Guidelines for Summer and Winter Maintenance Pruning of Mature Apple/Pear Trees

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Maintenance pruning involves the ongoing care of apple and pear trees to sustain their health and productivity. Mature trees have attained the desired dimensions in height and canopy spread. To maintain equilibrium, the amount of wood pruned off must generally equal the amount of increased growth since the last pruning session.

These guidelines provide a practical framework for pruning mature apple or pear trees that have been pruned at least once within the past three years. Pruning techniques can be highly individualized and are often more art than science, leading to varied methods among arborists. Nonetheless, there is widespread consensus on the necessity of allowing "light and air" to penetrate the canopy. Proper airflow minimizes the incidence of diseases affecting both the tree and its fruit, while sufficient light is critical for fruit set, development, and maturation.

A common form for mature apple or pear trees is the "open center" structure, characterized by 4-6 outwardly radiating structural branches instead of a central trunk. This configuration results in a donut-shaped canopy with a central opening and a nominal height of 8-10 feet. This shape is aesthetically pleasing, facilitates light exposure and air circulation, and simplifies pruning and harvesting activities. Alternative shapes are also appropriate, depending on the existing structure of the tree.

Winter pruning vs. summer pruning

During the summer, the foliage on the tree produces nutrients that are stored in the roots over the winter, to be used the following spring. So, when much of last year’s growth is pruned away in the winter, January-March, these nutrients are put to work producing excessive new growth the following spring/summer, water sprouts in particular, Fig. 13. If an old, slower-growing tree needs to be revitalized or a young tree needs stimulation for increased growth, winter pruning can be helpful to increase vigor. Another advantage to winter pruning is that the leaves are gone and there is a clear view of the tree’s structure.

By summer-pruning away nutrient-producing foliage in mid-July thru August, Fig. 10 and Fig. 11, the nutrients available to the tree the following spring are reduced. New growth is actually retarded and less vigorous, Fig. 12. For healthy, mature trees, one approach is to prune only once, in the summer, reducing excess vigor, particularly water sprouts.

The following guidelines apply to maintenance pruning of apple/pear trees, at any time of the year. Steps 1 and 2 are performed initially, then Step 3 is performed after all other foliage/wood has been removed. Reference glossary at the end for terms.

Step 1: Prune for the "4Ds". Remove these undesirable branches:

- Dead,
- Diseased,
- Damaged,
- Deranged/Dysfunctional (water sprouts, crossing branches, in/up/down pointers).
    - Water sprouts are vigorous, vertical shoots, oriented between 11:00 o'clock and 12:00 o'clock. With few exceptions, water sprouts should be removed during each pruning session.

Step 2: Prune for height and density:

- Remove old structural or scaffold wood to reduce height or density as needed, leaving branches that generally radiate outwardly from the center of the tree.
    - Secondary scaffold branches that produce laterals should be spaced so that laterals from adjacent branches don't interfere with each other, avoiding excess density. For instance, if two secondary scaffold branches are close together and running nearly parallel to each other, one should be removed.
- For open center trees, leave a "hole" in the center of the canopy, where most branches are pruned away. The hole is a nominal 20% of the canopy diameter. For instance, a 25' diameter canopy would have a 4-6' hole in the center, producing a donut-shaped canopy.
- Older wood eventually becomes unproductive and should be removed (in all areas including scaffold, secondary scaffold, lateral, or fruit spur level) so new wood can replace it, grow and fruit.
- If needed, reduce the diameter of the canopy with thinning cuts or with heading cuts around the circumference that "cut to a fruit bud".

Step 3: Focus on the new lateral shoots that will produce future fruit, leaning between 9:00 and 11:00. In a mature tree with a full canopy, most of the remaining new shoots will need to be pruned back or removed entirely to restore the proper size and density to the canopy. Their treatment directly impacts fruit quality and quantity.

