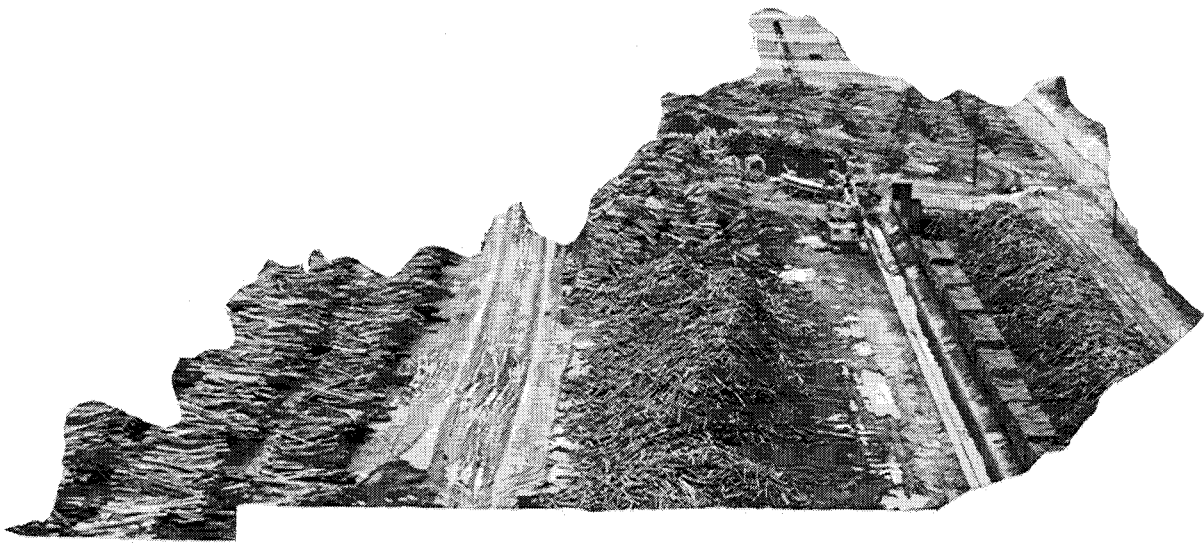


Primary Wood-Product Industries of KENTUCKY - - 1969



**by James T. Bones
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Introduction

THE FOREST SERVICE of the U. S. Department of Agriculture conducts continuing forest surveys of all states to provide up-to-date information about the timber resources of the Nation. Since the timber resource reports that result from these surveys are many years apart, information about the forest industries and timber-products output for intervening years is needed, particularly when drastic changes have occurred in the makeup of industry within a state.

The first forest survey of the timber resources of Kentucky was made in 1948-51. A report on this initial survey contained estimates of timber volume and forest area as of 1 January 1949. Fourteen years later a second forest survey of the timber resources of the State was made, resulting in another timber resource report as of 1 January 1963. This provided new inventory, timber-growth, and removals estimates for seven geographic regions in the State (fig. 1).

Since 1963 an entirely new wood-using industry has emerged in Kentucky. Three pulp-mills have been established within the State. These mills have provided additional markets

for hardwood roundwood and chipped coarse primary plant residues. An increase in timber cutting to meet these added industrial wood requirements is apparent. This development made necessary the recently completed primary wood-products-output survey that yielded data on Kentucky's industrial timber removals during 1969.

This report is the result of this 100-percent canvass of primary wood manufacturers in Kentucky by the Station's Forest Survey project and the Kentucky Department of Natural Resources' Forestry Division. Pulpwood production data were gathered as part of the Station's annual survey of woodpulp producers of the Northeast. The basic statewide resource statistics that appear in this report resulted from computer projections of previously collected timber-supply, growth, and cut statistics for Kentucky to 1 January 1968.

During the canvass, the Kentucky Forestry Division assembled a list of all known firms and later contacted in person all nonrespondents. The Experiment Station mailed questionnaires to each firm, including possible out-of-state consumers of Kentucky wood, and compiled data from the completed questionnaires.

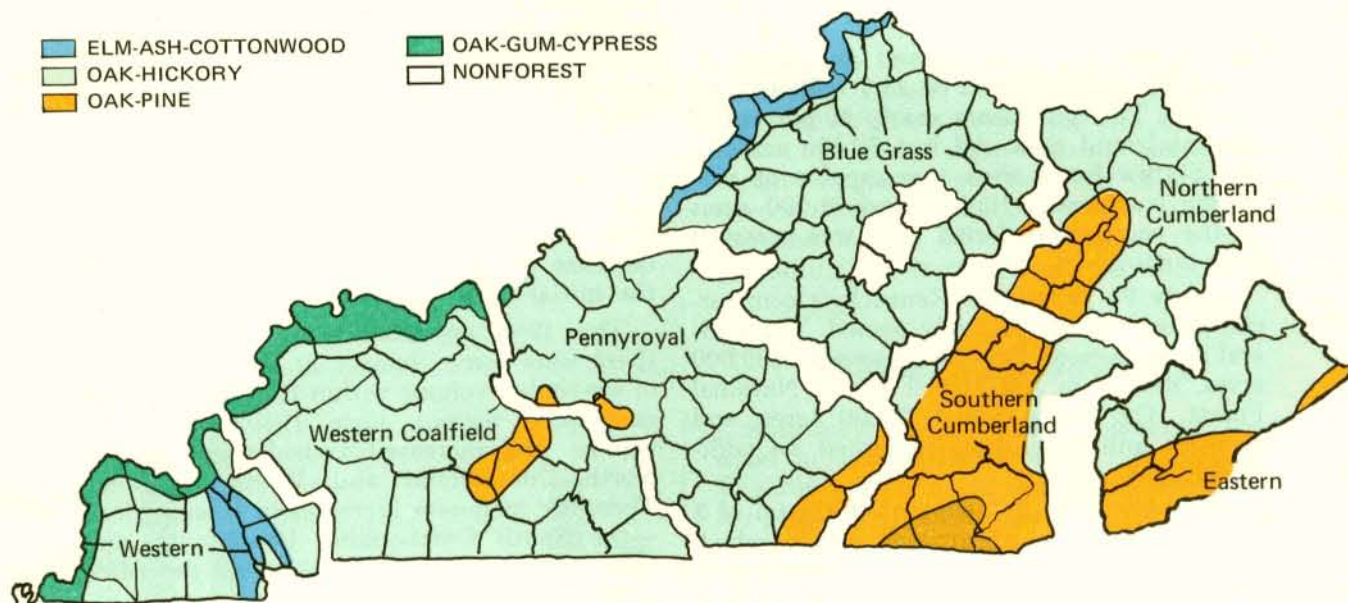


Figure 1.—The forest types and geographic regions of Kentucky.

Timber Industry

The relative importance of the timber industries of Kentucky is growing in comparison to the beverage, tobacco, and electrical equipment and supplies industries. Timber-based industries are vitally important to the economy of Kentucky. The 1967 U. S. Census of Manufacturers showed that the timber industries (24—Lumber and Wood Products and 26—Paper and Allied Products) accounted for the following percentages of the State's total manufacturing activities:

<i>Item</i>	<i>Percent</i>
Manufacturing employment	5.6
Manufacturing payrolls	4.4
Value added by manufacture	3.5
Cost of materials	3.9
Value of shipments	3.7
Capital expenditures	3.1

According to the Census of Manufacturers, the timber industries provided 12,600 jobs in 1967 and paid their employees nearly \$60 million in wages. Employment in the paper and allied products segment rose to 4,600 jobs in 1967—a 700-job increase over 1963—with a corresponding increase of \$30.6 million in the value added by manufacture. The timber industries in 1967 added a total value of \$128 million by manufacture.

Timber Resources

The commercial forest-land area in Kentucky was estimated to be 11.7 million acres in 1968. This represents nearly 46 percent of the total land area. All but 62,000 acres of the State's forest area was capable of producing commercial timber, and 81,000 acres of the commercial forest area was reserved from cutting.

Nearly 94 percent of Kentucky's commercial forest area is privately owned. The Federal Government in 1968 owned 660,000 acres, mostly in the Daniel Boone National Forest. The State owned 77,000 acres, and counties and municipalities owned an additional 5,000 acres.

The forests in 1968 supported a total of 8 billion cubic feet of growing stock, which included 29 billion board feet of sawtimber. More than 93 percent of the timber volume was in the hardwood species. The 1968 tim-

ber output at the primary wood-using plants, dealers, or other points of delivery, was valued at about \$35 million.

About 11 percent of the growing-stock volume is in public ownership—7 percent in the Daniel Boone National Forest and 4 percent mostly in state forests. Forest-industry holdings make up about 3 percent of the growing-stock volume. But farmers and other miscellaneous private owners account for most of the timber—86 percent of the total.

Kentucky forests are generally understocked and of poor quality. Only 38 percent of the total commercial forest area in 1968 was well stocked with merchantable or potentially merchantable trees. In the average stand, one out of every seven live trees over 5.0 inches in diameter at breast height was too rough or rotten to be used for industrial products. However, both growing stock and sawtimber volume in 1968 showed an overall 12-percent increase since 1963. These gains occurred mainly for trees in the 12- to 16-inch d.b.h. classes. These trees are still too immature to produce high-quality logs now, but under good management and protection these trees should produce high-quality logs sometime in the future.

The State's sawmill, cooperage, and veneer industries depend upon large, straight, relatively clear logs and bolts. These high-grade logs come mainly from large sawtimber trees, because log quality is closely related to log diameter. A grade-1 hardwood sawlog must be at least 13 inches in diameter at the small end and 10 feet long. In order for a tree to contain a log of this minimum diameter and length, it normally must be at least 17 inches in diameter at breast height. About 40 percent of the hardwood sawtimber volume in Kentucky in 1968 was estimated to be in trees 17 inches d.b.h. and larger. This is a decrease of about 1 billion board feet since the initial forest survey of 1949.

The 1968 appraisal also indicated that there were some changes in the distribution of sawtimber volume within Kentucky's seven geographic regions since 1949. Sawtimber volume has increased considerably in the North Cumberland and Western regions. There are moderate increases in three regions—the South Cumberland, Pennyroyal, and Western Coalfield—and moderate decreases in the Eastern and Bluegrass regions.

