



United States
Department of
Agriculture

Forest Service

**Southern Forest
Experiment Station**

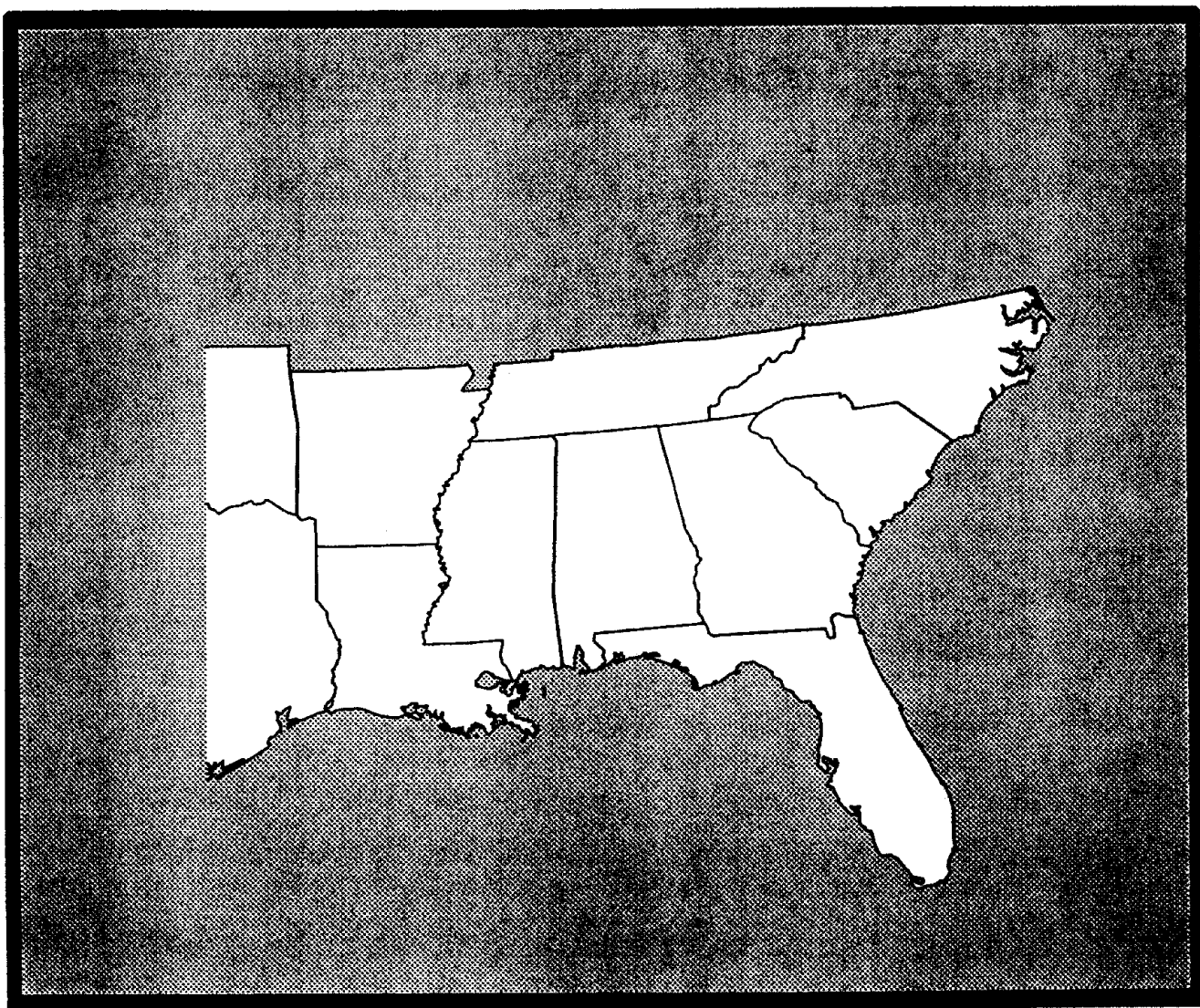
New Orleans,
Louisiana

Research Paper
SO-290
September 1995



Forest Plantations in the Midsouth, U.S.A.

James F. Rosson, Jr.



FOREWORD

The USDA Forest Service, Southern Forest Experiment Station, Midsouth Forest Inventory and Analysis (MIDSO-FIA) unit, headquartered in Starkville, Mississippi, conducts forest inventories covering the States of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas and the U.S. Commonwealth of Puerto Rico. The MIDSO-FIA mission is to develop, analyze, and maintain forest resource information essential for the formulation of forest policies and programs.

The MIDSO-FIA inventories of the Midsouth United States are part of a nationwide effort originally authorized by the McSweeney-McNary Act of 1928. More recent legislation pertinent to the MIDSO-FIA mission includes the Forest and Rangeland Renewable Resources Planning Act of 1974, the National Forest Management Act of 1976, and the Forest and Rangeland Renewable Resource Research Act of 1978.

SUMMARY

The latest forest surveys of the seven Midsouth States show 16,278,700 acres of forest plantations, mostly planted pine. Twenty percent of the Midsouth softwood growing-stock volume is in plantations. Plantations average 1,241.2 ft³/acre in softwood growing-stock volume in poletimber and sawtimber size stands versus 957.7 ft³/acre for natural stands. Results of the analysis show that per-acre pine volume is enhanced across the Midsouth by plantation forestry but that there is little difference between plantations and natural stands in total per-acre volume.

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INTRODUCTION

Continued population growth and the assumed expansion of the United States economy will impact heavily on the forest resources of the United States. Additionally, changes in social values and attitudes are increasing the demand on the forest resource to produce a variety of goods and services. Such demands are shifting harvesting pressure from western to eastern forests. The South currently accounts for most of the timber removals in the United States—55 percent, up from 45 percent in 1970 (Powell and others 1993).

Recent surveys in the Midsouth have revealed large increases in softwood removals. For example, the sixth Louisiana forest survey shows a removal-to-growth ratio of 1.27 to 1 (Rosson 1995). Clearly, such harvest-to-growth ratios cannot continue indefinitely without depleting the softwood reserve. With little likelihood that demand will decrease, it is imperative that harvested timberland be regenerated in a timely manner and that adequate stocking be maintained throughout the regeneration cycle. Two publications have addressed such issues in Louisiana (Rosson 1994a, 1994b).

Plantation forestry is one means of controlling the temporal and spatial aspects of stand regeneration after harvest. Although plantation forestry has been criticized for fostering clearcutting, monocultures, and loss of biological diversity, intensive plantation forestry can ultimately reduce harvesting pressure and disturbance on natural stands and stands intended to be set aside for esthetics, recreation, or watershed protection. The reasoning is that maximum timber production can be concentrated in plantations—land intended solely for timber production. Otherwise, as demands on the resource continue to increase, more and more of the timberland base must be brought into the harvest rotation to meet demand, usually from lands that are less than optimally stocked.

Reported here is the status of forest plantations in the Midsouth States (fig. 1). It is important to know if plantations are meeting their fullest potential and what shortcomings, if any, need to be addressed. In-

formation gathered includes plantation area, forest type, ownership, volume, site class, and stocking. Additionally, comparisons were made to see if there was any difference between plantation and natural-stand volumes. Data were taken from the latest forest surveys of each Midsouth State (table I). The appendix contains definitions of terms and resource tables.

METHODS

The sample design consisted of two phases: dot counts for estimating timberland area and measurements on sample plots for stand and tree attributes. Sample plots were located on a 3-mile-square grid and were revisited during successive inventories. At each plot location, a 10-point satellite plot was used to sample tree attributes. Trees ≥ 5.0 inches in diameter at breast height (d.b.h.) were selected with a 37.5-basal-area-factor prism. Saplings (trees ≥ 1.0 inch and < 5.0 inches in d.b.h.) were measured on 7.1-ft-radius plots at satellite points 1, 2, and 3. Saplings were also tallied (to supplement stocking assessment only) at the other seven points where fewer than two live trees ≥ 5.0 inches in d.b.h. were sampled at a specific point. Stocking is expressed as the relative measurement (in percent) of sampled stand density (based upon the aggregation of individual tree density) to a specified density (see stocking definition in the appendix). Seedlings (trees < 1.0 inch in d.b.h.) were tallied at any point where no live trees ≥ 1.0 inch in d.b.h. occurred in the respective point sample. This sampling procedure was based on a theoretical maximum plot stocking of 160 percent. Therefore, each satellite point in the sample could not be more than 16-percent stocked. The seedling sample was limited to only the four dominant seedlings at each point where no trees ≥ 1.0 inch in d.b.h. occurred. Therefore, complete enumerations of seedlings were not done in the sample. Complete sapling enumerations were done on satellite points 1, 2, and 3, but not on points 4 through 10. For additional details on the sample design, see Rosson (1995).

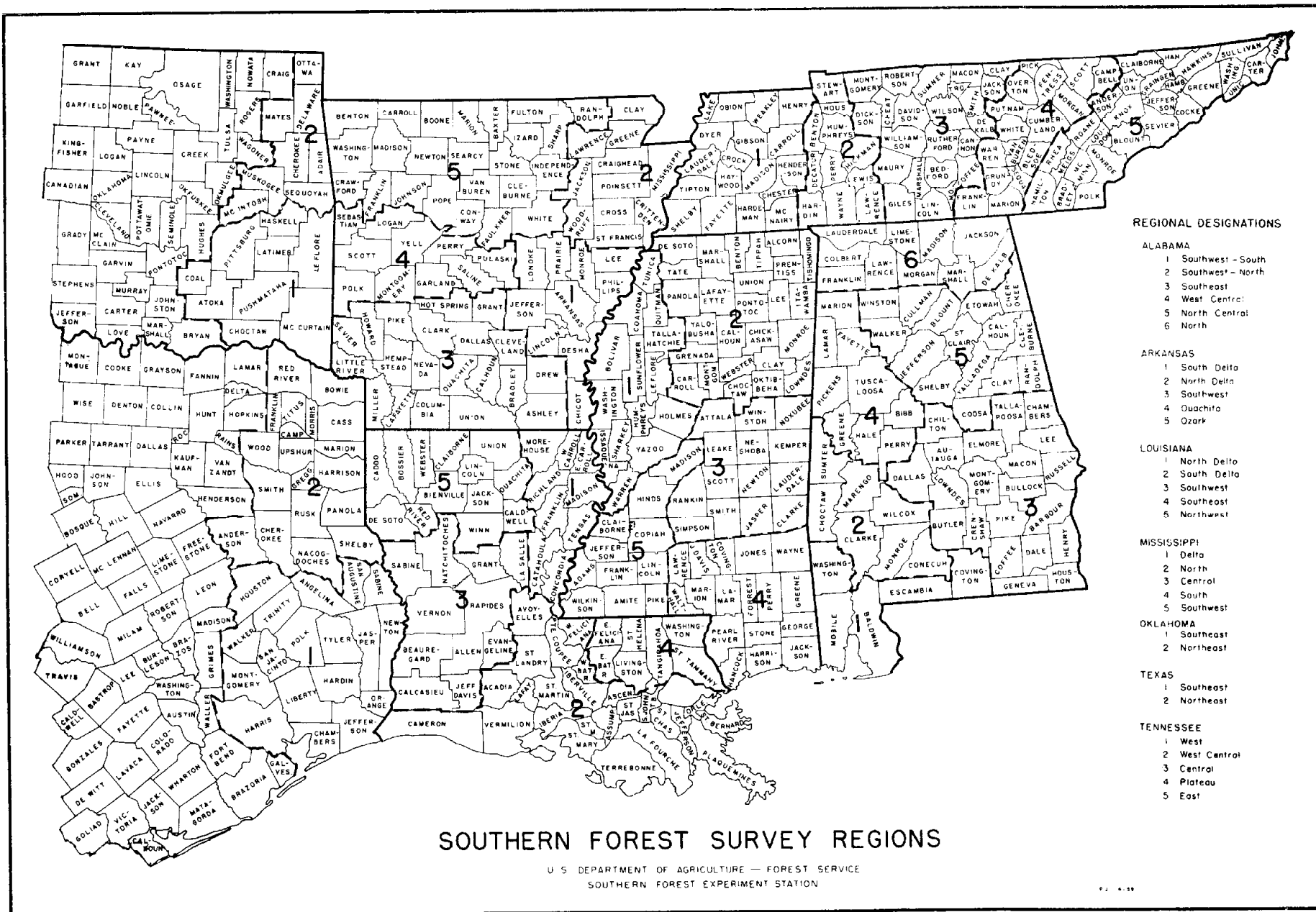


Figure 1.—Southern forest survey regions, Midsouth, U.S.A.

