

Training/Pruning APPLES and PEARS

Why Prune and Train Your Fruit Trees?

- To shape and balance your tree's form
- To open the tree to light and air circulation
- To improve fruit quality
- To control vigor

Central leader tree form

This is probably the easiest form to train apples and pears. See *diagram 1*.

A Central leader tree form pyramidal, similar in shape to a Christmas tree. The bottom branches stick out farther from the trunk than those at the top of the tree.

The guidelines below apply directly to this tree form, however the concepts can be used with any pruning or training system.

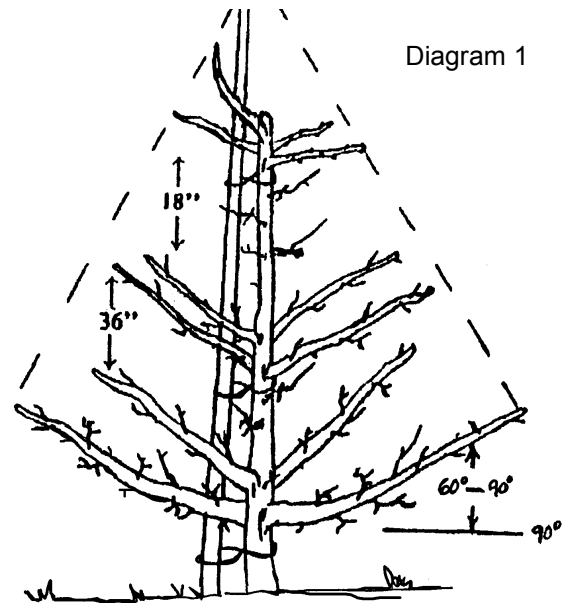


Diagram 1

Prune Bareroot fruit trees at planting- "Bareroot" trees have had most the tiny and microscopic feeder roots cut or damaged during the digging/storage process. If the branches that will produce leaves are not reduced via pruning at planting, the tree will become moisture stressed when it begins to leaf out. As the leaf surfaces will overtax the tree's ability to draw water up from the roots. From planting, the tree may take 6 to 10 weeks to regenerate feeder roots. Which is why you want to prune your tree immediately.

Pruning your tree at Planting- Choose 3 to 5 branches that radiate from the trunk and are evenly spaced around the tree. These branches should be as close to the same thickness at the base as possible. (Remember that the greater the diameter of a branch the faster the branch will grow.) Branches that are growing in a horizontal habit tend to be more fruitful than upright branches. Next, prune all of these branches to a length of 18-24 inches; if the branches are only that long or slightly shorter then no pruning will be required.

Pruning the leader at planting- You must select one upright shoot to become the leader. It doesn't have to be the straightest shoot nor the strongest shoot; in fact, we tend to choose a shoot that is closest to the caliper of the side branches. Prune off all other upright shoots. Then prune the future leader to 8-10 inches above the highest branch on the tree.

Training to Stake - Years 1-6

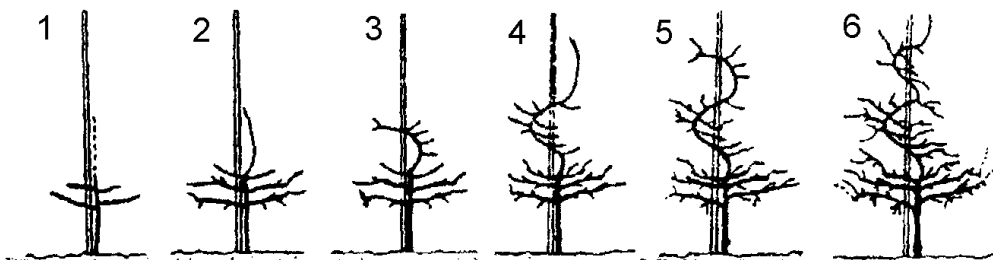


Diagram 2

Stake your fruit

trees- Use posts that will be at least 5'-6' tall at finished grade after burying. The PNW is a windy place to live; the stake not only should be used to hold the tree up but more importantly, it will be

used to hold the branches supporting fruit up. The varieties available often begin bearing fruit in the trees' second year. You may have the fortune of being the recipient of 10-15 lbs of fruit in the second year, but if your tree isn't staked, it will probably be destroyed by the weight of the fruit even before the wind has a chance.

Use your tree stake as a training tool. Tie the trunk of the tree to the stake just below the first branches. Tie the leader to the stake every 18"-2'. For all tree tying, we recommend using an expandable material that won't cut into the tree as it grows. '**Stretch Tie**' is a commercial orchard product designed for this purpose, available at the nursery.

Pruning- General Rules: Pruning is a requirement for success.

Utilize training into your pruning program for the best success.

- If you prune into one-year wood you will delay fruiting of that branch
- If you prune into one-year wood, the net effect will be to make more one-year wood.
- If your goal is to produce fruit, don't prune into one year wood after the planting year.
- Unpruned one-year-old wood will develop many flower buds in its second year.
- Pruned or headed one-year-old wood will develop almost no flower buds in its second year.

It is important to let the one-year wood grow into two year old wood. Does that mean letting the young branch you think you should shorten get too long? In some cases, yes. In the second winter you can cut the branch back to the desired length. Make sure when you prune, you are cutting into the two-year old wood. Pruning does decrease your tree's fruiting potential by removing wood from the tree, but is necessary for fruiting success.

Limb spacing (Branch Placement) on semi-dwarf trees

(the importance of **Branch Placement** is discussed below)

- Bottom set of branches should be about 26"-36" above the ground.
- Lowest set of branches should have 24" min and 36" preferred before you start your second set of branches.
- All other sets of branches only need 2 feet between them.

