

Predicted Cubic-foot Yields of Lumber, Sawdust, and Sawmill Residue from the Sawtimber Portions of Hardwood Trees

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ABSTRACT

We have presented prediction equations and tables for estimating the gross cubic-foot volume of sawtimber for hardwood trees, and cubic-foot yields of lumber, sawdust, and sawmill residue that are produced during the sawing process. Yields are presented for northern red oak, black oak, white oak, chestnut oak, red maple, sugar maple, yellow-poplar, yellow birch, paper birch, and basswood.

Predicted Cubic-foot Yields of Lumber, Sawdust, and Sawmill Residue from the Sawtimber Portions of Hardwood Trees

SINCE THE TURN of the century, much has been written about the board foot versus the cubic foot as the standard measure for tree volume. Now, after many years, the cubic-foot measure is being viewed more favorably.

The board-foot measure has been used for trees that are sawed into lumber, and this practice will continue for some time. But, if lumber volume is measured in board feet, why not use the same unit for measuring log and tree volumes? On the surface this may appear reasonable, but utilization practices have changed; the multiproduct tree is now on the scene. Veneer, chips, sawdust, and, of course, lumber, are all being marketed from the same tree. And each of these products requires a separate unit of measure.

Initially we have to account for the total wood content of a tree; this requires a unit of measure that can be used without regard for the product that is marketed from that tree. The cubic foot is such a measure, and cubic-foot tree volume can be related meaningfully to any end product.

The cubic-foot volumes of end products in this paper represent the output of several sawmills. The trees that were processed through the mills varied in size, straightness, and interior defect; the mills' cutting schedules also varied. Therefore we are not presenting case histories for specific sawmills and the surrounding timber, but species averages that will be useful to timber sellers and buyers.

SAMPLE

The trees used for this study were selected in groups of about 50 at 45 locations in 16 states (figs. 1-10). We measured the diameter at breast height (dbh) on standing trees, and measured the merchantable height after the trees were felled. The merchantable height included all logs that qualified as local use or better.¹ Inside bark diameter at each end of a log was measured to the nearest 0.1 inch, and length was measured to the nearest 0.1 foot. Log lengths ranged from 8 to 16 feet, and averaged about 12 feet. The logs were sawed, and nominal green board widths, lengths, and thicknesses were recorded for all lumber that was produced from the sawing. Ninety-five percent of the lumber volume was sawed in thicknesses of 4/4, 5/4, 6/4, and 8/4 inch. We numbered the logs and boards so that all boards from a tree could be identified.

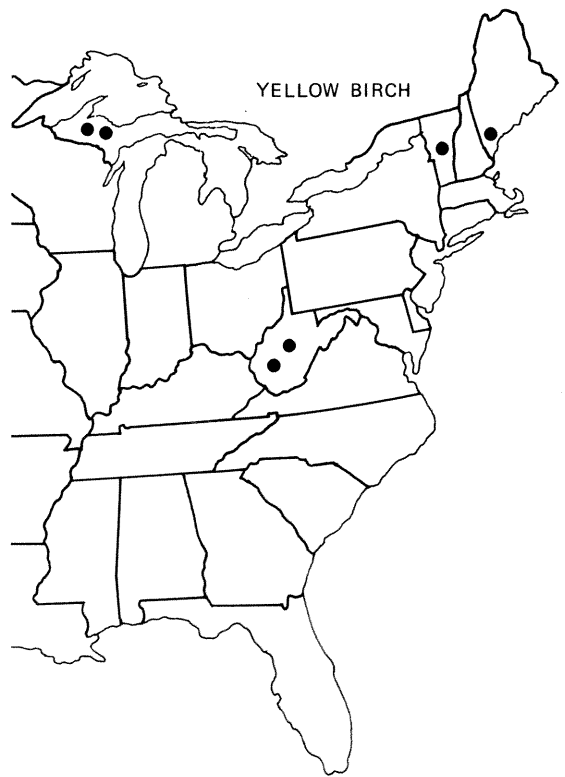
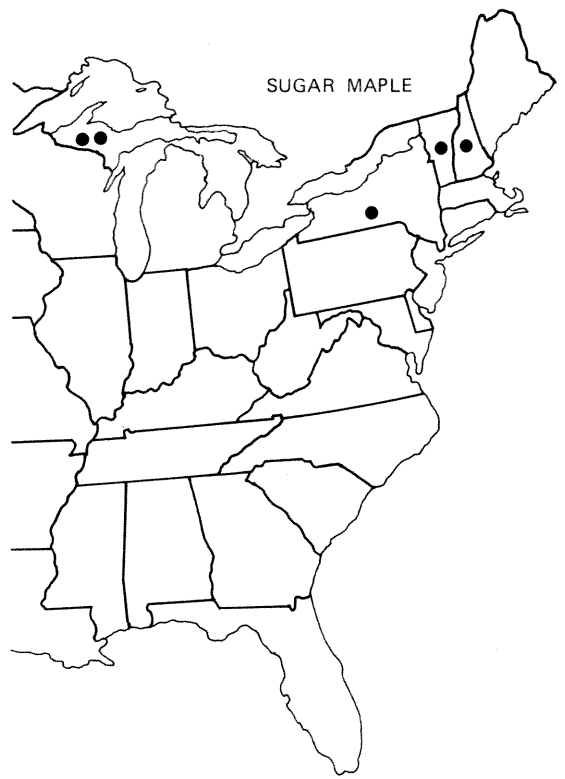
For each of the 10 species that we studied, data were separated by trees that were sawed at band mills and those sawed at circular mills. Because we required a minimum sample of 100 trees for inclusion in the analysis, our investigation at circular mills was limited to red maple, yellow-poplar, yellow birch, and paper birch.