The stocking standard (developed in the 1950's by a consortium of forestry professionals from industry and government) was based on normal yield tables of average stocking in natural, uncut stands. The survey standard was derived by reducing these normal stocking averages to averages found on recently cut areas judged to be well managed. Thus, the stocking standard used by the forest survey represents about 50 to 70 percent of normal stocking for stands of pole- and sawtimber-sized trees. The seedling and sapling tree standard was reduced even further to less than 50 percent below normal stocking. Originally set at 1,000 trees per acre (t.p.a.), it was lowered to 600 t.p.a. in the 1960's to reflect standards based on new studies of southern forests. Reasons for adopting standards so much lower than normal for small trees were based on the well-recognized tendency for young forest stands of varying stocking levels to reach or approach normal stocking as they grow older.

Table 1.—*Midsouth States and year of field work*

State	Year
Alabama	1990
Arkansas	1988
Louisiana	1991
Mississippi	1987
Oklahoma (east)	1993
Tennessee	1989
Texas (east)	1992

A stand is designated as artificially or naturally regenerated when data are collected on each sample plot. On many plots this is an easily observed phenomenon as evidenced by young pine trees in rows on intensively prepared sites. However, in other situations, artificial regeneration may be difficult to detect and might go unnoticed. Such situations include direct seeding (both aerial and surface), hand planting on uneven terrain, hand planting on forest land that had not been site prepared, or any other application making it difficult to discern the difference between an artificial or natural stand origin. Additionally, as plantations become older, with subsequent mortality and/or management activity, it becomes an arbitrary decision as to when these stands are no longer considered to be plantations.

In this study, the data from the previous forest survey were screened to see if a sample plot had been artificially regenerated. If it had been and there had been no commercial harvesting on the plot between surveys, the stand was still considered to be a plantation. New plantations were noted by the field crews on the current survey. This methodology aids in tracking plantation failures and documents their current status; otherwise, they would become classified as

natural stands, and subsequently, information would be lost about these particular types of plantations.

Due to such unavoidable constraints, the estimate of plantation area for the Midsouth States is conservative. Undoubtedly, more plantations could be identified by screening three survey periods. Additionally, some plots that were destined to be artificially regenerated were not so noted because the plots were visited before all site preparation and planting (if planned) could be completed. This activity probably encompasses a period of 1 to 3 years or more in the South.

RESULTS AND DISCUSSION

The most recent forest surveys of the seven Midsouth States between 1987 and 1993 show the area of timberland to be 99,877,700 acres. Alabama has the most timberland (21,932,000 acres) and east Oklahoma, the least (4,895,500 acres). Most of the Midsouth timberland originated from naturally regenerated stands (83,599,000 acres). Sixteen percent of timberland (16,278,700 acres) is in stands that were regenerated artificially. Alabama has most of these plantation stands (4,600,300 acres), and Oklahoma the least (621,300 acres). Four Midsouth States ranked closely in the proportion of their total timberland in plantations: Texas, Alabama, Louisiana, and Mississippi, with 22, 21, 20, and 19 percent, respectively (fig. 2).

Most timberland across the Midsouth States (67 percent) is in nonindustrial private ownership. In contrast, most of the Midsouth plantations (55 percent) are on forest industry timberland (8,946,500 acres). Thirty-nine percent of plantations are on nonindustrial private forest (NIPF) land, whereas less than 7 percent are on public land.

The predominant forest type group of Midsouth plantations is the loblolly-shortleaf type (9,872,400 acres). The oak-pine, oak-hickory, and longleaf-slash pine forest type groups are also well represented. Most of the plantings are loblolly pine except where specific sites dictate the use of shortleaf, slash, and longleaf pine. Some plantations are classed as oak-hickory and bottomland hardwood forest types because softwood stocking was too sparse (relative to hardwoods) to be classed as a pine type. However, these types cannot be defined with certainty because the forest survey does not distinguish between softwood and hardwood artificial regeneration—only that a stand is artificially regenerated. Probably few plantations in the Midsouth States are planned to be established as hardwoods.

The predominant plantation stand size in the Midsouth is seedling-sapling size, (54 percent) (8,830,900 acres). Only 18 percent of the plantation area (3 percent of all timberland) is in sawtimber-sized stands.

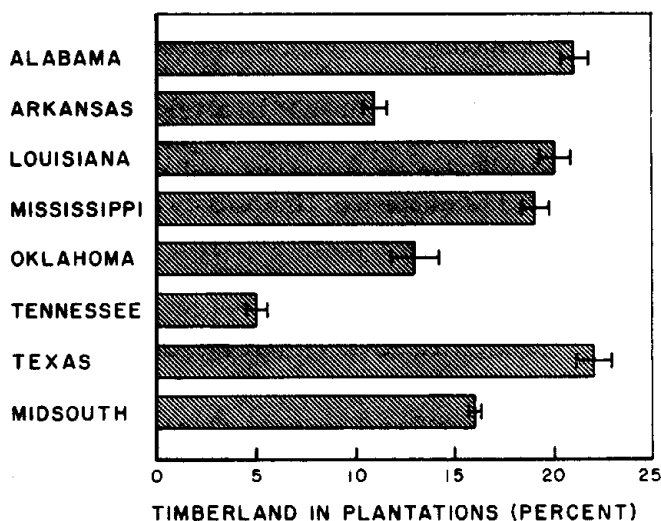


Figure 2.—Percent of total timberland in plantations by State and Midsouth, U.S.A. Error bars are one standard error.

Again, this is a conservative estimate of sawtimber-sized stands because some of the sample plots can no longer be identified with certainty as to stand origin. Louisiana leads all Midsouth States with 756,700 acres in sawtimber stands, 28 percent of all plantation timberland in the State.

There are 5,139,300 acres of Midsouth plantations with less than 60 percent softwood stocking. Several things may account for this: (1) initial planting density may have been purposely low, depending on management goals; (2) seedling survival may have been poor with no follow-up treatment; (3) no effort was made to control competition. A total of 9,709,700 acres are adequately stocked with softwoods, whereas 1,429,700 acres are overstocked and would benefit from thinning. Mississippi has the most acreage in understocked stands, 1,467,200 acres, or 45 percent of plantation timberland.

Most of the Midsouth's plantations (11,014,200 acres) are on good sites, with the potential of producing $>120 \text{ ft}^3/\text{acre}/\text{yr}$. Alabama has almost one-third of the plantation area in the Midsouth capable of producing $>225 \text{ ft}^3/\text{acre}/\text{yr}$.

Approximately one-fourth of the area that was in plantations during the prior forest survey underwent some form of commercial harvest before the most recent survey. A total of 1,273,500 acres were partially harvested and 996,400 acres were clearcut. A small amount of plantation timberland underwent either a seed tree/shelterwood harvest or a salvage harvest

(<80,000 acres). Most of the plantation harvests were done in Alabama, Louisiana, and Mississippi.

A total of 3,634,000 acres underwent site preparation before planting in the Midsouth States. Mississippi had the most; site preparation was done on 36 percent of its plantation timberland since the previous forest survey. Stand improvement was done on 2,901,800 acres of Midsouth plantations, mostly to reduce hardwood competition. Louisiana had the highest proportion of land undergoing stand improvement. Only 1,043,000 acres were thinned in the region. Again, Louisiana led all other States, both in total plantation thinnings (323,300 acres) and in proportion of plantations thinned (12 percent of Louisiana plantation timberland).

Hardwood stem density is higher than softwood across the Midsouth States. Hardwoods average 372 t.p.a., whereas softwoods average 330 t.p.a. for a total of just over 700 t.p.a. Hardwood sapling stocking is especially high, 53 percent higher than softwoods. Only Louisiana and Texas had total softwood stocking higher than hardwoods. Texas led all States with a softwood density averaging 373 t.p.a.; Louisiana was a close second at 366 t.p.a.

Total growing-stock volume in the Midsouth States is 112,903.0 million ft^3 . Forty-four percent of this is softwood (50,197.1 million ft^3) and 56 percent is hardwood (62,705.9 million ft^3). Alabama leads the Midsouth in softwood volume, and Tennessee leads in hardwood volume.

Twenty percent of Midsouth softwood growing-stock is in plantations (9,915.1 million ft^3). Alabama and Louisiana lead in Midsouth softwood plantation volume, accounting for 49 percent of the volume. However, Oklahoma has the highest proportion of its growing-stock volume in plantations (fig. 3). Hardwoods are only a minor component of plantation volume, making up 15 percent of this volume and only 3 percent of total Midsouth hardwood volume.

Most softwood growing-stock volume in plantations is owned by forest industry (50 percent). Nonindustrial private forest (NIPF) owners hold 41 percent; the remaining 9 percent is in public ownership. In three Midsouth States, Alabama, Mississippi, and Tennessee, forest industries own less softwood volume than NIPF owners. By contrast, in Texas, forest industry owns 2.5 times as much softwood volume as NIPF owners.

Fifty-two percent of Midsouth softwood growing-stock volume is in trees 5.0 to 10.0 inches in d.b.h. Eighty-eight percent is in trees <15.0 inches in d.b.h.; only 2 percent is in trees >20.0 inches in d.b.h.

The Midsouth States have 209.9 billion foot board measure (fbm) of softwood sawtimber and 194.0 billion fbm of hardwood sawtimber on all timberland. Fourteen percent of the softwood sawtimber is in plantations, whereas only 2 percent of hardwood sawtimber is in plantations. Louisiana leads all Midsouth States in total softwood sawtimber volume (44.9 bil-

lion fbm) and in plantation softwood sawtimber volume (8.4 billion fbm). The latter is 29 percent of the softwood plantation volume in the Midsouth States.

In contrast to the softwood cubic-foot volume, NIPF owners hold more plantation softwood sawtimber than does forest industry. Only Louisiana, Oklahoma, and Texas have more softwood sawtimber in forest industry than NIPF ownership.

Most softwood sawtimber is in trees 9.0 to 15.0 inches in d.b.h. (76 percent); very little is in trees 20.0 inches in d.b.h. or larger (only 4 percent). Louisiana has 40 percent of the Midsouth plantation sawtimber volume in these large trees and 34 percent of the volume in trees 15.0 to 20.0 inches in d.b.h.

Most inventory data show different mean volumes among different geographic regions and in subsamples of the data. However, these differences are based on samples and may in fact arise by statistical chance. The smaller the difference, the larger the probability that it is simply a matter of sampling. In this study, *t*-tests were conducted on differences in softwood per-acre volumes between plantations and natural stands in order to test the assumption that the numbers reported are in fact the same (the null hypothesis). These tests were run for individual State totals as well as the Midsouth total. There are minor technical objections to running *t*-tests repeatedly in this fashion, but the large numbers of samples reported in the tests offset some of these technical objections, which are more applicable when sample sizes are small ($n < 15$) (Zar 1984). All these *t*-tests were performed at $P \leq 0.05$.

The results of the *t*-tests indicate that there are differences in softwood volume between natural stands and plantations for the Midsouth as a whole and for all the individual States except Oklahoma (table II). Oklahoma has the smallest mean volume per acre and a nominal difference of only 90 ft³ between plantations and natural stands.

Another series of tests was conducted to discern differences in total volume (softwood and hardwood) between plantations and natural stands (table III). Three States (Alabama, Arkansas, and Tennessee) appear to have no significant differences between plantations and natural stands. Consequently, the apparent excess of total volume for plantation means for these States should probably be discounted. There is a reasonable probability that even in these States, the stand volume is at least equal for plantation and natural stands. The rest show greater per-acre volumes in natural stands than in plantations.