Lateral shoots might:

- Extend from an apical bud at the tip of an existing lateral branch. Fig. 1
- Come from a vegetative bud on the side of a lateral branch headed last year. Fig. 4
- Originate from an adventitious bud on a scaffold branch. Fig. 13

There are 2 common approaches to pruning new shoots on laterals, Fig. 1 thru Fig. 5:

Approach #1: Head back the new shoots, leaving them 3”-12” long. Fig. 1 and Fig. 3

- This approach is used when there is adequate space for the new growth, such as after removing older fruit-bearing wood or scaffold branches. In the following season, several new shoots will emerge from the remaining buds near the end of the shoot. One can be kept and the rest pruned off, Fig. 4.
- Avoid leaving long thin laterals that will bend into each other or break with a heavy fruit load.

Approach #2: Head back into older wood containing fruit buds, removing the new shoot entirely. Fig. 2 and Fig. 4.

- This approach is used when removing the new shoot is necessary to restore proper density.
- Heading back to older wood will remove the vegetative buds and prevent the continued extension of that lateral.

When a tree is properly pruned:

- There are generally no water sprouts.
- Sloped laterals with fruit buds are the prevalent branches, spaced a nominal 9” apart. They are short and stout enough to support a fruit load without severe bending.
- The canopy has the proper density. By the time of the next pruning session, new growth will have produced excess congestion in the canopy that must be reduced again.

This lateral was not pruned last year, so one new shoot grew from the apical bud at the tip.

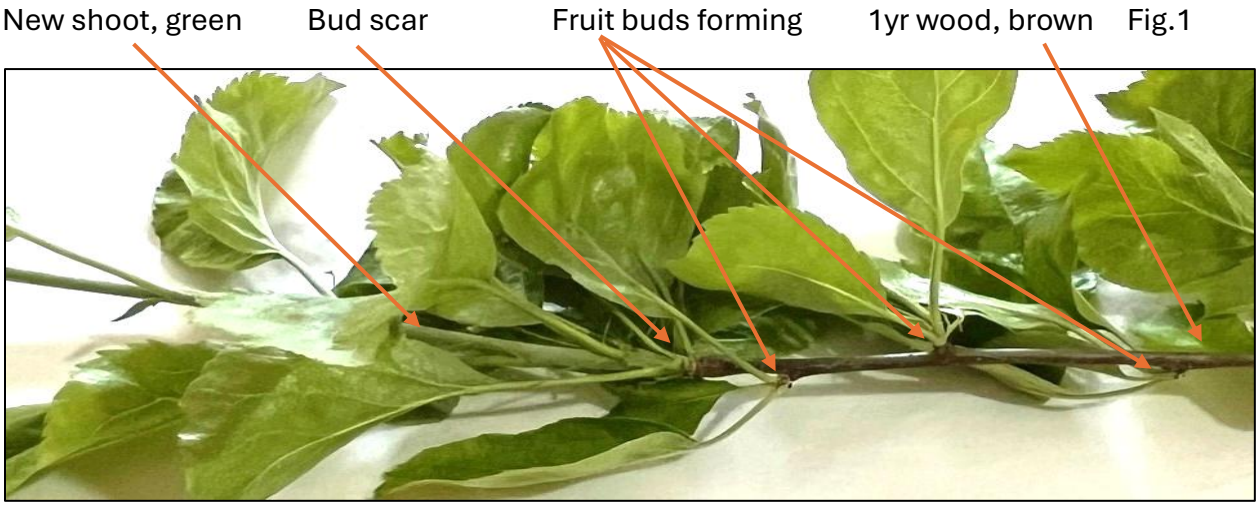
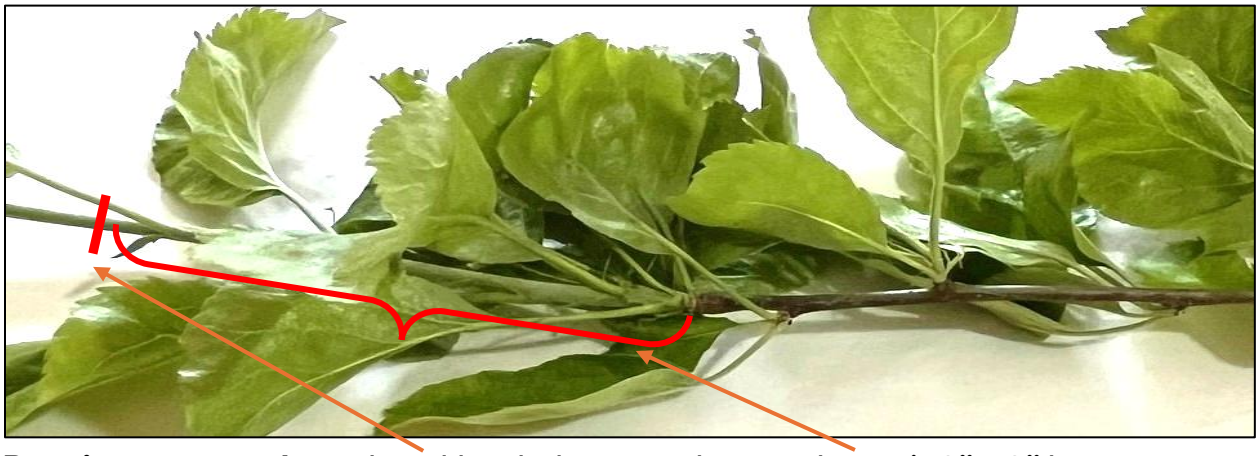


