Restoring Fruit Trees

Fruit tree culture is considered to be a horticultural, rather than an arboricultural, subject. Consequently, fruit tree pruning tends to be excluded from most standard arborist training courses. Bob Lever from the East of England Apples and Orchards Project describes the pruning methodology to cultivate and restore fruit trees.

Anyone who undertakes tree care work in private gardens will almost certainly be faced with pruning aged and overgrown fruit trees at some point in their career. Meanwhile the introduction of agri-environment grants for orchard restoration also opens a new market to those who understand the principles of fruit tree restoration.

What makes fruit trees special?

Undertaking work in accordance with good arboricultural practice for Rosaceae is sufficient to preserve the health and safety of a fruit tree; but there is a difference between pruning for tree preservation and pruning for fruit. Lack of understanding of this aspect can often lead to clients becoming disappointed. However if someone hires a qualified arborist to prune their old apple tree and then gets no fruit at all for 4 or 5 years, they are going to be disillusioned - even if the work done benefits the tree!

Pruning practices and fruit tree forms vary considerably, but the most common traditional tree shape encountered is the 'open centre' form. The central leader of the tree was stopped in the formative years and a 'framework' of boughs was developed, radiating from the trunk. Smaller side branches known as 'laterals' were allowed to arise along the main framework. The framework branches were considered to be long-term structures, whereas the laterals were pruned and renewed on a frequent basis. The shape of an open-centre fruit tree, pruned for fruit production, resembles a wine goblet or an umbrella in shape.

The principles behind this tree shape are as follows:

- Most apples and many pears fruit more prolifically on branches that are placed at a shallow angle to the horizontal, while vigorous cultivars (such as the very common Bramley apple) fruit most prolifically on weeping branches.
- The open centre allowed light to fall on all branches, to encourage even ripening of fruit
- Low angled branches make picking easier.
- Laterals were replaced frequently because best quality fruit occurs on wood that is less than 5-6 years old.

When pruning ceases, the open centre tree form can lead to structural problems. Upright growing laterals

usually dominate the tree, closing the canopy and causing lower branches to lose vigour. Fruit production on vertical branches is often scant, and any worthwhile fruit will tend to be at the top of the canopy where it cannot be reached. Overgrown trees may become prone to windthrow, while branches may grow overlong and heavy, causing the trunk to split, particularly as the tree becomes hollow.

Planning Restorative Work

When planning restoration work, the fruit species present in a garden or orchard must be taken into account. In the case of Malus (apple) and Pyrus (pear) trees, major pruning work is usually carried out while the tree is dormant. Prunus (plum, gage, damson, cherry) species can be prone to diseases such as Silverleaf so pruning has traditionally been undertaken in the late spring/ early summer when it is thought that the tree will be less exposed to the spores of the fungus. Meanwhile the combination of rising sap and active growing conditions of the trees means that they are more able to resist infection.

If fruit production is important, tree restoration should be phased over at least two years. A good rule is to avoid removing more than 25% of a tree in a single year. Harder pruning may encourage excessive vigour at the expense of fruit formation. If fruit production is not a priority, it is reasonable to remove more in a single year, but this must be considered with allowance for the tree's health, vigour and past management history.

Some fruit tree species produce suckers from their rootstocks. Prunus species are especially prone to this, as are pears, which have been grafted onto quince stock. These will need to be removed. In the case of long neglected trees, the rootstock growth may form a very considerable percentage of the tree. In all cases, it must be removed before moving on to restorative pruning work on the main tree.

Overgrown open-centre tree with dominant vertical laterals. Close-up of vertical lateral

Trunk splitting as a result of long branches

Suckers from Rootstock

Restorative Pruning – First Phase

In all cases, the safety and integrity of the tree must be the first consideration. This will involve the removal of any particularly unsafe or badly placed branches and the shortening of any overlong and heavy branches. Avoid cutting branches back to vertical growth – choose new leaders that will develop into branches that grow outwards.

It may be necessary to reduce the height of the canopy in order to make a tree more accessible for harvesting, or to lift the canopy to enable grass-cutting machinery to be used beneath the tree.

