



*A Manual for Planted Farm Forestry for the
Northern Inland of New South Wales*

Appendix N

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Appendix N, Pruning Schedules for *Pinus radiata*, Eucalypts, Acacias and Casuarinas for Southern Australia, by Bird, *et al.* 1996.

The following pruning schedules have been developed by Rod Bird and Co-workers from their farm forestry experience in Victoria and other southern states. They have been reproduced below, directly from the publication Bird, P.R., Jowett, D.W., Kellas, J.D. and Kearney, G.A. (1996). *Farm forestry clearwood production – A manual for south-east Australia*. Technical Report Series January 1996, Agriculture Victoria, Hamilton.

Farm foresters from the Northwest of NSW should be aware that farm-grown trees in our region may grow at different rates to those implied below. The schedules are reproduced here as a guide only. They provide excellent information on general pruning principles and give good practical tips for efficient pruning management for each species group.

PINUS RADIATA

Form-pruning

- ◆ Remove double leaders

Clear-bole pruning

- ◆ Where 500 or 666 trees/ha have been planted - when the trees are 4-5 m tall prune the best 2 pines in each clump of 4 trees (or 3 pines in a clump of 6, if that gives better spacing). Walk between rows 1 & 2, back between rows 3 & 4, and so on, counting to left and right. Include missing trees in this process.
- ◆ When the trees have reached a height of 4-5 m, prune them to half their height.
- ◆ Continue pruning each year, leaving 3-4 m of green crown, until the 6-7 m point where the diameter is less than 10 cm. Maintaining the target is difficult if 3-4 m of green crown is to be retained on poor exposed sites, or where trees are wide-spaced. The branch size will become very large if that is attempted with an annual pruning schedule. Tackle the problem by pruning every 8 months or so, removing a single whorl. Pruning must be done despite the impact on growth.

Thinning

- ◆ After the first pruning remove unwanted trees, leaving about 300 trees/ha. This is best done following the first pruning and should be completed when the pruning is completed. Delaying the thinning allows for possible loss from windthrow and, at this early stage, may improve the height growth of the trees. However, the diameter growth of the pruned trees will be seriously affected if the unpruned trees are left for too long. In most cases the unpruned trees will have no value.
- ◆ If thinning is done in the autumn then sheep will consume the leaf material. If stock are grazed among the pruned pines regrowth will be controlled and fire hazard reduced. If the staple is long the needles may contaminate the fleece.

EUCALYPTUS

Form-pruning - **removing competitive leaders - this is vital for most species planted open-spaced, in belts or wide-spaced in woodlots.**

- ◆ Inspection within first 4 months - untangle leaders in guards, prune to a single stem, prop badly tilted stems (use a spade of earth at one side), lighten the foliage on species which are severely bent over as a consequence of rapid top growth and exposure (the form of *E. viminalis*, in particular, can be improved in this way).
- ◆ Subsequent action - remove double leaders and major forks but do not touch any small forks (these should be re-considered next visit). Start at year 1 or 2 to direct the growth of difficult species to give a single straight stem. Correct the top list

Pre-emptive pruning - **beginning year 3 or 4, controlling branch size before clear-bole pruning starts and continuing through later clear-bole pruning years.**

- ◆ Check the top - remove any major fork missed during the form-pruning stage.
- ◆ Remove branches which are larger than ~ 30 mm - large branches left on wide-spaced trees are unlikely to self prune, result in difficult and slow pruning and are slow to heal. Only remove 3-4 large branches at any visit. Tip-pruning (remove 50% of a branch) leaving some growth to keep the branch alive, is an option.
- ◆ Do not remove more than half of the crown - resist the temptation to “clean up” small basal branches - their leaf area is required to promote the growth of the leader. Rapid growth usually means good form. If too much leaf area is removed the growth of the tree (particularly the diameter) will be depressed. The aim should always be to prune little and often. This stage is not clear-bole pruning.
- ◆ Prune cleanly, leaving a rim of callus tissue - do not cut off the collar because that will cut into the cambium, retarding healing and allowing fungal infections to degrade the log. On the other hand, do not leave long stubs because these will often die, delay healing and so allow fungal spores to enter the trunk. It may also reduce the clearwood. Cut just on the edge of the collar.

Clear-bole pruning - **this begins when the tree is around 5-6 m tall, when the potential 6.5 m clearwood trunk is obvious.**

- ◆ Prune to half height or a stem diameter of 8-10 cm - the aim is to leave at least 50% of the foliage, while removing all the lower branches up to a point on the trunk where the stem diameter is about 8-10 cm. Do not remove any branches above that point (pre-emptive pruning) unless there is a fork that should have been removed in the form-pruning stage, or large branches that will be 40-60 mm diameter at the next visit. Research in NZ has shown that infection - and resulting decay along the core and adjacent wood - can be minimised by pruning before branch size exceeds about 25 mm. This is difficult to achieve, unless the tree form is excellent. Choice of species/provenance and initial planting pattern is critical.
- ◆ Prune only the crop trees - there is little point in pruning a crooked tree - in most cases this should be cut out. It is often necessary to plant 3-10 times as many trees as required, to get enough trees with a suitable form. With some species it is also necessary to plant them close together to encourage good form and early height growth. Species planted on a poor site may be impossible to manipulate.
- ◆ Leave at least half of the foliage - it will take several visits to achieve the pruned lower log target. The more foliage removed the slower will be the growth. However, without heavy pruning some trees will not produce a straight single stem and a quality sawlog.

