Corangamite Region Guidelines

Acacia melanoxylon
Blackwood

TAXONOMY

Division	Angiosperm (flowering plant)
Subclass	Dicotyledonae (dicotyledon)
Family	MIMOSACEAE

Previous Taxonomic Names
Mimosa melanoxylon (ANH et al 2006)
Racosperma melanoxylon (ANH et al 2006)

Taxonomic Status
Long lived woody perennial.

Common Names
Blackwood, Paluma Blackwood, Hickory, Sallow Wattle, Sally Wattle, Black Wattle (ANBG n.d.).

MORPHOLOGY
Often a tree 3-45m high, sometimes a shrub 1.5-3m high. The bark is hard, fissured and somewhat scaly. The phyllodes (flattened leaf stalks) are narrowly elliptic, 4-16 cm long, 6-25 mm wide, phyllode tips can be either blunt or pointed, dark green and smooth, 3-5 main veins with a prominent network of smaller veins in between. The bipinnate leaves (feathery compound leaves) often persist on young plants. Inflorescences (arrangement of a group of flowers) comprise mostly 3-5 headed racemes (stalked flowers along an axis). Peduncles (main flower stalk) are 4.5-13 mm long. Heads are globular, 6 mm diameter, 30-56 flowered and cream coloured (Walsh & Entwisle 1996).

Photograph showing variation of phyllodes on the same plant and samples of seed and pods.

There is appreciable variation in phyllode characteristics between populations, for example, variation in the time it takes for the phyllodes to develop, mostly thought to be due to climatic effects (Farrell & Ashton 1978).

SUBSPECIES
None

HYBRIDS
No known natural hybrids.

SIMILAR SPECIES
Acacia implexa (Lightwood) - *A. implexa* has more sickle shaped foliage as opposed to the shorter, blunter foliage of *A. melanoxylon*. *A. implexa* has a white funicle, which surrounds the seed, while *A. melanoxylon* has a red funicle. Flowering time for the two species is different with *A. implexa* flowering from Jan-March, and *A.*

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melanoxylon from Aug-Oct in Corangamite (Gowers 1990).

GEOGRAPHIC RANGE
Widespread and often common throughout Victoria except in the north-west. Grows in a diversity of habitats but favours fertile soils in valleys and on flats in mountainous areas, often in wet sclerophyll forest and rainforest. Also SA, QLD, NSW & TAS (Walsh & Entwisle 1996). It chiefly grows on soils of fair to high fertility (Farrell & Ashton 1978).

BIOREGIONS

Central Victorian Uplands	Victorian Volcanic Plain	Otway Plain
Otway Ranges	Warrnambool Plain	

PLANT COMMUNITIES
Blackwood is common and widespread in a variety of plant communities within the Corangamite catchment. It is often found in Lowland Forest, Riparian Forest, Grassland, Riparian Scrub, Herb Rich Woodland, Coastal Scrub, Heathland, Dry Forest and Wet Forest communities. In the Otway Ranges it is known to occur in Cool Temperate Rainforest communities, while on the Volcanic Plains it can be found in the Plains Grassy Woodland.

FRAGMENTATION
Fragmentation is thought to be mostly recent, since European settlement (< 200 years).

RELEVANT HISTORY & RESEARCH
Playford et al (1993) studied 27 populations of *A. melanoxylon* from its distribution across Eastern Australia. They found a high genetic diversity when compared to other Australian trees and plants. Two genetically distinct geographic regions were identified, the first north of the Hunter River, NSW, the second south of it, including southern NSW, Victoria, Tasmania and South Australia. The southern region was divided in two, with the point of disjunction being Mt Bogong, with populations south and west of Mt Bogong separated from those to the north and east.

Farrell & Ashton (1978) found considerable variation in phyllode shape and size between populations of *A. melanoxylon* sampled over a wide geographical range in tropical and temperate eastern Australia. They found that the most important factors determining phyllode shape was the distance of the collecting site from the coast, and the seasonal distribution of the annual rainfall. Differences were also found between seed characteristics, but there was no evidence of correlation with environmental factors.

Nursery trials of thirteen provenances were carried out in 2006-2007 for the Corangamite Seed Supply and Revegetation Framework Project. Seed was used from existing stocks in the Ballarat Region Seed Bank and raised in the same nursery conditions. Observations indicate that there is higher growth rates and later phyllode development in some of the higher rainfall samples and strong lateral growth in an Enfield sample. Statistical analysis is currently being completed by Greening Australia and the University of Melbourne has undertaken genetic analysis of the trials to determine if these observations are valid. The results will be finalised by June 2007.

