3-1970

Texas Forestry Paper No. 1

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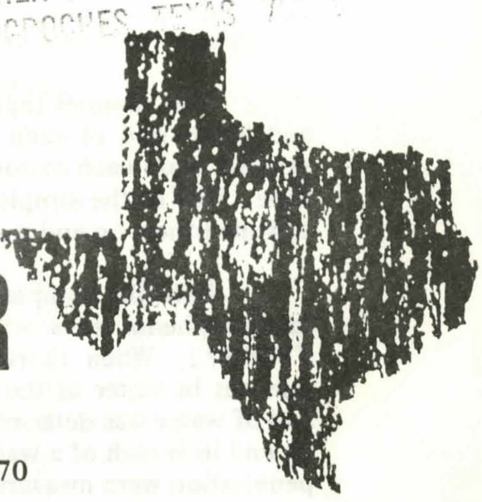
TEXAS FORESTRY PAPER



No. 1 – MARCH 1970

LOG STORAGE UNDER WATER SPRAY MAKES LUMBER MORE POROUS

by

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Although water spraying of logs was first recommended for fire prevention, its fungus control value was soon observed (Hoxie 1920). Storage under water spray effectively controls stain and decay in southern pine pulpwood (Mason et al. 1963, Volkman 1966). As is the case with pond storage of western pine, spray storage of southern pine does permit souring due to bacterial activity. This activity increases wood porosity, and in southern pine veneer logs, adds to the difficulty of producing veneer of uniform thickness (Lutz et al. 1966.)

Because increasing volumes of southern pine logs are being stored under water sprays, it is desirable to assess possible effects of such storage on lumber sawed from the stored logs. The current test was devised to determine (1) the amount of increased porosity of southern pine lumber cut from logs stored under a commercial water spray and (2) whether increased porosity can be counteracted by a dip in a water-repellent preservative.

TEST PROCEDURE. A 20-inch southern pine log was cut into three 8-foot bolts and put under the water-spray system at a commercial mill on September 30, 1966. Two 12-inch sections of the log were taken to the laboratory at the beginning of the storage period; similar sections were taken from the ends of one of the stored bolts after one month, and the other two bolts were similarly sampled after 3½ and 5½ months, respectively. Since bacteria completely penetrate western pine logs in two months (Ellwood and Ecklund 1959), these end sections probably are representative.

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Test samples (approximately 0.75 x 0.75 x 3 inches long) were cut from the sapwood and heartwood of each section and quickly dried in a ventilated oven at 60°C. The dried samples from each exposure period were stored until all samples were ready for testing at one time. Half of the samples collected after each period of storage were coated on lateral surfaces and the others on end surfaces with an oil-and water-resistant vinyl chloride paint.

Half the samples of each test group were immersed for three minutes in 5% pentachlorophenol plus a water repellent in mineral spirits, meeting Federal Specification TT-W-572. When thoroughly dry, these and the untreated samples were dipped for three minutes in water at the same temperature as the wood. Absorption of preservative solution and of water was determined by weighing. When again completely dry, the samples were stood on end in ½ inch of a water solution of safranin for 15 minutes. The surface creep and internal penetration were measured. There were 5 or 6 samples in each test category.

RESULTS. After a month's storage the logs developed a sour odor but no visual evidence of microbial infection. The wood remained bright during the entire 5½ months.

Porosity of sapwood, as measured by absorption of oil (Fig. 1) and water (Fig. 2) and by depth of penetration of dyed water (Fig. 3), increased significantly during the first month, and continued to increase progressively with increasing time of storage. There was no change in porosity of heartwood during the test.

The water-repellent treatment effectively overcame the increased absorptiveness (Figs. 2 and 3).

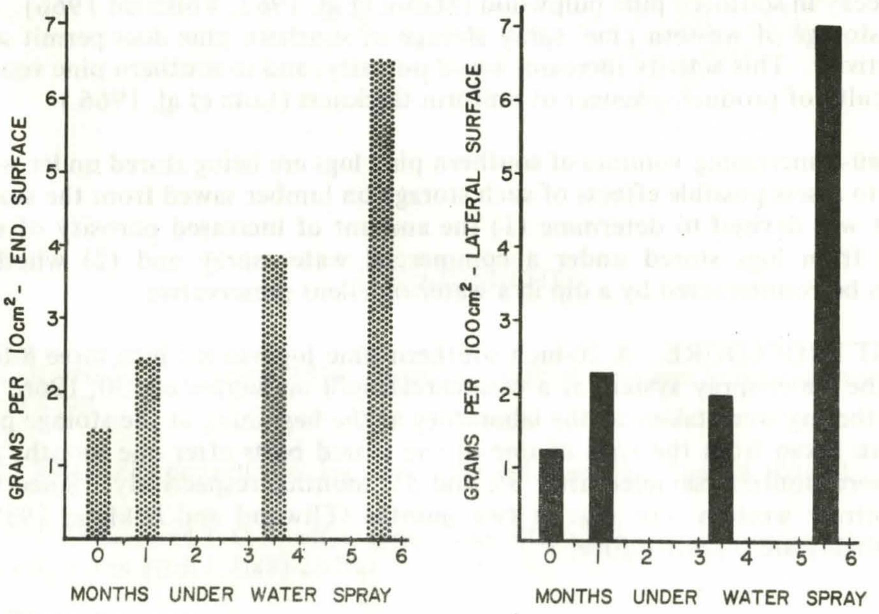

Figure 1. Absorption of an oil water-repellent solution during a 3-minute dip, by pine sapwood lumber cut from lots stored under water spray. Left, End absorption: Right, Lateral absorption.

