



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Growing lemons in Australia- a production manual - Readers' Note

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<http://www.dpi.nsw.gov.au/agriculture/horticulture/citrus/lemon-manual>

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LEMON TREE GROWTH AND STRUCTURE

Lemon trees tend to have a more willowy or weeping tree structure than that of most orange and mandarin varieties. The branches and limbs tend to be more easily broken in strong winds and when the crop load is heavy. Overall lemon tree branches tend to be longer, thinner and more flexible than those of orange trees. Pruning should aim to shorten these branches.



Structural pruning of young trees

In some varieties, such as Eureka and Meyer, the fruit tend to be borne in clusters at the ends of branches, which then bend downwards under the weight of the fruit. When the fruit are removed the branch normally springs back into position. Sometimes the crop load is so heavy that these long willowy branches can break. Fruit produced on the outside of trees and in clusters on the ends of branches are more prone to wind damage. Pruning should aim to encourage fruit on the insides of trees where it is more protected from wind.

Lemons also have a tendency to produce strong, vigorous upright water shoots that are usually thorny. These are normally unproductive and should be removed as early as possible. Sometimes these water shoots can be used quite effectively to replace old unproductive structural limbs when rejuvenating trees.

In some areas lemons grow almost continuously throughout the year producing multiple leaf flushes and crops. The new leaf flush in lemons tends to be a reddish purple colour which changes to green as the leaves mature.

PRUNING STAGES

Young tree formation

Pruning normally starts when the trees are 18 months to 2 years old. At this stage pruning is used to develop the trees structural framework. The aim is to have 3-5 main limbs, with the lowest branch starting at least 65cm above the ground.

Maintenance pruning of bearing trees

A more regular program of pruning starts when the trees start to regularly crop. The aims of pruning now are more diverse. Pruning is undertaken to:

- remove diseased, dead, weak or old growth;
- remove crossed over branches or branches in the wrong place;
- thin out and open up the tree canopy to improve light and air penetration;



Vigorous new upright growth after pruning. Followup pruning to thin out the new growth should be undertaken about 8-12 weeks later.

Canopy Management

- reduce or manipulate flowering or crop load;
- reduce tree height or width;
- improve spray coverage.

Rejuvenation pruning of old trees

This type of pruning is normally undertaken on old trees which are still healthy with the aim of reinvigorating the tree to improve cropping potential. With this type of pruning major limbs are normally removed (skeletonizing) to encourage replacement with new young branches. This type of pruning should be undertaken over a number of years. Typically trees are pruned initially on one side so that some crop yield is retained, the other side is then pruned 1-2 years later.

OTHER PRUNING TECHNIQUES

Hedging is normally undertaken by mechanical hedging machines. Hedging removes the outer canopy shell of trees and is normally undertaken after fruit set to remove crop load or after harvest if crop load is adequate. It is also used to reduce the tree canopy in the plant row to improve movement of equipment and reduce damage to fruit caused by passing equipment.



A hedging machine

Light hedging removes about 30% of the bearing canopy and takes wood up to 8-12mm in diameter. The cutting angle is about 15-20°. Heavy hedging is used when you are rejuvenating trees. Branches up to 40mm in diameter are removed.

If trees are hedged at the same point each time the trees will develop a "thatched" or "witches broom" effect at the cutting site. This makes fruit more difficult to pick and the site holds dead leaves and small twigs which in turn harbour pests and disease and reduces light penetration. Therefore the hedging site on trees should be varied each time.



"Witches broom" effect from hedging at the same site.

Topping is done mechanically to reduce tree height. Topping is normally undertaken after harvest. If done in late spring or summer topping can result in unwanted vigorous upright growth. It is best to top trees in winter. Topping is the most invigorating form of pruning. Heavy topping if done at the wrong time

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can result in excessive upright vegetative growth which causes shading and uses the tree's water and nutrient reserves. Topping, like hedging, if done at the same height each time will cause trees to develop a "witches broom" effect. Therefore the height at which topping is done needs to be varied. The tops of trees should be cone shaped at an angle of 30° - 40°. If trees are topped flat they are difficult to harvest and tend to cause excessive vegetative regrowth which is non-productive.



Photo by Greg Moulds
A block of hedged trees



If hedging is used for the first time on very old trees a lot of dead wood can be left behind, which can be a source of disease.

Skirting is the removal of the lower tree branches up to a height of between 0.5-1m from the ground. Skirting trees improves undertree access for irrigation, weeding and fertilising practices. It also reduces the impact and access of certain pest and disease organisms.

PRUNING TIPS

- ✓ Pruning should be a regular part of tree management.
- ✓ When hand pruning sterilise your pruning equipment after each tree to reduce the spread of disease. When using mechanical pruning machinery, the blades should be sterilised after each block or variety. (A sterilising solution of 3% sodium hypochloride can be used.)
- ✗ Heavy pruning should not be carried out in hot weather as sunburn of branches or fruit may occur.
- ✗ In areas where there is the potential for frost, pruning should not be done at a time when the resulting young flush growth will be susceptible to frost damage.
- ! Heavy pruning at the wrong time can result in excessive vegetative growth.
- ! Pruning during budbreak or flowering will impact on crop load.
- ! The heavier you prune the longer it takes for the tree to recover and therefore crop.

Key References

- **Canopy Management for Bigger and Cleaner Fruit.** Module 3 Certificate III in Citrus Production. NSW Agriculture 2001.
- Krajewski, A. **Pruning for Improving Quality in Citrus.** Fruit Doctors. 2002.