A total of 1,802 trees from all species were sawed at band mills; 790 trees were sawed at cir-

¹ A local-use class log must scale at least 8 inches in diameter inside bark (dib) by 8 feet long, and it must be one-third sound.

Figures 1-10.—Location of general areas where sample trees for each species were cut.







cular mills. Because of the 100-tree minimum, 242 of the trees that were sawed at circular mills were available only for calculating the gross tree volumes (table 1).

DEPENDENT VARIABLES

Gross Tree Volume

Gross tree volume is the volume inside bark from the top of the stump to the top of the last sawlog. To calculate the actual gross tree volume, we added the cubic-foot volumes for all bucked sections, using this equation:

Sectional
cubic-foot

$$\text{volume} = .001818 (D^2 + Dd + d^2) L$$

D = inside bark diameter of large
end

d = inside bark diameter of small
end

L = log length

This equation produces the volume for a conoid, and has been used extensively for estimating the cubic-foot volume for logs. Because of butt-flare, the first log was divided at breast height, and volumes were determined for each section.

We used the equation to compute the cubic-foot volume of sawlogs for five groups of trees. We compared these volumes with those that were computed from measurements obtained with a Barr and Stroud dendrometer, a very accurate measuring device.²

² The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute endorsement or approval by the Forest Service or the U.S. Department of Agriculture of any product or service to the exclusion of others that may be suitable.

<i>Species</i>	<i>Number of trees</i>	<i>Dendrometer</i>	<i>Equation</i>	<i>Percent difference</i>
		----- <i>ft</i> ³ -----		
Black oak	43	2,752	2,755	+0.1
White oak	88	4,382	4,350	-0.7
Yellow-poplar	66	4,278	4,313	+0.8
Yellow-poplar	53	3,749	3,713	-1.0
Basswood	45	1,988	1,965	-1.2

The closeness of the sawlog volumes for each tree group indicates that our equation provides a good base from which to work.

Lumber Volume

Lumber volume is the cubic-foot volume of green lumber that is produced during the sawing of all sawlogs from a tree. We did not measure the actual dimensions of the lumber sawed from study trees; instead, we recorded nominal sizes and adjusted them to industry averages. These averages were then used to estimate cubic-foot volume. To determine the industry averages, we visited several mills and measured actual sizes of green lumber; other research groups provided similar data. As expected, the actual width of rough hardwood boards is random; this means that the industry average width of boards in the 7-inch class is 7.0 inches. We found that the industry practice for trimming hardwood lumber is to leave 2 inches of trim beyond the nominal length. Therefore we added 2 inches to the nominal length of every board.

It was more difficult to determine the industry average thickness for each thickness class because the thickness for each class varied within and between mills. The average thicknesses that we used for the nominal thicknesses of lumber were:

<i>Nominal thickness (inches)</i>	<i>Average thickness (inches)</i>
3/8	0.45
2/4	.60
5/8	.70
3/4	.90
4/4	1.15

5/4	1.40
6/4	1.65
7/4	1.95
8/4	2.20
9/4	2.50
10/4	2.70
3-10 ³	nominal

Therefore, the cubic-foot volume of each board that is sawed from the study trees is the product of nominal width, nominal length plus 2 inches, and average thickness.