ACACIA MELANOXYLON (and ACACIA DEALBATA)

Form-pruning - **removing competitive leaders.**

- ◆ Correct the top (look up!) - remove double leaders and major forks but do not touch any small forks (these should be re-considered next visit). Start at about 12 months (early spring) to direct the growth, rather than struggle to correct problems that could have been averted. Repeat 12 months later. Good form is engendered by close initial spacing and the use of a shelter species to “train” the blackwood.

Pre-emptive pruning - **controlling branch size before clear-bole pruning begins.**

- ◆ Remove large branches - from year 4 it is time to begin the removal of a few major branches but only those which are larger than ~ 25mm (these are unlikely to self-prune). Experience will show that to leave a large branch on wide-spaced trees will result in problems when it is pruned off later - difficult and slow pruning, slow healing and pre-disposition to infestation by borers. If in doubt, slow the branch development by tipping (remove half of the length) - leave some growth to prevent the death of the branch. The branch must be removed at the next annual visit because it will still be expanding in size.
- ◆ A fool-proof approach to pruning (especially for beginners) is to make a 25 mm or 30 mm branch gauge and only remove branches that are bigger than the gauge.
- ◆ Do not remove more than two thirds of the crown - that means only removing 4 or 5 large branches at any time. Resist temptation to cut off small diameter basal branches. Rapid growth usually means good form. If too much leaf area is lost the growth of the tree (particularly the diameter) may be depressed, although recent NZ data shows a surprisingly small effect of drastic pruning. The aim should always be to prune little and often. This stage is not clear-bole pruning.
- ◆ Prune cleanly, leaving a rim of callus tissue - do not cut off the collar because that will cut into the cambium, retarding healing and allowing fungal infections to degrade the log. On the other hand, do not leave long stubs because these will often die, delay healing and so allow decay to enter the trunk. It may also reduce the clearwood. Cut just on the edge of the collar.

Clear-bole pruning - **this begins when the tree is around 5 m tall when the potential 4-6 m clearwood trunk is obvious.**

- ◆ Prune the crop trees - do not bother to prune trees that will be thinned.
- ◆ Prune to a stem diameter of 8-10 cm - the aim is to leave at least 50% of the foliage, while removing all the lower branches up to a point on the trunk where the stem diameter is about 8-10 cm. The ultimate aim is a clear stem of 3.5-6.5 m.

Do not remove any branches above the 10 cm diameter point (pre-emptive pruning) unless there is a fork that should have been removed in the formative pruning stage, or branches which exceed 30 mm in diameter.

- ◆ Prune little and often - with poor sites or with wide-spaced trees it may pay to make visits at 6 monthly intervals in order to remove large basal branches which otherwise, if left a year, will blow out to 50 mm or more in thickness.
- ◆ Leave at least half of the foliage - it will take several visits to achieve the pruned lower log target. The more foliage removed the slower may be the growth.

Consider also *Acacia implexa*, *Acacia falciformis* and *Acacia mearnsii*.

CASUARINA & ALLOCASUARINA

- ◆ Correct the top (look up!) - remove double leaders and major forks but do not touch any small forks (these should be re-considered next visit). Start at about 12 months (early spring) to direct the growth, rather than struggle to correct problems that could have been averted. Repeat 12 months later.

Some provenances of *Allocasuarina verticillata* (drooping she-oak) and *Allocasuarina luehmannii* (bull-oak) appear to have very poor form. The key to good form with these species is the establishment of high initial stockings. Thinning needs to be delayed as long as possible in order to promote a straight stem. However, *Casuarina cunninghamiana* (river she-oak) has good form when grown in the open and requires little attention.

Pre-emptive pruning - **controlling branch size before clear-bole pruning begins.**

- ◆ Remove large branches - from year 4 it is time to begin the removal of a few major branches but only those which are larger than ~ 25 mm. If in doubt, slow the branch development by tipping but leave growth to prevent death of the branch. Remove the branch at the next annual visit.
- ◆ A fool-proof approach to pruning (especially for beginners) is to make a 25 mm or 30 mm branch gauge and only remove branches that are bigger than the gauge.

Clear-bole pruning - **this begins when the tree is around 5 m tall when the potential 4-6 m clearwood trunk is obvious.**

- ◆ Prune the crop trees - do not bother to prune trees that will be thinned.
- ◆ Prune to a stem diameter of 8-10 cm - the aim is to leave at least 50% of the foliage, while removing all the lower branches up to a point on the trunk where the stem diameter is about 8-10 cm. The ultimate aim is a clear stem of 3.5-6.5 m.

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- ◆ Prune little and often - with poor sites or with wide-spaced trees it may pay to make visits at 6 monthly intervals in order to remove large basal branches which otherwise, if left a year, may blow out to 50 mm or more in thickness.
- ◆ Leave at least half of the foliage - it will take several visits to achieve the pruned lower log target. The more foliage removed the slower may be the growth.

Care must be taken to prevent the entry of decay to the heartwood. This might be achieved by pruning branches before their diameter exceeds 25 mm and by pruning during a fine period in early winter. Unpruned mature drooping she-oak often have decay in the trunk, presumably as a result of entry through large wounds.

Other management issues

It is most unwise to graze stock amongst she-oak of any species during the early years because the foliage and bark are very palatable and the branches are very brittle and easily damaged.

