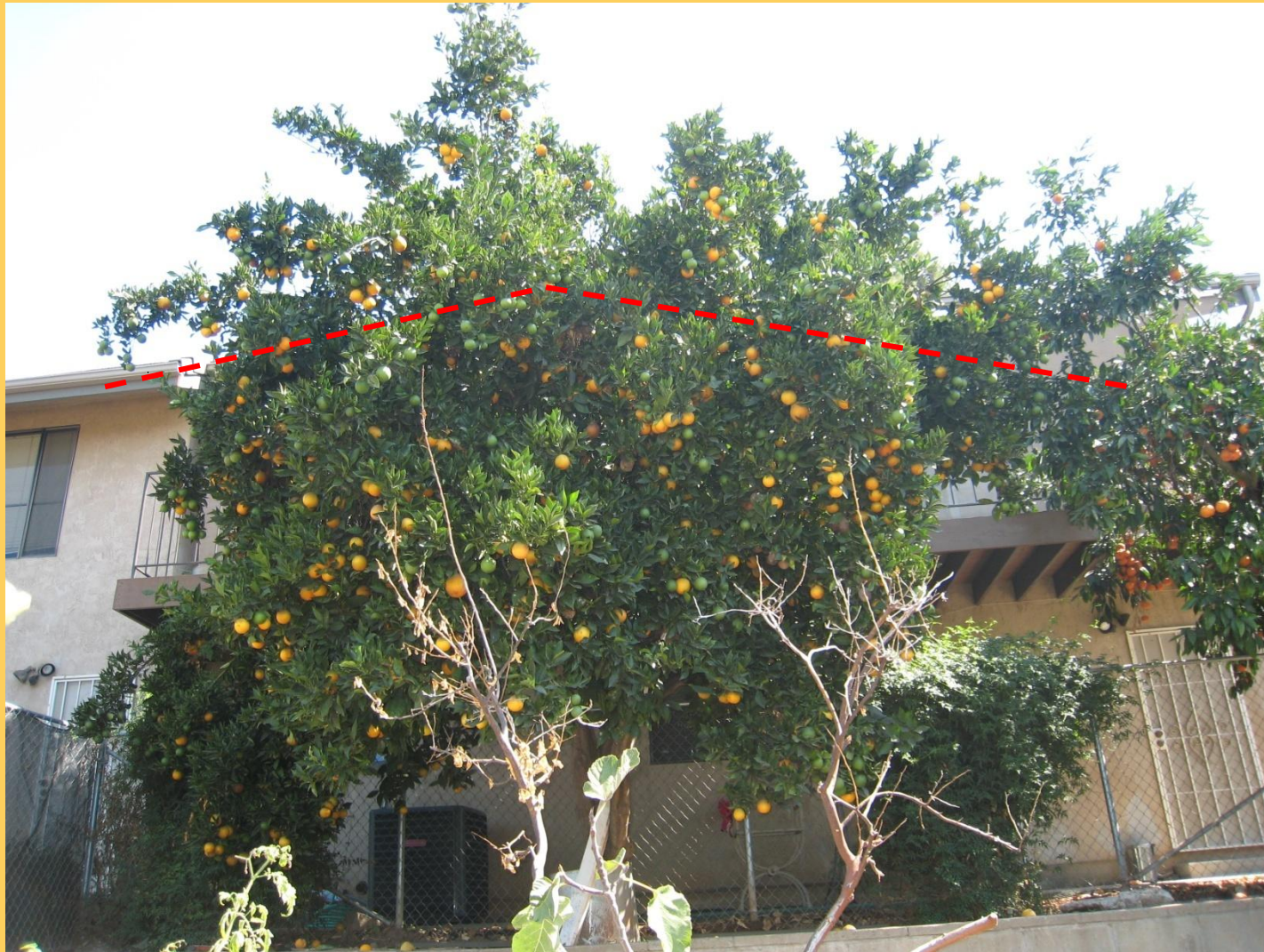
- **Always** prune to reduce the size of a tree by using drop-crotch pruning techniques.
- As you prune off the tallest, outermost canopy of the tree there will be less to prune on the lower layers.
- Be sure to maintain an outer canopy of foliage to protect the bark of the tree from sunburn! Wherever the bark is exposed to direct , strong sunlight, be sure to whitewash the bark to protect it from sunburn damage.



# A Systematic Approach to Pruning Citrus

## Size and Width Reduction :

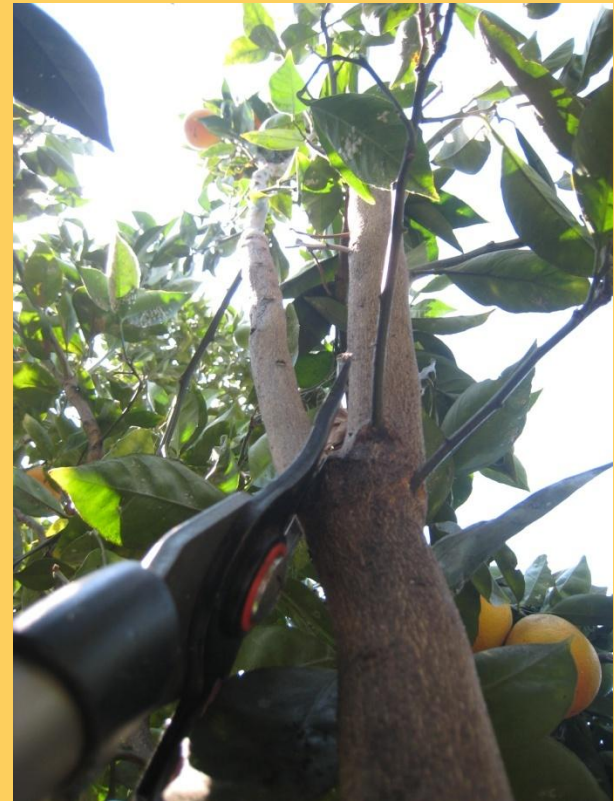
When reducing the size of a tree, it is recommended to remove no more than 20-30% of the canopy of the tree by at one time.



