Blackwood

and other cabinet timbers

Info Sheet No. 1 - Overview

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

OVERVIEW

Blackwood (*Acacia melanoxylon*) is native to Australia. It is one of the largest and longest lived of the Acacias. It occurs throughout most of Tasmania and much of eastern Australia, from south-eastern South Australia to northern Queensland. Blackwood tolerates a wide range of soil types and rainfall zones. On dry, exposed sites with poor soils and low rainfall it can form a small shrub with no commercial value. On high quality sheltered sites with high rainfall, it can form large commercial timber trees.

Blackwood plantations have been planted in several countries, including Australia, New Zealand, South Africa, Chile and China, with most planting and associated research occurring since the early 1980s. To date, limited success has been achieved with blackwood plantations in Australia, primarily due to inappropriate planting designs and a lack of management of associated nurse crops.

It is estimated that there are approximately 3,000 ha of blackwood in New Zealand. Forest Research of New Zealand and some private landowners have demonstrated effective management regimes for producing high quality blackwood in plantations. Although nurse crops have been utilised with success by some landowners, Forest Research has demonstrated how an intensive pruning regime can produce trees of acceptable form without planting a nurse crop.

GROWTH CHARACTERISTICS & SITE SELECTION

When open grown or growing with other species that do not result in intense competition for light, blackwood usually branches heavily, with resulting poor form and little or no commercial value. Form pruning and clearwood pruning are required to produce trees with acceptable form and knot-free, clearwood timber. The planting of a nurse crop of tea-tree, paper bark or dogwood in a plantation to induce acceptable form and self-pruning of the blackwood, as occurs in native forests, is not feasible due to the excessive number of seedlings that would be required.

The most common plantation regime in Australia has been to plant blackwood with an artificial nurse crop of faster growing species such as *Eucalyptus nitens* or *Pinus radiata*.

These species do not eliminate the need for form and clearwood pruning. They out-compete the blackwood for resources relatively early in the rotation, particularly for moisture and light, resulting in suppression of the blackwood. Plantation failure has been a common outcome. Success has occurred with such regimes where the nurse crop has been thinned appropriately.

While blackwood grows in a range of soil types and rainfall zones, the growing of commercial blackwood in plantations requires careful site selection.

Shelter is the most important factor to successful growth. Blackwood requires shelter from wind to enable rapid growth and adequate form. Locations that provide natural shelter such as gullies, lower valley slopes and adjacent vegetation are desirable. Shelterbelts can also be incorporated to increase available shelter.

The warmer the environment, the greater the growth rate, provided adequate moisture is available. Higher elevation induces colder temperatures and a shorter growing season. Elevations up to 500m are suitable provided they are sheltered and relatively frost-free. The best growth will occur at low elevations near the coast where the climate is relatively mild.

Adequate moisture is required for sustained growth, particularly during the drier months. Locations with an annual rainfall of at least 1,000mm are recommended. Increased moisture is usually available near watercourses, gullies and lower valley slopes. Dry, exposed ridges should be avoided.

Soils with good drainage that retain moisture are required for sustained growth. Swampy ground with poorly oxygenated water must be avoided. Tertiary basalt soil is usually ideal and is representative of typical locations on farms where commercial blackwood can be grown.

Sites that experience severe frost should be avoided. As a general rule, the higher the elevation the greater the chance of experiencing severe frost. Some low elevation sites can also experience frosts, particularly sites where cold air drainage is inhibited, such as valleys and locations where native vegetation can accumulate cold air.

Ex-pasture sites are ideal for blackwood plantation establishment, as weed control is usually relatively easy, with little regrowth of woody weeds to hinder access and growth of the blackwood. Ex-forest sites often have regrowth of woody weeds following establishment. This regrowth, with a deeper root system than pasture grasses, can provide on-going competition with the blackwood for moisture during the summer months, slowing growth.

While planting along previously cleared watercourses is possible, commercial harvest within streamside reserves may be subject to restriction under the Forest Practices Code. Farmers should contact Private Forests Tasmania or a Forest Practices Officer if unsure how the Code may impact upon potential harvesting.

TREE & WOOD QUALITY

Blackwood is a highly prized decorative timber. It is a medium density hardwood species. Density increases with age and is not influenced by growth rate. It has moderate durability, although it is not suitable for in-ground use or situations where it is exposed to the weather. Shrinkage upon drying is low, with good stability in use. Working properties are excellent, although highly figured grain can cause problems during machining. It is relatively easy to saw with portable mills and air-dry on farm, with little or no degrade.

Considerable variation exists in heartwood colour, varying from almost yellow to reddish-brown to almost black. Such variation can sometimes occur even within the same tree. This variation in colour causes some problems for manufacturers in matching timber. Some have used the natural colour variation as a visual and marketing tool for finished products. Colour variation has been attributed to:

- Genetics (this appears to be the dominant influence).
- Site (the influence of site is uncertain at this stage).

Occasionally, attractive grain patterns such as fiddleback or birdseye occur, and are believed to be genetically influenced. The sapwood is usually white and is not considered suitable for most end uses.

The width of the sapwood band and the percentage of heartwood can greatly influence the sawn recovery of valuable heartwood. Considerable variation in heartwood percentage can occur between trees. There are reports that a greater percentage of heartwood develops when growing in moist, well-drained organic soils. Heartwood percentage is likely to increase with age.

