



Fruit tree life cycle workshop

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Pruning & Training

Fruit trees of all types derive benefits from being pruned. Just some of the benefits of pruning include new growth being stimulated, providing a better shape for the tree, focusing growth into leaf or fruit production and keeping the tree healthy as it grows.

Tree shapes and sizes

The majority of fruit trees are grown on root-stock via grafting. The root-stock come in a variety of sizes with different resistance to pests and ability to live in different types of soil conditions. Different fruits normally require complimentary root-stock to support their growth although there are some that can use other fruit tree root-stock (refer to grafting section for more details on root-stock choices).

The first choice to make when you are looking for a new fruit tree is what size root-stock has it been grown onto. There are extreme dwarf, dwarf, semi-dwarf, semi-vigorous and vigorous for apples. These range in height from approximately 1.5m up to 6m or more. Consequently, where you are going to put them on your property, how much space they have to grow and how much light they will receive is extremely important to making the most appropriate selection.

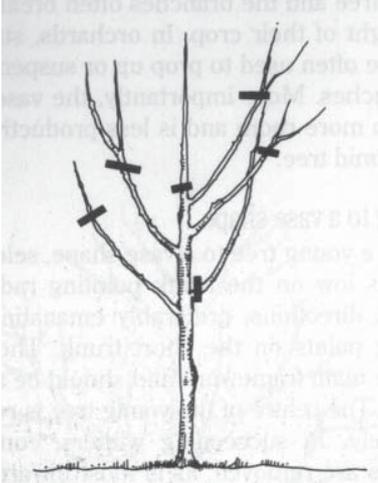
Once you have the correct tree size for your location you will plant it out, usually during the dormant season between leaf fall and spring bud burst, in NSW this is roughly between mid July and the end of August. If you bought it from a nursery it will usually have three or four main branches, often in the form of a cross if looked at from above, or one central leader along with two to four secondary branches. Also look at the graft and check there is a close size match between the root stock and the tree wood.

When planted you will need to cut roughly 1/3 off all the branches to help stimulate the new season's growth. As most fruit trees take 2-3 years before they bear fruit this is your first opportunity to examine the tree and decide what shape and function you would like to make it into over the next few years before it fruits.

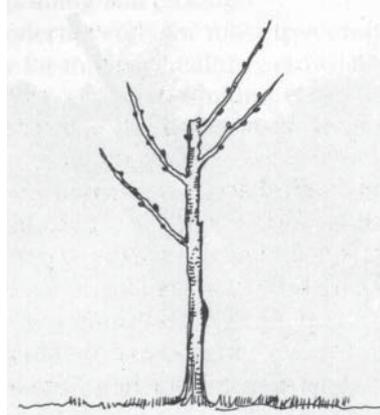
Fruit trees can be shaped into a large array of custom shapes such as pyramid, vase, espalier, cordon, fan and palmette just to name a few. Or they may be used as a summer shade tree instead of focusing on the production of fruit. Each requires a different approach to pruning.

Pruning

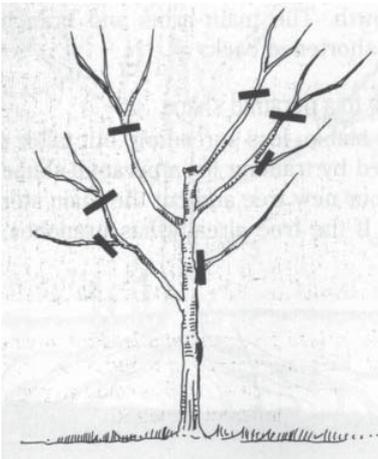
Pruning is done to both shape the tree and to fix/maintain it. The shape you have decided on will require different cuts however the description below for a vase shaped fruit tree will provide you with the basics of shaping.



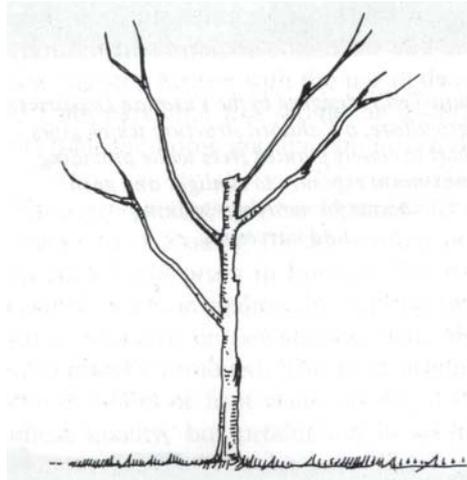
At planting time select 3-4 framework branches cut these back to around 1/3 of their original length and remove the rest



This will provide you with a skeleton of the shape. If needed use spreaders on the selected branches to make sure they are angles 45-60 degrees out from the main trunk



In the second winter, cut back the framework branches hard to the level that secondary branches are required.