Sawdust Volume

Sawdust volume is the cubic-foot volume of solid wood that was converted to sawdust during the sawing of all sawlogs from a tree. The sawdust volume equals the kerf multiplied by the sum of the area that is included in both edges and one surface of each board. We used kerfs of 17/64 and 10/64 for lumber sawed at circular and band mills, respectively.

Sawmill Residue Volume

Sawmill residue volume is the cubic-foot volume of a tree—including rot and voids—that reaches the mill and is not converted to lumber or sawdust. We calculated this volume for each tree by subtracting the cubic-foot volumes of lumber and sawdust from the gross cubic-foot volume of sawlog material.

³ A small amount of timber and sound square-edge material was sawed in these sizes; when sawed properly, this material was sized to nominal thickness.

Table 1.—Regression coefficients and statistics for 10 species of hardwoods

Volume of:	Independent variables				Number of trees	SE	R ²	Means		
	Constant	Dbh ²	Merchantable height	Dbh ² x Merchantable height				Dbh	Merchantable height	Volume
						f^3		in	ft	ft^3
NORTHERN RED OAK										
Sawtimber (gross)	-0.3881	0.039417	0.0868	0.002328	207	7.3	0.97	23.8	41.6	85.9
Lumber (band)	4.8744	.003100	-.2392	.002262	207	8.6	.93	23.8	41.6	54.5
Sawdust (band)	.5149	.000982	-.0075	.000305	207	1.1	.94	23.8	41.6	8.6
Sawmill residue	-7.3598	.034009	.3933	-.000283	207	6.9	.49	23.8	41.6	21.9
WHITE OAK										
Sawtimber (gross)	-5.3835	.054092	.1215	.002184	369	5.6	.98	19.7	38.0	57.3
Lumber (band)	1.3601	.023486	-.1751	.001814	304	6.9	.93	20.1	40.2	36.9
Sawdust (band)	-.3244	.004662	.0017	.000240	304	1.0	.93	20.1	40.2	6.0
Sawmill residue	-8.6249	.032797	.3701	-.000106	369	5.5	.67	19.7	38.0	17.2
BLACK OAK										
Sawtimber (gross)	2.0988	.034454	-.0597	.002662	224	7.1	.97	20.6	40.4	67.4
Lumber (band)	-.5110	.021918	-.0877	.001851	182	6.6	.95	20.7	41.3	42.9
Sawdust (band)	-.5027	.003953	.0106	.000239	182	1.0	.95	20.7	41.3	6.5
Sawmill residue	3.1353	.009322	.0048	.000553	224	4.6	.80	20.6	40.4	18.4
CHESTNUT OAK										
Sawtimber (gross)	1.2038	.030685	-.0533	.002628	325	4.9	.98	19.3	34.8	49.0
Lumber (band)	8.5231	-.004667	-.3550	.002418	278	6.3	.94	19.6	35.0	30.3
Sawdust (band)	.8519	.000404	-.0262	.000326	278	.9	.95	19.6	35.0	5.0
Sawmill residue	-5.9021	.025836	.2844	.000033	325	3.9	.77	19.3	34.8	14.7
RED MAPLE										
Sawtimber (gross)	-8.2716	.067257	.2919	.001582	290	4.5	0.96	16.8	37.7	41.6
Lumber band	-3.3243	.038318	.0645	.001239	148	2.8	.93	15.4	35.8	19.8
circular	-6.6517	.033630	.1033	.001199	131	5.1	.91	18.0	39.9	26.1
Sawdust band	-.8697	.007539	.0363	.000116	148	.4	.94	15.4	35.8	3.4
circular	-1.5823	.008581	.0323	.000344	131	1.5	.91	18.0	39.9	7.5
Sawmill residue	-6.5433	.043444	.2590	-.000293	290	3.8	.66	16.8	37.7	12.7
SUGAR MAPLE										
Sawtimber (gross)	-3.0969	.047412	.1522	.001972	302	4.4	.98	19.9	36.0	53.6
Lumber (band)	-.9914	.022793	.0712	.001209	247	5.6	.90	20.0	35.0	30.2
Sawdust (band)	.0855	.002969	.0165	.000173	247	.7	.91	20.0	35.0	4.6
Sawmill residue	-2.8548	.027218	.0848	.000343	302	5.2	.74	19.9	36.0	17.0

YELLOW-POPLAR

Sawtimber (gross)	2.1321	.041200	-.0853	.002540	334	5.6	.97	19.4	49.8	65.5
Lumber										
band	.0437	.036323	-.1723	.001789	164	5.8	.94	19.2	48.7	40.2
circular	-.4148	.026306	-.0905	.001659	170	4.7	.95	19.6	50.9	40.6
Sawdust										
band	.0807	.004333	-.0174	.000303	164	1.0	.94	19.2	48.7	6.8
circular	-.0939	.005563	-.0078	.000484	170	1.3	.95	19.6	50.9	12.0
Sawmill residue	1.1260	.006653	.1015	.000318	334	4.4	.60	19.4	49.8	15.2