The estimated volume of net annual growth

for growing-stock trees, on the average for the 5 years since the 1963 resurvey, exceeded the volume of average annual cut in the State by more than 180 million cubic feet (table 1). The annual net increase of hardwood growing-stock volume represented 2.2 percent of the 1968 hardwood inventory volume, while the annual net increase of softwood growing-stock volume represented 2.0 percent of the softwood total. An average of about 600 million board feet a year was added to the sawtimber inventory volume during the same period.

Industrial Roundwood Harvest

Nearly 97 million cubic feet of industrial roundwood was harvested from Kentucky timberlands in 1969, of which 87 million cubic feet were from hardwoods (table 2). These figures represented 8.6 percent of the total harvest for the Northeast (Connecticut, Delaware, Kentucky, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and West Virginia). Among the 14 Northeastern States, Kentucky was the fifth largest hardwood producer. The State ranked third in the production of hardwood sawlogs and first in the production of cooperage logs.

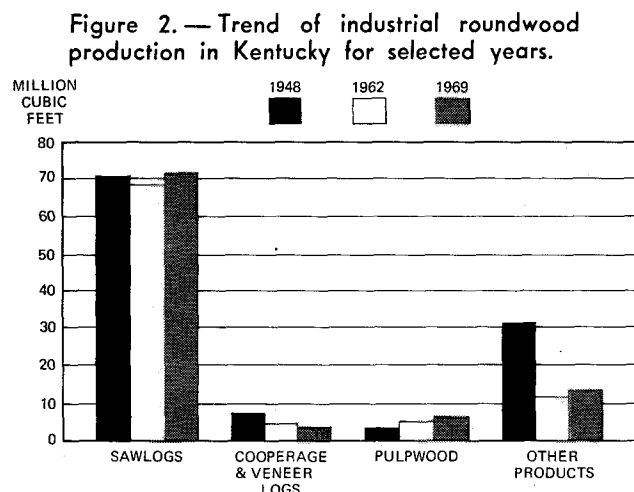
Sawlogs were the major product, accounting for 62 percent of the softwood and 76 percent of the hardwood cut. Pulpwood was second in importance, accounting for nearly 22 percent of the softwood, but only 5 per-

cent of the hardwood total. Other products cut included veneer and cooperage logs and bolts, mine timbers, posts and poles, roundwood for charcoal and flakeboard, bat and handle stock, and miscellaneous dimension stock.

During the past 21 years, the sawlog component of the industrial roundwood harvest has remained constant (fig. 2). The production of cooperage and veneer logs, and most of the other products, has dropped. However, the volume of wood going into mine timbers, handle and bat blanks, and furniture squares has risen recently and is expected to continue to make modest gains. The pulpwood component is the only industrial product that has consistently increased. Future increases in pulpwood production seem to be assured because of the expanding woodpulp manufacturing activities in the State.

Between 1962 and 1969 the sawlog, pulpwood, and mine timber harvests rose 7 percent, 17 percent, and 31 percent respectively (table 3). At the same time the veneer log, cooperage log, and post and pole harvests dropped 33 percent, 10 percent, and 75 percent respectively. Total timber products output increased 7 percent.

Kentucky's west-central regions — the Pennyroyal and Western Coalfield Regions—produced 47 percent of the State's industrial roundwood in 1969 (fig. 3). The 23.9 million cubic-foot hardwood cut in the Western Coalfield Region and 4.6 million cubic-foot softwood cut in the South Cumberland Region were records for the respective species groups (table 4). Larger volumes of sawlogs came from the Western Coalfields, and larger volumes of pulpwood came from the South Cumberland Region, than from any of the other regions of the State. The Pennyroyal Region had the largest harvest of other products, accounting for 31 percent of the total.

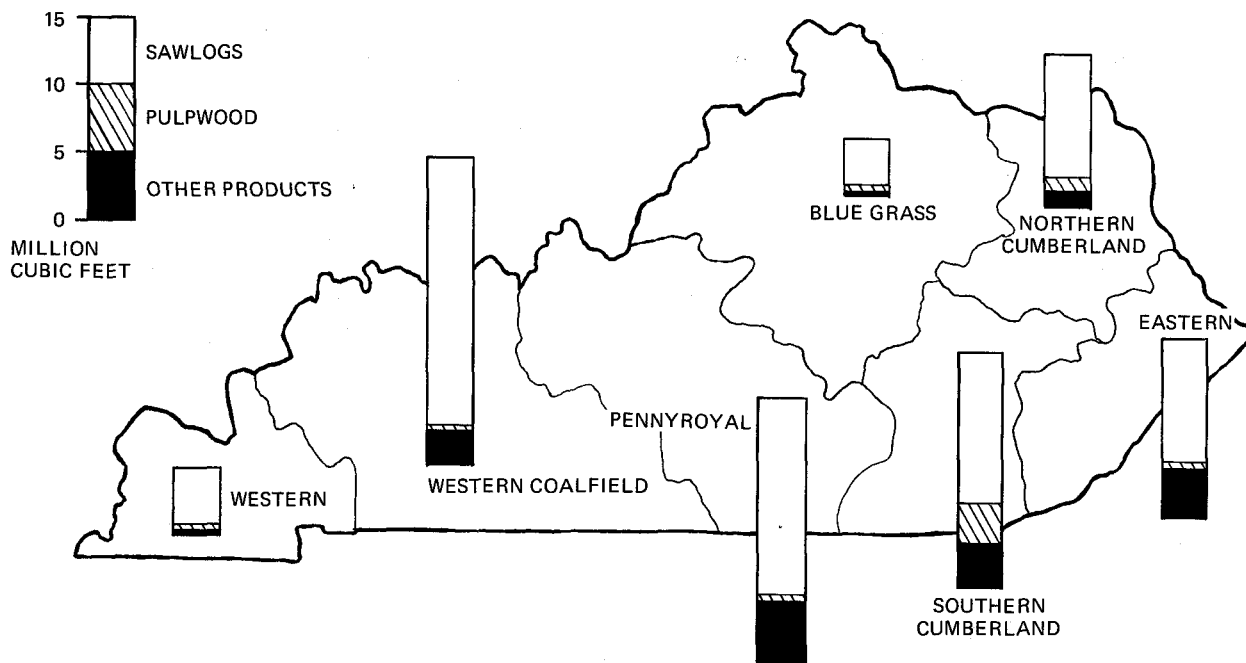


Lumber and Sawlogs

Kentucky has been an important hardwood lumber-producing state for a century. The 200 million board feet of hardwood lumber produced in 1869 placed the State seventh in the Nation. In 1962 the State reportedly ranked third behind Virginia and Tennessee.

Annual lumber production has ranged from 913 million board feet in 1907 to 180 million

Figure 3.—Harvest of industrial wood in Kentucky, by regions and major products, 1969.



board feet in 1933 (fig. 4). During World War II lumber production climbed from the lows of the depression years to over 500 million board feet. After the war, production tended to decline. During the last 15 years, production has again trended upward. Estimated total lumber production for Kentucky in 1969 was 511 million board feet.

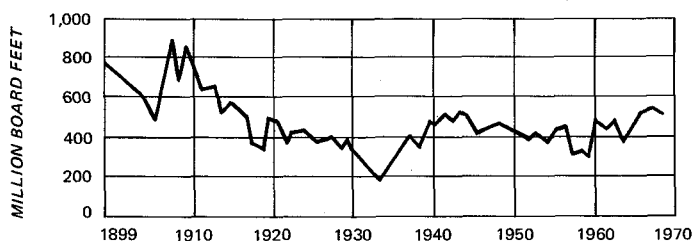
The number of sawmills operating in Kentucky has generally followed the fluctuations in lumber production. As lumber demand slackened and production dropped, the num-

ber of operating mills decreased. During the first decade of this century, when historic production levels were being reached, more sawmills were operating in Kentucky than at any other time. 2,351 sawmills operated in 1909. As production dropped, so did the number of operating sawmills. They dropped to 464 in 1918, to 331 in 1928, and finally to a low of 104 in 1933. Since then the number of sawmills climbed to 636 in 1939 and to 1,875 in 1942. By 1947 another high was reached—2,168 operating sawmills.

Most of these mills were portable circular sawmills, operating in the residual low-quality stands found throughout the State during that time. Fifty-nine of these mills—each producing more than a million board feet of lumber annually—produced a total of 146 million board feet in 1947. Thus 2.4 percent of the sawmills produced one-third of the State's total lumber production.

Decreases in the number of operating sawmills during the last two decades have been accompanied by increases in lumber production. Most of the mills closed had produced less than a million board feet annually (table 5). While the number of low-production sawmills decreased 47 percent between 1962 and 1969, the number of high-production mills

Figure 4.—Lumber production in Kentucky, 1899-1969. Sources: Steer, Henry. Lumber production in the United States, 1799-1946, U. S. Dep. Agr. Misc. Pub. 669, 233 pp. 1948; and lumber production statistics published by the U. S. Dep. Commerce.



increased 24 percent; and they now total 131. These high-production sawmills account for an ever-increasing percentage of the total lumber production. Since 1962 the number of high-production sawmills has increased in the South and North Cumberland Regions and Pennyroyal and Western Coalfield Region. However, all regions combined showed an overall decline in number of sawmills. In 1969, 378 sawmills were operating.

While sawlog production from Kentucky timberlands increased over 6 percent—to 489 million board feet—between 1962 and 1969, log receipts at sawmills rose over 13 percent (table 6). The State's Eastern Region had the largest increases in both sawlog production and receipts, up 53 percent and 56 percent respectively during the past 8 years. The Western Region had the largest production loss. Its receipts during the period also declined along with those of the Bluegrass Region.

The center of Kentucky's sawmill industry has shifted in the past 20 years from the southeastern portion to the west-central portion of the State. Today the Western Coalfield Region produces twice as much sawlog volume and receives two and a half times as much sawlog volume as the Eastern Region. While the number of sawmills that produce over a million board feet a year dropped from 14 to 13 during the past 8 years in the Eastern Region, the number rose from 30 to 39 in the Western Coalfield Region.

