

## **First fetch your ladder! Tim Scott-Ellis**

**Introduction.** The pruning we saw while in Belgium was typical for intensive fruit production in the commercial style. This level of pruning will not be suitable for most of the situations we will find ourselves in, the one's where we need to keep the trees healthy, producing sufficient fruit for our production needs and I don't think it very likely that we will need to prune any trees as hard as we were shown. However, the general principles of pruning, especially the biology, still apply to all fruit tree pruning. In fact seeing the extreme pruning should give us confidence when pruning by knowing that we don't need to be too shy when wielding the saws.

There are several types of pruning fruit trees; those that are done in various stages of a tree's life and those that are undertaken regularly to manage fruit production.

**Tree Biology Overview.** Pruning fruit trees is an exercise in managing the plants hormones. Hormones are the signalling molecules that are produced in the buds of the roots and shoots and in the leaves. The ones we're most interested in (honest) are the ones produced in the bud shoots or the apical meristem. The main one for us in terms of pruning is the auxins that are involved in many physiological responses including apical dominance. The bark of woody plants generally contains many uninitiated buds; these are prevented from growing by the auxins from the apical growth to varying degrees. This allows the trees to grow upwards in order to get most light for photosynthesis.

The strength of the suppression varies from the highest apical growth point to the second highest, then the third and on down the plant. If the dominant tip is removed the buds below this point are allowed to grow and the form of the plant will develop a more branched structure that is much more suitable for fruit production and harvesting.

Pruning is also wounding. When we remove so much of a tree's new growth it places the tree under stress (something that disturbs the optimum growth of the plant). A response to this stress is often the production of fruit; this is supposed to be the tree making sure it reproduces before it dies but who really knows. Therefore the pruning is intended to cause stress in order that we can use the fruit.

Lots of small cuts are better than one large one. Trees can compartmentalise smaller wounds more effectively (trees can't 'heal' themselves but they can callus over wounds). Don't use wound paints, they are expensive, mucky and don't work.

**General pruning.** There are several general pruning rules that should be followed. Always prune out any dead or diseased wood. If you see cankers or other dysfunctional tissue this should be pruned out and the prunings removed from the orchard.

Deadwood is considered a good thing for wildlife/nature conservation/biodiversity\* (delete as appropriate). However, when we are managing a stressed tree for fruit it is important

that we manage the health by ensuring it retains sufficient vitality to ward off any colonising or endophytic organisms.

Most often you are trying to form a goblet shape of the tree as this allows the free movement of air around the tree (not that I can ever remember being stuck for air in a tree) and for ease of fruit picking.

The ideal point is immediately outside the 'collar', which is normally visible as a distinct bulge - occasionally continuing all the way around the branch. The 'collar' may extend some way out but should not be cut into even if a 'snag' appears to remain. Branches should not be cut back flush to the main trunk or left with a large snag as these will result in excessive dieback or poor callusing.

The objective is to improve branch spacing, so that light and air can reach all parts of the tree and picking and maintenance are made easier.

### **Forming the tree.**

I have presumed you have chosen a healthy tree with a good graft and the correct root stock for the site you are planting the tree in. The first years pruning is the all important formative pruning, this involve removing the highest point of the tree down to a point about half a metre down the tree. This will allow the lower buds to grow and the form of the fruit tree can be started.

I have also presumed we are talking about trees you need a ladder for but the principles are the same for all apples and pears.

In year 2 all the shoots should be cut back by at least a third. Everyone knows that buds grow in the direction they point so bear this in mind when pruning back. Very low branches should be removed back to the trunk.

To ensure the right goblet shape is achieved you can tie down some of the branches. This will concentrate the plants resources in the desired branches via geotropism and hormonal (auxin) management. Getting the right shape and maintaining it is a largely a matter of intuition as is the case with much tree work (but certainly not all, please call a professional, my number is at the bottom of this letter). If the basic rules are followed you will produce more than enough fruit for your wants and needs.

Year 3 & 4. You should start seeing the form of the trees developing. This will help you to manage the tree for fruit throughout the rest of its life. New shoots growing from the framework branches should be pruned back to 2-3 buds to stimulate new growth.