Limb spacing (Branch Placement) on mini-dwarf trees

- Bottom branches should start at 24". All other sets of branches should be about 12"-16" between them.

Controlling branch vigor

Branch vigor refers to how strongly a branch is growing. **Three major factors control branch vigor and flower bud formation: branch placement, branch angle, and caliper. These three things interact to balance and counterbalance growth within the tree.**

- **Branch placement (elevation) in tree.** The lower the branch in the tree, the less vigor the branch has. The top of the tree will always be the strongest growing part of the tree.
- **Branch Angle.** The more upright the branch, the more vigorously the branch will grow. If you take a vigorous branch and pull it down (**training bands** are available at the farm) to a horizontal position, you can nearly stop all of the growth in that branch.
- **Caliper (thickness of branch).** When comparing two branches in a tree, if the branches are the same elevation and growing at the same angle, the thicker branch will be more vigorous. This is why it is important to maintain older branches in the bottom of the tree.

You can control branch vigor by manipulating these three factors.

- **Branch angle is the easiest way to manipulate branch vigor.** By pulling upright branches more toward horizontal, you can decrease vigor. Experiment with branch angle to manage your fruit trees' vigor. Ideal branch angle for fruit bud production should be between 60 and 90 degrees (90 ° is horizontal).
- Remember that **branch caliper plays a key role in the vigor equation.** Think of branch thickness as the width of a road. The wider the road, the more cars you can get down the road, or in this case energy (growth) through the branch. In an ideally shaped central leader tree, the lowest branches will be the thickest, and the topmost branches will be pruned and trained to reduce vigorous growth and encourage short, less vigorous, productive branches.

Pruning the trees' central leader: year 2 and up

- On the leader, make a pruning cut leaving a side shoot of one-year-old wood, and leave that side shoot unpruned. This means the side shoot can't be too long; 4"- 15" is ideal. On older trees, this is the preferred cut to use to manage the leader. See diagram 2, year 3.
- If the leader shoot is long enough that it needs to be tied, it is best to bend it to approximately a 45-degree angle and tie it to the post. Left unpruned and trained at this angle, the shoot will push many fruit buds and many short, weak, productive branches. This will enable the top of the tree to fruit a year earlier. The best way to reduce the vigor in the top of a fruit tree is to produce lots of fruit in the top.

Tools for Successful Fruit Trees

- Stake for each tree
- Stretch tie for tying
- String or Training bands for branch training
- String for supporting fruit load
- Fertilizer and Lime
- Pest & Disease Management Plan and sprays

Pruning 100yr Old Trees (and those not that old !)

If you find yourself standing in your yard holding this tutorial and looking up at one of the infamous 'umbrella trees', well consider yourself one of the privileged few who own and get the chance to prune one of these Edsel's. Yep, these trees exhibit everything you could do wrong in pruning an apple tree. These trees were on seedling rootstock, so they were pruned to keep them from becoming giants. In the process, they became umbrellas with incredibly vigorous annual 'watersprouts'. So where do you start?

In some sense you need to further digest the principles of training and pruning. Branch placement, branch angle, branch caliper; these are the keystones to successful pruning. They are the rules to pruning a slender spindle, an open center tree, or an umbrella tree. So let's try and walk through the process on these mature trees. If these trees haven't been pruned in awhile then the first year should be dedicated to several large cuts to either bring the top down or to open up light bays. The general rule I was taught was never cut more than 25% out of a tree in a year.

Remember that several big cuts will not impact the trees re-suckering tendency compared to a lot of little cuts. The first year stick to your major big cuts. You will want to develop a mental or written 3-5 year plan. Each consecutive year you will focus more on detail.

- Year 1 - big structural cuts.
- Year 2 - thinning out major side branches.
- Year 3 - thinning more side branches.
- Year 4 - mostly detail pruning on two and three year old wood.

Where you have lots of one year shoots suckering, try cutting out all of the really big ones, leave all of the one year shoots that have some angle to them and that are not too strong in growth (under 2' in length). You can even bend these down to the horizontal like we do with the slender spindle. One shoot every 12" works.

With the remainder of shoots evaluate how many of these shoots you can thin out. Remember the goal is to let light into the shoots you are leaving. If you can leave what I would call a small collection of safety valves every 6' or so, you would have several 1-year old shoots, several 2 year old shoots and one or two 3 year old shoots. Do not even think about tipping these. Let them grow with wild abandon.

Every year you will cycle out the 3 year old shoots. They are easy to tell because they should have been loaded with beautiful fruit. But no mercy here, cut them out at the base. Your 2 year old shoots- reduce the number to 2 or so and same with the one year old shoots that are now the 2 year olds. Get the idea, you rotate out the suckers.

These mature trees have a lot of horsepower in them. And my guess is most of these trees were not allowed to grow to the height needed to maintain a balanced tree. Cycling that vigor into shoots will let the rest of the tree begin to come into balance. And the weak shoots with some horizontal angle, you won't believe the volume of fruit they will produce. What if there is still a lot of vigor in your tree? If this is the case then you will want to strategically choose several of these 3 year old shoots and let them develop into an upper tier of branches in the tree. Give the new upper tier of branches at least 3' or more above the lower tier of branches.



Same limb as above, pruned. Angled shoots are left to mature into fruit wood. We also left some of the strong upright shoots to soak up some of the tree's vigor. **Do not tip these shoots!** They can be removed as two year old shoots, or left to form another tier of fruiting wood above.