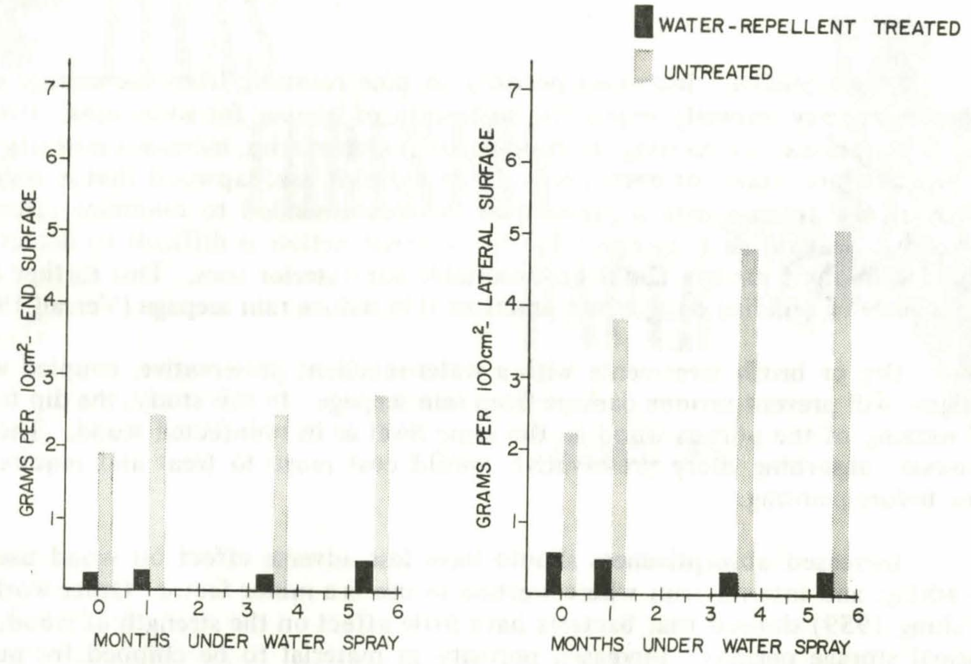

Figure 2. Absorption of water during a 3-minute dip, by untreated and water-repellent treated pine sapwood lumber cut from logs stored under water spray. Left, End absorption: Right, Lateral absorption.

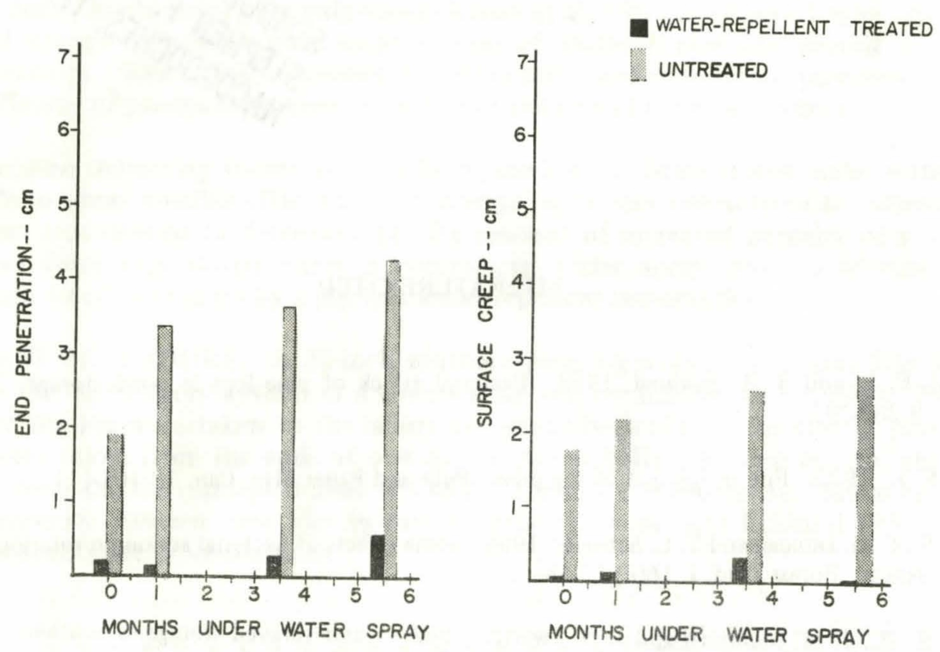

Figure 3. Penetration and surface spread of safranin solution in and on pine sapwood lumber cut from logs stored under water spray.

DISCUSSION. Increased porosity in pine resulting from the storage of logs under a water spray may seriously impair the suitability of lumber for some uses. Where wood is exposed to periodic rain wetting, as in siding and exterior trim, increased porosity can contribute to paint failure, stain, or even decay. For exterior use, sapwood that is stain free and kiln dried, or else treated with a preservative, is recommended to minimize effects of increased porosity. Because such increasc due to bacterial action is difficult to detect visually, some bright, kiln-dired lumber could be unsuitable for exterior uses. This further emphasizes the importance of building designs and practices that reduce rain seepage (Verrall 1966).

Dip or brush treatments with a water-repellent preservative, coupled with reasonable designs, will prevent serious damage from rain seepage. In this study, the dip treatment reduced wetting of the porous wood to the same level as in uninfected wood. The porous wood, however, absorbing more preservative, would cost more to treat and require longer drying time before painting.

Increased absorptiveness should have less adverse effect on wood used for framing, sheathing, and interior trim where wetting in use is a minor factor. Other work (Ellwood and Ecklung 1959) showed that bacteria have little effect on the strength of wood, at least during normal storage periods. Increased porosity in material to be chipped for pulping could be advantageous since it might reduce cooking time.

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