In the third winter, select two secondary branches from each framework branch, giving eight leaders in all.

Maintaining the tree

Both pruning and training are required to shape a tree but pruning is principally focused on managing what is often referred to as the four D's; dead, diseased, damaged or diagonals (crossed branches) wood which can cause a variety of damage to the tree if left unattended. Winter pruning is done during the dormant period just like when you planted out your tree.

Pruning can also be done during summer but this is mostly done for shaping purposes instead of maintaining health.

Any pruning in summer will help to control a vigorous tree while winter pruning will enhance vigour. Consequently, winter pruning focuses in on the four D's as noted above plus some tip pruning to help stimulate growth in the new season.

Principles to keep in mind when pruning

- The more vertical the branch or shoot the more vigorous it is and the less likely it is to produce fruit.
- Branches should be trained out to at least 65 degrees if you want to have fruit production.
- Top buds will inhibit lower buds so it is always best to leave lower branches longer than upper branches to help balance the tree.
- Always use disinfectant on your secateurs to help control any diseases.
- Always keep your secateurs sharp.
- Cut at an angle around 5mm from the bud to stop any wood from rotting and to allow water to run off instead of puddle on the cut.
- The direction of the bud below your cut will determine which way the new branch will grow.

Grafting

A lot of fruit trees do not produce trees from seeds that are the same as their parent trees. This is why nearly all apple trees and most other fruit trees are created by taking a small piece of last year's wood, called scion wood, and attaching it to a bare root-stock to produce a 'clone' of the original tree.

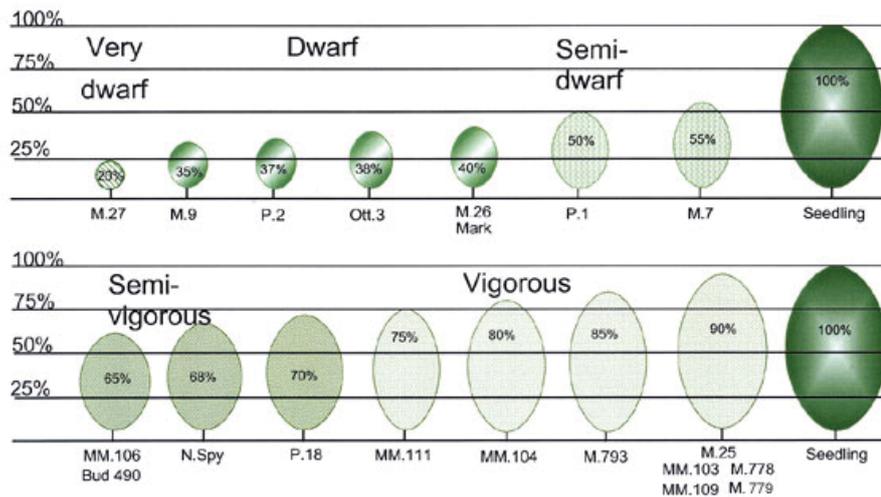
An example of this is the apple tree found in Sydney around 100 years ago by Mrs Smith down by the banks of the creek running by her house, every Granny Smith sold throughout the world has been grown via scion wood originally taken from this tree.

This should not stop you from using seeds from your apples to grow trees as they may be perfect as a shade tree even if the fruit isn't as delicious as its parent tree. A lot of the trees on our property have been from trees on the side of the road, we stop each year during fruiting to sample different trees, especially the apples then go back in mid August to gather scion wood off the trees and graft them onto our preferred root stock. The benefit to this is we get a tree that we know the taste of, is at the correct size as we select the type of root-stock it is grafted onto, is almost always stronger than any tree you buy from a nursery and is accustomed to the local conditions and diseases - all for the princely sum of around \$5 for the root-stock. So don't forget to check out your local trees and seeds before going to the nursery.