POPULATION DENSITY
No data cited.

BREEDING SYSTEMS
FLOWERING
Pale yellow to cream flowers in August-October (Walsh & Entwisle 1996). Flowers are honey-scented (Gowers 1990).

Not all trees within a population will flower every year. A Mt Macedon population did not flower at all for over five years, although buds formed and large amounts of seed were found in the soil (Farrell & Ashton 1978).

POLLEN
Low to moderate pollen yields (Gowers 1990).

POLLINATION
Predominately out-crossing (Muona et al 1990).

Muona et al (1990) studied two populations of *A.* melanoxylon in NSW, a mixed forest at Tallaganda with out-crossing rates of 86% and a roadside population at Moss Vale with out-crossing rates of 88%. They found pods within the same cluster or inflorescence had a higher proportion of shared paternity. Though Muona et al (1990) also indicated that there is a significant fraction of pods that have more than one pollen parent. In Tallaganda 19 pods were considered pollinated by 2 trees. In Moss Vale a similar analysis revealed three cases of multiple paternity.

POLLINATORS
Pollination patterns indicate the species is predominately insect pollinated (Muona et al 1990).

SEED
SEED DESCRIPTION
Seed is contained within openly coiled and often twisted pods, which are up to 15cm long and 3.5-8mm wide, smooth, and leathery to almost woody.
Seeds longitudinal, like a flattened circle in shape, 3-5mm long, glossy, black. The funicle is fleshy, pink to deep red in colour, and twice encircles the seed (Walsh & Entwisle 1996).
The seed generally has high viability and is capable of long periods of dormancy (Crocker 1938, in Farrell & Ashton 1978).

Estimates of the number of seeds and germinants per gram varies.
- 58-89 seeds/gram (GAV n.d.; Gowers 1990; Ralph 2003)
- 36-45 viable seeds/gram (Ralph 2003)
- 26-45 germinants/gram (GAV n.d.)
- 62 germinants/gram at 25°C (Gunn 2001).

Ralph (2003) recorded that *A. melanoxylon* collected from 17 sites across Victoria, and treated with boiling water for 30 seconds had a germination rate of between 10-90% after thirty days.

SEED CROP
Collect seed December-February. Seed is released between 3-14 days after maturity but a portion of the seed is held on the tree for several weeks. *A. melanoxylon* is a frequent heavy seeder (Ralph 2003).

SEED DISPERSAL
Seed dispersal for *A. melanoxylon* is probably similar to the dispersal of *A. mearnsii* seed as described by Searle (1997), which is primarily dispersed by gravity and ant activity, with some dispersal from birds that may feed on seed.

EXTRACTION & STORAGE
Seed needs to be separated from its pod. This can be achieved by placing on a tarp in direct sunlight (Ralph 1994), or rubbing pods over a sieve.
Seed stored at 18-22°C for 5 years had a viability of 82% (Gunn 2001).

PROPAGATION
Sow seed from early spring (Bonney 2003).

TREATMENT OPTIONS
Heat treatment by immersing seed in boiling water, and allow to soak for 12-24 hours (Ralph 1994; Bonney 2003). Seed that floats is not viable (Ralph 2003).
Scarification (GAV n.d.) - scarification is the process by which the hard seed coat is scratched or nicked, either by using fine sandpaper, or by using a sharp blade.
Smoke treatment has improved germination for some *Acacia* species (Ralph 2003).

GERMINATION TIME
Seed usually germinates in 3-10 weeks and seedlings are generally fast growing (Ralph 2003).