Differences based on the *t*-tests are rather robust when sample sizes are large. Although the variances tested equal, the sampling variation is quite large. Increasing sample size would not reduce the variation but would reduce the standard error. Because the numbers are already large, it would take many more samples to reduce the error. The best strategy to im-

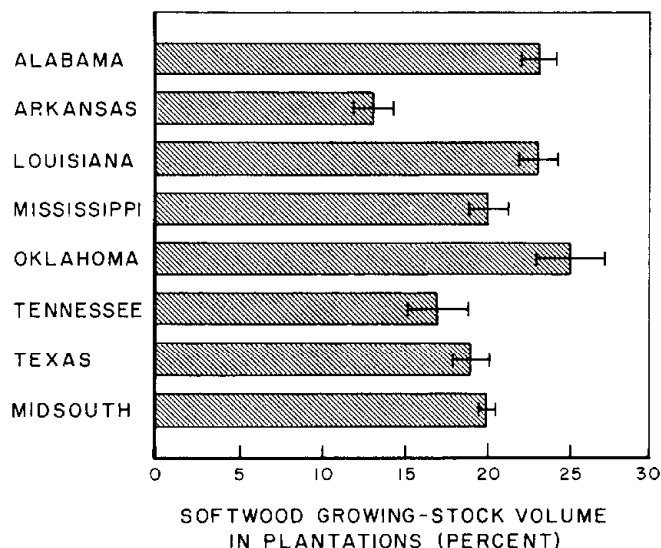


Figure 3.—Percent of total softwood growing-stock volume in plantations by State and Midsouth, U.S.A. Error bars are one standard error.

prove the estimate would be the implementation of a plot selection procedure that enhanced within-stand homogeneity of the plots. This would help reduce the variation, but perhaps at the cost of increased variability in other inventory objectives.

There were problems associated in selecting the plots used in these comparisons. Criteria used in the selection process were that a plot had to be on an upland site, it had to contain trees of poletimber or sawtimber size, and softwoods had to be present. No consideration was given to ownership, degree of disturbance, disturbance history, site, stocking condition, basal area, or age of the stand. Besides the difficulty in describing disturbance objectively, stratifying by these additional conditions would have drastically depleted the sample population. Moreover, the time it takes a plantation, versus a natural stand, to reach 1,500 ft³ of softwood volume per acre will affect stand productivity over several stand generations. These are all factors that may, singly or in combination, greatly influence the current plot-volume means being compared.

Regardless of the shortcomings of these data, they are the only ones describing the forest resources over the expanse of the Midsouth region. Overall, for the poletimber and sawtimber population described, mean per-acre softwood growing-stock volumes in plantation stands are 30 percent greater than natural stands (table II). In contrast, mean per-acre total growing-stock volume in natural stands is 10 percent higher than in plantations (table III).

Table II.—*Softwood growing-stock volume by stand type in poletimber and sawtimber stands (combined) for each State and for the Midsouth*

State and stand type	Number of sample plots	Standard deviation	Cubic feet per acre, mean	Comparison
Alabama Natural Plantation	1,484 331	711.6 772.6	838.3 1,212.2	S*
Arkansas Natural Plantation	1,219 128	781.4 1,016.0	910.5 1,254.2	S*
Louisiana Natural Plantation	736 248	885.2 855.7	1,301.7 1,527.4	S*
Mississippi Natural Plantation	1,046 224	871.8 831.9	1,055.5 1,235.9	S*
Oklahoma (east) Natural Plantation	253 72	571.9 476.2	668.8 757.8	NS†
Tennessee Natural Plantation	721 68	577.8 805.8	536.9 1,190.3	S*
Texas (east) Natural Plantation	769 210	1,052.3 726.2	1,290.1 1,128.7	S*
Midsouth Natural Plantation	6,228 1,281	839.9 826.0	957.7 1,241.2	S*

*Means of natural stands and plantation stands are significantly different at $P \leq 0.05$.

†Means of natural stands and plantation stands are not significantly different at $P \leq 0.05$.

CONCLUSION

Currently, there are 16,278,700 acres of timberland in plantations in the Midsouth States. Fifty-five percent of this land is owned by forest industry, 61 percent is in the loblolly-shortleaf pine forest type group, 54 percent is in sapling-seedling size trees, and 32 percent is <60 percent stocked with softwoods.

Twenty percent of the softwood growing-stock volume in the Midsouth is in plantations (9,915.1 million ft^3). Plantations have a higher mean per-acre softwood volume than natural stands, possibly because adequate pine stocking is achieved sooner in plantations than in naturally regenerated stands and that the management regime in the Midsouth favors pine, the latter to the detriment of hardwoods. Further study is needed to determine if there are other possible reasons for this difference in volumes.

Midsouth mean per-acre volumes for upland poletimber and sawtimber stands (where softwoods are present) average $\approx 1,500.0 \text{ ft}^3/\text{acre}$ with natural stands averaging slightly higher than plantations.

At this time, under the current harvesting and management regimes, plantation forestry as practiced in the Midsouth has not dramatically increased total stand volume. It does appear, however, that plantation forestry does substantially increase softwood volume.

Table III.—*Total growing-stock volume by stand types in poletimber and sawtimber stands (combined) for each State and for the Midsouth*

State and stand type	Number of sample plots	Standard deviation	Cubic feet per acre, mean	Comparison
Alabama Natural Plantation	1,484 331	769.3 848.7	1,469.4 1,383.6	NS*
Arkansas Natural Plantation	1,219 128	780.9 1,059.6	1,421.8 1,464.4	NS*
Louisiana Natural Plantation	736 248	903.4 891.0	1,837.9 1,636.8	S†
Mississippi Natural Plantation	1,046 224	1,684.4 1,464.9	885.6 847.8	S†
Oklahoma (east) Natural Plantation	253 72	578.6 472.6	945.9 781.3	S†
Tennessee Natural Plantation	721 68	724.7 919.5	1,404.6 1,530.7	NS*
Texas (east) Natural Plantation	769 210	1,033.7 736.5	1,778.4 1,236.4	S†
Midsouth Natural Plantation	6,228 1,281	857.7 871.6	1,549.1 1,404.8	S†

*Means of natural stands and plantation stands are not significantly different at $P \leq 0.05$.

†Means of natural stands and plantation stands are significantly different at $P \leq 0.05$.

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APPENDIX

Definition of Terms

Dimension Classes of Trees

Poletimber trees—Softwoods 5.0 inches to 8.9 inches in diameter at breast height (d.b.h.) and hardwoods 5.0 to 10.9 inches in d.b.h.

Rough, rotten, and salvable dead trees—See “tree classes.”

Saplings—Trees 1.0 inch to 4.9 inches in d.b.h.

Sawtimber trees—Trees 9.0 inches and larger in d.b.h. for softwoods and 11.0 inches and larger for hardwoods.

Seedlings—Trees less than 1.0 inch in d.b.h. and greater than 1 ft tall for hardwoods, greater than 6 inches tall for softwoods, and greater than 0.5 inch in diameter at ground level for longleaf pine.

Forest Land Classes

Forest land—Land at least 10 percent stocked by forest trees of any size, or formerly having such tree cover, and not currently developed for nonforest uses. Minimum area considered for classification is 1 acre. Forest land is divided into timberland, reserved timberland, and woodland.

Reserved timberland—Public timberland withdrawn from timber utilization through statute or administrative regulations.

Timberland—Forest land that is producing, or is capable of producing, crops of industrial wood and is not withdrawn from timber utilization. Timberland is synonymous with “commercial forest land” in prior reports.

Woodland—Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Forest Type Groups

Elm-ash-cottonwood—Forests in which elms, ashes, or cottonwoods, singly or in combination, comprise a plurality of the stocking. Common associates include willows, sycamore, American beech, and maples.

Loblolly-shortleaf pine—Forests in which pines (except longleaf and slash pines) and eastern redcedar, singly or in combination, comprise a plurality of the stocking. Common associates include oaks, hickories, and gums.

Longleaf-slash pine—Forests in which longleaf or slash pine, singly or in combination, comprises a plurality of the stocking. Common associates include other southern pines, oaks, and gums.

Nontyped—Timberland currently unoccupied by any live trees or seedlings; for example, very recent clearcut areas.

Oak-gum-cypress—Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, comprise a plurality of the stocking except where pines comprise 25 to 49 percent, in which case the stand would be classified oak-pine. Common associates include cottonwoods, willows, ashes, elms, hackberries, and maples.

Oak-hickory—Forests in which upland oaks or hickories, singly or in combination, comprise a plurality of the stocking, except where pines comprise 25 to 49 percent, in which case the stand would be classified oak-pine. Common associates include yellow-poplar, elms, maples, and black walnut.

Oak-pine—Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which softwoods, except southern cypress, comprise 25 to 49 percent of the stocking. Common associates include gums, hickories, and yellow-poplar.

Miscellaneous Definitions

Basal area—The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

D.b.h. (diameter at breast height)—Tree diameter in inches, outside bark, usually measured at 4.5 ft above ground.

Mortality—Number or sound-wood volume of growing-stock trees or live trees that died from natural causes during a specified period.

Natural stands—Stands with no evidence of artificial regeneration including those stands established by seed-tree regeneration methods.

Plantations—Planted or artificially seeded stands.

Sawlog top—The point on the bole of a sawtimber tree above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches in diameter outside bark (d.o.b.) for softwoods and 9.0 inches in d.o.b. for hardwoods.

Site class—A classification of forest land in terms of potential capacity to grow crops of industrial wood.

Tree grade—A classification of the sawlog portion of sawtimber trees based on: (1) the grade of the butt log or (2) the ability to produce at least one 12-ft or two 8-ft logs in the upper section of the sawlog portion.

Upper-stem portion—That part of the main stem of a sawtimber tree above the sawlog top to a d.o.b. of 4.0 inches or to the point where the main stem breaks into limbs.

Ownership Classes

Farmer-owned land—Lands operated as a unit of 10 acres or more and from which the sale of agricultural products totals \$1,000 or more annually.

Forest industry land—Lands owned by companies or individuals operating wood-using plants (either primary or secondary).

National forest land—Federal lands that have been legally designated as national forests or purchase units and other lands under the administration of the Forest Service, including experimental areas.

Nonindustrial private forest (NIPF) land (corporate)—Lands privately owned by private corporations other than forest industries and incorporated farms.

Nonindustrial private forest (NIPF) land (individual)—Lands privately owned by individuals other than forest industries or farmers.

Other Federal land—Federal lands other than national forests.

State, county, and municipal land—Lands owned by States, counties, and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Stand-Size Classes

Nonstocked stands—Stands less than 10 percent stocked with live trees.

Poletimber stands—Stands at least 10 percent stocked with live trees, with half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber stocking.

Sapling-seedling stands—Stands at least 10 percent stocked with live trees, with more than half of this stocking in saplings or seedlings.

Sawtimber stands—Stands at least 10 percent stocked with live trees, with half or more of this stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Stocking

Stocking is a measure of the extent to which the growth potential of the site is utilized by trees or preempted by vegetative cover. Stocking is determined by comparing the stand density in terms of number of trees or basal area with a specified standard. Therefore, full stocking is 100 percent of the stocking standard.

Stocking categories are arbitrarily defined as follows:

Optimally stocked—Stands 61 to 100 percent stocked with growing-stock trees. These stands are growing toward a fully stocked condition (ideal space required for each tree increases with age). Optimum growth and bole form occur in this range.

Overstocked—Stands greater than 100 percent stocked with growing-stock trees. These stands will become stagnant with mortality of individuals increasing as stocking increases over 100 percent.

Understocked—Stands 0 to 60 percent stocked with growing-stock trees. These stands will take a very long time to reach full stocking. Meanwhile, poor bole form will result, and much of the productivity will be placed on heavy limbs instead of on the bole.

The following tabulation shows the density standard in terms of trees per acre by size class required for full stocking.

D.b.h.	Trees per acre	D.b.h.	Trees per acre
<i>Inches</i>		<i>Inches</i>	
Seedlings	600	16	72
2	560	18	60
4	460	20	51
6	340	22	42
8	240	24	36
10	155	26	31
12	115	28	27
14	90	30	24

Tree Classes

Commercial species—Tree species currently or potentially suitable for industrial wood products.

Cull trees—Rough or rotten trees.

Growing-stock trees—Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. Trees must contain at least one 12-ft or two 8-ft logs in the sawlog portion currently or potentially (if too small to qualify) to be classed as growing stock. The log(s) must meet dimension and merchantability standards to qualify. Trees must also have currently or potentially one-third of the gross board-foot volume in sound wood.

