Blackwood

and other cabinet timbers

Info Sheet No. 2 - Establishment

Private Forests Tasmania

This series on Blackwood and other cabinet timbers has four parts. Each part can be read individually or as part of the series.

1. Overview
2. **Establishment**
3. Management Regime
4. Labour Estimates

ESTABLISHMENT

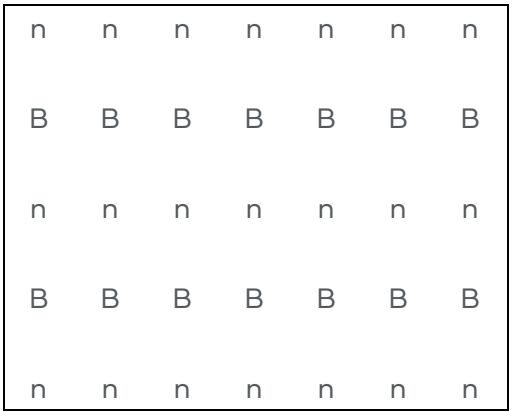
The successful establishment of any plantation crop requires careful planning, consideration of site factors, managing the timing of operations and consideration of the season. Establishment includes the selection of the planting stock, site preparation (cultivation and weed control), planting, and post-plant management (browsing and weed control).

The establishment of blackwood plantations are similar in basic principles to a eucalypt plantation unless planted with a nurse crop for form and branch control. Following is a description of specifics associated with nurse crop establishment.

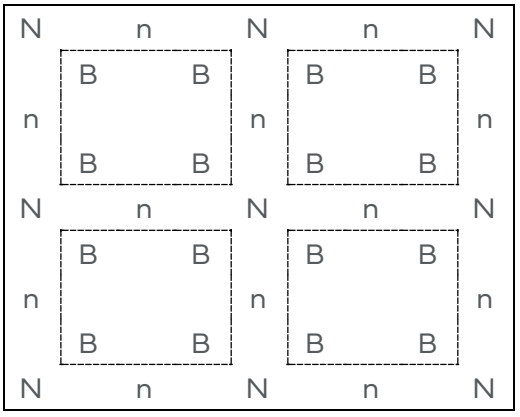
PLANTING DESIGN / LAYOUT

The following planting design options are recommended for establishment of a blackwood plantation with a nurse crop. Ongoing form pruning will be required to produce trees of acceptable form.

Row Planting (Figure 1)



Group Planting (Figure 2)



Row Planting (Figure 1)

- Easiest and cheapest planting design to establish.
- Suitable where ripping and mounding is to be undertaken.
- Even distribution of final crop trees is not guaranteed.
- Thinning must take into account the spacing between final crop trees.

Where possible, rows should be orientated perpendicular (90 degrees) to the direction of the prevailing wind. Rows established in the same direction as the prevailing wind may funnel the wind between the taller nurse crop trees. Form and growth rate of the blackwood is likely to be reduced under such conditions, increasing the form pruning requirements. This may not always be possible when ripping and mounding, as constraints upon row direction may be dictated by the Forest Practices Code.

Distance b/w blackwood trees within rows (m):	2.0	2.0	2.0	2.5	2.5
Distance b/w blackwood rows (m):	6.0	7.0	8.0	6.0	7.0
Initial Blackwood stocking (stems/ha):	833	714	625	667	571

If utilising a nurse crop, it is recommended that the rows of nurse crop species are no closer than 3.0m from the rows of blackwood (blackwood rows 6.0m apart). At this distance, significant suppression of the blackwood may occur as early as age 4-5, particularly when fast growing eucalypts such as *E.nitens* are planted as the nurse crop.

Group Planting (Figure 2)

- A slightly more difficult and expensive planting design to establish.
- More suitable for smaller areas where ripping and mounding are not undertaken.
- Relatively even distribution of final crop trees.
- Thinning is simply to the best tree/group, with no need to take into account the spacing between final crop trees.
- Final stocking is determined at establishment.
- Final stocking may be less than anticipated, as not all groups are guaranteed to produce a final crop tree of suitable form, health and vigour.
- Three to four blackwood are planted as a group, with 1.5 - 2.0m between trees within each group.

Distance b/w groups (m):	6.0	6.5	7.0	7.5	8.0
Number of groups/ha (final stocking):	278	237	204	178	156

A. Fully Nursed

- A nurse crop tree is planted at all locations, as indicated by 'N' and 'n' (Figure 2).
- Planting ratio of nurse crop trees to groups is 3:1. Groups planted at a spacing of 7.0m (~200 groups/ha) will require ~600 nurse crop trees/ha, for a total stocking of ~1,400 stems/ha (assuming four blackwood planted/group).
- Shelter and sidelight suppression are maximised, with the aim of minimising the amount of form pruning required.