PAPER BIRCH

Sawtimber (gross)	1.0228	.031134	.0240	.002639	107	2.2	.96	15.5	32.9	30.7
Lumber										
band	.9502	.011203	-.0476	.001575	107	2.2	.86	15.5	32.9	14.8
Sawdust (circular)	.2882	.002978	-.0035	.000469	107	.6	.87	15.5	32.9	4.7
Sawmill residue	-.2709	.016963	.0771	.000590	107	2.2	.69	15.5	32.9	11.2

YELLOW BIRCH

Sawtimber (gross)	-.6746	.042149	.0480	.002116	289	4.0	.98	18.4	32.9	42.7
Lumber										
band	1.2459	.014880	-.1192	.001693	149	5.1	.94	19.0	34.0	26.4
circular	-2.9289	.028893	.0518	.001075	140	3.3	.93	17.8	31.8	20.4
Sawdust										
band	.6902	.000377	-.0271	.000328	149	1.0	.92	19.0	34.0	4.5
circular	-.2540	.005756	.0183	.000344	140	1.0	.92	17.8	31.8	6.1
Sawmill residue	-.5104	.016796	.1118	.000344	289	4.4	.70	18.4	32.9	13.4

BASSWOOD

Sawtimber (gross)	-11.6496	.076817	.3247	.001426	145	3.8	.97	16.6	43.4	43.2
Lumber (band)	-9.6836	.044338	.2508	.000819	123	4.9	.89	16.7	43.0	24.8
Sawdust (band)	-1.9536	.007502	.0572	.000129	123	.8	.89	16.7	43.0	4.4
Sawmill residue	2.1330	.015172	-.0364	.000638	145	3.4	.78	16.6	43.4	13.3

RESULTS

Prediction Equations

For each species and dependent variable, standard regression procedures were used to calculate equations of the following form:

cubic-foot

$$\text{volume} = a + b (\text{dbh})^2 + c (\text{merchantable height}) + d (\text{dbh}^2 \times \text{merchantable height}).$$

Cubic-foot regression coefficients and related data are shown in table 1.

Gross tree volumes and sawmill residue volumes are not affected by kerf size, so all trees were used when these variables were investigated. However, kerf size does influence lumber and sawdust volumes, so the equations for these variables are identified by type of headsaw.

Cubic-foot tables

For each species, the prediction equations were solved for various size classes, and the cubic-foot volumes of sawmill products were obtained by band or circular mills, or both (tables 2-14). The boxed area in each table indicates the size classes that were included in our sample trees. Differences between gross tree volume and the sum of lumber, sawdust, and sawmill residue volumes may be attributed to cull sections within the merchantable stem that were bucked out and left in the woods. The volumes that are outside of the boxed areas should be used with caution.

DISCUSSION

Gross Tree Volume

Gross tree volumes are of interest to those who purchase and sell timber on a cubic-foot basis. From the predicted gross cubic-foot volumes we learned that differences in volume between species were often small. To test whether these differences were significant, we conducted F-tests on the residual mean squares. The results indicated that there were significant differences between species, so we have included separate equations and tables for each species. If a user does not feel that the differences

between species are meaningful, he may combine two or more species and create a composite table for gross cubic-foot volume.

Lumber Volume

For three species we tabulated cubic-foot lumber volumes for both band and circular mills. We expected the band mills to produce greater volumes of lumber than the circular mills; this was true for red maple in every tree size. However the small yellow-poplar and yellow birch trees that were processed through circular mills yielded more lumber than did comparable trees processed through band mills. This can happen for many reasons, but an inspection of the log scales showed that the band mills yielded less lumber from these two species because of a large amount of scalable defect in several logs that were sawed at these mills. Defect in the trees was not considered in the equations because the benefits gained would not offset the difficulties encountered in estimating the defect.

When using the predicted cubic-foot volumes of lumber for small yellow-poplar and yellow birch trees, one should be aware of the inconsistency between volumes for band and circular mills. Use the circular mill volumes as is; use the band mill volumes as is, or adjust them upward to circular mill volumes.