Hardwoods—Dicotyledonous trees, usually broad leaved and deciduous.

Live trees—All living trees. Included are all size classes, all tree classes, and both commercial and non-commercial species.

Noncommercial species—Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Rotten trees—Live trees of commercial species that are unmerchantable for sawlogs currently or potentially because of rot deduction in the sawlog section. See definition of growing-stock trees.

Rough trees—Live trees of commercial species that are unmerchantable for sawlogs currently or potentially because of roughness or poor form in the sawlog section. Also included are all live trees of noncommercial species. See definition of growing-stock trees.

Salvable dead trees—Standing or downed dead trees that were formerly growing stock and are con-

sidered merchantable. Trees must be at least 5.0 inches in d.b.h. to qualify.

Softwoods—Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Volume

Volume of cull—The cubic-foot volume of sound wood in rough and rotten trees at least 5.0 inches in d.b.h. from a 1-ft stump to a minimum 4.0-inch top diameter outside bark (d.o.b.) of the central stem or to the point where the central stem breaks into limbs.

Volume of growing stock—The cubic-foot volume of sound wood in growing-stock trees at least 5.0 inches in d.b.h. from a 1-ft stump to a minimum 4.0-inch top d.o.b. of the central stem or to the point where the central stem breaks into limbs.

Volume of live trees—The cubic-foot volume of sound wood in growing-stock, rough, and rotten trees at least 5.0 inches in d.b.h. from a 1-ft stump to a minimum 4.0-inch top d.o.b. of the central stem or to the point where the central stem breaks into limbs.

Volume of sawlog portion of sawtimber trees—The cubic-foot volume of sound wood in the sawlog portion of sawtimber trees. Volume is the net result after deductions for rot, sweep, and other defects that affect use for lumber.

Volume of sawtimber—The board-foot volume (International 1/4-inch Rule) of sound wood in the sawlog portion of sawtimber trees. Volume is the net result after deductions for rot, sweep, and other defects that affect use for lumber.

Volume of timber—The cubic-foot volume of sound wood in growing-stock, rough, rotten, and salvable dead trees at least 5.0 inches in d.b.h. from a 1-ft stump to a minimum 4.0-inch top d.o.b. of the central stem or to the point where the central stem breaks into limbs.

TABLES

Table 1.—Area of timberland by State and stand type, Midsouth States*

State	All timberland	Stand type	
		Natural	Plantation
-----Thousand acres-----			
Alabama	21,932.0	17,331.7	4,600.3
S.E. [†]	0.0030	0.0088	0.0312
n [‡]	3,917	3,102	815
Arkansas	17,246.6	15,331.2	1,915.5
S.E. [†]	0.0020	0.0067	0.0514
n [‡]	3,033	2,688	345
Louisiana	13,783.0	11,047.3	2,735.7
S.E. [†]	0.0030	0.0106	0.0410
n [‡]	2,413	1,930	483
Mississippi	16,981.6	13,754.4	3,227.2
S.E. [†]	0.0030	0.0095	0.0385
n [‡]	2,899	2,349	550
Oklahoma (east)	4,895.5	4,274.2	621.3
S.E. [†]	0.0060	0.0146	0.0918
n [‡]	820	708	112
Tennessee	13,265.2	12,628.3	636.9
S.E. [†]	0.0030	0.0056	0.0934
n [‡]	2,275	2,163	112
Texas (east)	11,773.8	9,232.0	2,541.9
S.E. [†]	0.0030	0.0120	0.0421
n [‡]	2,056	1,611	445
All States	99,877.7	83,599.0	16,278.7
S.E. [†]	0.0010	0.0035	0.0172
n [‡]	17,413	14,551	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[‡]Number of sample plots.

Table 2.—Area of timberland in plantations by State and ownership, Midsouth States*

State	All ownerships	Ownership			
		National forest	Other public	Forest industry	Nonindustrial private
-----Thousand acres-----					
Alabama	4,600.3	46.8	39.8	2,031.2	2,482.5
S.E. [†]	0.0312	0.3457	0.3746	0.0501	0.0448
n [‡]	815	18	7	356	434
Arkansas	1,915.5	172.8	28.3	1,246.5	467.5
S.E. [†]	0.0514	0.1805	0.4481	0.0651	0.1088
n [‡]	345	30	5	226	84
Louisiana	2,735.7	149.4	29.6	1,534.3	1,022.4
S.E. [†]	0.0410	0.1945	0.4389	0.0576	0.0720
n [‡]	483	37	4	265	177
Mississippi	3,227.2	227.5	74.6	1,498.7	1,426.5
S.E. [†]	0.0385	0.1594	0.2797	0.0598	0.0614
n [‡]	550	39	13	257	241
Oklahoma (east)	621.3	50.3	0.0	526.6	44.3
S.E. [†]	0.0918	0.3426	0.0000	0.1008	0.3653
n [‡]	112	12	0	92	8
Tennessee	636.9	3.6	57.7	293.9	281.8
S.E. [†]	0.0934	0.0000	0.3172	0.1393	0.1423
n [‡]	112	1	10	52	49
Texas (east)	2,541.9	133.2	5.3	1,814.9	588.5
S.E. [†]	0.0421	0.2062	0.0000	0.00517	0.0962
n [‡]	445	35	1	312	97
All States	16,278.7	783.5	235.2	8,946.5	6,313.5
S.E. [†]	0.0172	0.0852	0.1560	0.0242	0.0292
n [‡]	2,862	172	40	1,560	1,090

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[‡]Number of sample plots.

Table 3.—Area of timberland in plantations by State and forest type group, Midsouth States*

State	All types	Forest type group					
		Longleaf-slash pine	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Bottomland hardwoods [†]	Other [‡]
-----Thousand acres-----							
Alabama	4,600.3	465.6	3,081.5	635.8	395.1	11.7	10.6
S.E. [§]	0.0312	0.1085	0.0396	0.0925	0.1180	0.6905	0.7276
n [‡]	815	87	540	113	71	2	2
Arkansas	1,915.5	0.0	1,242.4	388.2	256.6	28.3	0.0
S.E. [§]	0.0514	0.0000	0.0652	0.1197	0.1478	0.4480	0.0000
n [‡]	345	0	225	69	46	5	0
Louisiana	2,735.7	600.6	1,644.5	324.6	128.7	37.3	0.0
S.E. [§]	0.0410	0.0954	0.0554	0.1311	0.2097	0.3909	0.0000
n [‡]	483	108	289	57	22	7	0
Mississippi	3,227.2	371.4	1,395.3	843.0	534.6	82.9	0.0
S.E. [§]	0.0385	0.1242	0.0621	0.0813	0.1031	0.2653	0.0000
n [‡]	550	67	240	142	89	12	0
Oklahoma (east)	621.3	0.0	479.9	97.0	44.5	0.0	0.0
S.E. [§]	0.0918	0.0000	0.1061	0.2457	0.3647	0.0000	0.0000
n [‡]	112	0	87	17	8	0	0
Tennessee	636.9	0.0	384.8	122.4	105.4	13.9	10.4
S.E. [§]	0.0934	0.0000	0.1213	0.2173	0.2343	0.6464	0.7496
n [‡]	112	0	68	22	18	2	2
Texas (east)	2,541.9	175.2	1,643.9	522.1	159.9	40.7	0.0
S.E. [§]	0.0421	0.1795	0.0548	0.1024	0.1880	0.3743	0.0000
n [‡]	445	31	291	88	28	7	0
All States	16,278.7	1,612.8	9,872.4	2,933.0	1,624.7	214.8	20.9
S.E. [§]	0.0172	0.0592	0.0229	0.0436	0.0589	0.1632	0.5233
n [‡]	2,862	293	1,740	508	282	35	4

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Includes oak-gum-cypress and elm-ash-cottonwood types.

[‡]Includes white pine-hemlock forest type.

[§]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[‡]Number of sample plots.

Table 4.—Area of timberland in plantations by State and stand-size class, Midsouth States*

State	All classes	Stand-size class			
		Nonstocked	Sapling- seedling	Poletimber	Sawtimber
-----Thousand acres-----					
Alabama	4,600.3	10.5	2,712.0	1,250.4	627.3
S.E. [†]	0.0312	0.7301	0.0426	0.0650	0.0932
n [‡]	815	2	480	223	110
Arkansas	1,915.5	0.0	1,195.6	438.3	281.5
S.E. [†]	0.0514	0.0000	0.0666	0.1125	0.1410
n [‡]	345	0	216	69	50
Louisiana	2,735.7	11.2	1,285.0	682.7	756.7
S.E. [†]	0.0410	0.7127	0.0636	0.0892	0.0845
n [‡]	483	2	226	118	137
Mississippi	3,227.2	0.0	1,858.0	724.4	644.8
S.E. [†]	0.0385	0.0000	0.0531	0.0880	0.0935
n [‡]	550	0	318	124	108
Oklahoma (east)	621.3	0.0	223.7	337.7	59.9
S.E. [†]	0.0918	0.0000	0.1597	0.1284	0.3139
n [‡]	112	0	40	60	12
Tennessee	636.9	0.0	215.5	229.4	192.1
S.E. [†]	0.0934	0.0000	0.1632	0.1581	0.1730
n [‡]	112	0	37	41	34
Texas (east)	2,541.9	0.0	1,341.1	820.1	380.7
S.E. [†]	0.0421	0.0000	0.0616	0.0807	0.1207
n [‡]	445	0	233	143	69
All States	16,278.7	21.7	8,830.9	4,483.1	2,942.9
S.E. [†]	0.0172	0.5136	0.0244	0.0350	0.0435
n [‡]	2,862	4	1,550	788	520

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.[‡]Number of sample plots.

Table 5.—Area of timberland in plantations by State and softwood stocking class, Midsouth States*

State	All classes	Stocking class (percent)				
		<30	30- 59	60- 89	90- 119	≥120
-----Thousand acres-----						
Alabama	4,600.3	361.1	781.8	1,644.6	1,414.5	398.2
S.E. [†]	0.0312	0.1235	0.0832	0.0562	0.0609	0.1175
n [‡]	815	65	139	290	251	70
Arkansas	1,915.5	256.3	461.3	630.6	408.7	158.5
S.E. [†]	0.0514	0.1479	0.1095	0.0932	0.1166	0.1885
n [‡]	345	46	82	114	74	29
Louisiana	2,735.7	142.0	442.8	902.6	931.6	316.7
S.E. [†]	0.0410	0.1995	0.1118	0.0770	0.0757	0.1328
n [‡]	483	25	78	161	166	53
Mississippi	3,227.2	589.0	878.2	982.0	604.8	173.1
S.E. [†]	0.0385	0.0980	0.0796	0.0750	0.0967	0.1830
n [‡]	550	97	147	171	106	29
Oklahoma (east)	621.3	55.9	130.0	210.7	159.7	64.9
S.E. [†]	0.0918	0.3251	0.2114	0.1648	0.1902	0.3014
n [‡]	112	10	23	37	30	12
Tennessee	636.9	118.9	122.3	232.5	112.2	51.1
S.E. [†]	0.0934	0.2205	0.2174	0.1570	0.2271	0.3371
n [‡]	112	20	22	41	20	9
Texas (east)	2,541.9	185.2	614.3	742.6	732.4	267.2
S.E. [†]	0.0421	0.1745	0.0940	0.0851	0.0857	0.1448
n [‡]	445	32	105	129	131	48
All States	16,278.7	1,708.4	3,430.9	5,345.7	4,364.0	1,429.7
S.E. [†]	0.0172	0.0575	0.0402	0.0319	0.0355	0.0629
n [‡]	2,862	295	596	943	778	250

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.[‡]Number of sample plots.

