

Radiata pine 'the remarkable pine'

Radiata pine (*Pinus radiata*) was originally named *Pinus insignis* or 'remarkable pine' – an apt name for a tree which has had such a dramatic impact on the world timber scene. Radiata pine grows in a range of environments, is easily raised and planted, and provides larger yields of usable timber in a shorter timespan than many native species.

Radiata pine is a softwood tree, which means the wood does not have pores and in comparison to hardwoods has long fibres (tracheids).

The name softwood is confusing because radiata pine is harder (denser) than many hardwoods such as balsa and poplars.

Radiata pine is native to North America and grows naturally on a narrow stretch of coast in southern California and on two small islands off the coast of Mexico.

However, it is now one of the most widely grown exotic timber species in the world, with combined global plantations covering 3.7 million hectares (ha). There are large radiata pine plantations in New Zealand (1.2 million ha), Chile (1.3 million ha), Australia (740 000 ha) and Spain (260 000 ha).

Forestry Corporation is the largest producer of plantation-grown radiata pine in Australia, selling enough timber to construct about one quarter of the houses built in Australia each year. There are around 251 000 ha of radiata pine plantations in NSW. Of these, 64 000 ha (25 per cent) are private plantations and 187 000 ha (75 per cent) are State owned.

Radiata pine in Australia

Radiata pine was introduced to Australia in the early 1850s, possibly by miners coming from the Californian gold rushes to the Australian goldfields. The tree was grown in the Sydney Botanic Gardens as early as 1857.

The first commercial radiata pine plantation in NSW was established at Tuncurry on the mid-north coast in 1914. Although this site proved unsuitable, plantations were expanded throughout the State after the Forestry Commission was established in 1916.

Planting accelerated in the mid-1960s with the assistance of the Commonwealth-financed, Softwoods forestry agreement loans. During the 11 years that these agreements were in operation, the Forestry Commission of NSW planted a total area of 76 000 ha of radiata pine. Today, around 1000 ha of new plantations are established each year and 5000 ha of second rotation crops (second crops on the same ground as the first) are established annually.

In its native habitat around Monterey in California, the tree seldom grows taller than 35 metres or older than 75 years and many trees are misshapen or affected by disease. Growing conditions in many other regions of the world, including parts of NSW, have proven more favourable. Some Radiata pine trees in NSW have reached heights of more than 50 metres in 70 years. However, a typical radiata pine tree in NSW is around 35 metres tall when harvested at about the age of 35.



Above: Millions of Radiata pine seedlings are grown for plantations in NSW. Photo: Forestry Corporation Image Library.

The tree

When grown in a plantation, radiata pine is usually a tall, straight tree with small branches, except on the edge of the plantation where the accessibility to light and space allows the trees to grow large branches. Genetic selection has contributed to improvements in growth rates, straightness and uniformity of plantation-grown radiata pine.

A small number of pests and diseases may attack pine plantations. Fortunately, most of these can be mitigated by good site selection and management of harvesting schedules, but in some cases spraying with chemicals is necessary.

The tree can tolerate a wide variety of climates and rainfall patterns, but performs poorly in heavy clay soils. The species grows best in soils at least 50 centimetres deep with well-drained subsoil and weathered rock, which is penetrable by water and root systems.

While radiata pine tolerates frost and cold, it can be seriously damaged by heavy snowfalls so it is generally planted below 1000 metres in the NSW Southern Slopes, and below 1200 metres in the NSW Central Tablelands.

Plantation radiata pine grows reasonably well in areas with an average annual rainfall as low as 600 millimetres, but a mean annual rainfall of at least 700 millimetres a year is best for commercial development.