Sawdust Volume

Sawdust volume is directly related to kerf size. For a kerf size that differs from the size that we used (band: 10/64; circular: 17/64), an adjusted sawdust volume can be determined by this equation:

$$\begin{array}{l} \text{Adjusted} \\ \text{sawdust} \\ \text{volume} \end{array} = \begin{array}{l} \text{Published} \\ \text{sawdust} \\ \text{volume} \end{array} \times \frac{\text{new kerf}}{10/64 \text{ or } 17/64}$$

To adjust the sawdust volumes for red maple, yellow-poplar, or yellow birch, select the kerf that is closest to what your mill is using. The sawdust volumes that are derived for that kerf are the volumes that you will adjust.

TEXT CONTINUES ON PAGE 22.

TABLE 2.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM NORTHERN RED OAK BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	4.9	4.8	4.7	4.6	4.5	4.4	4.2
	SAWDUST	1.2	1.3	1.5	1.7	1.9	2.1	2.3
	RESIDUE	4.8	7.7	10.6	13.6	16.5	19.4	22.3
	GROSS TREE	11.2	13.8	16.3	18.9	21.5	24.0	26.6
11	LUMBER	6.1	6.4	6.6	6.9	7.2	7.5	7.7
	SAWDUST	1.3	1.6	1.8	2.0	2.3	2.5	2.8
	RESIDUE	5.4	8.2	11.1	14.0	16.9	19.7	22.6
	GROSS TREE	13.2	16.2	19.1	22.1	25.0	28.0	30.9
12	LUMBER	7.4	8.1	8.8	9.5	10.2	10.9	11.6
	SAWDUST	1.5	1.8	2.1	2.4	2.7	3.0	3.3
	RESIDUE	6.0	8.8	11.6	14.5	17.3	20.1	22.9
	GROSS TREE	15.4	18.8	22.2	25.5	28.9	32.3	35.7
13	LUMBER	8.8	10.0	11.1	12.3	13.4	14.6	15.7
	SAWDUST	1.7	2.1	2.4	2.8	3.1	3.5	3.9
	RESIDUE	6.7	9.4	12.2	15.0	17.7	20.5	23.3
	GROSS TREE	17.8	21.6	25.5	29.3	33.2	37.0	40.9
14	LUMBER	10.4	12.0	13.6	15.3	16.9	18.5	20.2
	SAWDUST	2.0	2.4	2.8	3.2	3.6	4.1	4.5
	RESIDUE	7.4	10.1	12.8	15.5	18.2	20.9	23.6
	GROSS TREE	20.4	24.7	29.1	33.4	37.8	42.1	46.4
15	LUMBER	12.0	14.2	16.4	18.5	20.7	22.8	25.0
	SAWDUST	2.2	2.7	3.2	3.7	4.2	4.6	5.1
	RESIDUE	8.2	10.8	13.5	16.1	18.8	21.4	24.0
	GROSS TREE	23.1	28.0	32.9	37.8	42.7	47.6	52.4
16	LUMBER	13.8	16.5	19.3	22.0	24.7	27.4	30.1
	SAWDUST	2.3	3.0	3.6	4.2	4.7	5.3	5.8
	RESIDUE	9.0	11.6	14.2	16.7	19.3	21.9	24.4
	GROSS TREE	26.1	31.6	37.0	42.5	47.9	53.4	58.9
17	LUMBER	15.7	19.0	22.4	25.7	29.0	32.3	35.6
	SAWDUST	2.7	3.4	4.0	4.7	5.3	6.0	6.6
	RESIDUE	9.9	12.4	14.9	17.4	19.9	22.4	24.9
	GROSS TREE	29.2	35.3	41.4	47.5	53.5	59.6	65.7
18	LUMBER	17.7	21.7	25.6	29.6	33.5	37.5	41.4
	SAWDUST	3.0	3.8	4.5	5.2	5.9	6.7	7.4
