

# Southern pine (plantations)

**Species:** Caribbean pine (*Pinus caribaea* var. *hondurensis*), Slash pine (*Pinus elliottii* var. *elliottii*) and an advanced hybrid of both.



Young stand of southern pine trees.



Southern pine timber supports a large market in the building industry.



Wood grain of mature southern pine.

## Key attributes

Southern pine is a well-established group of commercial plantation species in Queensland and produces a premium grade, quality softwood. The southern pines group is valued for excellent growth, straightness, minimal branching, wood density and even wood texture.

Southern pine timber products have a well-established processing industry and market in Queensland. It is in demand both nationally and internationally. High-grade sawn wood serves the upper end of the domestic market and exports include sawn wood and woodchip.

## The potential for southern pine plantations in Queensland

Around 148,000 hectares of commercial southern pine plantations produce mostly sawlog and ply log, and some pulpwood in Queensland. Planted estates occur in coastal southeast, central and north Queensland and inland central and southeast Queensland.

Rotation length is generally around 30 years and on suitable sites Queensland's southern pine sawlog yield (at clearfall age) is usually 250 to 300 cubic metres per hectare (m<sup>3</sup>/ha).

When matched to appropriate sites plantation southern pine shows good growth rates and productivity, and is relatively tolerant of pests and diseases.

Southern pine is suitable for agroforestry plantings, and commercial timber growing integrates well with benefits such as animal shelter and land protection.

## Growing southern pine

### **Rainfall**

*Better growth:* sites receiving an annual average rainfall of >800 mm for 7 out of 10 years.

### **Potential productivity**

Productivity depends on site quality and stocking rates, and can be 10–20 m<sup>3</sup> per hectare per year on better sites.

### **Soils**

Southern pine grows in many soil conditions including combinations of clay, silt and loam. In Queensland, it grows reliably on sedimentary, yellow, red and grey podzolics as well as granitic and metamorphic soils.

### **Site conditions**

*Soil fertility:* Prefers relatively low soil fertility and a low pH.

*Shade:* Can tolerate partially shaded conditions.

*Dry sites:* Moderately drought tolerant.

*Drainage:* Grows on poorly drained soils.

*Salinity:* Low to moderate tolerance of saline conditions.

*Frost:* Moderately sensitive to frost.

*Fire:* Young trees are sensitive to fire. A good network of external and internal firebreaks will help to protect plantations.

*Cyclone prone areas:* Low to moderate resilience to cyclonic winds, especially when planted away from the coast (depending on the variety). Tropical Cyclone Yasi damaged plantations in the Ingham and Cardwell region significantly in 2011.

### **Pests and diseases**

*Stems:* Sirex woodwasp (*Sirex noctilio*) is present in Queensland although it has not spread to the main, coastal plantation areas. It causes foliage to wilt and stem damage, and stains the wood. The five-spined bark beetle (*Ips grandicollis*) may damage trees but also introduces a fungus that causes blue stain, which can affect the value and aesthetic quality of the wood.

*Diseases:* The trees may be damaged by Cinnamon fungus (*Phytophthora cinnamomi*) Diplodia shoot blight (*Diplodia* species) and Dothistroma needle blight (*Dothistroma septosporum*).

Important, exotic pests and diseases that could damage pine plantations if they became established in Australia include: pine wilt nematode, pitch pine canker and pine wilt disease.

## Tree improvement

Tree improvement for southern pines is very advanced and intensive selection produced improved trees for commercial plantations. Research trials identified the best performing hybrids between slash and Caribbean pines that are now most widely planted.

## Seedling availability

Southern pine seedlings may be available from some commercial nurseries.

## Wood

The versatile southern pine timber is suitable for pole construction, and for external applications when treated with preservative. It is widely used in general construction including framing and boards, joinery and mouldings.

## Potential products and applications for plantation southern pine

Southern pine timber is potentially suitable for a number of product types:

*Solid sawn wood:* Full-rotation timber (30 years or older) is suitable for house framing, flooring, beams, moulding, lining and joinery. When treated with preservative, it is suitable for external cladding, decking, boards, fencing and landscaping.

*Poles:* When treated with preservative, southern pine poles are suitable for pole frame construction and power poles.

*Veneers and engineered wood:* Full-rotation timber (30 years or older) is potentially suitable for plywood and medium density fibreboard.

*Pulp and paper:* Potentially suitable for paper products.

## Wood properties

Southern pine heart wood is reddish-brown varying to shades of yellow. The sapwood is usually pale yellow to yellow. The grain is generally straight and it has a very distinctive figure when it is back-sawn.

Wood properties	Plantation-grown (full rotation – 30 years or older)
Air dry density (kg m <sup>3</sup> )	625
Heartwood proportion	In mature plantations, sapwood makes up more than 50% of the stem radius. Immature plantation stems are usually entirely sapwood.
Janka hardness (kN)	3.4 - seasoned (soft)
Unit shrinkage (% dimensional change per 1% moisture content change)	0.2 - radial 0.29 - tangential
Strength group (1–8: high–low)	5–6   Stress grades: F5–7, F7–8, F8–11, F11–14, F14–17 (seasoned)
Estimated carbon content (kg m <sup>3</sup> )	275

### **Natural durability**

*Above-ground durability:* low: Class 4 – untreated life expectancy less than 7 years.

*In-ground durability:* low: Class 4 – untreated life expectancy less than 5 years.

### **Wood pests**

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

*Termite resistance:* Resistant to termite attack.

### **Working with southern pine wood**

Framing sizes dry best at high temperatures to avoid distortion, but boards dry well at conventional or high temperatures.

The wood is firm and should be dressed using sharp blades. Preparing surfaces for paint and varnish needs care and will be difficult in wood with high resin content.

### **Treatment requirements for approved uses**

Sapwood readily accepts preservative, but current commercial processes cannot treat the heartwood. Permitted uses, conditions for use and required preservative treatments are in 'Construction Timbers in Queensland' and 'Timber Answers' (see below).

### **More information**

[Slash pine](#). Wood properties of slash pine.

[Caribbean pine](#). Wood properties of Caribbean pine.

Index nos. 342 and 351 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.