Detailed breakdowns of sawlog production and receipts by regions and species groups for 1969 are contained in 16 tables, beginning with table 7. These tables showed that:

- Seventy-seven percent of the softwood sawlog volume was cut and sawed within the same region, while another 7 percent was transported across regional boundaries within Kentucky for manufacture. The remaining 16 percent—approximately 5.8 million board feet—was shipped from four different geographic regions to four neighboring states.
- Nearly 87 percent of the hardwood sawlog volume was cut and sawed at mills within the same region. Another 8 percent of the sawlog volume was transported across regional boundaries within the State for manufacture, while the remaining 5 percent was shipped from all of the State's

seven geographic regions to three neighboring states for manufacture.

- Five of the seven geographic regions in Kentucky were net exporters of sawlogs in 1969. In the Bluegrass Region, which is sparsely forested, nearly 10 million board feet of sawlogs were shipped to mills in neighboring regions while only 2.5 million board feet were shipped into the region. The Western Coalfield Region was the State's largest sawlog importer, receiving nearly 16 million more board feet of sawlogs than it shipped to other regions.
- Fifty-five percent of the softwood sawlog harvest, by volume, in 1969 was shortleaf pine. The oaks were the most important hardwoods harvested. Red oaks accounted for 35 percent of the hardwood harvest, and white oaks accounted for another 15 percent. Beech, hickory, and yellow-poplar were other important components of the 454 million board-foot hardwood harvest.

Sawlogs from Kentucky timberlands were shipped for manufacture to sawmills in four neighboring states during 1969 (table 23). Tennessee was the most important recipient. Smaller volumes were shipped to Illinois, Indiana, and West Virginia. Shortleaf pine and red oak were the major species shipped out of the State. Kentucky sawmills reported receiving sawlogs from Illinois, Indiana, Missouri, Ohio, Tennessee, and Virginia (table 24). Illinois accounted for about a third of the log receipts from other states. Sweetgum, red oak, and hickory were the major species imported.

Pulpwood

Probably the major hope for the expanded use of wood from Kentucky timberlands lies in the recently established woodpulp industry. The State's first woodpulp mill began operating in April 1967 at Hawesville. Initially this new enterprise had a negligible effect upon roundwood use because most of the mill's wood requirement came from the residues of local primary wood manufacturers.

However, 2 years later, a second pulpmill was constructed at Hawesville, and in 1969 a new \$80-million pulpmill at Wickliffe began building a wood inventory for its projected

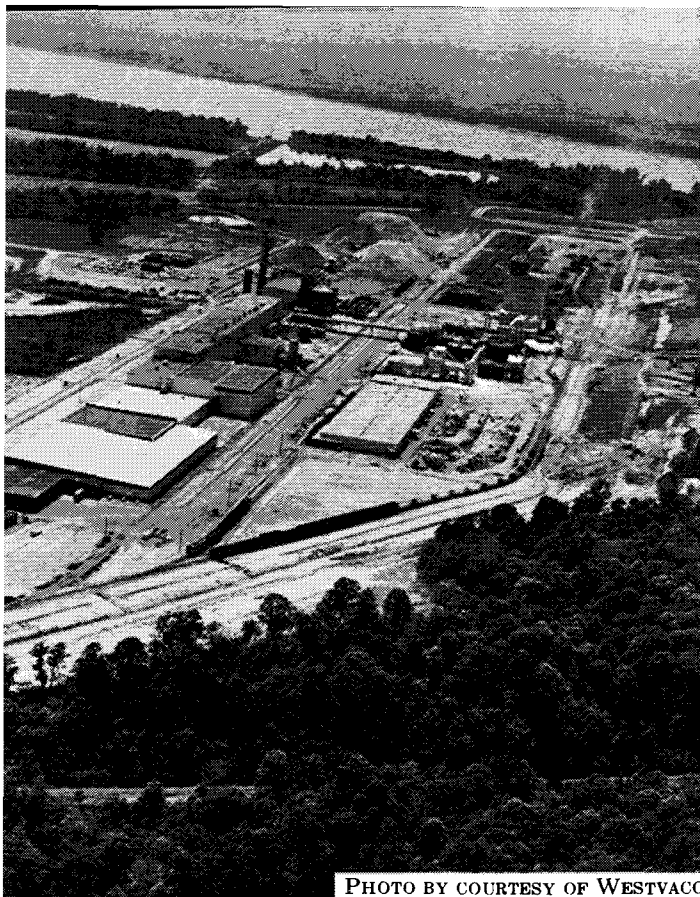


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Figure 5.—Establishment of this modern pulp-mill in the spring of 1970 provided Kentucky with ample local outlets for its abundant hardwood pulpwood resource. Located on the Mississippi River near Wickliffe, this mill features an 18-story continuous digester capable of producing 600 tons of woodpulp daily.

startup in the spring of 1970 (fig. 5). These three new facilities will be using ever-increasing quantities of pulpwood from both roundwood and plant residues, until they reach their combined peak operating capacities of nearly 1,100 tons of woodpulp per day. At this level, the annual pulpwood requirement for Kentucky pulpmills could approach 450,000 cords.

Pulpwood production in Kentucky was growing at a slow, steady pace until the State's first pulpmill was constructed. Average annual production was only 42,000 cords between 1955 and 1959 (table 25). In 1960 Kentucky produced 96 percent of the 32,204 cords of pulpwood that were shipped outside the Central States (Kentucky, Iowa, Missouri, Illinois, Indiana, and Ohio). Almost 99 percent of it was softwood, which was shipped south. Most of the hardwood pulpwood was shipped to Ohio or Illinois for processing.

During the 5 years between 1960 and 1964, an average of 75,000 cords of pulpwood was produced annually in Kentucky. The first chipping plant that produced chips from saw-mill residues began to operate in 1962. By 1965 over 12,000 cord equivalents were being shipped to Ohio pulpmills. The State's greatest annual increase in pulpwood production—from both roundwood and chipped residues—took place between 1966 and 1967, when production rose 40 percent, from 114,000 cords to 159,900 cords. The pulpwood production from hardwoods during the past decade has been responsible for most of the increase in total production. While the softwood production in 1960 and 1969 remained virtually the same, the hardwood production more than tripled.

Some 232,100 cords of softwood pulpwood from roundwood and 349,400 cords of hardwood pulpwood from roundwood were harvested from Kentucky timberlands since the 1963 timber inventory (table 26). Over 65 percent of the softwood came from the South Cumberland Region and nearly 58 percent of the hardwood came from the North Cumberland Region. Together the two Cumberland Regions accounted for 80 percent of the total round pulpwood harvest during the 7-year period between 1963 and 1969.

In 1969, 133,500 cords of pulpwood were produced in Kentucky. Twice as much roundwood pulpwood was from hardwoods as from softwoods. Wood chips from plant residues made up 37 percent of the production total.

Other Forest Products

Veneer logs and bolts.—Over 7.6 million board feet of veneer logs were cut in Kentucky in 1969 (table 27). Sixty-nine percent of this was shipped to seven other states for manufacture. Missouri, Indiana, and Tennessee were major recipients. More cottonwood was shipped from the State than any other species, while black walnut was favored for retention by local manufacturers.

Kentucky veneer plants received nearly 7.0 million board feet of veneer logs in 1969 (table 28). Nearly two-thirds of these logs were shipped from nine other states. Black walnut and hickory (pecan) were the major species.

During the 1969 survey, no attempt was

made to trace wood not channeled through primary manufacturers. Therefore the volume statistics presented for some species—such as black walnut—are low. They do not include veneer-log purchases by brokers for export overseas. More than 21 million board feet of walnut logs were exported nationally during 1969. Undoubtedly a good portion of these logs were cut from Kentucky timberlands, since the State leads the Nation in its volume of walnut growing stock.

In the past two decades, Kentucky has consistently produced greater volumes of veneer logs and bolts than were consumed at local veneer plants. Consequently the State has always shipped varying quantities of veneer logs to other states for manufacture. Only 40 percent of the State's veneer-log harvest was shipped outside the State in 1948, while 80 percent of the 1968 harvest was shipped out. To offset the heavy 1968 shipments, 74 percent of the Kentucky veneer-industry wood requirement was brought into the State from neighboring states.

Comparisons for selected years can be made with the following statistics:

Year	Operating plants (No.)	Production (million board feet)*	Receipts (million board feet)*
1948	6	9.6	5.8
1956	8	12.5	8.1
1958	5	12.1	6.3
1960	2	8.0	2.9
1963	3	11.2	2.5
1968	4	8.4	6.2

*International 1/4-inch rule.

Production and receipts of veneer logs in Kentucky peaked in the mid-1950's. Since then receipts fell to a low in 1960, when only two plants operated, and then began to recover. Recent annual production has been fluctuating around an 8-million board-foot average.

Changing consumer preferences have affected the species distribution of the veneer-log harvest over the years. Important veneer-log species cut from Kentucky timberlands during the last two decades are as follows:

Year	Species	Volume cut (million bd. ft.)*	Portion of total cut (percent)
1948.....	White oak	1.4	14
	Yellow-poplar	1.1	12
	Sweetgum	1.1	11
	Black walnut	1.0	10
1963.....	Yellow-poplar	3.5	31
	Black walnut	2.7	24
	Cottonwood	1.3	12
	Sweetgum	0.7	7
1968.....	Black walnut	2.6	31
	Cottonwood	1.3	15
	Hickory	1.1	13
	Yellow-poplar	0.8	10

*International 1/4-inch rule.

Species preferences for veneer logs were less pronounced in 1948 than in the 1960's. The four most important species cut in 1948 made up only 47 percent of the total volume cut. In 1968 four species accounted for nearly 70 percent of the total harvest. Black walnut has always been a major component of the veneer-log cut. However, the 1.0 million board feet cut in 1948 represented only 10 percent of the total, while the 2.6 million board feet cut in 1968 represented 31 percent of the total. White oak and sweetgum have been replaced by cottonwood and hickory as species preferred for veneer logs.

Cooperage.—Tight cooperage for whisky barrels has been an important use of white oak in Kentucky for many years. However, large high-quality white oak sawtimber is becoming increasingly difficult to find.

