

**LOCAL NAMES**

English (bunya pine, bunya bunya pine, bunya bunya)

**BOTANIC DESCRIPTION**

*Araucaria bidwillii* is a fast-growing tree 30-50 m tall, with a diameter of 1.5 m, and a straight, undivided trunk often free of branches for two-thirds of the tree height and showing little taper in this part of the bole. The crown is normally symmetrical and dome shaped (parabolic), tending to change from a pointed to a flattened apex with age. The drooping branches are themselves unbranched, with the leaves clustered at the ends. As the lower branches die, dormant buds become active at the base of each branch and a secondary, dome-shaped crown may develop below the primary one. Bark is persistent over the trunk and branches, with thin scales up to 2.5 x 7.5 cm. The outer surface of the bark is rough, bumpy, dark brown to black, covered with prominent leaf scars, and the cut blaze is red, grading to orange.

Juvenile leaves most commonly seen in double rows along the branchlets spirally arranged, venation not visible, glossy green, triangular in section, stiff; adult leaf shiny, tough, sharp-tipped, glossy green, discolorous, 2-6 cm long, 0.5-1 cm wide, spirally arranged but become two-ranked through twisting of the leaf bases. They are stalkless or very shortly petiolate, lanceolate.

Male and female strobili are usually borne on the same tree. Males up to 20 cm long, produced at the ends of short, lateral branches and made up of numerous spirally arranged scales, each with a diamond-shaped, expanded summit covering about 12 pollen cells. Females borne on short lateral branches and ovoid, made up of numerous bracts with sharp projections on the outer end; each bract has an ovuliferous scale attached to the upper surface.

Mature cones are ovoid to almost spherical, very large, with woody scales up to 15 cm broad, and upon maturing they turn from green to brown. Male cones up to 18 x 1 cm, upright near the ends of higher branches; female cones erect, remarkably large and heavy, up to 30 x 23 cm, weighing up to 5 kg each, bearing a single seed. Seeds joined to the cone scales, brown, pear-shaped or kite shaped, up to 6.5 x 3 cm.

The name *Araucaria* is derived from Arauco, a province of southern Chile, and the native habitat of *A. bidwillii*. The common name is of aboriginal origin. Bunya pine has a silhouette that is unique among Australian trees, and its seeds are much larger than those of other conifers.

**BIOLOGY**

*Araucarias* generally begin to flower and fruit between the ages of 15 and 20 years. Male and female flowers are typically found on different parts of the same tree. Male flowers usually appear at the base of the crown in young trees and female flowers at the top. As the tree grows older, the male and female flowers move closer to each other. Bisexual flowers are also found. After pollination, the female flowers develop slowly; the cones mature in about 2 years. They disintegrate on the tree or fall to the ground and disintegrate. Seed quality varies annually; if sufficient pollen is available, seed quality is usually good. The seeds generally fall within the periphery of the crown. In Queensland it flowers from September to October and fruits occur in January to February. Seeds disperse as the fruits mature. Trees bear seeds in 1-2 year intervals.



Foliage (Dennis Haugen, [www.forestryimages.org](http://www.forestryimages.org))



tree (Dennis Haugen, [www.forestryimages.org](http://www.forestryimages.org))



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**ECOLOGY**

The species does well at lower altitudes with good rainfall. In Australia, bunya pine mainly occurs in southeastern Queensland, between Gympie and the Bunya Mountains northeast of Dalby. There are small occurrences in northern Queensland, on Mt Lewis and at Cunnbullen Falls. Up to 30 frosts may occur each winter, mists are frequent, and the climate is generally humid. This species grows on the ranges within about 160 km of the coast, occupying various topographic positions from moist valley floors at low altitudes to ridge tops and upper slopes at higher localities. *A. bidwillii* is normally found as an emergent over tropical rainforest (simple notophyll vine forest), often in association with hoop pine (*Araucaria cunninghamii*).