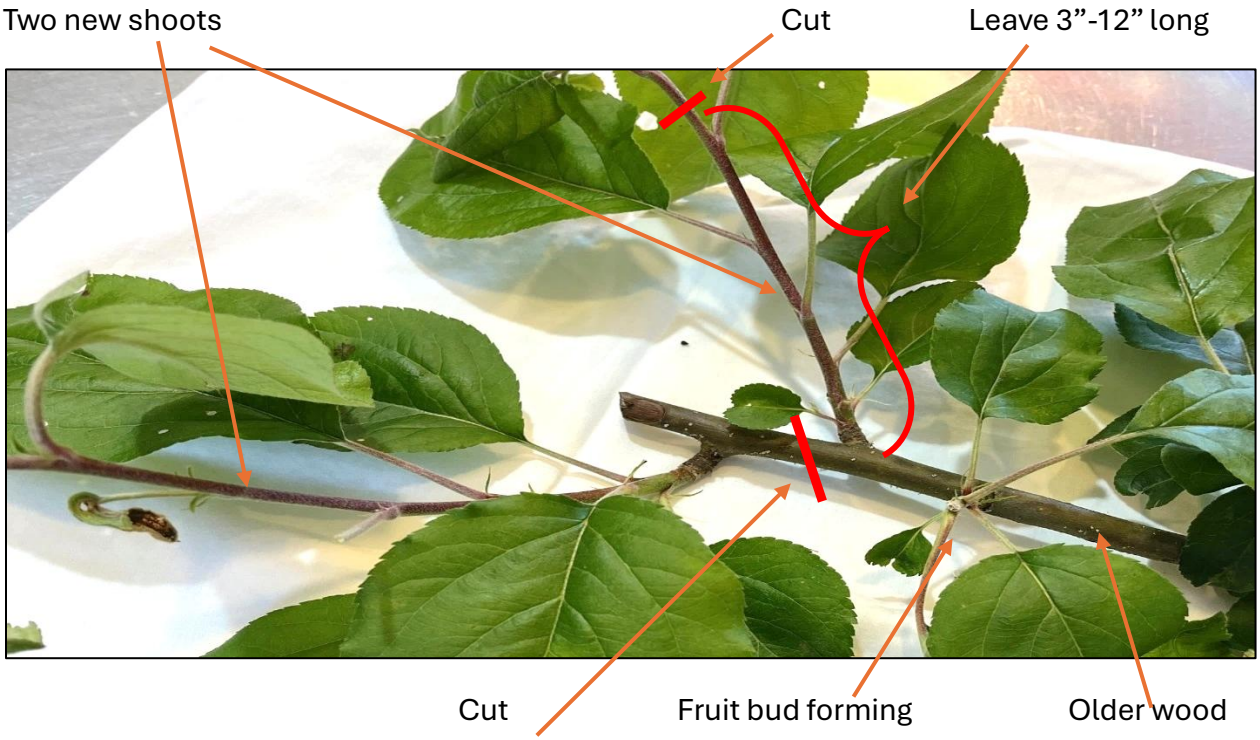
Fig.1



Pruning approach #1: head back the new shoot to leave it 3”-12” long. Fig. 2

Pruning approach #2: Remove the new shoot by heading back into older wood: cut to a fruit bud. Fig. 3

This lateral was a new shoot last year that was headed back, leaving vegetative buds. Two new lateral shoots grew from the buds near the tip.



Pruning approach #1: Leave one new shoot and head it back to 3”-12” long. Fig. 4

Pruning approach #2: Remove the 2 new shoots by heading back into older wood: cut to a fruit bud. Fig. 5

Picture taken 4-19 before “dormant” pruning. This open center apple tree was dormant-pruned about 12 months earlier. Fig. 6

After “dormant” pruning. Note removal of water sprouts and reduced density of the canopy. Total height ~12 feet. Fig. 7

Closer view before pruning. Note the congested density of the canopy. Fig. 8

After pruning with reduced density of the canopy. Fig. 9

Picture taken 8-2 before summer pruning. This open center apple tree was dormant-pruned in March.

If left unpruned, the water sprouts would reach 2x height by fall.

Fig. 10

After summer pruning.

Note removal of water sprouts and reduced density of the canopy. Total height ~9 feet.

Fig. 11