	RESIDUE	10.9	13.3	15.7	18.1	20.5	23.0	25.4
	GROSS TREE	32.6	39.3	46.0	52.8	59.5	66.2	72.9
19	LUMBER	19.9	24.5	29.1	33.7	38.3	42.9	47.6
	SAWDUST	3.3	4.2	5.0	5.8	6.6	7.4	8.3
	RESIDUE	11.9	14.2	16.6	18.9	21.2	23.6	25.9
	GROSS TREE	36.1	43.5	50.9	58.3	65.8	73.2	80.6
20	LUMBER	22.1	27.4	32.7	38.1	43.4	48.7	54.0
	SAWDUST	3.7	4.6	5.5	6.4	7.3	8.2	9.2
	RESIDUE	13.0	15.2	17.4	19.7	21.9	24.2	26.4
	GROSS TREE	39.8	48.0	56.1	64.2	72.4	80.5	88.7
21	LUMBER	24.4	30.5	36.6	42.6	48.7	54.8	60.8
	SAWDUST	4.0	5.0	6.0	7.0	8.1	9.1	10.1
	RESIDUE	14.1	16.2	18.4	20.5	22.7	24.8	27.0
	GROSS TREE	43.7	52.6	61.5	70.4	79.3	88.3	97.2
22	LUMBER	26.9	33.8	40.6	47.4	54.3	61.1	68.0
	SAWDUST	4.4	5.5	6.6	7.7	8.8	10.0	11.1
	RESIDUE	15.3	17.3	19.4	21.4	23.5	25.5	27.6
	GROSS TREE	47.8	57.5	67.2	76.9	86.6	96.4	106.1
23	LUMBER	29.5	37.2	44.8	52.5	60.1	67.8	75.4
	SAWDUST	4.7	6.0	7.2	8.4	9.6	10.9	12.1
	RESIDUE	16.5	18.4	20.4	22.3	24.3	26.2	28.2
	GROSS TREE	52.1	62.6	73.2	83.7	94.3	104.8	115.4
24	LUMBER	32.2	40.7	49.2	57.7	66.2	74.7	83.2
	SAWDUST	5.1	6.5	7.8	9.2	10.5	11.8	13.2
	RESIDUE	17.8	19.6	21.4	23.3	25.1	27.0	28.8
	GROSS TREE	56.6	68.0	79.4	90.8	102.3	113.7	125.1
25	LUMBER	35.0	44.4	53.8	63.2	72.6	82.0	91.4
	SAWDUST	5.5	7.0	8.5	9.9	11.4	12.8	14.3
	RESIDUE	19.1	20.8	22.6	24.3	26.0	27.7	29.5
	GROSS TREE	61.3	73.6	85.9	98.3	110.6	122.9	135.3
26	LUMBER	37.9	48.2	58.6	68.9	79.2	89.5	99.8
	SAWDUST	5.9	7.5	9.1	10.7	12.3	13.9	15.5
	RESIDUE	20.5	22.1	23.7	25.3	26.9	28.6	30.2
	GROSS TREE	66.1	79.4	92.7	106.0	119.2	132.5	145.8
27	LUMBER	41.0	52.2	63.5	74.8	86.1	97.4	108.6
	SAWDUST	6.4	8.1	9.8	11.5	13.3	15.0	16.7
	RESIDUE	21.9	23.4	24.9	26.4	27.9	29.4	30.9
	GROSS TREE	71.2	85.4	99.7	114.0	128.2	142.5	156.8
28	LUMBER	44.1	56.4	68.7	80.9	93.2	105.5	117.8
	SAWDUST	6.8	8.7	10.5	12.4	14.3	16.1	18.0
	RESIDUE	23.4	24.8	26.2	27.5	28.9	30.3	31.6
	GROSS TREE	76.4	91.7	107.0	122.3	137.6	152.9	168.2
29	LUMBER	47.4	60.7	74.0	87.3	100.6	113.9	127.2
	SAWDUST	7.3	9.3	11.3	13.3	15.3	17.3	19.3
	RESIDUE	25.0	26.2	27.5	28.7	29.9	31.2	32.4
	GROSS TREE	81.8	98.2	114.5	130.9	147.3	163.6	180.0
30	LUMBER	50.8	65.2	79.5	93.9	108.3	122.6	137.0
	SAWDUST	7.8	9.9	12.1	14.2	16.4	18.5	20.6
	RESIDUE	26.6	27.7	28.8	29.9	31.0	32.1	33.2
	GROSS TREE	87.5	104.9	122.4	139.8	157.3	174.7	192.2