**BIOPHYSICAL LIMITS**

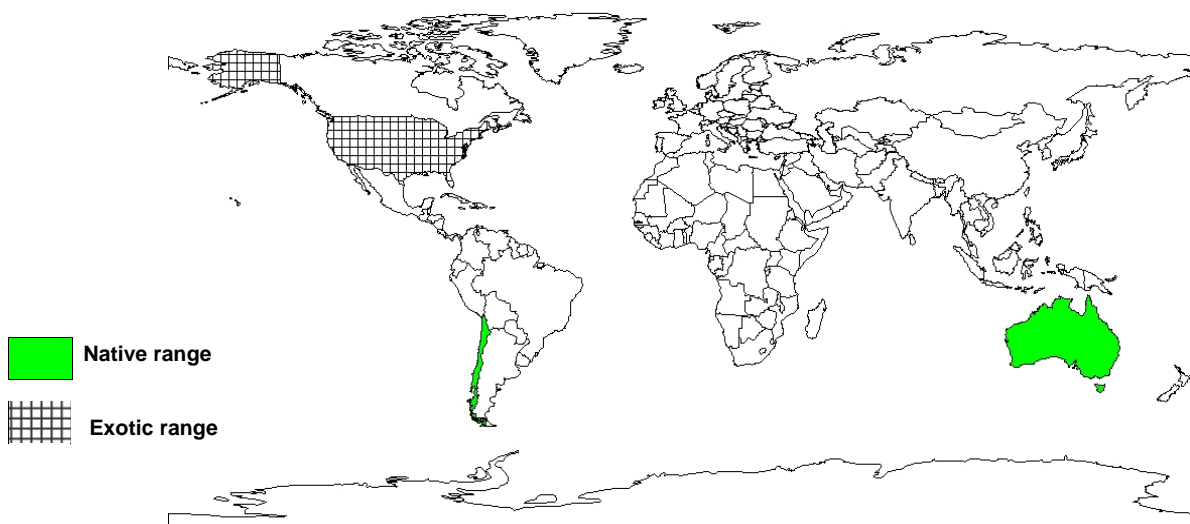
Altitude: 0-2500 m, Mean annual temperature: 20-27 deg. C, Mean annual rainfall: 900-2 000 mm

Soil type: Many of the soils where *A. bidwillii* occurs are Krasnozems or chocolate loams derived from basalt.

**DOCUMENTED SPECIES DISTRIBUTION**

Native: Australia, Chile

Exotic: US



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

**PRODUCTS**

Food: The raw or roasted seeds are an important item of the diet for some of the aborigines in Queensland.

Timber: The wood is very much like that of *Araucaria cunninghamii*, pale pinkish in colour, even in texture, with faint growth rings, and with a density of 520 kg/cubic m. It is not susceptible to lyctus attack.

**SERVICES**

Shade and shelter: *A. bidwillii* can be planted as a windbreak.

Ornamental: Is planted in parks and roadsides as an ornamental.

**TREE MANAGEMENT**

Trees may coppice slightly from cut branches and stems, and they should be planted under full sunlight.

**GERMPLASM MANAGEMENT**

Araucaria seeds have short viability under atmospheric conditions and should be sown within a month of collection. To be stored for any amount of time, seeds must be partially dried; the acceptable safe drying level is 25-40% mc. At this mc, seeds can be stored for some time at 5 deg. C. They should be sown as soon as they are removed from cold storage as they rapidly lose viability. On average, there are about 70-77 seeds/kg.

**FURTHER READING**

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Lanzara P. and Pizzetti M. 1978. Simon & Schuster's Guide to Trees. New York: Simon and Schuster

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Young JA, Young CG. 1992. Seeds of woody plants in North America. Dioscorides Press, Oregon, USA.

**SUGGESTED CITATION**

Orwa C, A Mutua, Kindt R , Jamnadass R, S Anthony. 2009 Agroforestry Database:a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)