Table 6.—Area of timberland in plantations by State and age class, Midsouth States*

State	All classes	Age class (years) [†]						Mixed age [‡]
		5	15	25	35	45	≥51	
-----Thousand acres-----								
Alabama	4,600.3	2,143.2	1,009.1	465.7	171.2	27.8	17.9	765.2
S.E. [§]	0.0312	0.0486	0.0728	0.1085	0.1801	0.4483	0.5586	0.0841
n	815	378	178	85	30	5	3	136
Arkansas	1,915.5	846.8	421.2	94.4	84.1	33.2	16.6	419.2
S.E. [§]	0.0514	0.0799	0.1148	0.2448	0.2594	0.4137	0.5842	0.1151
n	345	153	77	17	5	6	3	74
Louisiana	2,735.7	996.6	602.5	298.8	311.8	49.4	25.7	451.0
S.E. [§]	0.0410	0.0730	0.0953	0.1368	0.1338	0.3394	0.4710	0.1107
n	483	173	107	52	55	10	6	80
Mississippi	3,227.2	1,309.7	437.4	292.4	170.1	47.9	19.5	950.3
S.E. [§]	0.0385	0.0643	0.1143	0.1404	0.1847	0.3494	0.5476	0.0763
n	550	223	75	50	30	8	3	161
Oklahoma (east)	621.3	168.4	307.1	46.9	1.9	0.0	0.0	97.0
S.E. [§]	0.0918	0.1851	0.1351	0.3551	0.0000	0.0000	0.0000	0.2456
n	112	30	55	9	1	0	0	17
Tennessee	636.9	151.6	106.6	78.1	63.3	14.6	12.0	210.9
S.E. [§]	0.0934	0.1950	0.2330	0.2725	0.3029	0.6322	0.6968	0.1650
n	112	26	19	14	11	3	2	37
Texas (east)	2,541.9	1,110.1	684.3	132.5	46.4	0.0	5.6	562.9
S.E. [§]	0.0421	0.0684	0.0888	0.2067	0.3507	0.0000	0.0000	0.0985
n	445	192	121	25	8	0	1	98
All States	16,278.7	6,726.3	3,568.2	1,408.7	848.8	172.8	97.4	3,456.5
S.E. [§]	0.0172	0.0282	0.0394	0.0634	0.0819	0.1820	0.2425	0.0400
n	2,862	1,175	632	252	150	32	18	603

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Values are midpoints of 10-year ranges; i.e., 5 = 0-10 years, 15 = 11-20 years, etc.[‡]Stand structure disturbed to the point where no single age class could be defined; i.e., two or more strata >10 years difference in age.[§]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.^{||}Number of sample plots.

Table 7.—Area of timberland in plantations by State and basal area class, Midsouth States*

State	All classes	Basal area class (Square feet per acre) [†]				
		0-29	30- 59	60- 89	90- 119	≥120
-----Thousand acres-----						
Alabama	4,600.3	1,609.5	755.9	911.6	749.2	574.0
S.E. [‡]	0.0312	0.0569	0.0846	0.0768	0.0850	0.0973
n [§]	815	285	133	164	133	100
Arkansas	1,915.5	777.6	335.5	286.5	268.1	247.7
S.E. [‡]	0.0514	0.0836	0.1289	0.1397	0.1445	0.1504
n [§]	345	140	61	51	48	45
Louisiana	2,735.7	740.7	495.9	683.3	493.9	321.9
S.E. [‡]	0.0410	0.0855	0.1054	0.0892	0.1056	0.1317
n [§]	483	129	88	122	89	55
Mississippi	3,227.2	1,132.1	576.9	623.1	522.0	373.1
S.E. [‡]	0.0385	0.0696	0.0991	0.0952	0.1043	0.1240
n [§]	550	194	99	107	88	62
Oklahoma (east)	621.3	79.3	175.8	186.0	139.9	40.3
S.E. [‡]	0.0918	0.2722	0.1810	0.1758	0.2037	0.3835
n [§]	112	14	31	33	25	9
Tennessee	636.9	88.8	117.5	138.6	154.9	137.2
S.E. [‡]	0.0934	0.2554	0.2218	0.2041	0.1929	0.2051
n [§]	112	15	21	24	28	24
Texas (east)	2,541.9	814.0	473.7	573.7	367.0	363.4
S.E. [‡]	0.0421	0.0810	0.1078	0.1023	0.1230	0.1236
n [§]	445	141	82	91	66	65
All States	16,278.7	5,242.2	2,931.2	3,352.8	2,695.1	2,057.4
S.E. [‡]	0.0172	0.0322	0.0436	0.0407	0.0455	0.0523
n [§]	2,862	918	515	592	477	360

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Based upon all live trees ≥1.0 inch in d.b.h.

[‡]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[§]Number of sample plots.

Table 8.—Area of timberland in plantations by State and site class, Midsouth States*

State	All classes	Site class [†]					
		20-49	50-84	85-119	120-164	165-224	≥225
-----Thousand acres-----							
Alabama	4,600.3	5.4	313.6	1,009.5	1,966.2	1,191.6	114.0
S.E. [‡]	0.0312	0.0000	0.1327	0.0728	0.0510	0.0667	0.221
n [§]	815	1	55	177	347	214	21
Arkansas	1,915.5	0.0	38.0	288.9	805.8	735.1	47.7
S.E. [‡]	0.0514	0.0000	0.3865	0.1391	0.0820	0.0861	0.3450
n [§]	345	0	7	52	147	131	8
Louisiana	2,735.7	22.4	292.8	1,133.2	942.7	316.8	27.7
S.E. [‡]	0.0410	0.5044	0.1382	0.0681	0.0752	0.1327	0.4534
n [§]	483	4	51	201	166	56	5
Mississippi	3,227.2	24.9	224.9	717.2	1,575.8	659.5	24.7
S.E. [‡]	0.0385	0.4843	0.1603	0.0885	0.0581	0.0924	0.4863
n [§]	550	4	39	121	267	115	4
Oklahoma (east)	621.3	0.0	13.0	42.7	110.0	378.2	77.5
S.E. [‡]	0.0918	0.0000	0.6759	0.3724	0.2304	0.1208	0.2755
n [§]	112	0	3	9	21	66	13
Tennessee	636.9	0.0	31.8	108.2	215.6	214.6	66.7
S.E. [‡]	0.0934	0.0000	0.4279	0.2312	0.1631	0.1635	0.2949
n [§]	112	0	6	20	38	37	11
Texas (east)	2,541.9	6.6	91.1	900.1	1,191.0	347.7	5.3
S.E. [‡]	0.0421	0.0000	0.2497	0.0767	0.0658	0.1265	0.0000
n [§]	445	1	18	156	208	61	1
All States	16,278.7	59.4	1,005.3	4,199.7	6,807.1	3,843.6	363.5
S.E. [‡]	0.0172	0.3106	0.0752	0.0362	0.0280	0.0379	0.1254
n [§]	2,862	10	179	736	1,194	680	63

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Potential yield in cubic feet per acre of mean annual growth at culmination of the increment in fully stocked natural stands.

[‡]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[§]Number of sample plots.

Table 9.—Area of timberland in plantations by State and type of harvest, Midsouth States*

State	All classes	Commercial harvests				
		None	Partial	Seed tree and shelterwood	Clearcut	Salvage
-----Thousand acres-----						
Alabama	2,499.3	1,980.2	220.4	10.4	276.9	11.3
SE†	0.0447	0.0508	0.1586	0.7326	0.1413	0.7036
n‡	446	353	41	2	48	2
Arkansas	853.1	615.2	128.0	5.7	86.4	17.7
SE†	0.0796	0.0944	0.2100	0.0000	0.2559	0.5658
n‡	153	111	23	1	15	3
Louisiana	1,910.8	1,278.8	411.6	0.0	213.9	6.5
SE†	0.0508	0.0637	0.1161	0.0000	0.1622	0.0000
n‡	337	226	73	0	37	1
Mississippi	1,783.8	1,254.0	288.3	6.1	230.0	5.4
SE†	0.0543	0.0658	0.1413	0.0000	0.1585	0.0000
n‡	302	212	48	1	40	1
Oklahoma (east)	523.3	478.2	38.9	0.0	6.2	0.0
SE†	0.1011	0.1063	0.3901	0.0000	0.0000	0.0000
n‡	94	86	7	0	1	0
Tennessee	470.5	383.5	36.7	5.7	44.6	0.0
SE†	0.1094	0.1215	0.3980	0.0000	0.3612	0.0000
n‡	83	68	7	1	7	0
Texas (east)	1,719.4	1,420.1	149.5	5.3	138.4	6.2
SE†	0.0534	0.0596	0.1945	0.0000	0.2022	0.0000
n‡	303	251	26	1	24	1
All States	9,760.1	7,410.0	1,273.5	33.2	996.4	47.1
SE†	0.0230	0.0268	0.0667	0.4159	0.0755	0.3490
n‡	1,718	1,307	225	6	172	8

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

[‡]Number of sample plots.

Table 10.—Area of timberland in plantations by State and management activity, Midsouth States*

State	All classes	Management activity				
		None	Thinning operation	Stand improvement	Site preparation	Natural disturbance
-----Thousand acres-----						
Alabama	4600.3	2,704.9	148.4	802.1	914.3	30.5
S.E. [†]	0.0312	0.0427	0.1936	0.0821	0.0767	0.4283
n [‡]	815	478	27	145	160	5
Arkansas	1,915.5	713.5	194.9	291.6	693.4	22.1
S.E. [†]	0.0514	0.0874	0.1699	0.1385	0.0887	0.5069
n [‡]	345	128	35	52	126	4
Louisiana	2,735.7	1,236.6	323.3	670.6	494.1	11.2
S.E. [†]	0.0410	0.0649	0.1314	0.0901	0.1056	0.7147
n [‡]	483	220	56	119	86	2
Mississippi	3,227.2	1,228.6	174.9	604.1	1,171.1	48.5
S.E. [†]	0.0385	0.0666	0.1821	0.0967	0.0683	0.3472
n [‡]	550	207	31	105	199	8
Oklahoma (east)	621.3	411.3	67.2	86.7	56.1	0.0
S.E. [†]	0.0918	0.1155	0.2960	0.2602	0.3243	0.0000
n [‡]	112	74	12	16	10	0
Tennessee	636.9	471.8	14.1	75.5	69.8	5.8
S.E. [†]	0.0934	0.1092	0.6434	0.2771	0.2884	0.0000
n [‡]	112	83	3	13	12	1
Texas (east)	2,541.9	1,806.3	120.3	371.1	235.1	9.0
S.E. [†]	0.0421	0.0519	0.2171	0.1223	0.1545	0.7988
n [‡]	445	314	21	67	41	2
All States	16,278.7	8,572.9	1,043.0	2,901.8	3,634.0	127.0
S.E. [†]	0.0172	0.0248	0.0738	0.0438	0.0390	0.2124
n [‡]	2,862	1,504	185	517	634	22

*Numbers in rows and columns may not sum to totals due to rounding.

†Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

‡Number of sample plots.

Table 11.—Softwood and hardwood tree density in plantations by State, species group, and diameter class, Midsouth States*

State	Diameter class (inches in d.b.h.)											
	All classes		1.0-4.9		5.0-9.9		10.0-14.9		15.0-19.9		≥20.0	
	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]
<i>Trees per acre</i>												
Alabama	340.2	383.0	238.1	364.9	91.0	15.2	10.0	2.2	1.0	0.5	0.1	0.2
S.E. [§]	0.0366	0.0452	0.0495	0.0463	0.0421	0.0652	0.0697	0.0873	0.1257	0.1163	0.2084	0.1458
n [†]	815	815	815	815	815	815	815	815	815	815	815	815
Arkansas	328.2	369.4	247.6	347.4	68.4	17.8	10.6	3.5	1.5	0.6	0.1	0.1
S.E. [§]	0.0616	0.0629	0.0771	0.0657	0.0750	0.0960	0.1200	0.1343	0.1612	0.1404	0.2729	0.2387
n [†]	345	345	345	345	345	345	345	345	345	345	345	345
Louisiana	365.5	312.8	262.9	297.4	81.6	12.4	17.9	2.3	2.7	0.6	0.3	0.2
S.E. [§]	0.0574	0.0637	0.0792	0.0660	0.0565	0.0971	0.0677	0.1185	0.1040	0.1483	0.2059	0.1933
n [†]	483	483	483	483	483	483	483	483	483	483	483	483
Mississippi	261.1	385.6	179.9	357.4	68.3	22.2	11.1	4.4	1.6	1.2	0.1	0.4
S.E. [§]	0.0487	0.0522	0.0657	0.0545	0.0593	0.0698	0.0748	0.0931	0.1177	0.1185	0.2103	0.1382
n [†]	550	550	550	550	550	550	550	550	550	550	550	550
Oklahoma (east)	330.1	451.3	157.1	442.1	165.5	7.6	6.7	1.4	0.7	0.2	0.0	0.0
S.E. [§]	0.0801	0.1127	0.1607	0.1143	0.0791	0.2352	0.1952	0.2554	0.4781	0.3969	0.5250	0.6221
n [†]	112	112	112	112	112	112	112	112	112	112	112	112
Tennessee	284.5	450.9	159.8	406.5	106.5	32.9	17.1	7.9	1.1	2.9	0.1	0.7
S.E. [§]	0.0884	0.0806	0.1376	0.0887	0.0979	0.1224	0.1388	0.1358	0.2426	0.1796	0.5782	0.2236
n [†]	112	112	112	112	112	112	112	112	112	112	112	112
Texas (east)	373.1	360.0	257.5	344.5	104.8	12.8	9.8	2.0	0.9	0.5	0.1	0.2
S.E. [§]	0.0506	0.0541	0.0700	0.0558	0.0535	0.0980	0.0883	0.1431	0.1715	0.1743	0.2868	0.1884
n [†]	445	445	445	445	445	445	445	445	445	445	445	445
All States	329.9	371.8	228.7	351.4	87.9	16.4	11.7	3.0	1.5	0.8	0.1	0.2
S.E. [§]	0.0210	0.0231	0.0289	0.0239	0.0230	0.0350	0.0343	0.0467	0.0566	0.0608	0.1063	0.0740
n [†]	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

†Softwood species.