From now on pruning should concentrate on the central leader and the internal shoots. Side shoots should be left unless it causes an obstruction.

**Winter pruning.** This is the normal time for pruning apple and pear trees that are managed as shrub or standard trees, preferably January and/or February when the tree is still in its winter dormancy period.

**Summer Pruning.** This should be undertaken when you need to restrict the future growth of the tree. Summer pruning is generally used for the management of cordons, espaliers and other trees managed on dwarfing root stocks. A pruning in the summer suppresses growth and stimulates fruit production. It can limit re-growth by reducing the vigour of the tree (not really but too technical for this note) if done in June, if done after late August then it helps encourage fruit development.

**Stone Fruits.** These trees are very susceptible to Silver leaf disease and should only be pruned in the high summer when the tree is displaying the greatest signs of vitality and the rising sap can 'flush' any wounds clean. There is apparently some research that saying sealing wounds of cherries with wound paints has some beneficial effects so if you need to slap some of the glutinous muck about here is your chance.

**Restoration Pruning of Orchards.** The point of our trip was to look at the restoration pruning of old orchard trees. These need to be pruned as for standard pruning but there may be considerably more wood taken out of the tree than on a more routine pruning operation.

Where we are restoring trees these general rules are sufficient for the initial restoration work. Once you have identified the fruit variety then the intricacies of regulated, spur or renewal pruning can be discussed, probably in a shed on an allotment. These pruning methods differ as to where the main fruit bearing wood, however renewal pruning will always give results.

When looking at the tree consider it as a whole and think about the end product being a tree that will bear fruit well and you can harvest. Don't start concentrating on individual shoots at the expense of the whole tree.

Leave strongly growing shoots alone and remove the poor ones. Only lightly prune the ones in between.

When pruning, always cut to the main stem or trunk, or to above a well-placed outward-growing side branch.

**Overgrown, large trees.** Prune out the larger, dominant stems that are unproductive. Take out any crossing, damaged, diseased shoots and branches and any that are growing back to the centre of the tree. If the tree looks congested balance it out. Remember to prune back to a bud that points in the direction of growth you want. This should be done over a period of years removing no more than 20% of the tree every year (though we mustn't tell Paul that). However, these trees haven't always read the same books as us so if the situation dictates, i.e. the trees are bearing small fruit, and you are feeling bold then you can try going

in a little harder. It's best avoided though as it can reduce too much of the photosynthetic capacity of the tree and therefore its potential to recover fully.

Remove or shorten any branches that are growing too close together - with less than 60 cm between them if next to each other, or with less than 90 cm between them if growing one above the other.

Pruning too hard will encourage the growth of water-shoots and these will then need to be managed. Deal with water shoots as follows:

- In the first year, remove any water shoots growing directly from the trunk or from the lower parts of main branches and cut away half of the remaining upright water shoots from their base.
- Tip-prune the remaining water shoots, simply cutting off the top 10 cm or so, to encourage branching.
- In the second year, remove half the water shoots retained in the previous year. Prune the remaining shoots to an outward-facing bud or branch, to encourage an open-centred branch structure.
- In the third year, continue to prune to outward-facing buds or branches. Fruit buds should have started to form on the new shoots. Where this has occurred, revert to routine winter pruning.

**Stunted, starved trees.** These trees often have few new branches, but have overcrowded, dense spur systems (clusters of short, stubby branches producing flowers and fruit on older wood).

Thin out some of the spur systems, removing those that are unproductive or that are overshadowing others. These will eventually replace the older, worn-out branches.

Over-pruning (removing more than one quarter of the canopy in any one year) may result in the production of water shoots, which are tall, upright and leafy branches, producing no flowers or fruit.

Look out for common problems of old or neglected trees, such as canker, woolly aphid and biennial bearing.

**Fertilising.** We won't be fertilising any of these trees. Trees are very effective at obtaining the nutrients they need from any reasonable soil. If the tree is sickly then fertilisers will only help if the exact cause of the decline is identified and only the correct nutrients added. Very often the tree will be struggling due to disturbance of its rooting area or it is the wrong species or variety of tree/rootstock; in neither situation does fertiliser help.