TABLE 3.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM WHITE OAK BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	3.9	3.9	4.0	4.0	4.1	4.1	4.2
	SAWDUST	0.8	1.0	1.2	1.4	1.6	1.8	2.0
	RESIDUE	3.3	1.2	9.0	11.9	14.8	17.7	20.5
	GROSS TREE	8.2	10.9	13.6	16.3	19.1	21.8	24.5
11	LUMBER	5.3	5.6	6.0	6.3	6.7	7.0	7.4
	SAWDUST	1.0	1.2	1.5	1.7	2.0	2.2	2.5
	RESIDUE	3.9	6.8	9.6	12.5	15.4	18.2	21.1
	GROSS TREE	10.4	13.5	16.6	19.7	22.8	25.9	28.9
12	LUMBER	6.8	7.5	8.2	8.9	9.6	10.3	10.9
	SAWDUST	1.2	1.5	1.8	2.1	2.4	2.7	3.0
	RESIDUE	4.6	7.5	10.3	13.1	16.0	18.8	21.6
	GROSS TREE	12.9	16.4	19.8	23.3	26.8	30.3	33.8
13	LUMBER	8.5	9.5	10.6	11.6	12.7	13.7	14.8
	SAWDUST	1.5	1.8	2.2	2.5	2.8	3.2	3.5
	RESIDUE	5.4	8.2	11.0	13.8	16.6	19.5	22.3
	GROSS TREE	15.5	19.5	23.4	27.3	31.2	35.2	39.1
14	LUMBER	10.3	11.7	13.2	14.6	16.1	17.5	19.0
	SAWDUST	1.8	2.1	2.5	2.9	3.3	3.7	4.1
	RESIDUE	6.2	9.0	11.8	14.6	17.4	20.2	23.0
	GROSS TREE	18.4	22.8	27.2	31.6	36.0	40.4	44.8
15	LUMBER	12.2	14.1	16.0	17.8	19.7	21.6	23.4
	SAWDUST	2.1	2.5	3.0	3.4	3.8	4.3	4.7
	RESIDUE	7.1	9.8	12.6	15.4	18.1	20.9	23.7
	GROSS TREE	21.5	26.4	31.3	36.2	41.1	46.0	50.9
16	LUMBER	14.3	16.6	18.9	21.3	23.6	25.9	28.2
	SAWDUST	2.4	2.9	3.4	3.9	4.4	4.9	5.4
	RESIDUE	8.0	10.7	13.5	16.2	19.0	21.7	24.5
	GROSS TREE	24.8	30.2	35.7	41.1	46.6	52.0	57.5
17	LUMBER	16.5	19.3	22.1	24.9	27.7	30.5	33.3
	SAWDUST	2.7	3.3	3.9	4.4	5.0	5.6	6.1
	RESIDUE	9.0	11.7	14.4	17.1	19.9	22.6	25.3
	GROSS TREE	28.3	34.3	40.4	46.4	52.4	58.4	64.4
18	LUMBER	18.9	22.2	25.5	28.8	32.1	35.4	38.7
	SAWDUST	3.1	3.7	4.4	5.0	5.6	6.3	6.9
	RESIDUE	10.1	12.7	15.4	18.1	20.8	23.5	26.2
	GROSS TREE	32.0	38.7	45.3	51.9	58.6	65.2	71.8
19	LUMBER	21.4	25.2	29.0	32.9	36.7	40.5	44.4
	SAWDUST	3.5	4.2	4.9	5.6	6.3	7.0	7.7
	RESIDUE	11.2	13.8	16.5	19.1	21.8	24.5	27.1
	GROSS TREE	36.0	43.3	50.5	57.8	65.1	72.4	79.7
20	LUMBER	24.0	28.4	32.8	37.2	41.6	46.0	50.4
	SAWDUST	3.9	4.7	5.4	6.2	7.0	7.8	8.6
	RESIDUE	12.4	15.0	17.6	20.2	22.8	25.5	28.1
	GROSS TREE	40.1	48.1	56.1	64.0	72.0	79.9	87.9
21	LUMBER	26.7	31.7	36.7	41.7	46.7	51.7	56.7
	SAWDUST	4.3	5.2	6.0	6.9	7.8	8.6	9.5
	RESIDUE	13.6	16.2	18.8	21.4	23.9	26.5	29.1
	GROSS TREE	44.5	53.2	61.9	70.5	79.2	87.9	96.6
22	LUMBER	29.6	35.2	40.8	46.5	52.1	57.7	63.3
	SAWDUST	4.8	5.7	6.6	7.5	8.5	9.5	10.4
	RESIDUE	14.9	17.5	20.0	22.6	25.1	27.7	30.2
	GROSS TREE	49.1	58.5	67.9	77.4	86.8	96.2	105.7
23	LUMBER	32.6	38.9	45.2	51.4	57.7	64.0	70.3
	SAWDUST	5.2	6.3	7.3	8.3	9.3	10.4	11.4
	RESIDUE	16.3	18.8	21.3	23.8	26.3	28.8	31.3
	GROSS TREE	53.9	64.1	74.3	84.5	94.7	104.9	115.2
24	LUMBER	35.8	42.7	49.7	56.6	63.6	70.6	77.5
	SAWDUST	5.7	6.8	8.0	9.1	10.2	11.3	12.4
	RESIDUE	17.7	20.2	22.6	25.1	27.6	30.0	32.5
	GROSS TREE	58.9	69.9	81.0	92.0	103.0	114.1	125.1
25	LUMBER	39.0	46.7	54.4	62.1	69.7	77.4	85.1
	SAWDUST	6.2	7.4	8.7	9.9	11.1	12.3	13.5
	RESIDUE	19.2	21.6	24.0	26.5	28.9	31.3	33.8
	GROSS TREE	64.1	76.0	87.9	99.8	111.7	123.6	135.5
26	LUMBER	42.5	50.9	59.3	67.7	76.1	84.5	92.9
	SAWDUST	6.8	8.1	9.4	10.7	12.0	13.3	14.6
	RESIDUE	20.7	23.1	25.5	27.9	30.3	32.6	35.0
	GROSS TREE	69.5	82.3	95.1	107.9	120.7	133.4	146.2
27	LUMBER	46.0	55.2	64.4	73.6	82.7	91.9	101.1
	SAWDUST	7.3	8.7	10.1	11.6	13.0	14.4	15.8
	RESIDUE	22.3	24.7	27.0	29.3	31.7	34.0	36.4
	GROSS TREE	75.2	88.9	102.6	116.3	130.0	143.7	157.4
28	LUMBER	49.7	59.7	69.7	79.6	89.6	99.6	109.6
	SAWDUST	7.9	9.4	10.9	12.4	14.0	15.5	17.1
	RESIDUE	24.0	26.3	28.6	30.9	33.2	35.5	37.8
	GROSS TREE	81.0	95.7	110.4	125.0	139.7	154.4	169.1
29	LUMBER	53.5	64.3	75.1	85.9	96.7	107.5	118.3
	SAWDUST	8.5	10.1	11.7	13.4	15.0	16.6	18.3
	RESIDUE	25.7	27.9	30.2	32.4	34.7	36.9	39.2
	GROSS TREE	87.1	102.8	118.4	134.1	149.8	165.4	181.1
30	LUMBER	57.5	69.1	80.8	92.5	104.1	115.8	127.4
	SAWDUST	9.1	10.8	12.6	14.3	16.1	17.8	19.5
	RESIDUE	27.5	29.7	31.9	34.1	36.3	38.5	40.7
	GROSS TREE	93.4	110.1	126.8	143.5	160.2	176.9	193.6