‡Hardwood species.

§Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

¶Number of sample plots.

Table 12.—Volume of softwood and hardwood growing stock by State and stand type, Midsouth States*

State	All types		Stand type			
	Soft [†]	Hard [‡]	Natural		Plantation	
			Soft [†]	Hard [‡]	Soft [†]	Hard [‡]
	----- Million cubic feet -----					
Alabama	11,101.5	11,974.0	8,539.2	11,514.8	2,562.2	459.2
S.E. [†]	0.0213	0.0201	0.0237	0.0195	0.0473	0.0762
n [‡]	3,917	3,917	3,102	3,102	815	815
Arkansas	7,923.0	11,066.7	6,924.4	10,845.4	998.6	221.3
S.E. [†]	0.0281	0.0195	0.0294	0.0189	0.0897	0.1172
n [‡]	3,033	3,033	2,688	2,688	345	345
Louisiana	9,928.0	8,916.3	7,644.8	8,678.4	2,283.3	237.9
S.E. [†]	0.0255	0.0245	0.0292	0.0232	0.0519	0.1191
n [‡]	2,413	2,413	1,930	1,930	483	483
Mississippi	9,086.8	10,331.6	7,319.3	9,858.9	1,767.5	472.7
S.E. [†]	0.0260	0.0218	0.0290	0.0212	0.0589	0.0905
n [‡]	2,899	2,899	2,349	2,349	550	550
Oklahoma (east)	1,394.8	1,606.7	1,047.0	1,590.9	347.7	15.8
S.E. [†]	0.0562	0.0454	0.0676	0.0438	0.0851	0.2561
n [‡]	820	820	708	708	112	112
Tennessee	2,892.9	13,753.4	2,408.9	13,548.9	484.0	204.4
S.E. [†]	0.0458	0.0160	0.0492	0.0157	0.1030	0.1655
n [‡]	2,275	2,275	2,163	2,163	112	112
Texas (east)	7,870.1	5,057.2	6,398.4	4,879.4	1,471.8	177.8
S.E. [†]	0.0300	0.0284	0.0342	0.0273	0.0591	0.1141
n [‡]	2,056	2,056	1,611	1,611	445	445
All States	50,197.1	62,705.9	40,282.0	60,916.8	9,915.1	1,789.1
S.E. [†]	0.0112	0.0087	0.0126	0.0084	0.0246	0.0445
n [‡]	17,413	17,413	14,551	14,551	2,862	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Softwood species.

[‡]Hardwood species.

[§]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

^{||}Number of sample plots.

Table 13.—Volume of softwood and hardwood growing stock by State and ownership, Midsouth States*

State	Ownership									
	All classes		National forest		Other public		Forest industry		Nonindustrial private	
	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]
----- Million cubic feet -----										
Alabama	2,562.2	459.2	29.4	5.4	9.9	2.8	1,215.2	168.9	1,307.8	282.1
S.E. [§]	0.0473	0.0762	0.2904	0.3408	0.5004	0.5246	0.0658	0.1138	0.0690	0.1030
n [¶]	815	815	18	18	7	7	356	356	434	434
Arkansas	998.6	221.3	113.9	29.3	20.8	5.3	479.9	95.5	383.9	91.3
S.E. [§]	0.0897	0.1172	0.3006	0.2579	0.5314	0.4191	0.1183	0.1792	0.1473	0.1872
n [¶]	345	345	30	30	5	5	226	226	84	84
Louisiana	2,283.3	237.9	185.1	17.1	4.8	0.0	1,191.7	107.6	901.6	113.2
S.E. [§]	0.0519	0.1191	0.1772	0.2755	0.6630	0.0000	0.0686	0.1817	0.0876	0.1754
n [¶]	483	483	37	37	4	4	265	265	177	177
Mississippi	1,767.5	472.7	191.3	62.0	53.7	16.7	696.7	128.9	825.8	265.1
S.E. [§]	0.0589	0.0905	0.1603	0.2209	0.2803	0.3915	0.0931	0.1475	0.0885	0.1295
n [¶]	550	550	39	39	13	13	257	257	241	241
Oklahoma (east)	347.7	15.8	24.6	2.5	0.0	0.0	295.7	11.7	27.5	1.6
S.E. [§]	0.0851	0.2561	0.3280	0.6835	0.0000	0.0000	0.0859	0.3019	0.4849	0.7016
n [¶]	112	112	12	12	0	0	92	92	8	8
Tennessee	484.0	204.4	2.4	1.3	53.1	34.4	142.8	37.8	285.7	131.0
S.E. [§]	0.1030	0.1655	0.0000	0.0000	0.1721	0.2847	0.1671	0.2830	0.1403	0.2197
n [¶]	112	112	1	1	10	10	52	52	49	49
Texas (east)	1,471.8	177.8	145.9	8.6	0.0	0.0	954.7	99.9	371.1	69.3
S.E. [§]	0.0591	0.1141	0.1771	0.2444	0.0000	0.0000	0.0682	0.1540	0.1381	0.1820
n [¶]	445	445	35	35	1	1	312	312	97	97
All States	9,915.1	1,789.1	692.7	126.1	142.4	59.1	4,976.6	650.3	4,103.5	953.5
S.E. [§]	0.0246	0.0445	0.0927	0.1417	0.1614	0.2361	0.0328	0.0649	0.0408	0.0653
n [¶]	2,862	2,862	172	172	40	40	1,560	1,560	1,090	1,090

*Numbers in rows and columns may not sum to totals due to rounding.

†Softwood species.

‡Hardwood species.

§Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

¶Number of sample plots.

Table 14.—Volume of softwood and hardwood growing stock in plantations by State and forest type group, Midsouth States*

State	Forest type group													
	All types		Longleaf-slash pine		Loblolly-shortleaf pine		Oak-pine		Oak-hickory		Bottomland hardwoods†		Other‡	
	Soft§	Hard§	Soft§	Hard§	Soft§	Hard§	Soft§	Hard§	Soft§	Hard§	Soft§	Hard§	Soft§	Hard§
<i>Million cubic feet</i>														
Alabama	2,562.2	459.2	423.3	23.5	1,943.8	235.5	159.2	120.5	31.3	77.8	0.0	0.7	4.7	1.2
S.E.**	0.0473	0.0762	0.0910	0.2867	0.0552	0.0927	0.1240	0.1486	0.2380	0.2310	0.0000	1.0000	1.0000	1.0000
n††	815	815	87	87	540	540	113	113	71	71	2	2	2	2
Arkansas	998.6	221.3	0.0	0.0	888.7	93.6	93.2	79.4	14.4	23.2	2.2	25.1	0.0	0.0
S.E.**	0.0897	0.1172	0.0000	0.0000	0.0938	0.1428	0.1933	0.1939	0.2902	0.2132	0.6160	0.4661	0.0000	0.0000
n††	345	345	0	0	225	225	69	69	46	46	5	5	0	0
Louisiana	2,283.3	237.9	751.3	13.0	1,433.3	102.0	88.2	60.9	10.4	28.3	0.0	33.7	0.0	0.0
S.E.**	0.0519	0.1191	0.0683	0.2619	0.0672	0.1473	0.2419	0.2343	0.4530	0.3279	0.000	0.3178	0.0000	0.0000
n††	483	483	108	108	289	289	57	57	22	22	7	7	0	0
Mississippi	1,767.5	472.7	286.6	10.3	1,191.1	125.0	257.8	151.3	29.6	130.1	2.3	56.0	0.0	0.0
S.E.**	0.0589	0.0905	0.1161	0.2948	0.0707	0.1136	0.1028	0.1321	0.2054	0.1734	0.7064	0.3928	0.0000	0.0000
n††	550	550	67	67	240	240	142	142	89	89	12	12	0	0
Oklahoma (east)	347.7	15.8	0.0	0.0	321.9	6.3	19.5	5.1	6.3	4.3	0.0	0.0	0.0	0.0
S.E.**	0.0851	0.2561	0.0000	0.0000	0.0829	0.3701	0.2455	0.3641	0.3313	0.5733	0.0000	0.0000	0.0000	0.0000
n††	112	112	0	0	87	87	17	17	8	8	0	0	0	0
Tennessee	484.0	204.4	0.0	0.0	401.2	58.5	50.8	52.3	9.5	58.8	2.4	28.3	20.1	6.6
S.E.**	0.1030	0.1655	0.0000	0.0000	0.1016	0.2074	0.2161	0.2392	0.3682	0.2756	1.0000	0.6639	0.6757	0.2212
n††	112	112	0	0	68	68	22	22	18	18	2	2	2	2
Texas (east)	1,471.8	177.8	184.8	7.1	1,152.5	65.5	117.0	62.2	7.4	24.9	10.0	18.0	0.0	0.0
S.E.**	0.0591	0.1141	0.1406	0.2863	0.0651	0.1268	0.1445	0.1842	0.5022	0.4455	0.3714	0.3332	0.0000	0.0000
n††	445	445	31	31	291	291	88	88	28	28	7	7	0	0
All States	9,915.1	1,789.1	1,646.0	54.0	7,332.6	686.5	785.8	531.7	108.9	347.4	17.0	161.7	24.8	7.7
S.E.**	0.0246	0.0445	0.0479	0.1562	0.0284	0.0533	0.0612	0.0727	0.1168	0.1083	0.3228	0.2086	0.5951	0.4465
n††	2,862	2,862	293	293	1,740	1,740	508	508	282	282	35	35	4	4

*Numbers in rows and columns may not sum to totals due to rounding.

†Includes oak-gum-cypress and elm-ash-cottonwood types.

‡Includes white pine-hemlock forest type.

§Softwood species.

§Hardwood species.

**Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

††Number of sample plots.