Picture taken the following April. Note reduced number and height of new water sprouts that grew after summer pruning.

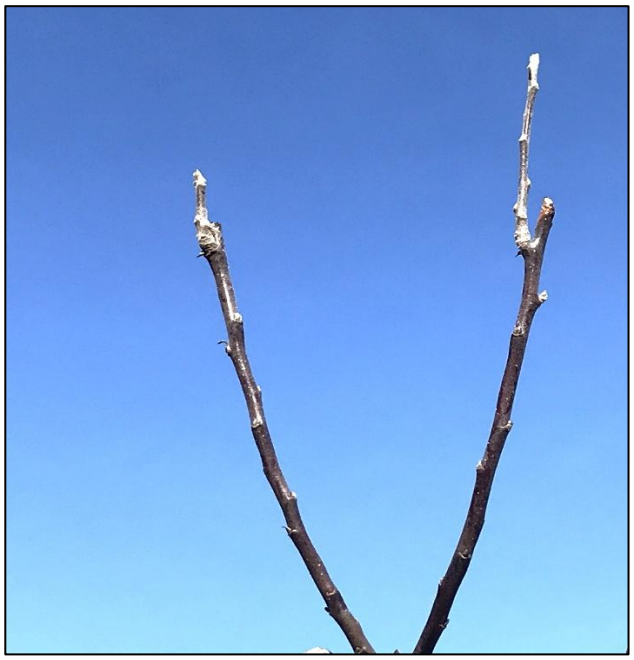
This tree will be summer-pruned again in July/August

Fig. 12

For years, this open center apple tree was pruned every winter to remove all the water sprouts and the new lateral shoots from the previous growing season. There is almost no 2 yr wood on this tree, and therefore fruit production was limited. Picture taken 3-9. Fig. 13

After dormant pruning. All water sprouts were removed and future fruit-bearing laterals remain, spaced 6-12" apart. These laterals will produce new shoots to re-develop the canopy. This tree should be summer-pruned in July/August. Fig. 14

Blossoms on pear tree1 yr wood pruned the previous summer season. Fig. 15



New short shoots developed on an apple tree after summer pruning. Fig. 16

Other Pruning Considerations:

1) Some arborists recommend pruning off no more than 20-30% of the canopy at any one time. The most notable consequence of heavy pruning is the vigorous growth of new shoots in the following spring, driven by the stored nutrients. Healthy trees are remarkably resilient and will withstand even severe pruning of large branches undertaken to restore a neglected tree or to perform top working.