# Size and Width Reduction

## Step 1:

- Begin at the highest point in the tree. **Reduce the length of each branch, one limb at a time**, by drop-crotch pruning to a lower lateral branch or canopy of lateral branches or by removing the limb to a the point of attachment (using a thinning cut) below the preceding canopy of branches. **Do not head or top branches!**



# Size and Width Reduction

## Step 2:

- After lowering the top of the tree, work your way downward maintaining a balanced shape as you go.
- Continue to lower each of the highest branches using drop-crotch pruning techniques.
- As you drop down to the lower layers of the tree, drop-crotch or remove the longer branches to reduce the width of the tree.



# Size and Width Reduction

## Step 2:

- **Be sure to maintain an apical tip or growing point on each remaining branch** in order to prevent the development of excessive “watersprouts” and the other detrimental effects caused by topping.





# Size and Width Reduction

## Step 2:

- Pruning for size reduction should maintain a canopy of foliage that continues to produce food for the tree and that helps to protect the bark from sunburn.



# Size and Width Reduction

## Step 2:

- Branch height should descend progressively lower from the central growing point, downward as the branches move further out from the center of the tree.
- The width of the tree should gradually increase as the branches descend from the top of the tree towards the ground.



# Size and Width Reduction

## Step 3:

- After reducing the size of your citrus tree, you should follow the recommendations on pruning citrus under “A Systematic Approach to Pruning Citrus” to correctly prune the remaining branches.



- As the upper layers of the tree are removed, the increased light levels to the lower limbs of the tree will help to stimulate the development of new growth on lower branches and on the interior of the tree. The development of this lower growth can allow the tree to be further reduced in size.

# Size and Width Reduction

## Step 3:

- 4 months after being pruned, the tree has produced a full canopy of foliage.
- Interior branch development has been stimulated by increased light penetration into the interior of the tree. Increased air circulation and light penetration has helped to reduce pests.
- Yearly maintenance pruning will keep the tree in good health and maintain the trees size.



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%

- Although it is possible to successfully reduce the size of a citrus tree by as much as 40% at one time, this should be done infrequently and is not as desirable as gradually reducing the size of a tree by pruning less.

- **It is generally better to reduce the tree size over a period of several years by pruning no more than 20% at one time.**



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%

- Whitewash the bark if pruning has exposed the bark of the tree to direct sunlight.





# A Systematic Approach to Pruning Citrus

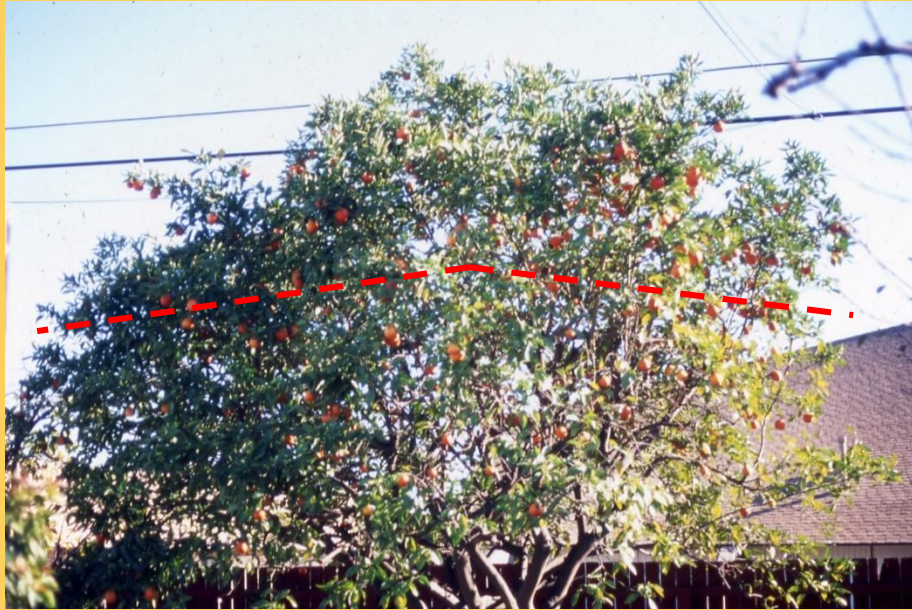
## Reducing a tree by more than 30%

- Pruning to reduce the size of a tree by more than 20-30% may result in reduced fruit production or the loss of fruit production for a period of one to two years.
- Be sure to whitewash all exposed bark after pruning whenever the potential for sunburn or sunscald exists to protect the bark from damage.



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%



# A Systematic Approach to Pruning Citrus

## Reducing a tree by more than 30%



# A Systematic Approach to Pruning Citrus

## Maintaining a tree's size

- Yearly maintenance pruning by removing tall vertical “watersprouts” can keep a citrus tree at a desired height or width with minimal loss of fruit or harmful effects on the tree.
- Always use thinning cuts to remove watersprouts.



# A Systematic Approach to Pruning Citrus

## Maintaining a tree's size



# A Systematic Approach to Pruning Citrus

- Following these principles can also help restore a tree which has been neglected, damaged or in poor health to a productive healthy tree.





# CITRUS PRUNING

By Tom Del Hotal



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