In 1948 there were 87 tight stave and heading mills operating in the State (table 29). Most of them were portable, and they shifted their location from county to county to take advantage of local markets and available timber. Although stave bolts brought a high price, they also required more labor per unit of wood produced than any other wood product.

Approximately 44 million board feet of oak were cut for cooperage in Kentucky during 1948. Eighty percent was processed at local stave and heading mills. A small volume of red oak that was exported was used for wine kegs.

In a decade the number of stave and heading mills in Kentucky had dropped 78 percent, and cooperage log and bolt production had been halved. These decreases were paral-

leled by a slackening of demand for all primary wood products in Kentucky. Many marginal cooperage mills ceased operations as competition for shrinking stave markets became intense and employees trained in the skills of stave and barrel making turned to other more promising enterprises for their livelihood.

Even so, Kentucky has remained a major processor of cooperage logs. The 19.4 million board feet that were processed by Kentucky's 19 mills in 1958 represented over 21 percent of the production total for the Central States. The Central States in turn produced 40 percent of the national cooperage-log requirement during that year.

Over the years Kentucky cooperage log receipts have been tied closely to the number of new whisky barrels produced nationally (fig. 6). During the past decade Kentucky has on the average accounted for slightly over 21 percent of cooperage log receipts in the Central States. However, the Central States' portion of the national market has slipped, accounting for the growing divergence of the lines in figure 6.

Cooperage log and bolt production during the last decade has continued to fluctuate slightly above the 20-million board-foot level. In 1962 the tight-cooperage industry curtailed production temporarily while awaiting the outcome of proposals to change federal

regulations regarding the re-use of bourbon barrels. This development caused a 20-percent decline in cooperage-log production for the Central States and a 25-percent decline for Kentucky under 1960 production levels. A modified version of the regulation was put in force late in 1968, and it seems certain to have a negative effect upon new barrel production and the industry's wood requirements.

Some 20.8 million board feet of white oak cooperage logs and bolts were harvested from Kentucky timberlands during 1969. The State's 23 cooperage mills received and processed 22.4 million board feet of wood.

Miscellaneous.—Kentucky has many small stable wood-using industries whose combined wood requirements from the timberlands of the State approached 6.8 million cubic feet in 1969.

Handle-blank plants use local ash and hickory. The three plants that were operating in 1948 consumed 1.1 million board feet of logs from high-quality timber. Ninety-five percent of the total volume was hickory, used mainly for such striking tools as picks and hammers. The remaining 5 percent was ash, which is used for handles in lifting and pulling tools, such as shovels and rakes. Another 4.4 million board feet of hickory and ash was shipped to plants in neighboring states for manufacture.

By 1962 nine handle-blank plants were operating in Kentucky. These plants consumed 3.8 million board feet of logs, which represented nearly 26 percent of the handle-log consumption for the Central States during that year. This entire wood requirement was harvested from Kentucky timberlands. Sixty-four percent of it was hickory. In addition, one-half million board feet of handle logs were exported to two neighboring states.

Twenty-two plants received handle logs in 1969. Many of them were producing furniture squares and bat blanks in addition to handle blanks. About 10.4 million board feet of handle logs were cut in Kentucky during the year. Small quantities of these logs were exported, and like amounts were imported from neighboring states.

Kentucky's charcoal industry has been slowly expanding in response to increased use of charcoal briquettes for outdoor cooking. Four companies were operating 24 rectangular cinder-block kilns in 1956. Most of

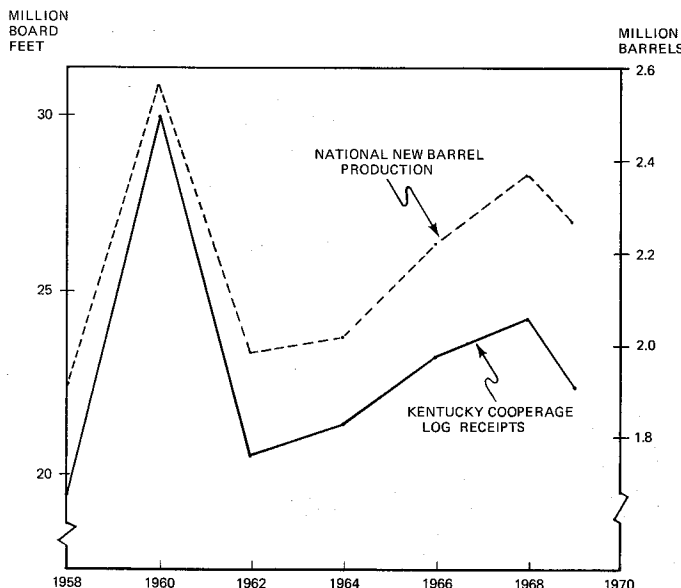


Figure 6.—Relationship of Kentucky cooperage-log receipts to national new barrel production, 1958 to 1969.

the kilns were new. They consumed 61,600 cubic feet of roundwood and 80,000 cubic feet of coarse plant residues during the year. Over 90 percent of the roundwood was oak and hickory from small trees and the tops and limbs of larger trees that were cut for sawlogs. Kiln operators paid slightly under \$7 per cord for roundwood and \$6 per cord for plant residues delivered to the kiln.

By 1961 the 44 kilns operating in Kentucky consumed 1.3 million cubic feet of roundwood and 0.3 million cubic feet of coarse plant residues. Virtually all of the charcoal produced—over 8,000 tons—was sold kiln run and unscreened to briquetting plants for an average of \$33.40 per ton.

About 4.2 million cubic feet of roundwood and 1.4 million cubic feet of plant residues were consumed at five locations within the State in 1969. Charcoal producers are finding it increasingly difficult to compete with the woodpulp industry for raw material. Although coarse plant residues bring approximately \$3.30 per ton at the charcoal kiln, chipped residues bring \$8.30 at the pulpmill. Currently, local charcoal producers are experimenting with producing charcoal from bark and sawdust in an effort to cut raw-material costs.

Coal mining, which is concentrated in eastern Kentucky, has depended upon local forests over the years as a source of mine props and shoring material. Some 6.7 million cubic feet of local wood was used during 1969 in underground coal mines as round and split mine timbers. This figure represents a drop of nearly 10 million cubic feet of wood in the past two decades, when larger tonnages of coal were being mined annually.

Manufacturing Plant Residues

Woodpulp, charcoal producers, and other primary manufacturers that depend upon inexpensive sources of wood are becoming increasingly dependent upon primary plant residues as a major source of raw material. On the other hand, more stringent air- and water-pollution laws are forcing many wood manufacturers to find new uses for their plant residues as a means of defraying at least a portion of the rising costs of waste disposal.

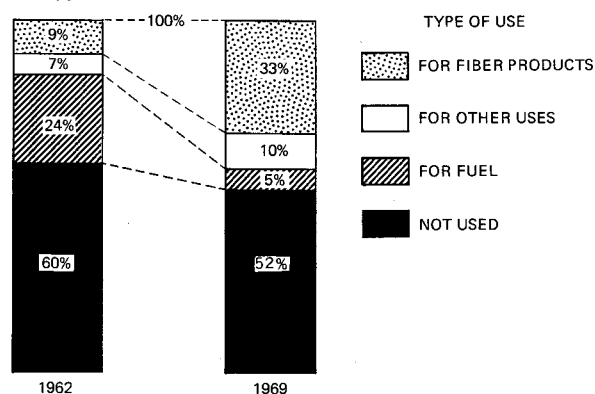
Cooperage mills, handle-blank mills, and manufacturers that generate large quantities of residues per unit of finished product are especially affected by these new laws. An opportunity exists for these two classes of industry—those that require inexpensive wood and those that generate large quantities of residues—to join forces in solving their interrelated problems. Certainly the pressures are stronger today than ever before for manufacturers to reduce the percentage of residues that are not used.

Over 33 million cubic feet of wood residues were generated by Kentucky primary wood manufacturers in 1969 (table 30). Nearly 64 percent—21 million cubic feet—of these residues were large enough to be suitable for chipping. Over 2 million cubic feet of the total volume of residues were from softwood trees.

Forty-nine percent of all residues—16.3 million cubic feet—were used (table 31). Chipped coarse residues accounted for 65 percent of the residue use. Woodpulp, flakeboard, and electro-metallurgical chips are the main products produced from chips. The local charcoal industry used nearly 2.8 million cubic feet of residues.

The State's sawmills in 1969 generated more than 92 percent of all residues. Therefore, the types of use for sawmill residues are indicative of residue use for all primary manufacturers of the State. Herrick (11) studied the uses of sawmill residues during a 1962 lumber-marketing survey. When his results are compared with our 1969 study, some important trends emerge (fig. 7).

Figure 7.—Percent of sawmill residues by type of use, 1962 and 1969.



- 8 percent more of the sawmill residue volume generated in 1969 was being used than in 1962.
- 19 percent less of the sawmill residue volume generated in 1969 was being used for fuel—both industrial and domestic—than in 1962.
- 24 percent more of the sawmill residue volume generated in 1969 was being used for fiber-product chips than in 1962.

The availability of unused residues also depends to a great extent upon the distribution of sawmills within the State. Over 6 million cubic feet of coarse residues and nearly 10 million cubic feet of fine residues were piled or destroyed by Kentucky sawmills during 1969 (table 32). Large quantities of coarse hardwood residues were available in the Western Coalfield, Pennyroyal, and North

Cumberland Regions. All the regions have large volumes of fine hardwood residues because of the small demand for agricultural bedding. As more low-production sawmills cease operations, the high-production sawmills that replace them will cause greater quantities of the coarse residues to become economically available for chipping.

In addition to wood residues, bark is also concentrated at wood-using manufacturing plants. We estimate that 185 thousand dry tons of bark was received by Kentucky sawmills and other plants during 1969 (table 33). At least 82 Kentucky sawmills with debarkers separated the bark from the logs as they arrived. The other manufacturers made no effort to separate the bark from the wood. Therefore most of this bark was not readily available to be used. Less than 15 percent of the total bark receipts in 1969 were used.