END USES

Knot-free clearwood is used for various high-value end uses. Lower grade timber is rarely used for high-value end uses, although it can be utilised for firewood and pulpwood.

- Furniture
- Cabinet making
- Veneers
- Flooring
- Panelling
- Turning and carving
- Musical instruments
- Steam bending

PESTS & DISEASES

Although blackwood has relatively few pests and disease, some problems can be expected. Damage in Tasmanian plantations has been caused by:

- **Browsing** - Rabbits, hares, wallabies, possums and domestic livestock can cause establishment failures unless adequate browsing control is undertaken. Cows can damage mature blackwood through bark stripping, with subsequent decay of the underlying timber.
- **Psyllids** - Small insects that feed on the phloem (sap) in the growing shoots. Black sooty mould (fungi) is associated with sugars that accumulate on the young trees following infestation by psyllids. Sooty mould is more common on trees that are exposed to strong wind. Psyllids are a common cause of reduced vigour and poor form, resulting in

multi-leadering. They can be controlled with insecticides, but the cost and time is prohibitive.

- **Cicadas** - Female cicadas place their eggs in small branches and stems, causing obvious herringbone scars. There are no known control methods.
- **Wattle Grubs** - These are the larvae of the Wattle goat moth. Eggs are laid on the bark surface and once the grubs develop, enter the tree through points of damage such as damaged bark or poor-quality pruning wounds. Trees that are under stress may be more susceptible, such as suppressed trees or those planted in dry, exposed situations. Grubs tunnel through the wood, leaving holes ~10mm in diameter before emerging as the adult moth. The recommended defence against Wattle grubs is to prune branches before they become too large, ensure quality pruning cuts, maintain good diameter growth to ensure rapid occlusion and avoid bark damage from pruning ladders. Good site selection and appropriate thinning of the nurse crop (if utilised) to prevent suppression and tree stress is recommended.
- **Heart Rot Fungi** - Occasional tree death has occurred in plantations in Australia and New Zealand. Armillaria is thought to be responsible[1], with extensive decay spreading throughout the tree. No method of control is known.

ALTERNATIVE SPECIES

Quercus petraea (Sessile oak)

Quercus petraea is native to much of western, central and eastern Europe. It is cold hardy and generally windfirm but can be damaged by late spring frosts. Tolerant of exposure but will develop poor form; for timber production should be planted in sheltered sites. A species of intermediate shade tolerance which can grow well on mineral soils of poor or medium nutrient status. Will tolerate slightly drier soils than pedunculate oak and is not suited to compacted or wet soils.

https://www.forestresearch.gov.uk/tools-and-resources/tree-species-data-base/131560-sessile-oak-sok/

Quercus robur (Pendunculate oak)

Quercus robur is native to much of Europe. Considered to be more light demanding than *Quercus petraea*. Wind-firm and cold hardy but is susceptible to damage by late spring frost at young age. Can tolerate some exposure, but form is likely to be poor; for timber production grow on sheltered sites. Suited to soils in the medium to rich nutrient status; prefers heavy and moist soils (pH range between 4.5 and 7) and can tolerate some waterlogging provided such soils do not dry out in summer. Its ability to root into heavier soils is ecologically valuable for its structure-improving and drainage effects. Avoid very free-draining soils with a fluctuating water table as this can lead to ring shake.

https://www.forestresearch.gov.uk/tools-and-resources/tree-species-data-base/131559-pedunculate-oak-pok-2/

Quercus rubra (Red oak)

Quercus rubra is native to eastern North America and is a long-standing plantation species in the Netherlands, Belgium and northern France. It is cold hardy. Best suited to moderately dry to moist soils of poor to medium nutrient status. The species is windfirm and moderately tolerant of exposure and drought.

https://www.forestresearch.gov.uk/tools-and-resources/tree-species-data-base/133218-red-oak-rok/

Platanus × acerifolia (London plane)

Platanus × acerifolia is a hybrid between Oriental plane (*Platanus orientalis*) from southern Europe and American sycamore (*Platanus occidentalis*). It grows best on soils of medium to rich nutrient status and slightly dry to moist soil moisture. However, it can grow on drier soils and is reasonably drought tolerant. It is not suited to very wet or alkaline soils. It is cold hardy to but is sensitive to exposure, particularly to cold, drying winds.
https://www.forestresearch.gov.uk/tools-and-resources/tree-species-data-base/london-plane-lpl/

Castanea sativa (Sweet chestnut)

Castanea sativa is native to southern Europe and the Mediterranean region. The species is suited to dry to moist. sites generally 550 to 850 mm on medium to poor soils. It is not suited to waterlogged soils. Acid sandy loams are an ideal soil type for this species which although cold hardy, is not tolerant of exposure.
https://www.forestresearch.gov.uk/tools-and-resources/tree-species-data-base/131550-sweet-chestnut-sc-2/

Fraxinus americana (White ash)

Fraxinus americana grows naturally on the east coast of North America. It grows best on rich, moist, well-drained soils to medium size. Once established, it can grow rapidly. It grows from near sea level to high elevations, with a broad climatic range. *Fraxinus americana* wood is tough, strong, and highly resistant to shock.
https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_2/fraxinus/americana.htm

REFERENCE

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

[2] Neilson, W.A. & Brown, D.R., (1997). 'Growth and silviculture of Acacia melanoxylon plantations in Tasmania', Tasforests, Vol. 9, pp. 51-70, Forestry Tasmania.

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