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It is conceivable that a pre-cutting for pound poles might not be wise in Virginia pine stands that are being held for saw log production. Especially in younger stands on the better sites, some of the trees cut might be those that would have been selected for saw log crop trees, or for piling. But in stands being grown for pulpwood only, this would not be of much consequence.

It was concluded that a cut for pound poles is a very desirable one for Virginia pine owners to consider. The returns per acre for stumpage can be large, and harmful effects are unlikely. Cutting pound poles can substantially increase the total returns possible from suitable stands. In the example described, the stand volume exceeded 20 cords per acre even after the cutting—and that is ample to interest pulpwood buyers.

RICHARD H. FENTON,
Virginia Pine-Hardwood Research Center, Northeastern Forest Expt. Sta., U. S. Dept. Agric., Laurel, Md.

Loblolly Seedling Survival After Hardwood Control by 2,4,5-T

Loblolly pine seedlings can be safely planted promptly after hardwood control with low-volatile esters of 2, 4, 5-T. This conclusion, plus some interesting data on reactions of seedlings to drought, competition, and occurrence of insect attack, came to light in a recent study in east Texas.

In December 1953, three treatments were applied to a dense stand of hardwood saplings and poles (6,500 stems per acre) near Nacogdoches, Texas. On three tenth-acre plots the basal 18 inches of all stems was sprayed to the point of runoff with a solution made by dissolving 1 gallon of 2, 4, 5-T (propylene glycol butyl ether ester, 4 pounds acid equivalent) in 16 gallons of diesel oil. On three other plots the hardwoods were cut close to the ground and the same 2, 4, 5-T solution was painted on the stumps to prevent sprouting. On a third set of three plots, the hardwoods were similarly cut but no silvicide was used.

From 2 to 24 hours after the hardwoods had been treated, 50 loblolly pine seedlings were planted on each plot; they were set 4 feet apart in randomly assigned rows. Exposure to silvicide was probably more severe than would occur on most such operations, since the hardwood stems were closely spaced and liberal applications had deposited large amounts of the solution on the ground.

In February 1954, 50 additional seedlings were similarly planted on each plot. It was expected that any toxicity from the silvicide would have dissipated during the 2-month interval between plantings.

On the basal-spray plots most hardwoods reached half or full leaf before toxic effects were pronounced, and the dying foliage partially shaded the pines throughout the spring and summer. On plots where the hardwoods were cut but the stumps were left untreated, a vigorous stand of sprouts developed by midsummer and gave the seedlings some shade. Where the hardwood stumps were treated with silvicide, pines had little or no protection from the sun.

The study was favored by a mild winter (normal for the area) and a moist spring, but encountered a severe summer drought. From May 26 to July 29, 1954, five light showers produced a total of 0.52 inch of rain. A storm of 1.95 inches at the end of July was followed by a 38-day period in which only 0.30 inch was measured. During the summer, maximum air temperatures in a standard louvered shelter reached or exceeded 100°F. on 55 days. A high of 112°F. was reached on July 25.

The failure of the silvicide to affect seedling survival was conclusively demonstrated before the drought became lethal. By June 28, survival averaged 92 percent for all December plantings and 93 percent for February plantings (Table 1); the differences are not statistically significant. For neither planting period was survival lower where the 2, 4, 5-T had been used—in fact, it was generally somewhat higher, particularly on the basal-spray plots.

Survival in November 1954, though greatly reduced by drought, confirmed the absence of significant differences due to time of planting. Seedlings planted in December grew somewhat taller than those planted in February. Obviously the 2, 4, 5-T had had no adverse effect on either the survival or the growth of the seedlings.

Survival on the basal-spray plots in November 1954 was 84 percent, significantly (at the 1-percent level) above the 53 and 57 percent survival averages for the other two treatments. While this difference had become statistically significant by the end of June, its substantial increase with continuing drought has important practical implications. Regeneration plans for dry sites might well take advantage of this ability of a dying overstory to improve seedling survival in dry weather.

Just why survival was so much higher on the basal-spray plots cannot be fully explained from this study. All three treatments evidently reduced the moisture drain of competing vegetation. Survival on other study areas subject to tree and grass competition ranged from 4 to 32 percent. Whether more moisture was available to the seedlings in the basal-spray plots than on the other treatments is unknown.

TABLE 1.—PROPORTION OF PINE SEEDLINGS[1] SURVIVING ON JUNE 28, 1954

Hardwood treatment	December planting	February planting
	Percent	*Percent*
Hardwoods cut, no silvicide	89	91
Hardwoods cut, 2, 4, 5-T on stumps	89	93
2, 4, 5-T as a basal spray	97	95
Average	92	93

[1]Based on 150 pines planted under each type of hardwood control treatment on each planting date: 900 in all.