Table 15.—Volume of softwood and hardwood growing stock in plantations by State and diameter class, Midsouth States*

State	Diameter class (inches in d.b.h.)									
	All classes		5.0-9.9		10.0-14.9		15.0-19.9		≥20.0	
	Soft†	Hard‡	Soft†	Hard‡	Soft†	Hard‡	Soft†	Hard‡	Soft†	Hard‡
----- Million cubic feet -----										
Alabama	2,562.2	459.2	1,499.3	210.6	828.5	144.0	204.4	71.7	30.0	32.9
S.E.†	0.0473	0.0762	0.0469	0.0760	0.0774	0.1077	0.1433	0.1352	0.2309	0.1600
n†	815	815	815	815	815	815	815	815	815	815
Arkansas	998.6	221.3	449.0	91.7	400.4	90.9	128.6	29.5	20.6	9.3
S.E.†	0.0897	0.1172	0.0887	0.1127	0.1317	0.1574	0.1722	0.1650	0.3270	0.3166
n†	345	345	345	345	345	345	345	345	345	345
Louisiana	2,283.3	237.9	888.3	94.2	984.5	83.1	343.0	42.3	67.4	18.3
S.E.†	0.0519	0.1191	0.0567	0.1263	0.0729	0.1492	0.1101	0.1866	0.2260	0.2631
n†	483	483	483	483	483	483	483	483	483	483
Mississippi	1,767.5	472.7	856.7	178.3	659.5	164.5	221.6	95.4	29.6	34.4
S.E.†	0.0589	0.0905	0.0644	0.0876	0.0812	0.1183	0.1257	0.1479	0.2444	0.2275
n†	550	550	550	550	550	550	550	550	550	550
Oklahoma (east)	347.7	15.8	276.6	8.5	52.9	5.3	16.3	1.7	2.0	0.3
S.E.†	0.0851	0.2561	0.0882	0.3032	0.2502	0.3348	0.5052	0.5779	0.5181	1.0000
n†	112	112	112	112	112	112	112	112	112	112
Tennessee	484.0	204.4	257.2	65.4	196.1	66.9	26.9	53.0	3.8	19.1
S.E.†	0.1030	0.1655	0.1082	0.1439	0.1523	0.1756	0.2528	0.2365	0.5523	0.3479
n†	112	112	112	112	112	112	112	112	112	112
Texas (east)	1,471.8	177.8	961.0	72.9	401.2	56.7	90.8	27.7	18.8	20.5
S.E.†	0.0591	0.1141	0.0577	0.1169	0.1067	0.1768	0.1880	0.1985	0.3118	0.2224
n†	445	445	445	445	445	445	445	445	445	445
All States	9,915.1	1,789.1	5,188.2	721.6	3,523.2	611.4	1,031.5	321.3	172.2	134.8
S.E.†	0.0246	0.0445	0.0250	0.0424	0.0384	0.0577	0.0616	0.0753	0.1191	0.1016
n†	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

†Softwood species.

‡Hardwood species.

§Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

¶Number of sample plots.

Table 16.—Volume of softwood and hardwood growing stock in plantations by State and age class, Midsouth States*

State	Age class (years) [†]															
	All classes		5		15		25		35		45		≥51		Mixed age [‡]	
	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]	Soft [§]	Hard [§]
<i>Million cubic feet</i>																
Alabama	2,562.2	459.2	175.4	75.9	672.3	75.5	618.3	50.0	327.7	31.5	47.4	10.9	39.7	11.3	681.5	204.1
S.E. ^{**}	0.0473	0.0762	0.1189	0.1623	0.0557	0.1618	0.0709	0.1801	0.0947	0.2528	0.2513	0.4009	0.4453	0.3331	0.0759	0.1135
n ^{††}	815	815	378	378	178	178	85	85	30	30	5	5	3	3	136	136
Arkansas	998.6	221.3	36.9	24.1	190.1	15.5	146.8	31.4	187.5	12.8	107.1	4.5	27.8	4.7	302.4	128.3
S.E. ^{**}	0.0897	0.1172	0.2296	0.2150	0.1002	0.2732	0.1219	0.4225	0.1252	0.3386	0.1558	0.4999	0.5803	0.5071	0.1392	0.1285
n ^{††}	345	345	153	153	77	77	17	17	15	15	6	6	3	3	74	74
Louisiana	2,283.3	237.9	71.7	37.5	408.2	26.9	424.4	31.1	642.5	28.9	130.7	8.3	78.3	1.7	527.5	103.4
S.E. ^{**}	0.0519	0.1191	0.2301	0.2805	0.0795	0.2952	0.0578	0.4265	0.0520	0.3786	0.0891	0.3153	0.1273	0.6803	0.1014	0.1563
n ^{††}	483	483	173	173	107	107	52	52	55	55	10	10	6	6	80	80
Mississippi	1,767.5	472.7	60.4	59.6	204.0	32.8	456.0	34.8	259.6	37.8	79.2	7.3	24.7	12.9	683.6	287.4
S.E. ^{**}	0.0589	0.0905	0.1986	0.2013	0.1055	0.2743	0.0808	0.2589	0.1200	0.2803	0.1999	0.6824	0.6374	0.7855	0.0718	0.1132
n ^{††}	550	550	223	223	75	75	50	50	30	30	8	8	3	3	161	161
Oklahoma (east)	347.7	15.8	24.2	2.6	208.2	2.7	52.1	0.1	6.5	1.6	0.0	0.0	0.0	0.0	56.9	8.8
S.E. ^{**}	0.0851	0.2561	0.2532	0.5735	0.0828	0.5424	0.2591	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1945	0.3033
n ^{††}	112	112	30	30	55	55	9	9	1	1	0	0	0	0	17	17
Tennessee	484.0	204.4	10.8	4.6	54.8	9.0	114.3	17.5	117.4	24.7	23.0	10.1	20.7	3.7	143.0	134.9
S.E. ^{**}	0.1030	0.1655	0.3487	0.4548	0.1681	0.4312	0.1592	0.3840	0.1300	0.3099	0.0813	0.8723	0.4010	0.7235	0.1752	0.2021
n ^{††}	112	112	26	26	19	19	14	14	11	11	3	3	2	2	37	37
Texas (east)	1,471.8	177.8	132.8	28.6	636.7	25.0	193.7	14.0	87.6	1.9	0.0	0.0	10.4	0.6	410.5	107.8
S.E. ^{**}	0.0591	0.1141	0.1541	0.2172	0.0582	0.1899	0.1255	0.3168	0.2317	0.9070	0.0000	0.0000	0.0000	0.0000	0.1089	0.1511
n ^{††}	445	445	192	192	121	121	25	25	8	8	0	0	1	1	98	98
All States	9,915.1	1,789.1	511.9	232.9	2,374.3	187.3	2,005.6	178.9	1,628	139.1	387.5	41.1	201.7	34.9	2,805.3	974.7
S.E. ^{**}	0.0246	0.0445	0.0735	0.0940	0.0312	0.1010	0.0364	0.1362	0.0404	0.1436	0.0841	0.2720	0.1386	0.3387	0.0403	0.0592
n ^{††}	2,862	2,862	1,175	1,175	632	632	252	252	150	150	32	32	18	18	603	603

*Numbers in rows and columns may not sum to totals due to rounding.

†Values are midpoints of 10-year ranges; i.e., 5 = 0-10 years, 15 = 11-20 years, etc.

‡Stand structure disturbed to the point where no single age class could be defined; i.e., two or more strata >10 years difference in age.

§Softwood species.

§Hardwood species.

**Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

††Number of sample plots.

Table 17.—Volume of softwood and hardwood sawtimber by State and stand type, Midsouth States*

State	All types		Stand type			
			Natural		Plantation	
	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]
----- Million board feet [§] -----						
Alabama	42,814.1	33,361.6	36,389.8	32,377.6	6,424.3	984.0
S.E. [†]	0.0266	0.0266	0.0280	0.0262	0.0771	0.1124
n ^{**}	3,917	3,917	3,102	3,102	815	815
Arkansas	33,667.2	33,109.2	30,427.0	32,613.1	3,240.2	496.1
S.E. [†]	0.0327	0.0274	0.0336	0.0271	0.1263	0.1609
n ^{**}	3,033	3,033	2,688	2,688	345	345
Louisiana	44,944.0	30,581.2	36,582.1	30,004.9	8,362.0	576.3
S.E. [†]	0.0294	0.0295	0.0323	0.0284	0.0714	0.1471
n ^{**}	2,413	2,413	1,930	1,930	483	483
Mississippi	39,597.2	33,612.7	34,049.1	32,340.8	5,548.1	1,271.9
S.E. [†]	0.0308	0.0286	0.0334	0.0283	0.0789	0.1284
n ^{**}	2,899	2,899	2,349	2,349	550	550
Oklahoma (east)	4,161.2	3,850.4	3,692.1	3,832.1	469.2	18.3
S.E. [†]	0.0750	0.0727	0.0790	0.0718	0.2365	0.3354
n ^{**}	820	820	708	708	112	112
Tennessee	9,613.5	43,957.1	8,262.4	43,389.1	1,351.2	568.0
S.E. [†]	0.0549	0.0222	0.0585	0.0221	0.1435	0.2164
n ^{**}	2,275	2,275	2,163	2,163	112	112
Texas (east)	35,077.5	15,568.4	31,910.7	15,117.4	3,166.9	451.0
S.E. [†]	0.0369	0.0375	0.0384	0.0369	0.1078	0.1549
n ^{**}	2,056	2,056	1,611	1,611	445	445
All States	209,874.8	194,040.5	181,313.0	189,675.0	28,561.7	4,365.5
S.E. [†]	0.0136	0.0115	0.0146	0.0113	0.0378	0.0625
n ^{**}	17,413	17,413	14,551	14,551	2,862	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Softwood species.

[‡]Hardwood species.

[§]International 1/4-inch Rule.

[†]Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

^{**}Number of sample plots.

Table 18.—Volume of softwood and hardwood sawtimber by State and ownership, *MidSouth States**

State	Ownership									
	All classes		National forest		Other public		Forest industry		Nonindustrial private	
	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]	Soft [†]	Hard [‡]
-----Million board feet [§] -----										
Alabama	6,424.3	984.0	66.2	9.4	16.0	11.6	2,480.2	332.5	3,861.8	630.5
S.E. [†]	0.0771	0.1124	0.3775	0.4502	0.7552	0.6107	0.1198	0.1829	0.1021	0.1456
n ^{**}	815	815	18	18	7	7	356	356	434	434
Arkansas	3,240.2	496.1	443.6	65.5	67.5	13.3	1,307.1	233.2	1,421.9	184.0
S.E. [†]	0.1263	0.1609	0.3321	0.3189	0.5866	0.6608	0.1986	0.2144	0.1857	0.3127
n ^{**}	345	345	30	30	5	5	226	226	84	84
Louisiana	8,362.0	576.3	1,027.5	63.6	0.0	0.0	3,775.5	247.6	3,559.0	265.0
S.E. [†]	0.0714	0.1471	0.2060	0.3491	0.0000	0.0000	0.1011	0.2023	0.1120	0.2436
n ^{**}	483	483	37	37	4	4	265	265	177	177
Mississippi	5,548.1	1,271.9	767.3	200.3	248.6	33.4	1,899.0	241.8	2,633.3	796.4
S.E. [†]	0.0789	0.1284	0.2140	0.2686	0.3829	0.4137	0.1309	0.1962	0.1131	0.1795
n ^{**}	550	550	39	39	13	13	257	257	241	241
Oklahoma (east)	469.2	18.3	77.3	4.8	0.0	0.0	316.4	10.5	75.4	3.0
S.E. [†]	0.2365	0.3354	0.5680	0.6267	0.0000	0.0000	0.2844	0.4277	0.6480	1.0000
n ^{**}	112	112	12	12	0	0	92	92	8	8
Tennessee	1,351.2	568.0	6.3	2.1	221.2	117.3	161.5	65.9	962.3	382.8
S.E. [†]	0.1435	0.2164	0.0000	0.0000	0.2355	0.3288	0.2897	0.3402	0.1648	0.2838
n ^{**}	112	112	1	1	10	10	52	52	49	49
Texas (east)	3,166.9	451.0	451.7	19.4	0.0	0.0	1,657.5	244.9	1,057.7	186.7
S.E. [†]	0.1078	0.1549	0.2620	0.2994	0.0000	0.0000	0.1294	0.2024	0.2194	0.2572
n ^{**}	445	445	35	35	1	1	312	312	97	97
All States	28,561.7	4,365.5	2,839.9	365.0	553.2	175.7	11,597.2	1,376.4	13,571.4	2,448.4
S.E. [†]	0.0378	0.0625	0.1207	0.1803	0.2251	0.2804	0.0569	0.0859	0.0557	0.0934
n ^{**}	2,862	2,862	172	172	40	40	1,560	1,560	1,090	1,090

*Numbers in rows and columns may not sum to totals due to rounding.

†Softwood species.

‡Hardwood species.

§International 1/4-inch Rule.