Grafting trees is extremely easy once you understand the principles involved and have a few practice grafts under your belt.

The first two things you need to decide on is what type of root-stock do you need for your environment and where are you going to get your scion wood from.

The types of root-stock available for apple is listed below. This is not the complete range but it will give you an idea of the types, their eventual sizes and what disease/bug tolerance they have.



Root-stock Pest and disease resistance

	Woolly aphid	Collar rot	Fireblight
Budagovsky 490	MS	MR	MR
M.7	S	MR	MR
M.9	VS	MR	VS
M.25	MS	SR	S
M.26	MS	S	VS
M.27	S	R	S
MM.103	R	S	?
MM.104	R	MS	MR
MM.106	R	S	MR
MM.109	R	S	MR
MM.111	R	R	MS
Merton 778	R	?	MS
Merton 779	R	R	?
Merton 793	R	R	MS
Mark	S	R	S
Northern Spy	R	MS	MR
Ottawa 3	S	R	S
P.1	S	R	S
P.2	S	R	S
P.18	VS	R	S

VS — very susceptible

S — susceptible

MS — moderately susceptible

MR — moderately resistant

R — resistant

? — not known

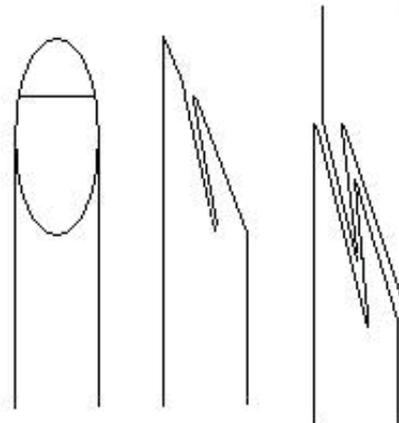
And those are just the apple trees!

Other fruits usually require their own type of root-stock and the variety available is just as wide as apple root-stock.

FRUIT TYPE	Root-stock	GRAFTING	BUDDING
Apples	All apple	preferred	yes
Pears	All pears	preferred	yes
Peach\Nectarine	peach/nect, plum	yes	yes
Apricots	plum, peach	yes	yes
Plums	plum, peach	yes	yes
Almonds	plum, peach	yes	yes
Cherries	sour cherry	preferred	yes
Quince	quince	yes	yes
Medlar	quince/hawthorn	yes	?
Chestnut	chestnut	yes	yes
Citrus	various relatives	yes	yes
Walnut	black walnut	difficult	no?
Loquat	quince	yes	?
Avocado	avocado	yes	?

Types of grafts

When grafting a tree there are a number of different ways that you can attach the scion wood to the root-stock. The standard graft is the whip and tongue where a long diagonal cut is made in both the scion wood and a corresponding cut in the root-stock. In the middle of each a small cut is made which is opened slightly, this is the tongue and each tongue is slotted into each other with each of the whips touching.



Whip and tongue graft

The key in this type of grafting is making sure the cambium layer of both the root-stock and the scion wood is touching. The cambium layer is the outside layer just under the bark that does all the trees 'plumbing'. This layer moves water up and down the tree plus proteins and hormones.

By concentrating on aligning the cambium layer of both the scion and root-stock you will allow the root-stock to provide the energy needed by the scion wood to bind itself to the root-stock and develop into a full sized tree.

To help keep the cambium layer aligned until they are properly joined grafting tape is wrapped around the full length of the whip until they have properly joined. This takes between two and three months and should be removed when you see leaves appearing on the scion wood and by moving the scion wood on the root-stock you should find it stable and strong. If you leave the tape on too long there is the possibility of strangling the wood as it grows and expands.

Grafting tools

The tools you need for grafting include a grafting knife, cutters (if doing larger wood), grafting tape and some tree stick (rubber glue).



The grafting knife is different to your standard gardening knife as it only has one side that has a bevel, the other is totally straight so that your cuts will stay straight on the wood while the bevel side helps to open up the cut. A lot of grafting knives also have a lifter point in them to facilitate bud grafting (as in the above image).

There is also a cutter tool that makes it much easier to do larger size scion grafts.



This often comes with different size blades for different tree and wood types.

You can buy a grafting knives and cutters from a variety of on-line gardening supplies such greenharvest.com.au or diggers.com.au.