If there are very large or vigorous branches growing vertically from the centre of the tree, or arising from the main framework, then these should be removed, to reinstate the open centre form.

Further work needed to thin the canopy may also be carried out, and all cuts should be made in accordance with good arboricultural practice.

Conventional pruning practice would then concentrate on the removal of the "3 Ds" – dead, damaged or diseased wood. However, if habitat conservation is one of the aims of restoration, it is appropriate to leave as much standing deadwood in the tree as is safe.

In many cases, first-phase restoration is all that is required, particularly in the case of Prunus species, or on Malus or Pyrus where fruit production is not the primary concern. Future maintenance would then involve revisiting the tree at least once in every five years and carrying out similar work as required.

Restorative Pruning - Second Phase

If a return to fruit production is the desired outcome of the pruning, then second-phase restoration may be carried out over the following years.

Trees after first phase restoration. Main framework boughs have been shortened, the canopy has reduced in height and any large vertical laterals have been removed

One of the results of first phase restoration work on a healthy tree should be some clusters of new growth from the points where the tree was pruned. These are known as "water shoots" in the fruit-growing world. Heavy restorative pruning may lead to large quantities of water shoots, in which case they should be thinned out. Remove the most vigorous and upright growing shoots and retain a few weaker shoots that are growing in the direction where new laterals could be developed. This work may be done in the July following the restoration pruning, when the unwanted shoots may be pulled off easily by hand. Alternatively, it can be done the following winter, as part of second stage restoration.

Malus and Pyrus trees may require second phase restoration work if improving fruit production is an aim. Such detailed work is not usually required on Prunus species.

The purpose of this phase of work is to thin the canopy to enable light to fall on the fruiting areas of the tree, to encourage the production of healthy new fruit-bearing growth, and to maintain a tree shape that will make it possible to harvest the fruit.

Second Phase Procedure

Deal with any boughs that interfere with the safety or management of the tree. Remove those that are too high to pick, and those that are too low. Shorten any boughs that are too long to bear their own weight, or are growing into the next tree. Remove diseased, damaged or dead wood. (unless required for habitat) and remove any branches that shade or clutter the centre of the tree.

Work along each main bough in turn, looking at the laterals in detail. Aim to leave well spaced laterals along each bough. When selecting which wood to remove and which to retain, note the following: The best fruit will tend to be on wood that is five years old and younger. Meanwhile branches that arise from the bough at a shallow angle, or have a flat or weeping habit, usually crop sooner and are more prolific than those that grow straight up, while branches in the shade produce poor quality fruit.

When shortening branches, take care to try to cut back to wood that is fairly flat-growing and well furnished with fruit buds, because shortening back to strong upright growing shoots, or to shoots that have little or no fruit bud, will only produce leaf at the expense of fruit.

Remove vigorous growing water shoots (if this was not done in the summer). Leave a few of the weaker, flatter growing, shoots to provide new branches. If there is a shortage of flat growing shoots, it may be possible to tuck, tie, or weight down a few of the more upright ones to form new branches where they are needed.

As a general rule, it is usually best to remove any one year old shoots that are over 12-14 inches long, as these are unlikely to form productive branches in the next year or so. With tip-bearing trees, care must be made to leave plenty of short young growths that have healthy fruit buds on the ends.

Thin out overcrowded laterals, removing the oldest, the badly placed or the most unproductive first. Aim to remove not more than 20% of the tree in a single season.

Apple tree after second phase of restorative pruning - pruning for fruit production

100 year old apple tree pruned using renewal system. The trees in this orchard are well over a century old but still producing a commercial crop. They are pruned annually using the renewal system

Maintenance pruning using the "Renewal System"

If fruit production is a priority, then annual pruning using the renewal system is probably the easiest and most effective cause of action to take.

Follow the procedure as for second phase restoration, taking care to leave well-placed two and three-year-old laterals that have started to form fruit buds, also leave fruiting four and five-year-olds if there is room. Older laterals can be removed as young shoots are selected to replace them. The object is to keep a "rotation" of laterals of different ages, removing the oldest and retaining young replacements.

By a combination of restorative methods and renewal pruning, it is often possible to rejuvenate very old fruit trees.