¶Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

**Number of sample plots.

Table 19.—Volume of softwood and hardwood sawtimber in plantations by State and forest type group, Midsouth States*

State	Forest type group													
	All types		Longleaf-slash pine		Loblolly-shortleaf pine		Oak-pine		Oak-hickory		Bottomland hardwoods ¹		Other ¹	
	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²
<i>Million board feet**</i>														
Alabama	6,424.3	984.0	1,029.8	27.2	4,827.0	494.7	440.5	296.3	110.9	163.8	0.0	2.1	16.0	0.0
S.E. ^{††}	0.0771	0.1124	0.1678	0.3174	0.0927	0.1406	0.1982	0.1836	0.3206	0.3864	0.0000	1.0000	1.0000	0.0000
n ^{‡‡}	815	815	87	87	540	540	113	113	71	71	2	2	2	2
Arkansas	3,240.2	496.1	0.0	0.0	2,889.4	170.8	305.3	195.3	41.9	48.9	3.6	81.1	0.0	0.0
S.E. ^{††}	0.1263	0.1609	0.0000	0.0000	0.1356	0.2087	0.2457	0.2328	0.5098	0.2695	0.6162	0.5418	0.0000	0.0000
n ^{‡‡}	345	345	0	0	225	225	69	69	46	46	5	5	0	0
Louisiana	8,362.0	576.3	3,162.6	15.6	4,790.9	244.5	380.1	181.2	28.4	51.7	0.0	83.2	0.0	0.0
S.E. ^{††}	0.0714	0.1471	0.0918	0.4359	0.0999	0.1871	0.3130	0.2700	0.7084	0.4517	0.0000	0.4027	0.0000	0.0000
n ^{‡‡}	483	483	108	108	289	289	57	57	22	22	7	7	0	0
Mississippi	5,548.1	1,271.9	737.0	17.5	3,836.5	284.8	872.6	372.5	93.9	380.6	8.1	216.4	0.0	0.0
S.E. ^{††}	0.0789	0.1284	0.1965	0.5449	0.0955	0.1604	0.1500	0.1730	0.3188	0.2298	0.7753	0.4544	0.0000	0.0000
n ^{‡‡}	550	550	67	67	240	240	142	142	89	89	12	12	0	0
Oklahoma (east)	469.2	18.3	0.0	0.0	429.9	11.2	25.2	4.1	14.1	3.0	0.0	0.0	0.0	0.0
S.E. ^{††}	0.2365	0.3354	0.0000	0.0000	0.2531	0.4430	0.6019	0.5418	0.5988	1.0000	0.0000	0.0000	0.0000	0.0000
n ^{‡‡}	112	112	0	0	87	87	17	17	8	8	0	0	0	0
Tennessee	1,351.2	568.0	0.0	0.0	1,056.7	129.0	176.3	142.6	31.3	155.9	13.1	113.5	73.8	27.1
S.E. ^{††}	0.1435	0.2164	0.0000	0.0000	0.1588	0.2271	0.3318	0.3094	0.5183	0.3643	1.0000	0.6430	0.7438	0.5546
n ^{‡‡}	112	112	0	0	68	68	22	22	18	18	2	2	2	2
Texas (east)	3,166.9	451.0	642.6	14.4	2,146.1	127.3	295.6	174.5	28.2	56.2	54.4	78.6	0.0	0.0
S.E. ^{††}	0.1078	0.1549	0.2152	0.4901	0.1353	0.1757	0.2405	0.2632	0.6678	0.4449	0.3948	0.3612	0.0000	0.0000
n ^{‡‡}	445	445	31	31	291	291	88	88	28	28	7	7	0	0
All States	28,561.7	4,365.5	5,571.9	74.8	19,976.6	1,462.2	2,495.6	1,366.5	348.7	860.1	79.3	574.9	89.7	27.1
S.E. ^{††}	0.0378	0.0625	0.0747	0.2164	0.0465	0.0744	0.0929	0.0923	0.1734	0.1513	0.3753	0.2421	0.6394	0.7337
n ^{‡‡}	2,862	2,862	293	293	1,740	1,740	508	508	282	282	35	35	4	4

*Numbers in rows and columns may not sum to totals due to rounding.

¹Includes oak-gum-cypress and elm-ash-cottonwood types.²Includes white pine-hemlock forest type.³Softwood species.⁴Hardwood species.⁵International 1/4-inch Rule.^{††}Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.^{‡‡}Number of sample plots.

Table 20.—Volume of softwood and hardwood sawtimber in plantations by State and diameter class, Midsouth States*

State	Diameter class (inches in d.b.h.)							
	All classes		9.0-14.9 [†]		15.0-19.9		≥20.0	
	Soft [‡]	Hard [§]	Soft [‡]	Hard [§]	Soft [‡]	Hard [§]	Soft [‡]	Hard [§]
----- Million board feet [¶] -----								
Alabama	6,424.3	984.0	5,088.6	462.7	1,160.5	353.4	175.2	167.9
S.E.**	0.0771	0.1124	0.0743	0.1296	0.1521	0.1378	0.2430	0.1629
n ^{††}	815	815	815	815	815	815	815	815
Arkansas	3,240.2	496.1	2,374.5	297.5	740.8	152.4	124.9	46.2
S.E.**	0.1263	0.1609	0.1331	0.1863	0.1812	0.1684	0.3376	0.3205
n ^{††}	345	345	345	345	345	345	345	345
Louisiana	8,362.0	576.3	5,936.4	263.0	2,011.6	215.8	414.0	97.4
S.E.**	0.0714	0.1471	0.0709	0.1708	0.1140	0.1856	0.2356	0.2714
n ^{††}	483	483	483	483	483	483	483	483
Mississippi	5,548.1	1,271.9	4,066.3	557.3	1,301.5	511.4	180.3	203.2
S.E.**	0.0789	0.1284	0.0798	0.1328	0.1291	0.1544	0.2536	0.2299
n ^{††}	550	550	550	550	550	550	550	550
Oklahoma (east)	469.2	18.3	367.8	9.7	90.9	7.2	10.5	1.3
S.E.**	0.2365	0.3354	0.1948	0.3880	0.5052	0.5550	0.5144	1.0000
n ^{††}	112	112	112	112	112	112	112	112
Tennessee	1,351.2	568.0	1,184.9	217.0	144.9	256.5	21.3	94.5
S.E.**	0.1435	0.2164	0.1471	0.2001	0.2592	0.2441	0.5459	0.3651
n ^{††}	112	112	112	112	112	112	112	112
Texas (east)	3,166.9	451.0	2,551.5	192.8	507.8	143.0	107.6	115.1
S.E.**	0.1078	0.1549	0.1056	0.1808	0.1927	0.2027	0.3205	0.2257
n ^{††}	445	445	445	445	445	445	445	445
All States	28,561.7	4,365.5	21,569.9	2,000.0	5,958.1	1,639.8	1,033.7	725.7
S.E.**	0.0378	0.0625	0.0373	0.0663	0.0641	0.0773	0.1249	0.1046
n ^{††}	2,862	2,862	2,862	2,862	2,862	2,862	2,862	2,862

*Numbers in rows and columns may not sum to totals due to rounding.

[†]Softwood sawtimber trees are ≥9.0 inches in d.b.h.; hardwood sawtimber trees are ≥11.0 inches in d.b.h.

[‡]Softwood species.

[§]Hardwood species.

[¶]International 1/4-inch Rule.

**Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.

^{††}Number of sample plots.

Table 21.—Volume of softwood and hardwood sawtimber in plantations by State and age class, Midsouth States*

State	Age class (years) ¹															
	All classes		5		15		25		35		45		≥51		Mixed age ¹	
	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²	Soft ²	Hard ²
----- Million board feet -----																
Alabama	6,424.3	984.0	211.3	178.4	567.3	146.0	1,385.5	78.5	1,389.4	65.7	203.1	24.0	232.2	28.6	2,435.5	462.8
S.E. ³	0.0771	0.1124	0.2294	0.2033	0.1286	0.2629	0.1130	0.3409	0.1282	0.3516	0.3621	0.8219	0.5546	0.5222	0.1001	0.1757
n ⁴	815	815	378	378	178	178	85	85	30	30	5	5	3	3	136	136
Arkansas	3,240.2	496.1	107.0	53.9	146.8	21.1	408.1	75.3	799.0	24.8	482.8	9.0	122.0	11.9	1,174.4	300.0
S.E. ³	0.1263	0.1609	0.3782	0.2832	0.2332	0.4138	0.2151	0.6524	0.1846	0.5278	0.2091	0.5287	0.5347	0.3994	0.1725	0.1716
n ⁴	345	345	153	153	77	77	17	17	15	15	6	6	3	3	74	74
Louisiana	8,362.0	576.3	158.4	87.9	467.4	71.9	1,272.0	62.6	3,066.7	49.5	731.4	11.7	505.3	1.3	2,160.6	291.4
S.E. ³	0.0714	0.1471	0.4182	0.3261	0.2286	0.4601	0.0920	0.4958	0.0631	0.4566	0.1109	0.4242	0.1438	1.0000	0.1195	0.1955
n ⁴	483	483	173	173	107	107	52	52	55	55	10	10	6	6	80	80
Mississippi	5,548.1	1,271.9	141.0	136.5	226.6	68.4	1,237.0	124.5	1,039.6	88.6	445.0	20.5	81.5	45.5	2,377.5	787.8
S.E. ³	0.0789	0.1284	0.2762	0.2350	0.2380	0.4301	0.1387	0.3200	0.1584	0.5053	0.2310	1.0000	0.5138	0.9027	0.0923	0.1679
n ⁴	550	550	223	223	75	75	50	50	30	30	8	8	3	3	161	161
Oklahoma (east)	469.2	18.3	1.0	3.0	118.4	6.3	161.5	0.5	40.7	2.7	0.0	0.0	0.0	0.0	147.5	5.7
S.E. ³	0.2365	0.3354	1.0000	1.0000	0.1989	0.6074	0.4651	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3503	0.4532
n ⁴	112	112	30	30	55	55	9	9	1	1	0	0	0	0	17	17
Tennessee	1,351.2	568.0	8.7	9.5	49.1	18.9	231.4	43.7	379.0	41.2	94.4	33.5	99.6	6.8	489.0	414.3
S.E. ³	0.1435	0.2164	0.7346	0.5816	0.4484	0.6883	0.3240	0.5332	0.2045	0.3072	0.1309	0.9615	0.3746	1.0000	0.2092	0.2560
n ⁴	112	112	26	26	19	19	14	14	11	11	3	3	2	2	37	37
Texas (east)	3,166.9	451.0	65.6	65.4	711.1	40.7	572.6	25.8	407.2	1.6	0.0	0.0	33.6	1.2	1,376.7	316.2
S.E. ³	0.1078	0.1549	0.3548	0.3412	0.1120	0.2602	0.2126	0.4189	0.3083	1.0000	0.0000	0.0000	0.0000	0.0000	0.1558	0.1886
n ⁴	445	445	192	192	121	121	25	25	8	8	0	0	1	1	98	98
All States	28,561.7	4,365.5	693.0	534.7	2,286.8	373.3	5,268.2	411.0	7,121.7	274.1	1,956.7	98.8	1,074.2	95.4	10,161.1	2,578.3
S.E. ³	0.0378	0.0625	0.1477	0.1173	0.0745	0.1655	0.0608	0.1948	0.0535	0.2139	0.0996	0.4211	0.1655	0.4631	0.0524	0.0838
n ⁴	2,862	2,862	1,175	1,175	632	632	252	252	150	150	32	32	18	18	603	603

*Numbers in rows and columns may not sum to totals due to rounding.

¹Values are mid-points of 10-year ranges; i.e., 5 = 0-10 years, 15 = 11-20 years, etc.²Stand structure disturbed to the point where no single age class could be defined; i.e., two or more strata >10 years difference in age.³Softwood species.⁴Hardwood species.⁵International 1/4-inch Rule.⁶Sampling errors are one standard error on a relativized scale ranging from 0.0000 to 1.0000.⁷Number of sample plots.

Rosson, James F., 1995. Forest plantations in the Midsouth, U.S.A. Res. Pap. SO-290. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 30 p.

Timberland that has been artificially regenerated in the seven Midsouth States was analyzed by ownership, forest type, stocking class, age, tree density, basal area, site class, and volume. Growing-stock volumes of natural stands and plantations were compared.

Keywords: Artificial regeneration, forest inventory, forest survey, monoculture, pine plantation, plantation forestry, planted pine.

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