

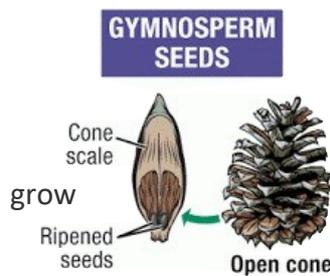
HARD WOODS ARE NOT ALWAYS HARDWOODS

The terms “hard” and “soft” are not definitive when used to describe timber. As it turns out, a hardwood is not necessarily a harder material and a softwood is not necessarily softer. For example, **balsa wood** is a hardwood. In any discussion about the differences words such as “usually” and “often” dominate. For example, hardwoods are *often* darker than soft woods and are *usually* denser in structure but there is no finite way in which the two types of timbers look or feel.

When we get to the very root of the problem the distinction between hardwood and softwood actually has to do with plant reproduction. All trees reproduce by producing seeds, but the seed structure varies.



Hardwood trees are **angiosperms**, plants that produce seeds with some sort of covering. This might be a fruit, such as an apple, or a hard shell, such as an acorn.



Softwoods, on the other hand, are **gymnosperms**. These plants let seeds fall to the ground as is, with no covering. Pine trees, which seeds in hard cones, fall into this category. In conifers like pines, these seeds are released into the wind once they mature. This spreads the plant's seed over a wider area.

Other than the angiosperm / gymnosperm definition all other methods of describing how to differentiate between hardwoods and softwoods are restricted by those words – “usually”, “often”, generally” and “in most cases”.

Hardwoods and softwoods are sub groups within the seeded plant division of the Plant Kingdom, There are 5 groups of within the seeded plant division. These are;

- cycads, a subtropical and tropical group of plants,
- Ginkgophyta, includes a single living species of tree in the genus [Ginkgo](#),
- conifers, which are cone-bearing trees and shrubs,
- Gnetophyta, the gnetophytes, various woody plants in the relict genera Ephedra, Gnetum, and Welwitschia, and
- Flowering plants, also known as angiosperms, the largest and most diverse group of spermatophytes.

The first four groups are collectively known as gymnosperms. Only the Ginkgo and the Conifers are classified as softwood. They have significant differences in sexual reproduction, cell and wood structure to angiosperms.

The flowering plants are angiosperms and are broken down into two sub groups;

- Monocots (eg Grasses and Palms), and
- Dicots (these are also known as hardwoods)

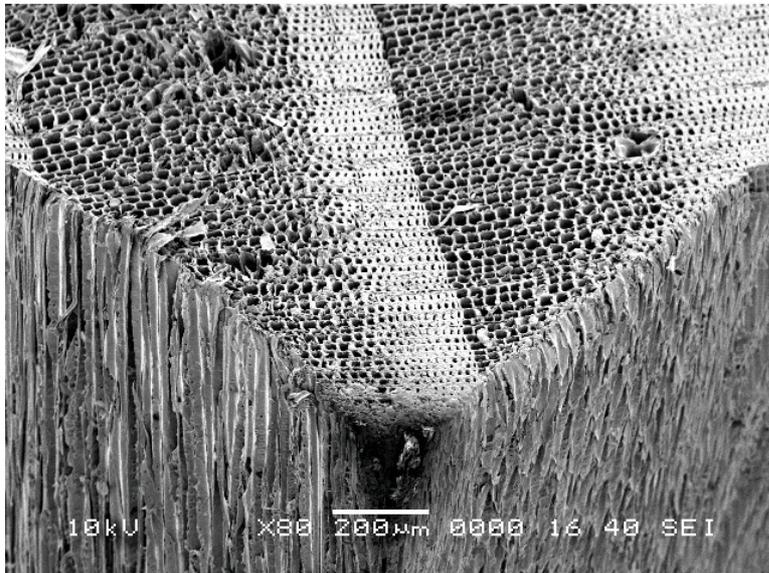
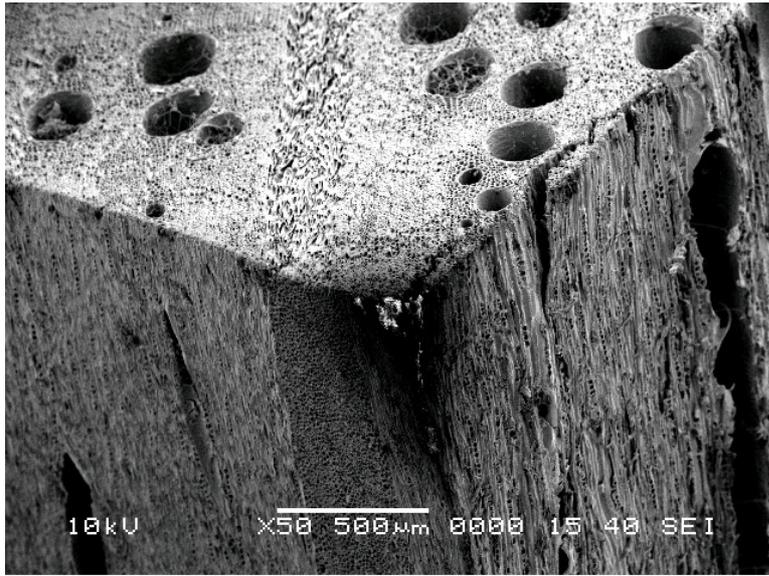
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For the most part, angiosperm trees in the higher latitudes of the northern hemisphere lose their leaves during cold weather while most gymnosperm trees keep their leaves all year round (Larch is a conifer that lose its needles). There are 3 species of eucalyptus that are deciduous during the dry period in the monsoonal areas,

