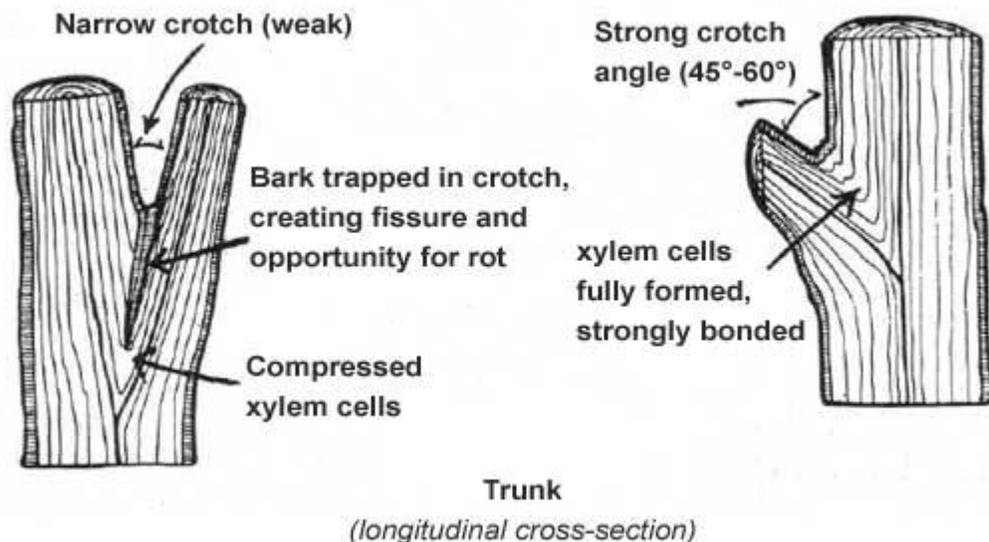


Pruning Guide for Fruiting Trees, Shrubs and Brambles

WHY PRUNE?

1. Removing dead and diseased wood helps prevent infection and the spread of disease.
2. Pruning can improve both the quantity and quality of the harvest. The interior of unpruned trees tends to be too shady for good production. Apples and pears may also demonstrate alternate-bearing, every other year, if not pruned.
3. Good shaping works with a plant's natural growth habit to develop a strong primary structure that can support the full weight of harvests.
4. Encouraging good branch angles can prevent them from breaking in high winds or under fruit load, which can tear deep into the trunk and endanger the whole tree. A narrow crotch (branch) angle is weak; at 17 degrees or less the bark gets pinched between the branch and trunk, trapping water and promoting rot. A crotch angle between 45 and 60 degrees is ideal, because the bark can develop fully.
5. Shorter trees and lower fruit growth make for easier harvesting. An unpruned tree may grow upward without bearing until the fruit is out of reach or tree is too large for the space.





the
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Pruning Guide

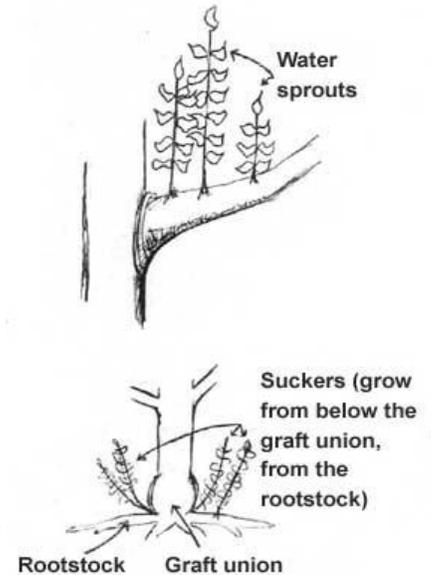
6. Pruning maximizes fruit production and health by controlling vegetative growth. Shoots, water sprouts, and vertical branches drain a tree's energy. Suckers grow from below the graft union and divert energy from the grafted tree.

7. Sunlight to the interior of the tree is essential for flower bud formation and fruit ripening.

8. Increased air circulation to the interior prevents development of fungal diseases and reduces pest populations.

KNOW YOUR PLANT

How, when, and what to prune will depend on what type of tree you are working with. Be familiar with your tree's growth habit: pyramidal, spreading, multi-trunked, vining, or vigorous. Also learn about its fruiting habit; inadvertently pruning fruiting wood or specialized fruiting structures (spurs) can seriously compromise a tree's ability to bear fruit.



WHEN TO PRUNE:

Damaged and diseased wood, suckers should be promptly pruned, no matter what time of year*.
*Beware of fire-blight if pruning in May-July.

