

# Red mahogany (plantations)

**Species name:** *Eucalyptus pellita*

**Other names:** Large-fruited red mahogany, Daintree stringybark, red stringybark, red stringy; traditionally, both *E. pellita* and *E. resinifera* have been traded as red mahogany



A young red mahogany plantation in north Queensland



13 year-old red mahogany plantation near Ingham, Queensland.



15 year-old red mahogany harvested from a plantation in northern Queensland.

## Key attributes

Red mahogany produces a hard, durable and attractive timber. In the past, small quantities of timber harvested from native forest has been used in construction, engineering and for appearance products and round timbers. It has well-established national markets, particularly in Queensland and NSW. It is also known in the international market as it is grown in plantations in other tropical regions.

## The potential for red mahogany plantations in Queensland

Red mahogany was the most widely planted eucalypt in humid, coastal areas of northern Australia and about 4,500 hectares were established in coastal, north Queensland until much of the resource was destroyed by Cyclone Yasi in 2011. About 500 hectares of existing small plantings still target timber production, although its susceptibility to cyclone damage may limit its potential in tropical Queensland.

Plantation-grown red mahogany generally targets integrated pulp and sawn wood production. Potentially, plantation-grown timber is suitable for solid wood products, veneers and other, appearance grade products, and it can be grown for carbon sequestration.

On appropriate sites, red mahogany plantations can provide shade and windbreak shelter, habitat, biodiversity and the benefits of improved water quality. Red mahogany's abundant flowers provide a source of honey.

## Growing red mahogany

### Rainfall

Better growth: sites that receive an annual average rainfall of >1500 mm for 7 out of 10 years.

### Potential productivity

Research trials and current plantation performance suggest that the best growing region for commercial red mahogany wood products is the North Tropical Coast.

### Productivity (volume) for young, plantation red mahogany in Queensland\*

MAI: mean annual increment (cubic metres/hectare/year)

North Tropical Coast:

MAI: 30 m<sup>3</sup>/ha/yr

*\*During these trials, regional temperatures were 0.6°C higher than the long-term average and rainfall was 8% higher than the long term average.*

### Soils

Red mahogany grows in a wide range of soils and tolerates relatively low soil fertility. It tolerates soil textures from sandy to clay loam as long as the soil is not water logged for more than a few days at a time. Good performance is associated with coastal metamorphic and volcanic soils in wetter regions.

### Site conditions

*Drainage:* Performs best on well-drained but moist sites, on lower slopes and alongside water courses. Extended waterlogging can reduce productivity or result in mortality. It is intolerant of prolonged dry conditions and ridge sites in dry areas.

*Soil fertility:* Low to high fertility and low to moderately high pH is preferable.

*Dry sites:* In drier areas it requires deep, moisture-holding soils. It can tolerate a dry season up to 5 months, but will suffer drought stress and associated damage from pests and diseases, in longer, dry periods.

*Frosts:* Sensitive to frosts.

*Salinity:* Tolerant of only low levels of soil salinity.

*Cyclone prone areas:* Very susceptible to cyclonic winds, especially young trees less than 10 years old.

## Pests and diseases

**Leaf pests:** Red mahogany is moderately susceptible to gum tree scale and free-living psyllids.

**Stem pests:** Red mahogany plantations are susceptible to longicorns, particularly away from the coast. Longicorn beetles are also sometimes responsible for ringbarking and have affected establishment rates in some young plantations.

**Diseases:** Red mahogany is potentially susceptible to myrtle rust (*Puccinia psidii*).

## Tree improvement

Red mahogany varieties with superior plantation productivity traits have been established in tree breeding programs. Superior traits of improved tree varieties include higher productivity, greater pest and disease tolerance, and better tree form and wood quality.

## Seed availability

Some improved seed produced in seed orchards is available from CSIRO's Australian Tree Seed Centre.



A 13 year-old, de-barked red mahogany log showing the typical proportion and colour of the heartwood.



A veneer sheet peeled from 13 year-old plantation-grown wood.



Wood grain of mature red mahogany.