The hardwood/softwood terminology does make some sense. Softwoods tend to be less dense than hardwood trees, and therefore easier to cut, while most hardwoods tend to be more dense, and therefore sturdier. But, as the classification of balsa wood demonstrates, there is no minimum weight requirement to become a hardwood.

Classifying wood as either a **hardwood** or **softwood** comes down to its physical structure and makeup, and so it is overly simple to think of hardwoods as being hard and durable compared to soft and workable softwoods. This happens to be *generally* true, but there are exceptions, such as in the cases of wood from yew trees — a softwood that is relatively hard — and wood from balsa trees — a hardwood that is softer than softwoods.



Top Hardwood cross section (note the pores)

Bottom softwood cross section

It is in the wood structure that we see significant difference.

Softwood has longer fiber length simpler structure. These two features are why hardwood generally the preferred furniture timber. However there are exception (Huon Pine, Rimu, etc).

The fiber length has significance in paper manufacture. High quality printing and photographic paper requires a certain percentage of hardwood fiber due to wetting ratings and not allowing the ink to bleed,

Comparison chart

Hardwood versus Softwood comparison chart		
	Hardwood	Softwood
Definition	Comes from angiosperm trees that are dicots; trees are usually broad-leaved. Has vessel elements that transport water throughout the wood; under a microscope, these elements appear as pores.	Comes from gymnosperm trees which usually have needles and cones. Medullary rays and tracheids transport water and produce sap. When viewed under a microscope, softwoods have no visible pores because of tracheids.
Pollen dispersal methods	Pollen dispersed by wind, insects (eg bees, flies, butterflies), birds (eg honey eaters), mammals (eg bats).	Winds disperse the pollen.
Seed dispersal methods	Wind and gravity, birds, mammals, occasional reptiles and floods.	Mainly wind and gravity and occasional mammals.
Uses	hardwoods are more likely to be found in high-quality furniture, decks, flooring, and construction that needs to last.	About 80% of all timber comes from softwood. Softwoods have a wide range of applications and are found in building components (e.g., windows, doors), furniture, medium-density fiberboard (MDF), paper, etc.
Examples	Eucalyptus, Queensland Maple, Red Cedar, Silky Oak, Wattle	Cyprees pine, Radiate Pine, Huon pine, Rimu, Larch, Hoop Pine
Density	generally higher density, makes better firewood	generally lower density
Cost	Hardwood is typically more expensive	Softwood is typically less expensive
Growth	Hardwood has a slower growth rate.	Softwood has a faster rate of growth.