Annual pruning should be done during the dormant season, before buds begin to swell, and preferably on a day when the temperature is above freezing (late January through early March). Most tree diseases are dormant in winter, thus reducing the spread of infection. Pruning cuts will also heal most quickly during the spring growing season to follow. Never prune in the fall or early winter! Also never prune during rain as this can spread disease.

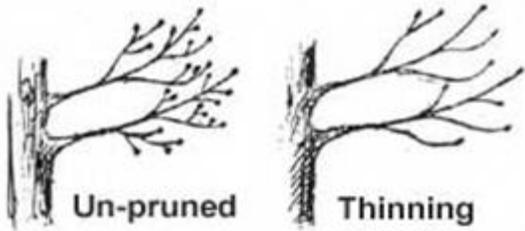
Summer pruning in the heat of August (summer dormancy) is important for limiting excessive growth and water sprouts on apples and pears, and can have a dwarfing effect on the trees.



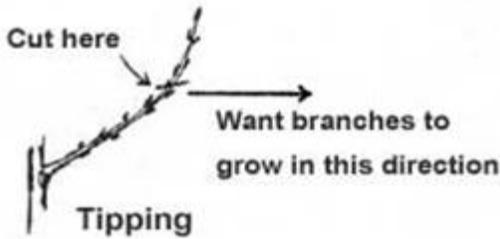
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PRUNING METHODS

Thinning: To allow more light and air into the interior, cut small side branches back to their point of origin on the parent branch. This is practiced not only on twigs, but on crowded limbs.



Tipping: To induce horizontal branching, remove the terminal bud to a lateral bud heading in the direction you want branch to grow. Make the cut ¼" above lateral bud (to allow for dieback) and at an angle parallel to the direction of the bud.



Notching: By nicking vascular tissue above or below a lateral bud, you can determine whether a bud becomes a shoot or a flower. The nick should be close to the bud, about 1/8" wide, but not deep (a mere scratch - to cut the phloem just below the bark

surface). It should reach halfway around the stem. To produce a shoot, notch above dormant bud, cutting off the flow of growth hormones from terminal bud. To produce a flower, notch below the dormant bud, sending the flow of carbohydrates from the leaf to the bud instead of the rest of the tree.

OTHER SHAPING METHODS

Spreading, bending, tying: hanging weights, using clothespins in late May-June, tying branches to ground or using various length limb spreaders to widen branch angles. This is very important in shaping the tree. Also, staking or splinting with bamboo and tie tape along the trunk can help establish central leaders.



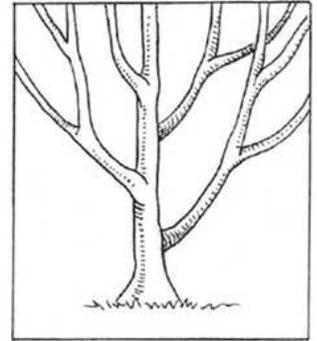
Clothespins spread young branches to a stronger, more fruitful position



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BASIC STRUCTURE OF FRUIT TREES

Central Leader The central leader method is for trees with a strong vertical (conical, pyramidal) growth habit (apples, pears, Asian pears, European plums). Usually 3 tiers (whorls, scaffolds), each consisting of 4 branches, 6-9" apart, and spaced evenly around the trunk. Example:

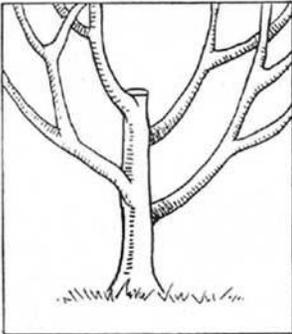


Tier (scaffold) #1: 2.5-3" above ground

Tier (scaffold) #2: 4.5-6' above ground

Tier (scaffold) #3: 7.5-9' above ground

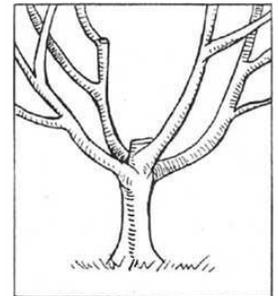
Modified Central Leader



The modified central leader is an alternate method for trees with a strong vertical growth habit, recommended for cherries, pears, and some apples. 5-6 branches are left spiraling evenly up the trunk, 8-12" apart, but the trunk is cut back to a main branch at 5-8', and treated like vase. Open-center from that point.

Vase or Open-Center Vase or open-center is used to encourage trees to a spreading, vase-shaped growth habit (such as peaches, and plums). A whorl of 3-5 branches is left within 2-3' above ground; any main trunk is cut back to the

topmost branch.



BASIC STEPS IN PRUNING *Note:* never remove more than 30% of living wood in one growing season (except for peaches) or there will be a flush of vegetative growth as the tree tries to restore its former food-producing capacity.

