

# Gympie messmate (plantations)

**Species name:** *Eucalyptus cloeziana*

**Other names:** Queensland messmate, dead finish, yellow messmate.



A 29 year old Gympie messmate plantation in south-eastern Queensland.



Gympie messmate has excellent stem form, with a long straight branchless bole.



A 6 year old Gympie messmate plantation at Curan, south-eastern Queensland.

## Key attributes

Gympie messmate is an important commercial wood products tree in Queensland that produces high quality, strong, extremely durable and attractive timber. Although only small volumes are harvested from native forests in Queensland, it has a well-established market, and is in demand nationally. Gympie messmate timber from native forest has been used for a range of construction, engineering, appearance products and round timbers.

## The potential for Gympie messmate plantations in Queensland

About 2,500 hectares have been planted in Queensland since the mid 1990s. Gympie messmate plantations have also been established in NSW and overseas.

When matched to appropriate sites, plantation Gympie messmate has shown good growth rates and productivity. It tends to perform best on sites with higher rainfall, and fertile, well-drained soils.

Plantation-grown Gympie messmate timber is potentially suitable for the same solid wood products and applications as Gympie messmate timber sourced from native forest, as well as veneers and other processed wood products, carbon sequestration and bioenergy fuel.

Gympie messmate plantations can also be a good source of pollen and nectar for honey, and play a role in land rehabilitation and management.

On appropriate sites, Gympie messmate plantations can provide shade and windbreak shelter, habitat, biodiversity, salinity control and the benefits of improved water quality.

## Growing Gympie messmate

### Rainfall

Better growth: sites that receive an annual average rainfall of >700 mm for 7 out of 10 years.

### Potential productivity

Results from research trials and the performance of current plantations in Queensland suggest that the better growing regions for Gympie messmate wood products are the Central Coast and Wide Bay Burnett.

#### Productivity (volume) for young, plantation Gympie messmate in Queensland\*

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

Central Coast - Whitsundays: MAI - best provenances: 12 m<sup>3</sup>/ha/yr | average: 10 m<sup>3</sup>/ha/yr

Wide Bay & Burnett: MAI - best provenances: 10 m<sup>3</sup>/ha/yr | average: 7 m<sup>3</sup>/ha/yr

*\*During these trials, regional temperatures were 0.4–0.7°C higher than the long-term average and rainfall was only 86–88% of the long-term average*

### Soils

Gympie messmate grows well on moderately deep, volcanic meta-sediments or loams; in shallow soils over sandstone to moderately deep coarse textured soils derived from granite, and in moderately acid to slightly alkaline soils. It prefers free-draining soils with moderate to high fertility.

### Site conditions

**Drainage:** Well-drained soils are preferable. Avoid heavy clay soils and soils with a root-limiting horizon. Extended periods of water-logging can result in reduced productivity and some mortality.

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

**Dry sites:** Although sensitive to drought in the early establishment stage, it can tolerate a 4–5 month dry season and should survive well in drought conditions once established.

**Frost:** Tolerates light frosts (0–5 per year).

**Salinity:** Intolerant of saline conditions.

*Cyclone prone areas:* Relatively resilient to cyclonic winds, especially when planted away from the coast.

### **Pests and diseases**

*Leaf pests:* In stressed trees, growth may be affected by several types of leaf beetles.

*Stem pests:* The stems of young, stressed trees may be affected by longicorn beetle larvae.

*Diseases:* Potentially susceptible to myrtle rust (*Puccinia psidii*), although susceptibility varies between provenances.

### **Tree improvement**

Queensland provenances of Gympie messmate that have 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**

Improved Gympie messmate seed is available to industry from the Queensland Government's Department of Agriculture and Fisheries with 6 months notice.



A Gympie messmate plantation at 16 years old in southern Queensland.



Harvested 19-year old Gympie messmate.



Wood grain of mature Gympie messmate.

## **Wood**

Traditionally, Gympie messmate from native forests has been used in construction (including house framing and as seasoned dressed timber in cladding, internal and external flooring), furniture, joinery and engineering (including wharf and bridge construction, railway sleepers, mining timbers and transmission poles in south-eastern Queensland). Because it is resistant to decay from ground contact or in damp, poorly ventilated conditions, it has been used for outdoor furniture, joinery, fencing, planking, landscaping and retaining walls. Nationally and internationally, it is also used for construction timbers, railway sleepers, tannin and charcoal.

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## Potential products and applications for plantation Gympie messmate

Wood properties and products research indicates that plantation Gympie messmate is potentially suitable for a number of product types.

*Solid and sawn wood:* Potentially suitable for general sawn construction and appearance products, particularly when around 30 years old or older.

*Veneers and veneer-based composites:* Potentially suitable for panels, veneers and engineered timbers, particularly plantation timber that is around 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

Gympie messmate timber is extremely durable and has excellent wood properties including high density, hardness and strength; the heartwood is yellowish brown, and machines and finishes well. Recent research has established that the properties of plantation timber grown in Queensland are similar to those published for mature, Gympie messmate wood from native forests.

Wood properties	Plantation-grown (age)	Mature, native forest-grown
Air dry density (kg m <sup>3</sup> )	715–796 (19–46 yrs)	810
Heartwood proportion	76–87% (19–46 yrs)	-
Janka hardness (kN)	11 (29 years) (very hard)	12 (very hard)
Unit shrinkage (% dimensional change per 1% moisture content change)	0.2–0.3 - radial 0.3–0.4 - tangential (19–58 years)	0.2 - radial 0.4 - tangential
Stiffness (GPa)	15 (19 yrs)	17
Estimated carbon content (kgm <sup>3</sup> )	-	445

### 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 1 – life expectancy >25 years.

### Wood pests

*Lyctine susceptibility:* Untreated sapwood is not susceptible to lyctine borer attack.

*Termite resistance:* Resistant.

## Working with Gympie messmate wood

Gympie messmate wood is easy to saw, especially if the wood is fresh. It machines, turns and dresses well. Pre-drilling is recommended for both nails and screws and it glues well. It is not suitable for bending. The wood readily accepts paint, stain and polish.

## Conditions for approved uses

Permitted uses, conditions for use and required preservative treatments are given in: 'Construction Timbers in Queensland' (see below).

## More information

[Gympie messmate](#) - Wood properties of native forest Gympie messmate.

Index no. 283 in: [Construction Timbers in Queensland](#) - Properties and specifications for satisfactory performance of construction timbers in Queensland. Books 1 and 2. Queensland Government, Brisbane (2013).

[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.