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Table 1.—Kentucky timber-resources data for sawtimber and growing stock, by species groups, 1968

Species group	Inventory volume	Average annual net growth	Average annual removals	Annual change	
				Volume	Rate
GROWING STOCK¹ (million cubic feet)					
					<i>Percent</i>
Softwoods	604	20.6	8.8	+11.8	2.0
Hardwoods	7,639	289.9	120.0	+169.9	2.2
All species	8,243	310.5	128.8	+181.7	2.2
SAWTIMBER (million board feet)²					
Softwoods	1,919	74.0	36.0	+38.0	2.0
Hardwoods	27,254	1,090.0	522.0	+568.0	2.1
All species	29,173	1,164.0	558.0	+606.0	2.1

¹Includes growing-stock trees on commercial forest land only.

²International 1/4-inch rule.

Table 2.—Volume of industrial roundwood produced in Kentucky during 1969

Product	Volume in standard units				Roundwood volume		
	Standard units	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
<i>Thousand cubic feet</i>							
Sawlogs	M board feet ¹	489,102	35,403	453,699	72,574	6,327	66,247
Pulpwood	Standard cords	83,600	27,500	56,100	6,688	2,200	4,488
Veneer logs	M board feet ¹	7,618	—	7,618	1,026	—	1,026
Cooperage logs	M board feet ¹	20,772	—	20,772	2,960	—	2,960
Mine timbers	M cubic feet	5,693	389	5,304	5,693	389	5,304
Posts	M pieces	843	821	22	1,072	1,042	30
Poles	M pieces	7	7	—	70	70	—
Misc. products ²	M cubic feet	6,792	101	6,691	6,792	101	6,691
Total	—	—	—	—	96,875	10,129	86,746

¹International 1/4-inch rule.

²Includes chipped roundwood for flakeboard, handle and bat stock, charcoal wood, and other miscellaneous dimension stock.

Table 3.—Change in timber-products output from roundwood in Kentucky between 1962 and 1969

Product	All species			Softwoods			Hardwoods		
	1962	1969	Change	1962	1969	Change	1962	1969	Change
	<i>Million cubic feet</i>		<i>Percent</i>	<i>Million cubic feet</i>		<i>Percent</i>	<i>Million cubic feet</i>		<i>Percent</i>
Sawlogs	68.0	72.6	+ 7	4.3	6.3	+44	63.7	66.3	+ 4
Pulpwood	5.7	6.7	+17	2.6	2.2	-15	3.1	4.5	+43
Veneer logs	1.6	1.0	-33	—	—	—	1.6	1.0	-33
Cooperage logs	3.3	3.0	-10	—	—	—	3.3	3.0	-10
Mine timbers	4.4	5.7	+31	.3	.4	+37	4.1	5.3	+31
Posts and poles	4.5	1.1	-75	1.9	1.1	-41	2.6	(¹)	-99
Misc. products ²	3.0	6.8	+124	.1	.1	+44	2.9	6.7	+126
Total	90.5	96.9	+ 7	9.2	10.1	+10	81.3	86.8	+ 7

¹Less than 50,000 cubic feet.

²Includes charcoal wood, handle and bat stock, miscellaneous dimension stock, flakeboard wood in 1969, and piling in 1962.

Table 4.—Industrial roundwood harvest in Kentucky by regions,
species groups, and major products, 1969

[In thousands of cubic feet]

Region and species group	Sawlogs	Pulpwood	Other products ¹	All products
Eastern:				
Softwood	792	384	364	1,540
Hardwood	8,817	—	3,240	12,057
Total	9,609	384	3,604	13,597
North Cumberland:				
Softwood	906	24	326	1,256
Hardwood	7,899	1,944	843	10,686
Total	8,805	1,968	1,169	11,942
South Cumberland:				
Softwood	2,660	1,440	532	4,632
Hardwood	9,115	1,408	2,148	12,671
Total	11,775	2,848	2,680	17,303
Bluegrass				
Softwood	267	168	54	489
Hardwood	2,870	352	293	3,515
Total	3,137	520	347	4,004
Pennyroyal:				
Softwood	1,511	184	217	1,912
Hardwood	13,519	224	5,296	19,039
Total	15,030	408	5,513	20,951
Western Coalfield:				
Softwood	81	—	109	190
Hardwood	19,906	456	3,570	23,932
Total	19,987	456	3,679	24,122
Western:				
Softwood	110	—	—	110
Hardwood	4,121	104	621	4,846
Total	4,231	104	621	4,956
All regions:				
Softwood	6,327	2,200	1,602	10,129
Hardwood	66,247	4,488	16,011	86,746
Total	72,574	6,688	17,613	96,875

¹Other products include veneer and cooperage logs, mine timbers, posts and poles, handle and bat stock, roundwood for flakeboard and charcoal, and miscellaneous dimension stock.

Table 5.—Number of operating sawmills in Kentucky by geographic regions and annual production classes, 1962 and 1969

Region	Production class ¹					
	Less than 1 million board feet		1 million board feet or more		Total	
	1962	1969	1962	1969	1962	1969
Eastern	50	24	14	13	64	37
North Cumberland	94	39	14	19	108	58
South Cumberland	74	45	11	20	85	65
Bluegrass	36	24	4	3	40	27
Pennyroyal	140	81	22	28	162	109
West Coalfield	56	24	30	39	86	63
Western	15	10	11	9	26	19
All regions	465	247	106	131	571	378

¹Based upon the volume of lumber produced during calendar years 1962 and 1969.

Table 6.—Sawlog production and receipt relationships in Kentucky by geographic regions between 1962 and 1969

Region	Production			Receipts		
	1962	1969	Change	1962	1969	Change
	<i>Million bd. ft.¹</i>	<i>Million bd. ft.¹</i>	<i>Percent</i>	<i>Million bd. ft.¹</i>	<i>Million bd. ft.¹</i>	<i>Percent</i>
Eastern	42.3	64.8	+53.1	40.1	62.6	+56.1
North Cumberland	70.6	59.2	-16.3	60.4	67.0	+10.9
South Cumberland	63.6	77.4	+21.7	67.4	77.0	+14.2
Bluegrass	16.5	21.1	+28.1	15.8	13.7	-13.3
Pennyroyal	86.5	101.1	+16.9	82.0	94.5	+15.2
Western Coalfield	140.7	136.7	+ 2.8	132.9	152.6	+14.8
Western	40.2	28.8	-28.4	38.0	27.4	-27.9
All regions	460.4	489.1	+ 6.2	436.6	494.8	+13.3

¹International 1/4-inch rule.

Table 7.—Sawlog production for Kentucky by species, groups, geographic regions, and where received, 1969

[Million board feet, International 1/4-inch rule]

Species group and geographic region	Where received			Total
	Within unit	Within state	In other states	
Softwoods:				
Eastern	4.3	(¹)	0.1	4.4
North Cumberland	5.0	—	.1	5.1
South Cumberland	9.9	0.7	4.3	14.9
Bluegrass	.8	.7	—	1.5
Pennyroyal	6.5	.8	1.2	8.5
West Coalfield	.3	.1	—	.4
Western	.5	—	.1	.6
All regions	27.3	2.3	5.8	35.4
Hardwoods:				
Eastern	54.3	4.4	1.7	60.4
North Cumberland	52.9	.4	.8	54.1
South Cumberland	51.0	8.8	2.7	62.5
Bluegrass	10.4	8.8	.4	19.6
Pennyroyal	79.2	9.6	3.8	92.6
West Coalfield	123.4	2.8	10.1	136.3
Western	23.3	1.3	3.6	28.2
All regions	394.5	36.1	23.1	453.7
All species	421.8	38.4	28.9	489.1

¹Less than 50,000 board feet.

Table 8.—Sawlog receipts for Kentucky by species groups, geographic regions, and where produced, 1969

[Million board feet, International 1/4-inch rule]

Species group and geographic region	Where produced			Total
	Within unit	Within states	In other states	
Softwoods:				
Eastern	4.3	0.2	—	4.5
North Cumberland	5.0	.8	—	5.8
South Cumberland	9.9	.9	0.1	10.9
Bluegrass	.8	(¹)	—	.8
Pennyroyal	6.5	.4	(¹)	6.9
West Coalfield	.3	—	—	.3
Western	.5	—	—	.5
All regions	27.3	2.3	0.1	29.7
Hardwoods:				
Eastern	54.3	3.0	0.8	58.1
North Cumberland	52.9	8.3	—	61.2
South Cumberland	51.0	5.2	9.9	66.1
Bluegrass	10.4	.9	1.6	12.9
Pennyroyal	79.2	8.1	.3	87.6
West Coalfield	123.4	9.1	19.8	152.3
Western	23.3	1.5	2.1	26.9
All regions	394.5	36.1	34.5	465.1
All species	421.8	38.4	34.6	494.8

¹Less than 50,000 board feet.

