Western white gum (plantations)

Species names: *Eucalyptus argophloia*

Other names: Chinchilla white gum, Burncluith gum, Queensland western white gum, scrub gum, lapunyah

Note: Western white gum is classified as 'vulnerable' under the *Queensland Nature Conservation Act 1992* and consequently it is **not** harvested from its very restricted, endemic distribution in Queensland.

A 10 year old western white gum plantation in south-eastern Queensland.

Seed orchards grow selected, faster-growing families and trees with improved wood quality.

Wood grain of mature western white gum

Key attributes

Western white gum produces a hard, heavy, durable and attractive timber that is potentially suitable for construction, appearance products and round timber products. It is no longer harvested from natural stands but is a productive plantation tree in Queensland. It is highly suitable for low rainfall areas in northern Australia and is frost and drought hardy, has good form and reasonable growth rates. It is generally unknown in either national or international markets.

The potential for western white gum plantations in Queensland

Around 4,000 hectares of western white gum plantation have been established in Queensland's subtropics in drier, inland areas where rainfall averages less than 1000 mm a year. It is grown for wood products, carbon sequestration or to make use of waste water from coal seam gas developments.

Plantation grown western white gum is potentially suitable for the same solid wood products and applications that were once sourced from natural forest as well as veneers, other processed wood products, carbon sequestration and bioenergy fuel.

It is suitable for rehabilitating saline sites as it grows in a range of saline conditions and survives on highly saline soils.

On appropriate sites, western white gum can provide shade and windbreak shelter, habitat, biodiversity, salinity control and the benefits of improved water quality.

Growing western white gum

Rainfall

Better growth: sites that receive an annual average rainfall of 700–900 mm for 7 out of 10 years.

Potential productivity

Research trials and current plantation performance suggest that the best growing regions for commercial western white gum are Capricornia and Wide Bay and Burnett (inland). It may also have potential in the Darling Downs and Granite Belt regions.

Productivity (volume) for young, plantation western white gum in Queensland*	
MAI: mean annual increment (cubic metres/hectare/year)	
Capricornia:	MAI - best provenances: 10 m^3/ha/yr | average: 9 m^3/ha/yr
Wide Bay & Burnett - inland:	MAI - best provenances : 6 m^3/ha/yr | average: 4 m^3/ha/yr

**During these trials, regional temperatures were regional temperatures were 0.4–0.7°C higher than the long term average and rainfall was only 77–86% of the long term average.*

Soils

Western white gum grows well in soils with a high clay content, low to high fertility, soil pH conditions from slightly acid to moderately alkaline, and in low to medium saline conditions. Soil types associated with good growth include Ferrosols, Kandosols, Chromosols and some Sodosol soils.

Site conditions

Drainage: Tolerates a wide range of sites from sandy soils to heavy, cracking clays.

Soil fertility: Low to high fertility; prefers pH conditions slightly acid to moderately alkaline.

Dry sites: Relatively drought hardy and grows in well-drained soils.

Frost: Moderately frost-tolerant. Damage or death is a risk in areas prone to heavy frosts.

Salinity: Tolerates low to medium salinity. It can survive highly saline conditions but may not be a productive timber tree.

High rainfall areas: Growth declines in areas with a high relative humidity and it is not recommended for plantations in areas with a mean annual rainfall above 900 mm for about 7 out of 10 years.

Pests and diseases

Leaf pests: The plate galler wasp (*Ophelinus* sp.) has caused significant damage to plantations but infestations appear to be rare or infrequent. Growth can be affected significantly in the first 3 years after the plantation is established.

Other pests that can cause damage are the wingless grasshopper (*Phaulacridium vittatum*), gum leaf skeletoniser (*Uraba lugens*), Flea beetles (*Chaetocnema* sp.), gum tree scale (*Eriococcus coreaceous*), psyllids (*Cardiaspina maniformis*) and the ribbed bagworm (*Hylarcta nigrescens*). Young western white gum plantations seem generally unaffected by infestations of leaf pests that affect early growth in spotted gum or Gympie messmate plantations.

Stem pests: Western white gum is highly resistant to longicorn beetle borers and has very low rates of attack by giant wood moth. Susceptibility to pests may increase if other growing conditions cause stress in the trees.

Diseases: Nursery-grown seedlings in north Queensland have been affected by cylindrocladium leaf blight (*Cylindrocladium quinqueseptatum*). Western white gum is potentially susceptible to myrtle rust (*Puccinia psidii*).

Tree improvement

Western white gum families with superior plantation productivity traits have been established in tree breeding programs. Superior traits of improved tree varieties include higher productivity, a greater tolerance to diseases, insects and frost, and better tree form and wood quality.

Seed availability

There is sufficient improved seed in store to meet industry needs. Seed from the new, clonal seed orchard is available from the Queensland Government's Department of Agriculture, Fisheries and Forestry.

Wood

Western white gum wood is an attractive and uniquely coloured timber. The heartwood is orange-brown to deep red-brown, contrasting with the whiter sapwood, making it potentially useful for producing a strong visual feature in suitable applications. The wood has a fine to medium textured grain, which can be straight or interlocked.

Potential products and applications for plantation western white gum

Wood properties and products research on young plantation wood indicates that plantation western white gum is suitable for high quality appearance grade products that do not rely on the use of adhesives. It produces a 'clean' timber with fewer incidences of gum vein and kino than spotted gum.

Solid sawn wood: Potentially suitable for general sawn construction and appearance products, particularly at 30 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

Western white gum produces a high quality timber that is hard and resistant to decay when in contact with the ground or in damp or poorly ventilated conditions. The heartwood is reddish-brown and the sapwood cream; it has an even, straight grain, which can be interlocking. Research has established that plantation timber has similar properties to wood previously harvested from native stands. *Mature, forest-grown timber is no longer harvested.

Wood properties	Plantation-grown (10–32 years)	*Mature, native forest-grown
Air dry density (kg m^3)	862–1005	1055
Heartwood proportion	21–80%	-
Janka hardness (kN)	7–14 (hard to very hard)	-
Unit shrinkage (% dimensional change per 1% moisture content change)	0.2–0.3 - radial 0.2–0.4 - tangential	-
Stiffness (GPa)	Up to 14 (13 years)	-
Estimated carbon content (kgm^3)	440	460
Peeling recovery	Up to 73% green (12 years)	-

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 susceptible to lyctine borer attack.

Termite resistance: Not resistant.

Working with western white gum wood

Western white gum wood is relatively easy to work and machines well. Some chipping may occur where interlocking grain is present. It accepts stain, paint and polish readily because it is relatively

resistant to surface checking. Surfaces should be machined and prepared immediately before gluing.

Conditions for approved uses

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

More information

Development of *E. argophloia* in Queensland: lessons learnt. Lee DJ, Zbonak A and McGavin R. In: Developing a Eucalypt Resource: learning from Australia and elsewhere, ed: J Walker (2011), pp. 13. University of Canterbury: Blenheim, New Zealand.

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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.

Plantation hardwoods research - Read more about research and development in Queensland's plantation hardwoods.

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Western white gum. Wood properties of western white gum.