- Suppression of the blackwood by the nurse crop may occur relatively quickly, requiring regular monitoring and four thinning operations.

B. Partially Nursed

- A nurse crop tree is planted at all locations, as indicated by 'N' (Figure 2).
- Planting ratio of nurse crop trees to groups is 1:1. Groups planted at a spacing of 7.0m (~200 groups/ha) will require ~200 nurse crop trees/ha, for a total stocking of ~1,000 stems/ha (assuming four blackwood planted/group).
- Shelter and sidelight suppression are reduced compared to a fully nursed planting, increasing the form pruning requirement.
- Suppression of the blackwood by the nurse crop will be reduced and occur later in the rotation compared to a fully nursed planting. Only two thinning operations are required to release the blackwood.

For optimum results when utilising nurse crops and group planting, each nurse crop tree planted at position 'N' should be successfully established. Any 'N' planting positions that fail to establish successfully can be re-planted 12 months after initial establishment. Nurse crop trees at positions 'n' are not as critical, provided a high proportion of successful establishment is initially achieved.

How many blackwood should be established?

Blackwood only

A planting ratio of at least 4:1 should be established. If a final crop stocking of 200 stems/ha is the objective, a minimum of 800 blackwood stems/ha should be planted.

Blackwood planted with a nurse crop

A planting ratio of at least 3:1, and preferably 4:1, should be established. For a final stocking of 200 stems/ha, a minimum of 600 blackwood stems/ha should be planted.

NURSE CROPS

The aim of a nurse crop is to force the blackwood to produce a straight stem of the desired length. Once this has been achieved the nurse crop is no longer needed and should be removed.

Advantages

- Increased shelter improves height growth and form of the blackwood.
- Sidelight suppression reduces branch development.
- Form pruning inputs are reduced.

Disadvantages

- Nurse crops can impose considerable suppression upon blackwood growth if thinning is not undertaken at the appropriate time.

- Additional costs are associated with the establishment and management of the nurse crop.
- Thinning of the nurse crop must be undertaken in several stages to reduce the potential for windthrow of the blackwood.
- The requirement to form prune the blackwood is not eliminated.

Nurse Crop Species

Fast growing eucalypts such as *E. nitens*

- Commonly planted as a nurse crop, although success is limited due to inappropriate management.
- Provides shelter and sidelight suppression from a young age, reducing form pruning requirements early in the rotation.
- Fast growth rates can result in significant suppression of the Blackwood as early as age 4-5, depending upon initial spacing.

Slower growing eucalypts such as *E. obliqua*

- Limited experience and knowledge to date with this species as a nurse crop.
- Shelter and sidelight suppression is not achieved as quickly, potentially increasing form pruning requirements.
- Slower growth rates result in less suppression of the blackwood, particularly early in the rotation.
- A greater window of opportunity exists for appropriate timing for removal of the nurse crop.

Pinus radiata

- Commonly planted as a nurse crop in the past, although with limited success.
- Early growth is slow. Blackwood usually outgrows the pine for the first few years. If utilised, *P. radiata* should be planted 1 year ahead of the blackwood.
- Shelter and sidelight suppression are not achieved until the *P. radiata* begins to outgrow the blackwood, usually from age 3-4 onwards.
- Effective 'nursing' of the blackwood is only achieved for 2-3 years, after which the *P. radiata* begins to suppress the blackwood significantly.
- *P.radiata* has a conical crown, compared to the more cylindrical crowns of the eucalypts. This conical crown shape further reduces effective shelter and sidelight suppression, particularly in the top third of the blackwood crowns.
- *P.radiata* has proven difficult to kill with stem injection, unlike the eucalypts. Manual felling may not be an option due to the risk of damaging the blackwood.

Blackwood established without a nurse crop

- Suitable form may be achieved with form pruning only. However, form may not be as good as that achieved with an appropriately managed nurse crop.
- Generally only suitable for very sheltered sites, or where shelterbelts are incorporated into the plantation design to reduce the impact of wind.

- Form, health and vigour of the blackwood are reduced by wind exposure.

WEED CONTROL

Successful weed control prior to planting is essential to obtain successful, uniform establishment of blackwoods. In particular, the control of grasses is important on ex-pasture sites to reduce competition for resources. Failure to control weeds successfully prior to planting can result in major difficulty and expense associated with post-planting weed control.