Table 9.—Sawlog production in the EASTERN REGION, by species and where received, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	1,671	0	25	1,696
Shortleaf pine	2,464	32	50	2,546
Virginia pine	0	0	25	25
Other pines	15	0	0	15
Eastern redcedar	0	0	0	0
Other softwoods	149	0	0	149
Total softwoods	4,299	32	100	4,431
Ash	1,149	90	0	1,239
Basswood	1,822	202	50	2,074
Beech	5,205	260	150	5,615
Cottonwood	1	0	0	1
Elm	25	0	0	25
Blackgum	733	80	7	820
Sweetgum	95	0	0	95
Hickory	6,864	129	100	7,093
Hard Maple	2,479	136	0	2,615
Soft maple	1,188	81	50	1,319
Northern red oak	3,685	337	50	4,072
Black oak	8,182	260	400	8,842
Other red oaks	2,391	175	300	2,866
White oak	6,801	239	100	7,140
Chestnut oak	3,728	509	250	4,487
Other white oaks	267	0	50	317
Yellow-poplar	7,939	1,511	169	9,619
Sycamore	5	0	0	5
Black walnut	307	74	0	381
Other hardwoods	1,448	277	31	1,756
Total hardwoods	54,314	4,360	1,707	60,381
Total species	58,613	4,392	1,807	64,812

Table 10.—Sawlog receipts in the EASTERN REGION, by species and where produced, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	1,671	30	0	1,701
Shortleaf pine	2,464	186	0	2,650
Virginia pine	0	0	0	0
Other pines	15	15	0	30
Eastern redcedar	0	0	0	0
Others softwoods	149	0	0	149
Total softwoods	4,299	231	0	4,530
Ash	1,149	73	40	1,262
Basswood	1,822	146	40	2,008
Beech	5,205	300	0	5,505
Cottonwood	1	0	0	1
Elm	25	0	0	25
Blackgum	733	20	27	780
Sweetgum	95	0	13	108
Hickory	6,864	507	127	7,498
Hard maple	2,479	66	40	2,585
Soft maple	1,188	153	27	1,368
Northern red oak	3,685	113	13	3,811
Black oak	8,182	300	147	8,629
Other red oaks	2,391	353	80	2,824
White oak	6,801	193	40	7,034
Chestnut oak	3,728	286	40	4,054
Other white oaks	267	0	0	267
Yellow-poplar	7,939	329	112	8,380
Sycamore	5	7	0	12
Black walnut	307	53	15	375
Other hardwoods	1,448	60	21	1,529
Total hardwoods	54,314	2,959	782	58,055
All species	58,613	3,190	782	62,585

Table 11.—Sawlog production in the NORTH CUMBERLAND REGION,
by species and where received, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	132	0	0	132
Shortleaf pine	2,709	0	25	2,734
Virginia pine	452	0	25	477
Other pines	567	0	0	567
Eastern redcedar	520	0	0	520
Other softwoods	639	0	0	639
Total softwoods	5,019	0	50	5,069
Ash	467	13	0	480
Basswood	259	0	25	284
Beech	2,505	0	50	2,555
Cottonwood	2	0	0	2
Elm	15	0	0	15
Blackgum	509	0	50	559
Sweetgum	95	0	0	95
Hickory	4,674	67	50	4,791
Hard maple	506	0	25	531
Soft maple	744	7	50	801
Northern red oak	5,876	0	50	5,926
Black oak	9,399	100	200	9,699
Other red oaks	9,413	133	50	9,596
White oak	5,600	33	100	5,733
Chestnut oak	6,005	33	50	6,088
Other white oaks	95	0	0	95
Yellow-poplar	5,808	61	46	5,915
Sycamore	136	0	0	136
Black walnut	217	13	0	230
Other hardwoods	554	6	4	564
Total hardwoods	52,879	466	750	54,095
All species	57,898	466	800	59,164

25,231
11,821

Table 12.—Sawlog receipts in the NORTH CUMBERLAND REGION,
by species and where produced, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	132	30	0	162
Shortleaf pine	2,709	300	0	3,009
Virginia pine	452	111	0	563
Other pines	567	334	0	901
Eastern redcedar	520	0	0	520
Other softwoods	639	0	0	639
Total softwoods	5,019	775	0	5,794
Ash	467	67	0	534
Basswood	259	60	0	319
Beech	2,505	318	0	2,823
Cottonwood	2	0	0	2
Elm	15	0	0	15
Blackgum	509	13	0	522
Sweetgum	95	0	0	95
Hickory	4,674	922	0	5,596
Hard maple	506	57	0	563
Soft maple	744	87	0	831
Northern red oak	5,876	1,018	0	6,894
Black oak	9,399	1,238	0	10,637
Other red oaks	9,413	1,428	0	10,841
White oak	5,600	857	0	6,457
Chestnut oak	6,005	1,088	0	7,093
Other white oaks	95	35	0	130
Yellow-poplar	5,808	981	0	6,789
Sycamore	136	0	0	136
Black walnut	217	67	0	284
Other hardwoods	554	94	0	648
Total hardwoods	52,879	8,330	0	61,209
All species	57,898	9,105	0	67,003

Table 13.—Sawlog production in the SOUTH CUMBERLAND REGION,
by species and where received, 1969

[In thousands of board feet, International 3/4-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	1,503	186	695	2,384
Shortleaf pine	6,781	400	2,816	9,997
Virginia pine	1,170	111	688	1,969
Other pines	172	15	59	246
Eastern redcedar	134	0	0	134
Other softwoods	154	0	0	154
Total softwoods	9,914	712	4,258	14,884
Ash	669	168	26	863
Basswood	881	173	8	1,062
Beech	4,186	673	392	5,251
Cottonwood	0	0	0	0
Elm	27	0	7	34
Blackgum	810	97	10	917
Sweetgum	128	14	1	143
Hickory	4,879	1,103	235	6,217
Hard maple	1,346	187	20	1,553
Soft maple	1,862	211	37	2,110
Northern red oak	5,475	1,012	236	6,723
Black oak	4,610	928	444	5,982
Other red oaks	6,345	1,119	111	7,575
White oak	3,115	824	424	4,363
Chestnut oak	6,081	970	100	7,151
Other white oaks	380	0	40	420
Yellow-poplar	8,457	1,018	516	9,991
Sycamore	240	34	0	274
Black walnut	271	89	5	365
Other hardwoods	1,212	147	73	1,432
Total hardwoods	50,974	8,767	2,685	62,426
All species	60,888	9,479	6,943	77,310

50,290

11,514

Table 14.—Sawlog receipts in the SOUTH CUMBERLAND REGION,
by species and where produced, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	1,503	413	26	1,942
Shortleaf pine	6,781	376	59	7,216
Virginia pine	1,170	0	0	1,170
Other pines	172	138	41	351
Eastern redcedar	134	0	0	134
Other softwoods	154	0	0	154
Total softwoods	9,914	927	126	10,967
Ash	669	90	204	963
Basswood	881	202	190	1,273
Beech	4,186	293	982	5,461
Cottonwood	0	0	0	0
Elm	27	0	9	36
Blackgum	810	82	275	1,167
Sweetgum	128	0	241	369
Hickory	4,879	140	1,130	6,149
Hard maple	1,346	139	442	1,927
Soft maple	1,862	81	115	2,058
Northern red oak	5,475	393	2,359	8,227
Black oak	4,610	371	134	5,115
Other red oaks	6,345	258	22	6,625
White oak	3,115	406	834	4,355
Chestnut oak	6,081	731	1,515	8,327
Other white oaks	380	67	0	447
Yellow-poplar	8,457	1,622	1,170	11,249
Sycamore	240	11	40	291
Black walnut	271	81	75	427
Other hardwoods	1,212	233	168	1,613
Total hardwoods	50,974	5,200	9,905	66,079
All species	60,888	6,127	10,031	77,046

Table 15.—Sawlog production in the BLUEGRASS REGION,
by species and where received, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	300	333	0	633
Virginia pine	102	0	0	102
Other pines	171	334	0	505
Eastern redcedar	188	0	0	188
Other softwoods	64	0	0	64
Total softwoods	825	667	0	1,492
Ash	147	151	84	382
Basswood	52	43	1	96
Beech	603	656	0	1,259
Cottonwood	8	0	0	8
Elm	67	7	0	74
Blackgum	157	42	0	199
Sweetgum	141	24	0	165
Hickory	1,016	682	8	1,706
Hard maple	305	92	17	414
Soft maple	220	110	0	330
Northern red oak	1,221	767	0	1,988
Black oak	1,556	1,170	0	2,726
Other red oaks	1,484	1,438	16	2,938
White oak	998	647	28	1,673
Chestnut oak	682	586	0	1,268
Other white oaks	58	35	0	93
Yellow-poplar	464	1,628	128	2,220
Sycamore	238	61	0	299
Black walnut	855	54	83	992
Other hardwoods	173	605	48	826
Total hardwoods	10,445	8,798	413	19,656
All species	11,270	9,465	413	21,148

7652

2,041

Table 16.—Sawlog receipts in the BLUEGRASS REGION,
by species and where produced, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	300	7	0	307
Virginia pine	102	0	0	102
Other pines	171	0	0	171
Eastern redcedar	188	0	0	188
Other softwoods	64	0	0	64
Total softwoods	825	7	0	832
Ash	147	7	0	154
Basswood	52	0	0	52
Beech	603	67	280	950
Cottonwood	8	0	0	8
Elm	67	7	0	74
Blackgum	157	20	0	177
Sweetgum	141	11	0	152
Hickory	1,016	133	0	1,149
Hard maple	305	17	120	442
Soft maple	220	16	0	236
Northern red oak	1,221	0	50	1,271
Black oak	1,556	133	0	1,689
Other red oaks	1,484	280	0	1,764
White oak	998	100	0	1,098
Chestnut oak	682	67	0	749
Other white oaks	58	0	0	58
Yellow-poplar	464	20	0	484
Sycamore	238	33	0	271
Black walnut	855	0	1,027	1,882
Other hardwoods	173	7	0	180
Total hardwoods	10,445	918	1,477	12,840
All species	11,270	925	1,477	13,672

Table 17.—Sawlog production in the PENNYROYAL REGION,
by species and where received, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	382	413	0	795
Shortleaf pine	2,251	351	825	3,427
Virginia pine	179	0	349	528
Other pines	1,609	69	0	1,678
Eastern redcedar	1,275	0	0	1,275
Other softwoods	754	0	0	754
Total softwoods	6,450	833	1,174	8,457
Ash	2,283	213	16	2,512
Basswood	505	7	1	513
Beech	10,321	770	126	11,217
Cottonwood	101	12	0	113
Elm	918	80	0	998
Blackgum	1,223	191	23	1,437
Sweetgum	1,087	356	87	1,530
Hickory	6,653	741	105	7,499
Hard maple	2,972	542	39	3,553
Soft maple	1,904	255	30	2,189
Northern red oak	11,355	968	659	12,982
Black oak	6,972	1,216	126	8,314
Other red oaks	7,725	1,101	7	8,833
White oak	5,700	1,189	816	7,705
Chestnut oak	4,359	333	19	4,711
Other white oaks	77	67	0	144
Yellow-poplar	9,390	864	256	10,510
Sycamore	1,918	251	3	2,172
Black walnut	569	99	509	1,177
Other hardwoods	3,125	360	991	4,476
Total hardwoods	79,157	9,615	3,813	92,585
All species	85,607	10,448	4,987	101,042