1. Remove dead and diseased wood.
2. Keep the central area open by removing crossed, crowded, and inward growing branches. This increases light to interior and improves air circulation.
3. Prune for branch strength by removing branches with acute crotches (less than 17 degrees between the branch and the main trunk). Encourage wider angles by training narrow forks through spreading techniques.
4. Don't prune off fruiting spurs on apples, pears, apricots, and plums* On sour cherries, thin the fruit-bearing wood by removing twigs under 4-6". On peaches, thin fruit bearing wood under 12" long. Ideal fruit wood on peaches should be 12-18" long and pencil thick.

*unless pruning older trees with crowded spurs.





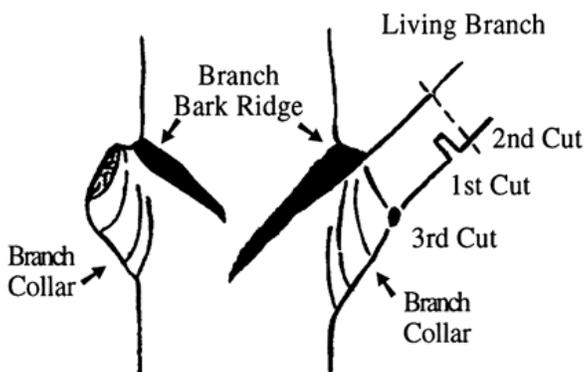
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GROVE

Pruning Guide

Making the Cut:

To removing a branch less than 1" wide you will make a single cut, with hand pruners, just outside the outermost ring of the branch collar. Start by locating the branch collar, which is a swollen area of compressed rings of bark tissue/wood at the base of a branch. It is the point at which the growth pattern of the trunk overlaps that of the branch, strengthening the connection of the branch to the tree as new growth is added each year. Branch collar tissue is the tissue that heals and closes over the wound made by removing a branch. It is also a storehouse of phenolic compounds which prevent fungal diseases from entering the plant while the wound is healing.

- Make precise cuts. Never cut into the branch collar (a flush cut). Cutting into the branch collar reduces the tree's capacity to heal.
- Don't leave a stub. If more than 1/8" of wood is left outside the branch collar, the wound takes much longer to heal, because the healing tissue of the branch collar must grow out over that extra wood. This increases the risk of attack by insects and diseases.



Branch bark ridge and branch collar

A three-cut approach is best for pruning branches larger than 1" in thickness. Although the final cut should be made in the same location, just outside the branch collar, preparatory cuts are recommended to avoid the weight of the branch tearing down the side of the trunk and causing significant damage to the tree. Use a handsaw rather than a pruner to make cuts on larger branches.

- The first cut should be made on the underside of the branch, a couple inches out from the branch collar.
- Saw only a quarter to halfway through the branch. This prevents the weight of the branch from tearing towards the trunk on the second cut.
- The second cut should be made just beyond the first cut. Saw all the way through the branch from the top. This removes most of the weight of the branch.
 - Make the third and final cut just outside of the branch collar, perpendicular to the branch bark ridge.



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Pruning Guide

Quick Pruning Notes for Specific Fruit and Nut Trees:

Apple (*Malus*)- Preferred form depends on variety, but modified central to central leader works for most. Work on scaffolds (tiers) Spreading/bending branches is recommended. Thin fruit to 5" apart.

Pear (*Pyrus*)- Central leader or modified central leader. Spreading/bending branches is necessary. Lateral branches are equally spaced around the trunk with 6-8" between. Thin fruit to 5" apart.

Asian Pear (*Pyrus*)- Central leader or modified central. After 5 years fruit buds tend to produce inferior fruit, and new laterals are encouraged to take place of older wood.

Peach (*Prunus persica*)- Last to prune in the dormant season. Remove up to 50% each year. Thin out twigs under 12", and crowding twigs. Proper fruit twigs are 12-18" and pencil thick. Open center form. Thin fruit to 8" apart.

Cherry, Tart (*Prunus cerasus*)- Open center or modified central leader.

Cherry, Sweet (*Prunus avium*)- Modified central leader. Head leader to create side-branching.

Jujube (*Zizyphus*)- Train as multi-trunk branching at 3-4' off ground. Minimal pruning except the limit height or crossing limbs.

Apricot (*Prunus armeniaca*)- Open center or modified central leader. Thin fruit to 2" apart if necessary.

Pawpaw (*Asimina*)- Minimal pruning needed. Keep root suckers at bay. Tree has central leader, spread laterals to help with sunlight.

Persimmon (*Diospyros*)- Modified central leader. Continue to work top to keep tree shorter.

Plum (*Prunus*)- Open center form, except for European varieties that prefer central leader. Thin to 2" apart on heavy bearing varieties.