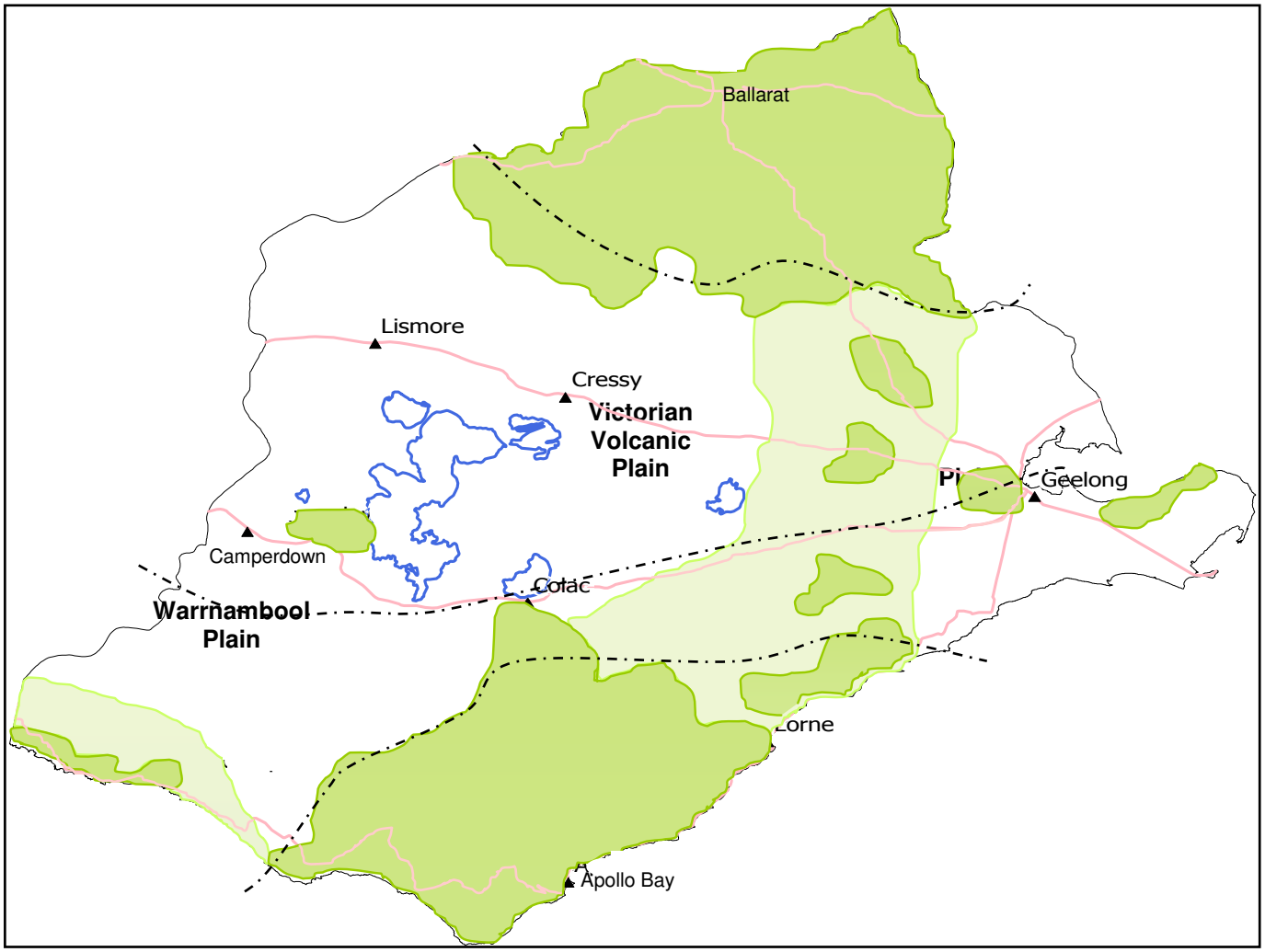
FIELD ESTABLISHMENT
Direct seeding has been very successful (GAV n.d.).
A. melanoxylon is one of the first species to establish after fire or clearing. It can sucker readily if roots are damaged (Gowers 1990), particularly on the plains where dense stands can form.
It is resistant to insect attack (Gowers 1990).

SEED COLLECTION RANGE -

Intermediate - within which, collection can be extended to formally contiguous remnants

According to Farrell and Ashton (1978), the most important factor influencing morphology of the plants appeared to be the distance from the coast and rainfall distribution with seedlings in nursery trials showing variations at a broad scale. Their study was based upon field studies and nursery trials of samples from a wide geographical range across eastern Australia. Initial observations of controlled nursery trials of *A. melanoxylon* currently being conducted for the Corangamite catchment do show some physical variation in growth form from various bioregion populations (S. Heyes per's comm. 2007). Further genetic research is currently being carried to confirm if these are valid.

Where populations are still very large and connected such as in the Central Victorian Uplands around Ballarat, it is appropriate to collect broadly within that bioregion. Collection should focus on matching seed from similar average annual rainfall patterns and soil. Ensure collection from at least 30-50 parent plants to maintain genetics. The study by Muona et al (1990) found that clusters of seed pods often shared 1 or 2 pollen parents. For this reason it is wise to collect from as many areas of a plant and from as many plants as possible to ensure genetic diversity.



Map: *Acacia melanoxylon* Distribution
DATA SOURCE: DSE Flora Information System 2004, accessed April 2004.

Large *Acacia melanoxylon* populations

Scattered *Acacia melanoxylon* distribution

Approximate Bioregion Boundaries

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