39,129

5,416

Table 18.—Sawlog receipts in the PENNYROYAL REGION,
by species and where produced, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	382	126	0	508
Shortleaf pine	2,251	247	0	2,498
Virginia pine	179	0	0	179
Other pines	1,609	0	3	1,612
Eastern recedar	1,275	14	0	1,289
Other softwoods	754	0	0	754
Total softwoods	6,450	387	3	6,840
Ash	2,283	208	8	2,499
Basswood	505	10	4	519
Beech	10,321	876	66	11,263
Cottonwood	101	3	0	104
Elm	918	7	20	945
Blackgum	1,223	114	11	1,348
Sweetgum	1,087	49	0	1,136
Hickory	6,653	540	4	7,197
Hard maple	2,972	205	23	3,200
Soft maple	1,904	117	10	2,031
Northern red oak	11,355	981	0	12,336
Black oak	6,972	723	40	7,735
Other red oaks	7,725	1,017	40	8,782
White oak	5,700	575	4	6,279
Chestnut oak	4,359	222	38	4,619
Other white oaks	77	0	0	77
Yellow-poplar	9,390	1,747	66	11,203
Sycamore	1,918	99	13	2,030
Black walnut	569	29	7	605
Other hardwoods	3,125	581	22	3,728
Total hardwoods	79,157	8,103	376	87,636
All species	85,607	8,490	379	94,476

Table 19.—Sawlog production in the WESTERN COALFIELD REGION,
by species and where received, 1969

[In thousands of board feet, International ¼-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	74	0	0	74
Virginia pine	0	0	0	0
Other pines	0	69	0	69
Eastern redecar	195	14	100	309
Other softwoods	0	0	0	0
Total softwoods	269	83	100	452
Ash	2,934	56	0	2,990
Basswood	1,708	0	0	1,708
Beech	8,085	185	934	9,204
Cottonwood	1,237	140	0	1,377
Elm	2,742	20	0	2,762
Blackgum	4,208	28	28	4,264
Sweetgum	7,199	31	98	7,328
Hickory	13,653	157	510	14,320
Hard maple	4,046	69	0	4,115
Soft maple	4,440	49	0	4,489
Northern red oak	12,393	525	4,153	17,071
Black oak	15,950	255	0	16,205
Other red oaks	17,301	300	0	17,601
White oak	6,973	313	1,501	8,787
Chestnut oak	2,873	7	0	2,880
Other white oaks	1,882	192	0	2,074
Yellow-poplar	5,211	200	1,050	6,461
Sycamore	4,468	74	0	4,542
Black walnut	483	21	208	712
Other hardwoods	5,600	214	1,629	7,443
Total hardwoods	123,386	2,836	10,111	136,333
All species	123,655	2,919	10,211	136,785

Table 20.—Sawlog receipts in the WESTERN COALFIELD REGION,
by species and where produced, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	74	0	0	74
Virginia pine	0	0	0	0
Other pines	0	0	0	0
Eastern redcedar	195	0	0	195
Other softwoods	0	0	0	0
Total softwoods	269	0	0	269
Ash	2,934	228	132	3,294
Basswood	1,708	7	540	2,255
Beech	8,085	670	273	9,028
Cottonwood	1,237	19	267	1,523
Elm	2,742	87	204	3,033
Blackgum	4,208	182	877	5,267
Sweetgum	7,199	621	3,139	10,959
Hickory	13,653	802	2,703	17,158
Hard maple	4,046	538	240	4,824
Soft maple	4,440	330	1,041	5,811
Northern red oak	12,393	1,085	1,925	15,403
Black oak	15,950	1,033	1,278	18,261
Other red oaks	17,301	1,078	4,944	23,323
White oak	6,973	969	322	8,264
Chestnut oak	2,873	44	386	3,303
Other white oaks	1,882	0	47	1,929
Yellow-poplar	5,211	562	320	6,093
Sycamore	4,468	209	797	5,474
Black walnut	483	99	1	583
Other hardwoods	5,600	603	345	6,548
Total hardwoods	123,386	9,166	19,781	152,333
All species	123,655	9,166	19,781	152,602

Table 21.—Sawlog production in the WESTERN REGION,
by species and where received, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where received			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	30	0	0	30
Virginia pine	0	0	0	0
Other pines	0	0	0	0
Eastern redcedar	55	0	0	55
Other softwoods	458	0	75	533
Total softwoods	543	0	75	618
Ash	688	22	38	748
Basswood	59	0	0	59
Beech	436	0	21	457
Cottonwood	1,687	7	37	1,731
Elm	518	14	52	584
Blackgum	267	13	11	291
Sweetgum	1,956	276	233	2,465
Hickory	2,162	205	934	3,301
Hard maple	366	16	0	382
Soft maple	789	91	128	1,008
Northern red oak	1,237	173	711	2,121
Black oak	4,477	61	0	4,538
Other red oaks	2,526	340	0	2,866
White oak	1,966	47	296	2,309
Chestnut oak	973	0	0	973
Other white oaks	896	0	0	896
Yellow-poplar	358	15	993	1,366
Sycamore	1,236	2	37	1,275
Black walnut	171	0	0	171
Other hardwoods	500	20	163	683
Total hardwoods	23,268	1,302	3,654	28,224
All species	23,811	1,302	3,729	28,842

9,595
3,302

Table 22.—Sawlog receipts in the WESTERN REGION,
by species and where produced, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Where produced			Total
	Within unit	Within state	In other states	
Hemlock	0	0	0	0
Shortleaf pine	30	0	0	30
Virginia pine	0	0	0	0
Other pines	0	0	0	0
Eastern redcedar	55	0	0	55
Other softwoods	458	0	0	458
Total softwoods	543	0	0	543
Ash	688	40	0	728
Basswood	59	0	0	59
Beech	436	20	0	456
Cottonwood	1,687	137	430	2,254
Elm	518	20	0	538
Blackgum	267	20	37	324
Swwetgum	1,956	20	252	2,228
Hickory	2,162	40	140	2,342
Hard maple	366	20	0	386
Soft maple	789	20	140	949
Northern red oak	1,237	192	74	1,503
Black oak	4,477	192	214	4,883
Other red oaks	2,526	192	354	3,072
White oak	1,966	192	214	2,372
Chestnut oak	973	0	0	973
Other white oaks	896	192	74	1,162
Yellow-poplar	358	36	0	394
Sycamore	1,236	63	177	1,476
Black walnut	171	21	37	229
Other hardwoods	500	51	0	551
Total hardwoods	23,268	1,468	2,143	26,879
All species	23,811	1,468	2,143	27,422

Table 23.—Sawlog production, by species and states where received, KENTUCKY, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Received in —					Total production
	Kentucky	Illinois	Indiana	Tennessee	West Virginia	
Hemlock	4,287	0	0	695	25	5,007
Shortleaf pine	15,725	50	0	3,591	75	19,441
Virginia pine	2,014	0	74	963	50	3,101
Other pines	3,021	0	0	59	0	3,080
Eastern redcedar	2,381	0	0	100	0	2,481
Other softwoods	2,218	0	0	75	0	2,293
Total softwoods	29,646	50	74	5,483	150	35,403
Ash	9,050	0	99	65	0	9,214
Basswood	5,711	0	2	8	75	5,796
Beech	33,885	0	0	1,473	200	35,558
Cottonwood	3,195	0	0	37	0	3,232
Elm	4,433	0	0	59	0	4,492
Blackgum	8,358	0	0	72	57	8,487
Sweetgum	11,402	0	0	419	0	11,821
Hickory	42,985	0	85	1,707	150	44,927
Hard maple	13,062	0	22	54	25	13,163
Soft maple	11,951	0	0	195	100	12,246
Northern red oak	45,024	0	0	5,759	100	50,883
Black oak	55,136	0	0	570	600	56,306
Other red oaks	51,791	0	23	111	350	52,275
White oak	34,445	0	323	2,741	200	37,709
Chestnut oak	27,139	0	0	119	300	27,558
Other white oaks	3,949	0	0	40	50	4,039
Yellow-poplar	42,924	0	178	2,774	206	46,082
Sycamore	8,663	0	0	40	0	8,703
Black walnut	3,223	0	589	216	0	4,028
Other hardwoods	14,241	0	38	2,857	44	17,180
Total hardwoods	430,567	0	1,359	19,316	2,457	453,699
All species	460,213	50	1,433	24,799	2,607	489,102

Table 24.—Sawlog receipts, by species and states where produced, KENTUCKY, 1969

[In thousands of board feet, International 1/4-inch rule]

Species	Produced in —							Total receipts
	Ky.	Ill.	Ind.	Mo.	Ohio	Tenn.	Va.	
Hemlock	4,287	0	0	0	0	4	22	4,313
Shortleaf pine	15,725	0	0	0	0	59	0	15,784
Virginia pine	2,014	0	0	0	0	0	0	2,014
Other pines	3,021	0	0	41	0	3	0	3,065
Eastern redcedar	2,381	0	0	0	0	0	0	2,381
Other softwoods	2,218	0	0	0	0	0	0	2,218
Total softwoods	29,646	0	0	41	0	66	22	29,775
Ash	9,050	45	53	0	0	181	105	9,434
Basswood	5,711	0	533	0	0	122	119	6,485
Beech	33,885	0	387	0	0	1,026	188	35,486
Cottonwood	3,195	367	33	215	0	82	0	3,892
Elm	4,433	160	33	0	0	32	8	4,666
Blackgum	8,358	172	701	37	0	271	46	9,585
Sweetgum	11,402	2,872	141	266	0	340	26	15,047
Hickory	42,985	1,797	677	175	0	1,037	418	47,089
Hard maple	13,062	142	145	0	0	289	289	13,927
Soft maple	11,951	931	62	123	0	132	85	13,284
Northern red oak	45,024	572	1,403	37	0	1,962	447	49,445
Black oak	55,136	325	891	106	0	253	238	56,949
Other red oaks	51,791	3,590	939	391	0	440	80	57,231
White oak	34,445	196	113	106	0	665	334	35,859
Chestnut oak	27,139	0	333	0	0	1,453	193	29,118
Other white oaks	3,949	0	0	37	0	84	0	4,070
Yellow-poplar	42,924	48	269	0	0	781	570	44,592
Sycamore	8,663	94	741	106	0	78	8	9,690
Black walnut	3,223	1	467	0	280	376	38	4,385
Other hardwoods	14,241	17	88	0	0	261	190	14,797
Total hardwoods	430,567	11,329	8,009	1,599	280	9,865	3,382	465,031
All species	460,213	11,329	8,009	1,640	280	9,931	3,404	494,806

Table 25.—Pulpwood production in Kentucky by species groups, 1955-1969¹

[In thousands of rough cords]

Year	All species	Softwoods	Hardwoods
1955	34.6	12.8	21.8
1956	53.4	25.0	28.4
1957	36.1	22.3	13.8
1958	35.1	16.3	18.8
1959	51.7	21.0	30.7
5-year total	210.9	97.4	113.5
1960	76.6	33.0	43.6
1961	73.4	31.6	41.8
1962	82.2	33.7	48.5
1963	72.4	37.5	34.9
1964	71.7	39.1	32.6
5-year total	376.3	174.9	201.4
1965	101.2	37.4	63.8
1966	114.0	30.1	83.9
1967	159.9	34.8	125.1
1968	177.1	29.9	147.2
1969	167.9	34.4	133.5
5-year total	720.1	166.6	553.5

¹Includes production from both roundwood and manufacturing plant residues.

