

# TECHNICAL NOTE NUMBER 229

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## COMPARATIVE DECAY RESISTANCE OF HEARTWOOD OF DIFFERENT NATIVE SPECIES WHEN USED UNDER CONDITIONS THAT FAVOR DECAY

Wood kept constantly dry or continuously submerged in water does not decay. A large proportion of the wood in use is kept so dry at all times that it lasts indefinitely. Moisture and temperature are the principal factors which affect the rate of decay; they vary greatly with the local conditions surrounding the wood in service.<sup>1</sup> When exposed to conditions that favor decay, wood in warm humid areas of the United States decays more rapidly than in cool or dry areas. High altitudes are as a rule less favorable to decay than low because the average temperatures are lower and the growing seasons for fungi are shorter.

The natural decay resistance of all common native species of wood is in the heartwood. When untreated, the sapwood of practically all species has low decay resistance and generally short life under decay-producing conditions. The decay resistance or durability of heartwood in service is greatly influenced by differences in the character of the wood, the attacking fungus, and the conditions of exposure. Therefore a widely different length of life may be obtained from pieces of wood that are cut from the same species or even the same tree and used under apparently similar conditions.

General comparisons of the relative decay resistance of different species must be estimates. They can not be exact and they may be very misleading if under-

<sup>1</sup>A mimeograph entitled "Factors Which Influence the Decay of Untreated Wood in Service," discusses this matter in more detail. Copies of the mimeograph may be obtained from the Forest Products Laboratory, Madison, Wis.

stood as mathematically accurate and applicable to all cases. They may be very useful, however, if understood as approximate averages only, from which specific cases may vary considerably, and as having application only where the wood is used under conditions that favor decay. The following classification of common native species is subject to the limitations mentioned:

From service records where available, supplemented by general experience, the heartwood of the following species<sup>2</sup> may be classed as durable even when used under conditions which favor decay: The catalpas, practically all of the cedars, chestnut, southern cypress, the junipers, black locust, red mulberry, osage-orange, redwood, black walnut, and Pacific yew.

Similarly the heartwood of aspen, basswood, cottonwood, the true firs (not Douglas fir), and the willows, when used under conditions that favor decay, may be classed as low in decay resistance, while the heartwood of Douglas fir, red gum, western larch, chestnut oak, southern yellow pine, and tamarack may be classed as intermediate. The heartwood of dense Douglas fir, honey locust, white oak, and dense southern pine may also be classed as intermediate but nearly as durable as some of the species named in the high durability group. The heartwood of the ashes, beech, the birches, the hemlocks, sugar maple, the red oaks, and the spruces may be considered on the border line between the intermediate and non-durable groups and can not with assurance be placed in either group.

<sup>2</sup>The species are listed alphabetically and not in order of their relative durability.

(This note supersedes Technical Note 173)