5.3.3

SILVICULTURE SPECIFICATION 1/87

Replaces Specification 1/86

JARRRAH THINNING AND REGENERATION

These specifications are to be read in conjunction with "Treemarking and Silviculture in the Jarrah Forest" 1987. They are applicable to areas that are classed as dieback free.

A . THINNING

Where sufficient crop trees exist to permit a thinning the area should be thinned using the following specification.

1. CRITERIA FOR SELECTION OF CROP TREES

Select crop trees to retain using the following considerations:

* Crop tree selection is based on the following species priority:-

  a) Jarrah/Blackbutt (refered to as jarrah hereafter)
  b) Marri
  c) Sheoak

* Eucalypt crop trees should be in the dominant or codominant level, with a healthy well structured crown. Trees with primary crowns are capable of expansion to take advantage of the space available. Secondary crowns show less capacity for expansion.

  - Trees with a deep, broad crown grow five times faster than trees with a narrow, shallow crown. Crown vigour is much more significant than bole length.

eg:	Original diameter	30cm	30cm
	Bole length	5m	10m
	Crown condition	Deep,broad, dense	Shallow,narrow dense
	Diameter in 20 yrs	50cm	34cm
	Volume on 20 yrs	.63cu.m	.5cu.m
	Time taken to reach sawlog size (50cm)	20 yrs	100 yrs

  - Crop trees should have a bole free of any defect that would preclude its use for either a sawlog or a pole (minimum defect free bole should be 3m for sawlogs).

  - In general, larger diameter trees will increase in diameter faster than smaller ones.

* Sheoak crop tree selection should be based on the following criteria:-

  - healthy, well structured deep but narrow crown.

  - minimum bole length of 1.8m with at least 50% of the diameter defect free.

* Even spacing is not a critical factor provided the crown of a selected crop tree has space to expand in at least two directions. The total space available (expressed as Basal area/hectare) is of more importance.

* In areas subject to leaf miner attack, resistant trees must be retained regardless of size, position or quality.

2. MARKING OF CROP TREES

Density of crop trees to be retained varies with average tree size (see part 5) but where the crop trees approach 30cm in diameter, crop trees should be retained at the rate of 10 sq.m. per hectare.

Where jarrah trees suitable for crop trees exceed 10 sq.m/ha then the surplus may be removed (as S.E.C. poles or any other marketable product). In this situation there is no requirement to keep an S.E.C. pole simply because it may be the 'best' crop tree. The requirement is that 10 sq.m/ha of acceptable crop trees are retained. In addition to these crop trees, provision is made to retain a further 5 sq.m/ha of potentially merchantable trees of high value - these are jarrah/marri trees which are within 5cm dbhob of becoming an S.E.C. pole or sawlog, and that meet crop tree specifications. Sheoak crop trees may also be kept as part of this 5 sq.m/ha. A further 1 sq.m/ha of potential pit props may also be retained where appropriate.

Where there are less than 10 sq.m/ha of jarrah crop trees available for retention, they should all be retained regardless of their present marketability. Additional numbers required should be made up with marri or sheoak crop trees if they are available. The total basal area should not exceed 10 sq.m/ha. Where significant amounts (5 sq.m/ha or more) of marri and sheoak are being considered for retention the alternative option of regenerating rather than thinning must be considered carefully.

3. COMMERICAL OPERATIONS

After marking the crop trees for retention, all other material is available for commercial removal i.e. sawlogs, S.E.C. poles, chipwood, pit props, minor produce.

4. FOLLOW UP SILVICULTURAL TREATMENT

Following commercial utilisation, areas selected for intensive treatment will have other surplus trees removed non-commercially to reduce competition to the crop trees. This will be done by notching and poisoning on most areas with felling and stump poisoning only in selected special areas.

In patches of forest where there are 10 sq.m/ha or more of jarrah crop trees, all surplus trees (including banksia) are removed. Trees within 1 metre of a crop tree should be felled, not poisoned, to avoid the risk of killing crop trees through root fusion.

Where there are less than 10 sq.m/ha of jarrah crop trees, crop trees are released individually from surrounding competition by

removing all surplus stems within 4 metres of each crop tree. This individual release should only be carried out for jarrah crop trees. Marri and sheoak crop trees, while protected from damage by nomination as crop trees do not warrant the additional expenditure of non-commercial release.

Large culls beyond 4 metres should be poisoned if they compete with the crop trees. As a guide a 50cm cull should be removed if it is closer than 8 metres to the crop tree or a 1 metre cull should be removed if it is closer than 15m to the crop tree.