2) Many beginning pruners are concerned they will "over-prune" the tree. Often, they do just the opposite and "under-prune" the tree, meaning they don't remove enough of the congested density and older, less productive wood. To maintain equilibrium, the amount of wood pruned off must generally equal the amount of increased growth since the last pruning session. If any area is actually "over-pruned", it will fill in with new growth in excess of what is needed, requiring normal pruning during the next session.

The openness of the canopy in Fig. 7 and Fig. 9, will again look like Fig. 6 and Fig. 8 before the next pruning session.

3) When is the "right time" to prune an apple/pear tree? There are preferred times for achieving certain goals. For instance, winter pruning, January-March, allows a full view of the bare tree and promotes vigorous growth the following spring. Summer pruning, mid-July-August, retards growth. But no harm will come to the tree itself regardless of the time of year the pruning takes place.

Some arborists promote the idea of only once-a-year summer pruning for mature trees.

4) Some owners mistakenly prune off most/all of their new shoots every year, removing the future fruit-producing laterals along with the undesirable shoots, Fig. 13 and Fig. 14. Every year, new shoots appear and every year they are all pruned off to leave the scaffold branches with no lateral wood, so the tree never reaches its potential for fruit production. Once the pruning error is corrected and new lateral shoots are trained to fill the canopy, they will produce fruit after 2 more growing seasons.

5) In the Pacific Northwest, the most common fungus infection is anthracnose. It causes cankers that damage the bark. Eventually, in severe cases, it will girdle a branch and kill it. Some cankers actually go into remission and the tree begins to heal, just like around a pruning cut or abrasion damage. Trees that have extensive anthracnose damage still produce prolific amounts of fruit, so can be worth keeping and maintaining. The damaged

wood can be removed, but if it is productive, it can be left in place. There are spray treatments available from licensed applicators.

6) Some pruners advocate making a precise heading cut just above an outwardly pointing bud. This is important when a tree is young and in the training/shaping phase to direct growth for height and diameter. However, in a mature tree, hundreds of cuts are made, sometimes in hard-to-reach places, and it's not always practical or time-efficient to find and trim at a specific bud. So, a shoot can be trimmed without consideration of how close it is to a bud. Excess new shoots that grow near the cut can be removed during the next pruning session, as in Fig. 4 or Fig. 5.

7) Some arborists advocate that a number of water sprouts should be left in the canopy to provide branches with a strong apical dominance to draw excess energy. This leaves the remaining shoots to develop at a more desirable, less vigorous rate. These sacrificial "lightning rods" can be removed at the end of summer

8) Moss and lichen are common on PNW trees, are not harmful and don't need to be removed.

Terms:

- From the end of growing season 1 until the next fall, new shoots are called **1 yr wood,** with only vegetative buds. From the end of growing season 2, the branch is called **2 yr wood**, containing fruit buds.
- **Fruit buds** produce blossoms and fruit on 2 yr wood in growing season 3.
- **Fruit spurs** are short, wrinkly branches on the fruit-bearing laterals. They continue to grow ~1/4 - 1/2" per year and produce fruit buds at their ends.
- **Laterals** are fruit-producing branches.
- **Pruning cuts:**
    - A **thinning cut** removes the entire branch back to the base where it originated.
    - A **heading cut** removes a portion of the shoot/branch length, halts future elongation and stiffens the branch.
- **Scaffold** and **secondary scaffold** branches form the framework to support the laterals.
- **Water sprouts** grow vertically and don't produce abundant fruit. They are generally removed every pruning session.

A good follow-on to reading this paper is having a hands-on session with an experienced pruner to evaluate specific situations and ask questions.

7/21/25
www.NWFruit.org

References:

These qualified references go into great detail on their given topics. Unfortunately, they sometimes contradict each other.

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