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FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Southern Forest Experiment Station, New Orleans, La.

No. 131 January 1961

COLD-STORED HARDWOODS SURVIVE DELAYED PLANTING

Red oak and sweetgum seedlings have survived well after 3 months of cold storage in shipping bales.

In north Mississippi, high water delayed a planting of Nuttall, cherrybark, water, and willow oak and sweetgum from January until late April. In the interim, the baled 1-0 stock was kept in an ice house at 34° F. and about 91 percent relative humidity.

The trees were bar-planted on two fields of Falaya silt loam and on a Waverly silty clay loam under a sweetgum-water oak stand that was subsequently deadened. One of the fields had been mowed and burned and the other mowed, burned, and disked. All soils were saturated at the time of planting. Air temperatures reached 90° F.

Although 4 weeks elapsed before the first ground-settling rain, first-year survival averaged 97 percent on the mowed field, 93 percent on the mowed and disked field, and 87 percent under the deadened hardwoods. At the end of the second growing season, survival percentages were 96, 93, and 64, respectively. The heavy mortality on the wooded-released site was attributed to the increased herbaceous and low woody competition that developed after the overstory hardwoods died. --R. M. Burns.

BURNING DESTROYS DUFF-STORED SEED

Shortleaf pine seed in the Ouachita Mountains of Arkansas sometimes lies in the duff for a year before it germinates. Untimely controlled burning for seedbed preparation can destroy duff-stored seed and thus reduce the crop of natural seedlings.

In unburned plots of a recent study, seed shed in the autumn of 1957 germinated in the spring of 1959, more than a year later, and produced 40 percent stocking. (No seed was produced in 1958.) Adjacent plots that were control-burned in November 1958 had 7 percent stocking. Destruction of potential natural reproduction may be particularly serious the year following a bumper crop.--*J.L. Smith* and *D.R. Bower*.

PLANTING VS. SEEDING IN OUACHITAS

On unburned areas in the Ouachita Mountains an experimental planting resulted in more and better-distributed shortleaf pines per acre than did direct seeding. On burned seedbeds, seeding yielded more trees than planting, and with equally good stocking.

Three burned and three unburned plots near Hot Springs, Arkansas, were sown in December 1958 with local shortleaf seed that was unstratified but coated with repellents--Arasan and endrin in a latex sticker. Seed was broadcast by hand, at the rate of ½ pound per acre. Equal numbers of burned and unburned plots were planted on March 2, 1959, with 1-0 shortleaf seedlings spaced at 6 by 6 feet.

In August 1960, the burned, direct-seeded plots had 2,370 seedlings per acre, and 77 percent of the milacres were stocked. The planted plots had 1,065 survivors, plus 300 natural seedlings per acre.

On unburned plots, direct seeding produced 500 seedlings per acre, with 43 percent stocking; planted plots had 944 survivors, plus 666 natural seedlings.--*D.R. Bower* and *J.L. Smith*.

FERTILIZER NO HELP TO LOBLOLLY SEEDLINGS

Loblolly pine seedlings planted on eroded Brown Loam and Coastal Plain sites in north Mississippi did not respond to heavy fertilization.

At planting time, the Brown Loam plots had a good sod of Bermuda grass, while the Coastal Plain plots supported bluestem grasses and an occasional small pine or sweetgum. Loblolly seedlings--1.0 stock--were planted in February

1955, and shortly afterwards fertilizer was broadcast by hand at the following rates per acre:

300 pounds N
300 pounds N plus 200 pounds P_2O_5
300 pounds N plus 100 pounds K_2O
300 pounds N plus 200 pounds P_2O_5 plus 100 pounds K_2O
300 pounds N plus 50 pounds of ES-MIN-EL, a commercial mixture of minor trace elements
Control--no fertilizer.

After one year, half of each plot was refertilized with the original treatment at the original rate.

A concentrated spray of a growth inhibitor, maleic hydrazide, was used in an attempt to control the Bermuda grass, but the grass responded so well to the fertilizer that it overtopped and smothered many pine seedlings.

At first the complete fertilizer seemed to stimulate pine growth, but after 5 years no significant advantage could be ascribed to any fertilizer treatment. On the Brown Loam site, unfertilized check plots had the best pine survival; on the Coastal Plain area some treatments were better and some poorer than the check plots. At the end of 5 years, survival on all plots averaged 78 percent, height growth 10.2 feet.--*D.C. McClurkin.*

CONTROL OF UNDERSTORY HARDWOODS FAILS TO SPEED GROWTH OF POLE-SIZE LOBLOLLY

Complete elimination of understory hardwoods has not significantly improved growth of pole-size loblolly pines on a good site near Alexandria, Louisiana. Growth during a 6-year period averaged 172 cubic feet per acre annually in untreated stands and 175 cubic feet where all hardwoods were eradicated.

The study was installed in a 26-year-old plantation on a site with a 90-foot index. Because the pines had been planted 12 by 12 feet apart and fire had been excluded, a moderate understory of oaks, gums, waxmyrtle, and other species had invaded. Hardwoods numbered more than 3,800 per acre when the study began in May 1954. At that time pines were thinned from 120 to 90 square feet of basal area per acre--from 2,800 to 2,100 cubic feet of volume, inside bark. Remaining pines averaged 11.8 inches in diameter and 62 feet in height. After the thinning, hardwoods on half the plots were treated with Ammate, and any sprouts or new hardwood seedlings were killed each year.

From 1954 through 1959, growth averaged 1,049 cubic feet per acre on treated plots and 1,034 on untreated. Height

growth was about the same on all plots, averaging 1.4 feet annually. Average diameter increased to 13.3 inches on treated plots and to 13.2 where hardwoods were undisturbed.

Research in other localities has sometimes indicated that understory hardwoods deplete soil moisture needed for pine growth. On sites where soil moisture is limiting, complete removal of small hardwoods may be needed for optimum pine volume gains.--*T.E. Russell.*

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*Smith, J.L. *Mist blower for controlling undesirable hardwoods.* Pp. 185-186.

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*Gammage, J.L., and Maisenhelder, L.C. *Refrigeration prolongs viability of cottonwood seed.* Pp. 5-6.

*McClurkin, D.C. *Legumes fail to benefit loblolly pine plantings in north Mississippi.* Pp. 11-12.

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*Snow, G.A. *Spraying before rains important for fusiform rust control.* Pp. 17-18.

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