TECHNICAL NOTE NUMBER 173

FOREST PRODUCTS LABORATORY - U. S. FOREST SERVICE - MADISON, WISCONSIN

RELATIVE DURABILITY OF NATIVE WOODS

In response to numerous requests for information on the relative durability, or resistance to decay, of untreated woods, the U. S. Forest Products Laboratory, Madison, Wisconsin, has prepared the following table from the service records and information it has collected. There are not enough records in existence on some of the woods to be conclusive, and the durability figures given should be accepted only because they are based on the most complete service data anywhere obtainable, supplemented by observation and expert opinion from many sources. They are subject to correction whenever authentic service data show the necessity.

No attempt has been made to translate the relative durability given here in per cent into years of life, since the variety of climate, soil, and moisture conditions to which timbers might be exposed would make such data worthless. Individual timbers of the same species may differ considerably in durability, too, according to the amount of heartwood and sapwood they contain and to their state of preservation when they are placed in service. Under any given set of conditions, however, the average service life of timbers of the different species will probably vary in proportion to the percentages given.

Black locust and osage orange are the most durable of the native woods. When exposed to conditions which favor decay they will probably last almost twice as long as white oak, and from three to four times as long as red oak. Bald cypress, redwood, catalpa, and most of the cedars are also highly durable species. Douglas fir, longleaf pine, the white pines, and western larch average only a little less durable than white oak.

Hemlock, the true firs, and loblolly, lodgepole, and western yellow pines fall considerably lower. The sapwood of practically all species has very low durability.

RELATIVE DURABILITY (RESISTANCE TO DECAY) OF UNTREATED WOODS

Durability of commercial white oak taken as 100 per cent

Conifers

Cedar, eastern red (juniper)	150-200	Pine, pitch, sugar	45-55
Cedar, southern white	80-100	Pine, shortleaf	60-80
Cedar, other species	125-175	Pine, So. yellow (dense)	80-100
Cypress, bald	125-175	Pine, western white	65-80
Douglas fir (dense)	75-100	Pine, white	70-90
Douglas fir, (ave. mill run)	75-85	Pine, western yellow, pond, loblolly, lodgepole	35-50
Fir (the true firs)	25-35	Redwood	125-175
Hemlock	35-55	Spruce, Engelmann, red, Sitka, white	35-50
Larch, western	75-85	Tamarack	75-85
Pine, jack	35-45	Yew, Pacific (western)	170+
Pine, longleaf, slash (Cuban)	75-100		
Pine, Norway	45-60		

Hardwoods

Ash	40-55	Hickory	40-55
Aspen	25-35	Locust, black	150-250
Basswood	30-40	Locust, honey	80-100
Beech	40-50	Magnolia, evergreen	40-50
Birch	35-50	Maple	40-50
Butternut	50-70	Mulberry, red	150-200
Catalpa	125-175	Oaks, red oak group	40-55
Chestnut	100-120	Oaks, white oak group	100
Cottonwood	30-40	Oak, chestnut	70-90
Elder, pale	25-35	Osage orange	200-300
Elm, cork (rock), slippery	65-75	Poplar, yellow	40-55
Elm, white	50-70	Sycamore	35-45
Gum, black, cotton (tupelo)	30-50	Walnut, black	100-120
Gum, red	65-75	Willow	30-40