## Wood

Traditionally, red mahogany wood harvested from native forest has been used for general construction and appearance products (e.g. flooring, decking, framing and fencing) and engineering (e.g. poles, piles and girders).

Red mahogany is valued for its colour; the heartwood is dark red, the sapwood paler pink-red, making it highly suitable for appearance grade, interior products including flooring and cabinetry. The wood properties also made it suitable for a wide range of other applications, including weather-exposed situations.

## Potential products and applications for plantation red mahogany

Wood properties and products research indicates that plantation red mahogany is potentially suitable for a range of product types:

*Solid sawn wood:* Potentially suitable for general, sawn construction and appearance products, particularly when around 25 years old or older.

*Veneers and engineered wood:* Potentially suitable for panels, veneers and engineered timbers, particularly when 15 years old or older.

*Solid round wood:* Potentially suitable for round timber such as poles.

*Pulpwood, other processed wood and bioenergy fuel:* Potentially suitable.

### Wood properties

Red mahogany timber is very durable and has excellent wood properties including high density, hardness, durability and strength.

Research has established that the properties of plantation timber are similar to those published for mature, red mahogany wood from native forests.

Research on the heartwood colour in plantation-grown red mahogany indicates that Queensland provenances display a darker, rich red colour than unimproved provenances from Papua New Guinea and Irian Jaya. The grain has an even, medium to coarse texture, sometimes interlocked, producing an attractive appearance figure.

Wood properties	Plantation-grown (8-15 years)	Mature, native forest-grown
Air dry density (kg m <sup>3</sup> )	Up to 771	995
Heartwood proportion	Up to 70%	-
Janka hardness (kN)	Up to 9 (hard)	12 (very hard)
Unit shrinkage (% dimensional change per 1% moisture content change)	0.2 - radial 0.3 - tangential	0.3 - radial 0.3 - tangential
Stiffness (GPa)	Up to 14	18
Estimated carbon content (kgm <sup>3</sup> )	Up to 340	440
Peeling recovery	35–60%	-

### **Natural durability**

For highly durable species (assessed from natural-grown timber), mature (30+ years) plantation-grown trees appear to have similar durability.

*Above-ground durability:* Class 1 – life expectancy >40 years.

*In-ground durability:* Class 2 – life expectancy 15–25 years.

### **Wood pests**

*Lyctine susceptibility:* Untreated sapwood is susceptible to lyctine borer attack.

*Termite resistance:* Resistant.

### **Working with red mahogany wood**

Red mahogany wood is relatively easy to work and machines well. It accepts stain, paint and polish readily because it is relatively resistant to surface checking. Surfaces should be machined and prepared immediately before gluing. Recommended kiln drying schedules for 25 mm boards (native forest grown) are given in 'Timber Answers' (see below).

### **Conditions for approved uses**

Permitted uses and conditions for use in Queensland are given in 'Construction timbers in Queensland' and 'Timber Answers' (see below).

### **More information**

Forest Trees of Australia. Boland DJ, Brooker MIH, Chippendale GM, Hall N, Hyland BPM, Johnson RD, Kleinig DA, McDonald MW, Turner, JD (2006) CSIRO Publishing, Melbourne.

Index no. 262 in: [Construction Timbers in Queensland](#). Properties and specifications for satisfactory performance of construction timbers in Queensland. Books 1 and 2. Queensland Government, Brisbane, 2010.

[Pests and diseases](#). Pests and diseases in trees, forests and plantations.

[Plantation potential in Queensland's regions](#). Information about plantation forestry research trials in Queensland.

[Productivity of plantation forest tree species in north-eastern Australia](#): a report from the Forest Adaptation and Sequestration Alliance. Lee DJ, Brawner J, Smith TE, Hogg BW, Meder R and Osborne DO (2011). A report to the Australian Government Department of Agriculture, Fisheries and Forestry, 52 pp.

[Red mahogany](#). Wood properties of native forest red mahogany.

[Research and innovation](#) - Plantation hardwoods research and development in Queensland

[Timber plantations in areas affected by tropical cyclones](#). A guide published by Timber Queensland <http://www.timberqueensland.com.au/Growing/Plantations-in-Cyclonic-Areas.aspx>