

CITRUS PRUNING

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

Citrus trees generally need to be pruned every two to five years. Primary reasons for pruning citrus are:

1. To remove dead wood.
2. To thin the crowded branches in order to improve light penetration and air circulation.
3. To develop structural strength and to remove damaged or dysfunctional branches.
4. To maintain tree shape.
5. To control size or to prune for specific landscape function.

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. 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.

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. Citrus can also be pruned or shaped into hedges or espaliers. Multiple trees are sometimes planted together in one hole to produce what appears to be a single tree with multiple trunks. When working with multiple plantings or trees that have multiple grafts, a balance should be maintained on the tree, or trees, so that all varieties occupy an equal portion of the overall space. Do not allow one variety to greatly overgrow the other varieties, otherwise it will dominate and stunt out or kill off the smaller, less vigorous varieties.

Pruning can reduce the mature height and width of a citrus tree by an average of 15-40%. 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.

All pruning cuts should be made using principles of **Natural Target Pruning!** These principles have been developed to minimize the harmful effects of making pruning wounds. Remember that making cuts on small branches is always preferable to making cuts on larger branches. Be proactive and prune your trees on a regular program to avoid having to make large cuts which are slower to seal over and take longer to compartmentalize the wound made by the pruning cut.

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.

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.)

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. 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.

Health:

Prune off the four D's: Dead, Damaged, Diseased and Dysfunctional branches.

Shape:

Prune trees to specific shapes for best fruit production. Citrus trees are generally pruned into a central leader or modified central leader shape.

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

Fruit or Flowers:

Prune to leave flowering and fruiting wood for specific fruit types. Citrus and many subtropical fruit are tip bearers and produce flowers and fruit off of new growth that arises from one year old wood.

Thin branches and fruiting wood to allow adequate light penetration and air circulation for proper fruit development as well as to reduce the stress of the weight load of the developing fruit.

Size:

Fruit trees which are pruned to their maximum size will produce the greatest amount of fruit. These trees are pruned into a central leader shape.

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 a modified central leader shape.

Citrus tree size is largely determined by the rootstock. Standard rootstocks will usually produce a tree 20-30 feet tall. Semi-dwarf (often called dwarf) rootstocks will usually produce a tree between 8 and 18 feet tall. True dwarf (Flying Dragon) rootstocks will usually produce a tree 4-8 feet tall. **It is important to select a tree on the appropriate rootstock for the tree size that is desired. Pruning is not a substitute for poor planning!**

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!

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**.

- **Pruning to reduce the tree size may result in loss of fruit production for a period of one to two years.**

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. Use drop-crotching pruning techniques to a side or top branch to redirect growth.

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 on citrus should be done during the early spring or early fall. In some cases, lighter summer pruning can be beneficial for keeping trees smaller, however, sunburn or bark boring insects may be promoted by summer pruning. If these insects are common in your area or if you are in a area with hot summer temperatures, keep summer pruning activities to a minimum.

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 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.

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 1st 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.
- 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. 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.
- 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 pulls branches downward onto lower branches or onto the ground.
- 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.
- Each layer of branches lies 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.
- 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 clusters should generally be thinned to no more than two or three fruit in each cluster.
- 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

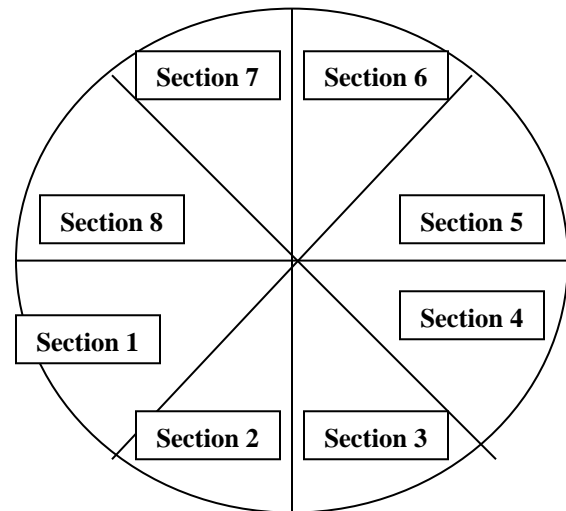
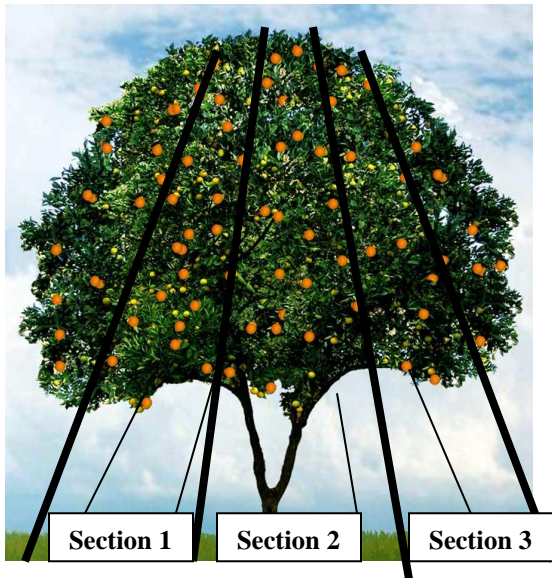
Citrus trees will sometimes defoliate due to cold or hot weather, due to over watering or under watering, or just before a growth flush of flowers or foliage. Pruning can also remove foliage so that the bark of the tree is exposed to direct sunlight. The thin bark of citrus trees is easily damaged or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

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.

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.**



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.

Step 2:

- Begin 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.
- **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.

Step 3:

- If longer 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 lain over the top of them. These lower branches are unproductive and will eventually die due to lack of sunlight.

Step 4: 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.
- 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.**

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.
- 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.

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.

Step 7:

- Repeat steps # 2-6 until you have finally worked your way completely around the tree pruning each branch one at a time.

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.

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.

Size or Width Reduction

To reduce the height of a tree, begin at the highest point in the top center of the tree. As you prune off the tallest, outermost canopy of the tree there will be less to prune on the lower layers.

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

Step 2

- Work your way downward from the highest layers of the tree maintaining a balanced shape as you go. 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.
- 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.

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.

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.**

Be sure to whitewash all exposed bark after pruning whenever the potential for sunburn or sunscald exists to protect the bark from damage.

Pruning to reduce the size of a tree may result in reduced fruit production or the loss of fruit production for a period of one to two years.

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.



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