- Slash or graze the site to reduce the existing weed volume if grasses and broadleaved weeds are the major weed species. Woody weeds such as blackberry and wattles should be treated with herbicides 6-12 months prior to slashing or burning to ensure sufficient uptake and death of the root systems, ensuring minimal germination post-planting.
- Strip or broad scale spray with knockdown herbicides (e.g. glyphosate) along planting lines 4-6 weeks prior to cultivation. Although sites can be cultivated without initial knockdown, a finer tilth is often achieved if existing weeds and associated root systems are dead.
- Apply residual herbicide and plant in accordance with the label instructions.

The following herbicide chemicals are for guidance only and does not imply any endorsement by Private Forests Tasmania, additional advice must always be sought before selecting and applying chemicals.

General herbicide options for knockdown of existing weeds

- ***Glyphosate*** - knockdown capability only.
- ***Triclopyr*** - Woody weedkiller for the control of perennial weeds such as blackberry.

General herbicide options for residual control of weeds

- ***Terbacil*** - A water dispersible or granular herbicide for *E. globulus* and *E. nitens* plantations. It has limited knockdown capability. Existing weeds are best controlled prior to application, although can be mixed with glyphosate. It is designed to control weeds prior to the planting of healthy seedlings taller than 20cm.
- ***Simazine*** - residual control only.

Note: *These residual herbicides have restrictions upon the method and volume of application depending upon soil types, slopes, proximity to watercourses, etc. More effective and longer lasting residual control of weeds is achieved when applied to bare soil following cultivation.* ***Do not*** *cultivate following the application of residual herbicides because soil disturbance will greatly reduce the effectiveness of the herbicide. Read the label carefully and follow any restrictions upon use. Seek expert advice before carrying out on ground work.*

Other noteworthy points specific to blackwood establishment weed control include:

- At this stage, little information is available on the impact of other residual chemicals upon blackwood. Hexazinone commonly used for weed control within *P. radiata* plantations is likely to kill blackwood seedlings.
- Blackwood is very susceptible to herbicides that are effective against legume species. Read the label carefully and if it indicates that the herbicide controls legume species then **do not** apply post-planting. Products that contain metsulfuron methyl have some soil residual activity and control pasture legumes.
- Blackwood is relatively slow growing and therefore will benefit from post-plant weed control if competing weeds become established.

Post-planting weed control for nurse crops?

It may be beneficial not to undertake post-planting weed control around fast growing nurse crop species such as *E.nitens*, provided good initial weed control and successful establishment was undertaken. This approach is likely to slow initial growth of the *E. nitens*, potentially delaying the onset of suppression.

BROWSING CONTROL

- Blackwood is palatable to browsing species such as wallabies, pademelons, possums, deer, rabbits, hares and livestock. Damage can be severe if not managed appropriately.
- Poisoning, shooting and trapping may be used individually or in combination. A permit from the Department of Natural Resources and Environment is required for these activities.
- Stock-proof fencing is required to exclude livestock. Stock may browse young trees. Cattle can also cause physical damage by pushing trees over as they move through the plantation.
- Although expensive, wildlife-proof fencing to exclude native animals is recommended where browsing pressure is high. Wire netting with an electric outrigger to exclude possums or electric fences with multiple hot-wires can be used.
- Tree guards and stockings can be utilised. Stockings provide good initial protection while seedlings establish prior to top growth. Guards are expensive in most instances. Guards can improve initial tree form and may be cheaper than fencing for small areas (less than 1 ha). Guards can lead to stem abrasion at the top of the guard, and potential tree instability when first removed.

FERTILISING

It is recommended that 150g of superphosphate (Phosphorous fertiliser) be applied to each tree 1-2 months after planting, provided good weed control has been achieved. The application of nitrogen (N) is not recommended, as blackwood is a legume and capable of fixing extra nitrogen from the soil through nodules that develop on the root system. Studies have indicated that the application of Phosphorous to blackwood can increase growth rates and root nodulation, while the addition of N has no significant effect.

Application Method

Measure 150 grams of superphosphate into a container (e.g. spray can cap) to calibrate the application. Sprinkle the superphosphate around each seedling, ~50cm from the base. Unlike N, P does not escape into the air and does not need to be buried.

Fertilising of the Nurse Crop

It may be beneficial not to fertilise a fast growing nurse crop species such as *E. nitens*, provided good weed control allows them to establish successfully. This approach is likely to slow the initial growth of the *E. nitens*, potentially delaying the onset of suppression of the blackwood.

FURTHER READING

Nicholas, I. & Brown, I., (2002). Blackwood: A Handbook for Growers and Users. Forest Research Bulletin 225, New Zealand Forest Research Institute Limited.

Pinkard, E.A. & Beadle, C.L., (2002). Blackwood (*Acacia melanoxylon* R.Br.) plantation silviculture: a review, Australian Forestry, Vol. 65, No. 1, pp.7-13.

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