5. JARRAH THINNING INTENSITY

Mean DBHOB of best 150 stems/ha at first thinning	Schedule
Less than 20cm	release 200 jarrah stems/ha from overtopping and crown abrasion. The objective is to maintain healthy crown development on future jarrah crop trees without promoting a permanent low crown break. This may involve more than one treatment as the stand develops.
20-25cm*	thin to 10 sq.m/ha O.B.- this will usually be a non-commerical thinning. It will leave more than 150 stems/ha but ensures that the stand is not left under-stocked. A further thinning will be required before the crop trees reach 50cm dbhob.
25-30cm*	thin to 10 sq.m/ha O.B. - this is likely to be both a commercial and non-commercial thinning. The remaining trees are capable of reaching 50cm dbhob without the stand becoming overstocked (50 years). More conservative future thinnings will maximise sawlog volume/ha.
40cm	thin to 18 sq.m/ha O.B.- thin again when crop trees reach 50cm dbhob. Above comments apply.
50cm+	thin to 20 sq.m/ha O.B.

* Additional jarrah/marri trees within 5cm dbhob of becoming a sawlog or S.E.C. pole, or sheoak crop trees may be left to bring the total retained basal area to 15 sq.m/ha,provided these trees are removed within 20 years.

* A further 1 sq.m/ha of potential pit props may also be retained where appropriate.

B . REGENERATION

Where there are insufficient crop trees to permit a thinning the area should be cut for regeneration taking into account the stage of advance growth, its stocking and distribution.

1. REGENERATION OPTION AND COMMERCIAL LOGGING

1.1 Stands with inadequate ground coppice or saplings

Where there is an inadequate number of ground coppice or saplings (less than 1,000 s.p.h.a.) or regeneration consists of seedling coppice or smaller, reduce the overstorey density by uniform selective cutting to create a shelterwood. Aim to leave about half the original basal area (about 15 sq.m/ha) uniformly spread over the area. Preferably, remove jarrah with poor crowns and marri, leaving a jarrah seed source on trees with growth potential.

1.2 Stands with adequate ground coppice or saplings

Where ground coppice or saplings are at a stocking of 1,000 s.p.h.a., more or less evenly distributed, then a gap should be created by completely removing the overstorey to release ground coppice to develop into saplings then poles.

The minimum gap size created should be approximately 4 mature tree heights in diameter. When there are no surrounding trees leaning into a gap, this size may be reduced to 2 mature tree heights.

The maximum gap size created should be 10 hectares (for reasons other than silvicultural i.e. aesthetic or hydrological). Retained unlogged or shelterwood groups or strips may be used to break up large continuous gaps. These should also exceed the minimum size specification above.

Occasional crop trees below marketable size may be retained in what is otherwise a gap. However, every opportunity should be taken to remove them commercially if possible.

In areas subject to leaf miner attack resistant trees must be retained regardless of size, position or quality.

2. FOLLOWUP SILVICULTURAL TREATMENT

2.1 Shelterwoods

Maximise soil disturbance to remove the scrub root stock and create an improved seed bed for seedlings to establish or develop without competition of the scrub. Remove banksia and sheoak understorey where necessary.

Top dispose and burn to create ashbeds (without excessive damage to retained stems) in a seed year. (Alternatively sow with jarrah seed after the burn).

Regular fuel reduction burns (about every 5 years) should follow until the lignotubers have reached the ground coppice stage.

At this stage treatment of stands with adequate ground coppice or saplings begins. (See 1.1 above).

2.2 Gaps

Areas selected to create gaps should have surplus trees (including cull trees and banksias) treated to reduce the competition on developing regeneration. These should be notched and poisoned, with felling and stump poisoning used only in selected special areas.

If required to enhance the stocking of regeneration, malformed jarrah stems less than 200mm diameter may be coppiced to induce the development of a stable shoot of better form.

A tops disposal burn should be carried out after one summer's drying. A spring burn (or an autumn burn after the soil has become wet) is the most appropriate.

N.B.: A hotter fire which completely burns off the above ground shoot of developing regrowth is preferable to a cooler fire which merely damages the sapling stem.

Complete fire protection of the developing regrowth is required until it can withstand a mild burn (< 70kw/m), when it reaches a height of 5-6m (at about age 10, depending on site).

Please Refer to "Silvicultural Guidelines for Virgin Southern Jarrah Forest" (Bradshaw 1986) for further information if required.

F.J. BRADSHAW
MANAGER SILVICULTURE BRANCH