Table 26.—Output of pulpwood from roundwood in Kentucky by species groups and regions, 1963-1969

[In thousands of rough cords]

Species group and region	Roundwood pulpwood output in—							
	1963	1964	1965	1966	1967	1968	1969	All years
Softwoods:								
Eastern	—	—	—	—	—	—	4.8	4.8
North Cumberland	9.1	7.8	12.5	3.1	3.6	3.3	.3	39.7
South Cumberland	24.6	24.0	23.5	22.3	19.7	19.8	18.0	151.9
Bluegrass	2.0	3.1	2.5	1.9	2.2	.9	2.1	14.7
Pennyroyal	1.7	2.1	3.5	2.8	2.4	2.5	2.3	17.3
West Coalfield	—	2.1	1.6	—	—	—	—	3.7
Western	—	—	—	—	—	—	—	—
All regions	37.4	39.1	43.6	30.1	27.9	26.5	27.5	232.1
Hardwoods:								
Eastern	0.1	—	—	—	—	0.2	—	0.3
North Cumberland	33.1	25.2	34.9	31.9	30.6	22.0	24.3	202.0
South Cumberland	.2	5.8	13.1	13.1	10.6	13.3	17.6	73.7
Bluegrass	.1	.1	.5	2.0	6.1	4.3	4.4	17.5
Pennyroyal	—	—	—	—	—	.3	2.8	3.1
West Coalfield	—	.2	6.2	5.7	5.3	15.2	5.7	38.3
Western	1.5	1.2	.2	3.8	5.4	1.1	1.3	14.5
All regions	35.0	32.5	54.9	56.5	58.0	56.4	56.1	349.4
All species	72.4	71.6	98.5	86.6	85.9	82.9	83.6	581.5

Table 27.—*Production of veneer logs and bolts in Kentucky by species and states where used, 1969¹*

[In thousands of board feet, International 1/4-inch rule]

Species	State where consumed								All States
	Ky.	Ind.	Mo.	N.C.	Ohio	Tenn.	Va.	W. Va.	
Ash	—	12	—	—	—	—	—	—	12
Black cherry	25	—	—	—	—	—	—	—	25
Cottonwood	—	162	1,629	—	—	—	—	—	1,791
Hickory	673	94	5	85	—	136	25	—	1,018
Soft maple	—	50	348	—	—	—	—	—	398
Red oaks	129	31	117	—	—	—	—	—	277
White oaks	—	50	—	42	—	—	—	—	92
Sycamore	25	125	117	—	—	63	—	—	330
Sweetgum	31	19	117	—	—	187	—	—	354
Black walnut	1,270	558	3	—	250	—	—	289	2,370
Yellow-poplar	100	100	—	3	—	625	—	—	828
Other hardwoods	116	7	—	—	—	—	—	—	123
All species	2,369	1,208	2,336	130	250	1,011	25	289	7,618

¹Veneer logs that were handled by brokers for overseas shipment are not included.Table 28.—*Consumption of veneer logs and bolts in Kentucky by species and states where cut, 1969*

[In thousands of board feet, International 1/4-inch rule]

Species	State where cut										All States
	Ky.	Ala.	Mich.	Tenn.	Ohio	Ill.	Ind.	Mo.	Iowa	Tex.	
Ash	—	—	—	—	6	—	6	—	—	—	12
Gum	31	40	—	—	—	—	—	—	—	—	71
Hickory	673	—	—	460	—	—	6	—	—	1,000	2,139
Hard maple	—	—	75	—	—	—	—	—	—	—	75
Yellow birch	—	—	70	—	—	—	—	—	—	—	70
Black cherry	25	—	—	—	—	—	—	—	—	—	25
Red oaks	129	—	25	—	4	—	—	—	—	—	158
Black walnut	1,270	—	—	275	390	340	450	300	275	—	3,300
Yellow-poplar	100	—	—	—	70	—	70	—	—	—	240
Other hardwoods	141	—	—	—	70	—	70	—	—	—	281
White oaks	—	—	—	—	300	—	300	—	—	—	600
All species	2,369	40	170	735	840	340	902	300	275	1,000	6,971

Table 29.—*White oak cooperage log and bolt production and receipts and number of operating cooperage mills in Kentucky for selected years, 1948-1969*

[Million board feet, International ¼-inch log rule]

Year	Number of operating mills	Volume received	Volume produced
1948	87	38.8	44.0
1958	19	19.4	22.3
1960	33	29.8	28.2
1962	26	20.5	21.0
1964	21	21.4	21.4
1969	23	22.4	20.8

Table 30.—*Total residues from primary wood-processing plants by industrial sources, types of residue, and by species groups, Kentucky, 1969*

[In thousands of cubic feet]

Industrial source ¹ and type of residue	All species	Soft-woods	Hard-woods
Sawmill industry:			
Coarse ²	19,489	1,056	18,433
Fine ³	11,045	951	10,094
Total	30,534	2,007	28,527
Cooperage industry:			
Coarse	1,039	—	1,039
Fine	727	—	727
Total	1,766	—	1,766
Other primary industries:			
Coarse	459	(⁴)	459
Fine	252	(⁴)	252
Total	711	(⁴)	711
All industries:			
Coarse	20,987	1,056	19,931
Fine	12,024	951	11,073
Total	33,011	2,007	31,004

¹Excludes woodpulp industry.

²Coarse residues include slabs, edgings, trimmings, and other material considered suitable for chipping.

³Fine residues include sawdust, shavings, and other material considered unsuitable for chipping.

⁴Less than 500 cubic feet.

Table 31.—*Volume of byproducts from primary wood-processing plants, by source industries, types of use, and species groups, Kentucky, 1969*

[In thousands of cubic feet]

Source industry ¹	Type of use	All species	Softwoods	Hardwoods
Lumber	Fiber ²	10,071	508	9,563
	Charcoal	2,097	70	2,027
	Fuel ³	1,594	60	1,534
	Agricultural ⁴	594	14	580
	Other ⁵	430	19	411
	All uses	14,786	671	14,115
Cooperage	Fiber	185	—	185
	Charcoal	640	—	640
	Fuel	187	—	187
	Agricultural	124	—	124
	All uses	1,136	—	1,136
Other industries ...	Fiber	243	(⁶)	243
	Charcoal	45	(⁶)	45
	Fuel	37	(⁶)	37
	Agricultural	14	(⁶)	14
	Other	9	(⁶)	9
	All uses	348	(⁶)	348
All industries	Fiber	10,499	508	9,991
	Charcoal	2,782	70	2,712
	Fuel	1,818	60	1,758
	Agricultural	732	14	718
	Other	439	19	420
	Total	16,270	671	15,599

¹Excludes woodpulp industry.

²Includes 6,744 thousand cubic feet of residues for pulp along with residues for flakeboard.

³Includes all residues used as domestic or industrial fuel whether sold or given away.

⁴Includes both chicken litter and livestock bedding.

⁵Includes residues used for specialty and small dimension items.

⁶Less than 500 cubic feet.

Table 32.—*Volume of unused sawmill residues by geographic regions, species groups, and types of residues, Kentucky, 1969*

[In thousands of cubic feet]

Geographic region	All species		Softwoods		Hardwoods	
	Fine	Coarse	Fine	Coarse	Fine	Coarse
Eastern	1,410	639	115	10	1,295	629
North Cumberland	1,358	1,286	135	92	1,223	1,194
South Cumberland	1,599	994	388	157	1,211	837
Bluegrass	373	219	32	25	341	194
Pennyroyal	1,838	1,268	208	133	1,630	1,135
West Coalfield	2,629	1,445	9	4	2,620	1,441
Western	495	195	15	14	480	181
All units	9,702	6,046	902	435	8,800	5,611

Table 33.—*Production¹ and disposition of bark residues by primary wood manufacturers in Kentucky, by uses, species groups, and regions, 1969*

[Tons, dry weight]

Species group and region	Total production	Used		Unused
		Fuel	Other uses ²	
Softwoods:				
Eastern	884	47	—	837
North Cumberland	1,131	18	—	1,113
South Cumberland	2,140	75	—	2,065
Bluegrass	192	3	—	189
Pennyroyal	1,335	63	—	1,272
West Coalfield	52	16	—	36
Western	106	—	—	106
All regions	5,840	222	—	5,618
Hardwoods:				
Eastern	20,726	1,078	—	19,648
North Cumberland	22,336	284	590	21,462
South Cumberland	28,437	1,958	4,847	21,632
Bluegrass	4,584	559	—	4,025
Pennyroyal	37,198	3,035	6,147	28,016
West Coalfield	56,501	2,665	4,001	49,835
Western	9,596	326	1,169	8,101
All regions	179,378	9,905	16,754	152,719
All species	185,218	10,127	16,754	158,337

¹Includes only bark concentrated at primary manufacturing plants, whether these plants employ a debarker or not.

²Includes charcoal production, mulches, and soil stabilizers.