Some insect infestation was noted on all plots. The pine webworm (*Tetralopha robustella* Zell.) attacked 18 percent of the seedlings on the basal-spray plots but only 4 percent of those on the other treatments. The difference is significant at the 1-percent level and substantiates other observations that the webworm is more apt to attack shaded than unshaded seedlings. The pine tip moth (*Rhyacionia frustrana* Comst.) was present but could not be associated with the hardwood treatments. Neither insect seriously affected seedling survival.

T. A. HARRINGTON
Southern Forest Experiment Station, Forest Service, U. S. Department of Agriculture

A Simplified Technique for Securing Wood Samples

A simplified technique for securing wood samples for microscope examination has been devised by the author.

In the past, when it was necessary to obtain samples of wood of a tree for microscope examination, any one of the following three general methods was usually employed: (1) the tree itself was cut down and then cut into the desired sample size (*1*); (2) small, wedge-shaped pieces were cut out with a saw (*2*); and (3) sections of branches were used (*3*).

Each of these three methods has objectionable features; (1) it is not always feasible or desirable to cut down the entire tree; (2) many large wounds are apt to damage the tree; and (3) the branch wood may not be characteristic because of the extreme anatomical variation between branch and stem wood.

This new technique employs a Swedish increment borer as the sampler. After the core was removed, the hole was plugged with a small piece of beeswax having the same diameter and length as the core in order to prevent the entrance of pathogens and insects which might cause damage to the tree. Samples have been taken in this manner from a black walnut and a tulip poplar at biweekly intervals for a year with no apparent damage to the two trees (*4*).

The core or a piece of the core can be mounted, imbedded or unimbedded, on the sliding microtome and the desired sections cut. They can then be handled in the usual manner. Figures 1, 2, and 3 show photographs (enlarged about 100 times) of cross, radial, and tangential sections cut from a sample of sweetgum (*Liquidambar styraciflua* L.) which was obtained with an increment borer.

The borer method has several distinct advantages: (1) the same tree may be sampled over a long period of time; (2) the work involved is reduced to a minimum, thereby allowing a large number of trees to be studied at one time; and (3) since a number of samples can be taken from a relatively small area of the tree trunk with no apparent damage to the tree, the results can be statistically analyzed (*4*).

The core does not afford a large amount of wood, but it has been found to be adequate for most purposes.

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THOMAS K. WILSON
Department of Botany, Indiana University, Bloomington, Indiana

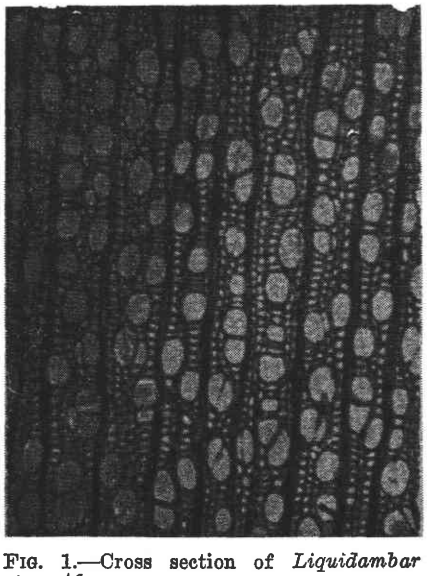

FIG. 1.—Cross section of *Liquidambar styraciflua.*

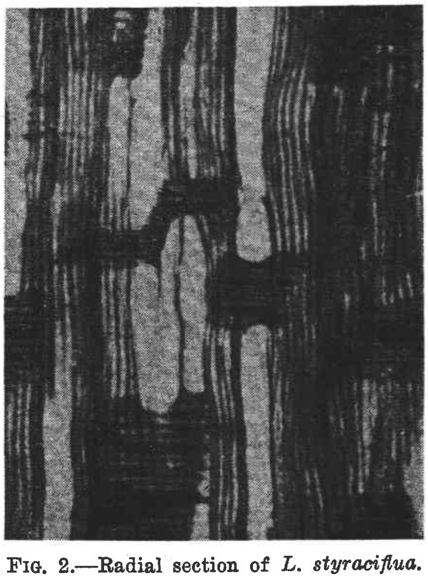

FIG. 2.—Radial section of *L. styraciflua.*

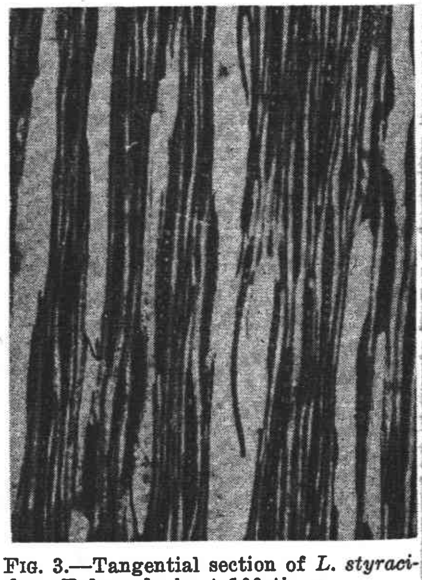

FIG. 3.—Tangential section of *L. styraciflua.* Enlarged about 100 times.