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Pruning Guide

Nuts

Pecan (*Carya*)- Central leader. Make sure branching is pruned off until the central leader is at least 5' tall. At this point make sure branches have a good angle of 45-60°.

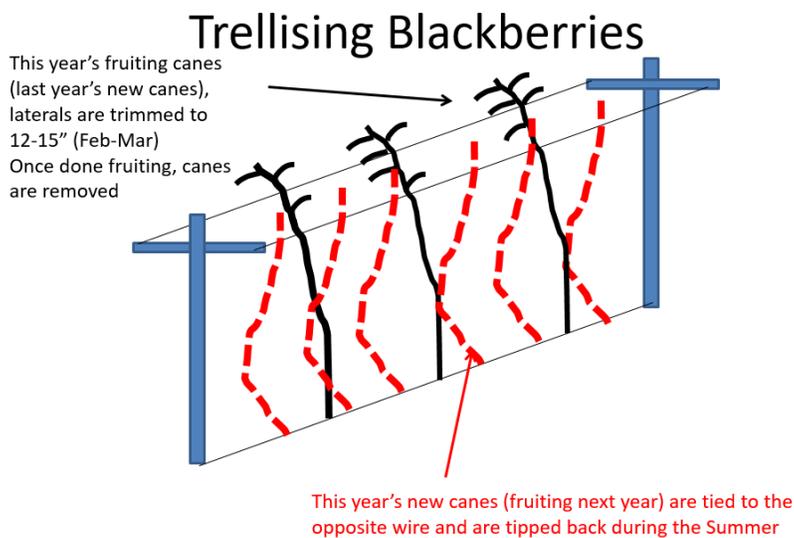
Chestnut (*Castanea*)- Central leader. Make sure branching is pruned off until the central leader is at least 5' tall. At this point make sure branches have a good angle of 45-60°.

Hazel/Filbert (*Corylus*)- Multi-trunk with 5-9 trunks. Keep suckers at a minimum

Pruning Notes for Berry Bushes: Brambles

Brambles are treated separately than other fruiting shrubs. All brambles are perennial, with some fruiting on biennial canes (floricanes). Blackberries are treated this way, except for primocane varieties which the Giving Grove does not offer.

Blackberries (*Rubus*)- Tip prune and tie first year canes late June-August. Tip laterals to 12-15" of second year canes in early March. Remove canes once done fruiting.



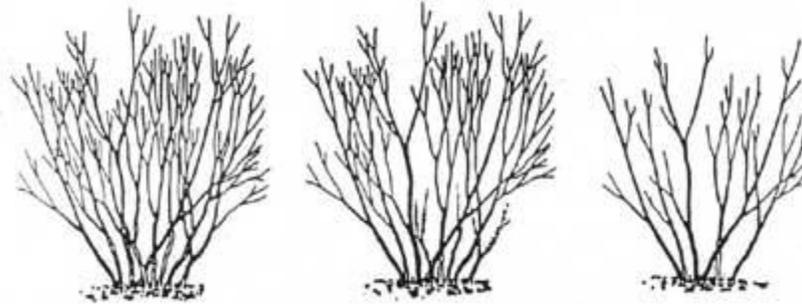
Raspberries (*Rubus*)- For fall bearing (primocane) such as Heritage/Caroline, cut back to 2" above ground in late fall or late winter.



the
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MULTI-STEMMED SHRUBS:

Use thinning cuts for a less bushy effect. This increases light and air circulation to the interior of plant. In general remove stems that are more than 4 to 6 years old; older stems are less productive, so their removal enables younger stems to take their place. When pruning, cut stems to 1-2" above crown of plant.



Aroniaberry (Aronia)- Very little pruning, thin out trunks older than 5 years.

Blueberry (Vaccinium)- Thin out canes older fruiting canes 5+ years.

Bush Cherries (Prunus)- Thin out crowded stems, 5yr and older stems can be removed to make room for younger trunks.

Currant/Gooseberry (Ribes)- Remove shoots after their 3rd fruiting year. Remove all but 6 new stems.

Elderberry (Sambucus)- All American varieties produce on new wood, so they can be cut down to the ground every year, for maximum production, or if a taller shrub is needed they can be left to grow. 'Marge', a European variety produces on 2-year wood.

Fig (Ficus)- In spring, after bud break (often late April), remove winterkilled branches. This may mean all the way to the crown. In exposed sites, wrapping or mulching may be needed for winter protection. Remove smaller trunks and excess growth throughout the season allowing for 10-12 main trunks.

Goumi (Elaeagnus)- Thin out larger trunks over 1.5" in diameter.

Serviceberry (Amelanchier)- Cultivate 5-9 trunks. Remove trunks over 1.5" in diameter to rejuvenate shrub.