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COMPARATIVE DECAY RESISTANCE OF HEARTWOOD OF NATIVE SPECIES[1]

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Abstract

Gives the general resistance to decay of a number of native wood species grown in the United States, and some factors affecting decay resistance.

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The common species of wood grown in the United States vary widely in their ability to resist decay, from the highly resistant osage-orange or black locust to willow and aspen. Such generalizations on decay resistance of untreated woods have value to potential users, but they must be regarded primarily as guidelines. Decay resistance should he important in the choice of species only when the wood is to be used under conditions that favor decay.

Resistance of common species to decay rests only in the heartwood (the darker colored central portion of the wood of the tree). When long life is desired of untreated wood under conditions favoring decay, all sapwood should be excluded--regardless of species.

The natural preservatives usually stored in the heartwood may be present in larger amounts in some trees than in others of the same species. Thus, marked differences in decay resistance may occur in heartwood of the same species, and even of the same tree.

Among trees of many species, the decay resistance of the outer heartwood tends to be higher with increasing diameter of the tree. Where radial differences are prominent, there may also be progressive differences in decay resistance vertically within the tree. In such cases, the greatest resistance generally is found in heartwood at the butt of the tree. Large differences in the overall decay resistance between. trees of a given species represent strain or inherited qualities. Present evidence indicates that such environmental influences as rainfall and soil have small effect on relative resistance.

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[1] **Revised from U.S. Forest Products Laboratory Report No. 68, "Factors that Influence the Decay of Untreated Wood in Service and Comparative Decay Resistance of Different Species," originally issued in 1928 and revised in 1958.**

In the pines and in Douglas-fir, occasional pieces are very resinous or pitchy. Wood thus saturated with pitch or resin is exceptionally resistant to decay and has very long life in contact with the ground or in other places where conditions favor decay.

Table 1 gives a classification of common native species according to the decay resistance of the heartwood. By necessity the groups are very general and subject to considerable variation within each. To aid in interpreting the groupings, untreated fence posts containing a large proportion of the very resistant heartwood may last 20 or more years, while those with nonresistant heartwood might only last 5 years or less.

Table 1.--Comparative decay resistance of the heartwood of some common native species

Resistant or very resistant	Moderately resistant	Slightly or nonresistant
Baldcypress (old growth)[1]	Baldcypress (young growth)[1]	Alder
Catalpa	Douglas-fir[2]	Ashes
Cedars	Honeylocust[2]	Aspens
Cherry, black	Larch, western	Basswood
Chestnut	Oak, swamp chestnut[1]	Beech
Cypress, Arizona	Pine, eastern white[1]	Birches[2]
Junipers	Pine, longleaf[1]	Buckeye[2]
Locust, black[3]	Pine, slash[1]	Butternut
Mulberry, red[3]	Tamarack	Cottonwood
Oak, bur		Elms
Oak, chestnut		Hackberry
Oak, Gambel		Hemlocks
Oak, Oregon white		Hickories
Oak, post		Magnolia
Oak, white		Maples
Osage-orange[3]		Oak (red and black species)[2]
Redwood		Pines (most other species)[2]
Sassafras		Poplar
Walnut, black		Spruces[2]
Yew, Pacific[3]		Sweetgum[2]
		Sycamore
		Willows
		Yellow-poplar

[1] The southern and eastern pines and baldcypress are now largely second-growth, with a large proportion of sapwood. Consequently, it is no longer practicable to obtain substantial quantities of heartwood lumber in these species for general building purposes.

[2] These species, or certain species within the groups shown, are indicated to have higher decay resistance than most of the other woods in their respective categories.

[3] These woods have exceptionally high decay resistance.

A technical discussion of decay resistance is contained in "Natural Resistance of Wood to Microbial Deterioration," by Theodore C. Scheffer and Ellis B. Cowling in the Annual Review of Phytopathology, Vol. 4. 1966.