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SOUTHERN FORESTRY NOTES

Southern Forest Experiment Station
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COMMERCIAL IMPROVEMENT CUT IN BOTTOMLAND HARDWOODS

Early effects of partial cutting on diameter growth in bottomland hardwood forests have been measured recently near Vance, Mississippi.

A stand of mixed hardwoods, principally cow, cherrybark, bottomland red, and willow oaks and sweetgum, was marked for a commercial improvement cut and logged in the summer of 1947. Before cutting, the stand averaged 105 sq. ft. of basal area per acre in trees of all sizes from saplings to large saw timber. It contained 2,900 bd. ft., Doyle rule, per acre in logs 14" in diameter and larger. The cut removed 1,500 bd. ft. per acre--25 ft. of basal area--in trees 18" d.b.h. and larger.

Two growing seasons later, 200 sample trees were classified by the degree of release they had received. Heavy release included removal of more than 1/2 the effective competition to suppressed trees and more than 3/4 of the competition to intermediates and codominants. Medium release ranged from removal of 1/3 the effective competition to suppressed trees to over 2/3 of that to dominants. Light release ranged down from medium release.

Trees that had received heavy release were found to be increasing in diameter at a rate 26% faster than in the 10-year period before the cut. Trees that received medium release showed no appreciable change in growth rate. Those with light or no release decreased 17%. The latter figure reflects the loss in rate that could have been expected for the entire stand if no cut had been made. The

actual decline for the stand as a whole, however, was only 4%, the cut having forestalled a greater deceleration.

The best response came from trees less than 18" d.b.h. Forty-five percent of these trees had received medium or heavy release. If more of them had been released, the average diameter growth rate of the stand would have been speeded considerably.--J. W. Johnson.

CULTIVATING BOOSTS FUSIFORM RUST INFECTION

Where hazard from southern fusiform rust is high, the increase in growth gained by cultivating and fertilizing a young slash pine plantation is offset by an increase in rust infection.

Slash and loblolly pine seedlings were planted on an old field in central Alabama in January 1945. In the spring of that year, two plots of each species were cultivated and fertilized. One plot of each species was left untreated as a check.

Four years after planting, the trees in the cultivated and fertilized plots averaged 9.6 feet tall, while those on the check plots were 7.5 feet high. Survival at that time was 71% on the cultivated and fertilized plots and 80% on check plots.

No rust cankers were found in June 1946, but percentages of trees with trunk or branch cankers increased sharply from June 1947 to March 1950. In the check plots, cankered loblolly jumped from 2% to 30%, and cankered slash from 6% to 43%. In the cultivated and fertilized plots, cankered loblolly jumped from 2% to 32%, and cankered slash from 11% to 67%. Thus the percentages of cankered trees were about the same for loblolly on both the check and the treated plots, but were considerably greater for slash on the treated plots. These findings substantiate results of a previous study on slash pine in Alabama.--Dwight L. Westberg.

COMPETITION FOR LIGHT, WATER, AND NUTRIENTS

The character of the hardwood that must be removed to release suppressed pine reproduction, and also the manner of removal, depend somewhat upon whether the competition is mainly for light or for soil moisture and nutrients. In an attempt to answer this question, a study was installed early in 1949 on the Crossett Experimental Forest. Forty-eight small plots were established, each having a 1-year-old loblolly pine seedling surrounded and overtopped by hardwoods from 1" to 3" in d.b.h.

First-year height growth indicates that competition for soil nutrients and water is much more severe than competition for light. A trench dug around the pines to free them from competition with hardwood roots significantly increased pine height growth. Watering the plots when soil moisture dropped to 12% (as happened twice during the first summer) also appeared helpful. There was no increase in pine growth where the roots of the hardwoods were undisturbed but the tops were tied back to allow full sunlight to reach the pine. These are tentative results only; observations will continue for several years.--Wm. F. Mann, Jr.

SCRUB OAK HELPS LONGLEAF SEEDLINGS ON DEEP SAND

On deep sands in south Alabama (sites with at least 4 feet of sand), first-year longleaf pine seedlings survive a late spring drought better if they are shaded by scrub oak than if they are in the open.

Survival of natural seedlings from the 1947 seedfall was studied during 1948. Areas studied had heavy seedling stands in the early spring of 1948, but there was a drought in May and June. On deep sands, stocking at the end of the drought averaged 2 seedlings per milacre on open plots, as compared with 30 per milacre on nearby plots in partial or full shade. Under oak crowns, pine stocking after the drought was the same, 87%, on deep sands as on

better soils; in the open it was 74% on deep sands and 86% on better soils.

In February 1949, longleaf was planted under oak stands on deep sands on the Conecuh National Forest. There was almost no rain in May. In the openings, survival in July was 43%, and did not change by February 1950. Trees in partial shade fared better, with 66% survival in both July and February. Trees in full shade had the best July survival, 78%, but dropped to 65% by the end of the year.

On deep sands, the improved early survival under shade is believed due to lower transpiration, more soil moisture, and less competition from grass than on open sites. The benefits appear to end when natural seedlings are 1 year old, or when summer rains replenish soil moisture in plantations. The best time to kill scrub oaks on deep sands will be the object of further study. On more productive soils, the sooner overtopping hardwoods are killed, the better the survival of small pines seems to be.--E.M.Gaines.

RECENT PUBLICATIONS BY STAFF MEMBERS

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*Copies are available at the Southern Station.