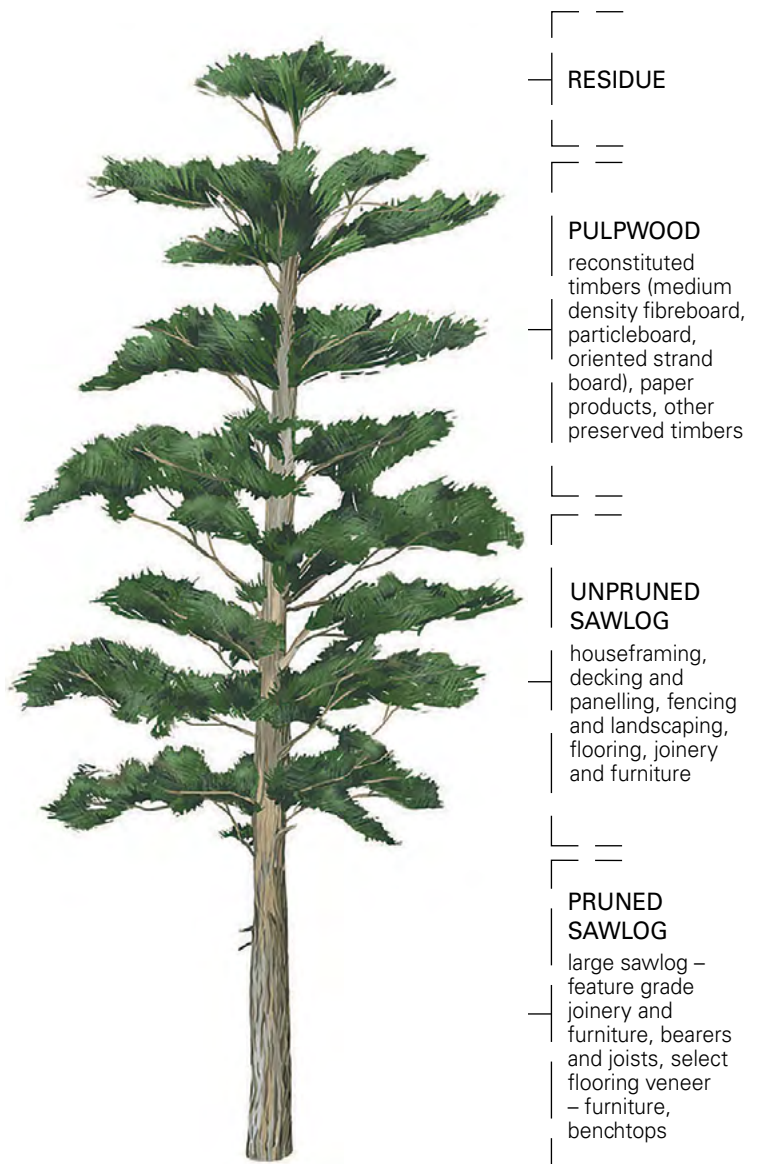
Meeting Australia's timber needs



200 thousand hectares of pine plantations

Enough timber to construct **a quarter** of all the houses built in Australia each year

Below: Radiata pine produces a versatile timber used in a variety of products from house frames to particleboard and paper products.



The timber

Radiata pine trees produce a reddish brown timber that varies to shades of yellow. It has a relatively fine but uneven texture and knots are often present in construction timber grades.

Radiata pine timber is very versatile. The timber can be readily sawn, peeled, or converted to pulp, has good nail-holding power, is pliable, can be easily stained, and is suitable for long-life applications in the ground when treated with preservatives.

Radiata pine sawlogs are used for house frames, decking and panelling, fencing and landscaping, flooring, joinery and furniture. Pulpwood is used to make reconstituted timbers such as medium density fibreboard or particleboard and paper products.

Common misconceptions about radiata pine

One of the most common myths associated with growing pines is that they acidify soils. Research over a 20-year period has shown that this is not the case. In fact, in some instances pine trees have proven to have less of an acidifying effect on soils than eucalypts or improved pasture.

While there will be some changes in the nature of surface soil because of the high carbon to nitrogen ratio in pine needle litter, pine plantations do not significantly deplete soil nutrient reserves, even after several rotations (crops).

Radiata pines recycle nutrients from about age eight, which results in plantations accumulating less nutrients than agricultural crops. Nutrient cycling under radiata pine may also slowly reverse the trend in nitrogen mineralisation and nitrate production caused by pasture improvement, and even reverse soil acidification.

While some changes in soil nutrient status will occur under pines, the soils will remain suitable for alternative forms of land use, such as pasture, after the trees are harvested. This was demonstrated at Mannus Correctional Centre, where 325 hectares of land formerly under mature pine plantation was returned to highly productive pasture.

Another misconception is that wildlife do not live in radiata pine forests.

While radiata pine forests, like most other agricultural crops, are monocultures (single species), many species of wildlife have adapted readily to living in or adjacent to pine forests.

Forestry Corporation surveys have shown that of the 214 species of birds and 31 native mammals recorded in State forests, 110 of the birds and nine of the mammals are also found in pine plantations.

Animal life in plantations is often highly visible but lacks diversity. In particular, animals that depend on the foliage of native vegetation for food or hollow branch stubs for nesting or roosting are less likely to be found in pine plantations.

There are some animal species that have adapted particularly well to living in pine plantations, including larger mammals, such as the eastern grey kangaroo, red-necked wallaby, swamp wallaby, common wombat and echidna.

Further information

For more information about State forests, visit www.forestrycorporation.com.au



Above: Forestry Corporation is the largest producer of plantation-grown radiata pine in Australia. Photo: Forestry Corporation Image Library.

FCNSW0104

© Forestry Corporation of NSW, 2016

The information contained in this publication is to the best of Forestry Corporation's belief, true and correct at the time of publication. However, changes in circumstances after the publication may impact upon the accuracy of the material. No warranty or guarantee is provided by the State of New South Wales, Forestry Corporation and its employees and agents and no liability is accepted for any loss or damage, costs or expense resulting from the use or reliance upon the information contained in this publication.