TABLE 4.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM BLACK OAK BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	4.0	4.8	5.6	6.4	7.1	7.9	8.7
	SAWDUST	0.7	1.0	1.3	1.5	1.8	2.1	2.4
	RESIDUE	5.5	6.0	6.5	7.0	7.4	7.9	8.4
	GROSS TREE	10.5	12.2	13.8	15.5	17.1	18.8	20.4
11	LUMBER	5.4	6.5	7.6	8.7	9.8	10.9	12.0
	SAWDUST	0.9	1.2	1.6	1.9	2.2	2.5	2.8
	RESIDUE	6.0	6.6	7.1	7.7	8.3	8.9	9.4
	GROSS TREE	12.6	14.7	16.8	18.9	21.0	23.1	25.2
12	LUMBER	6.9	8.4	9.8	11.2	12.7	14.1	15.5
	SAWDUST	1.1	1.5	1.9	2.2	2.6	2.9	3.3
	RESIDUE	6.5	7.2	7.9	8.5	9.2	9.9	10.6
	GROSS TREE	14.8	17.4	20.0	22.6	25.2	27.8	30.4
13	LUMBER	8.6	10.4	12.2	14.0	15.8	17.6	19.4
	SAWDUST	1.4	1.8	2.2	2.6	3.0	3.4	3.8
	RESIDUE	7.1	7.9	8.6	9.4	10.2	11.0	11.8
	GROSS TREE	17.3	20.4	23.5	26.7	29.8	32.9	36.0
14	LUMBER	10.4	12.6	14.8	17.0	19.2	21.4	23.6
	SAWDUST	1.7	2.1	2.6	3.0	3.5	3.9	4.4
	RESIDUE	7.7	8.6	9.5	10.4	11.3	12.2	13.1
	GROSS TREE	19.9	23.6	27.3	31.0	34.7	38.4	42.1
15	LUMBER	12.3	14.9	17.6	20.2	22.8	25.5	28.1
	SAWDUST	1.9	2.4	3.0	3.5	4.0	4.5	5.0
	RESIDUE	8.3	9.4	10.4	11.4	12.5	13.5	14.5
	GROSS TREE	22.8	27.1	31.4	35.7	40.0	44.4	48.7
16	LUMBER	14.4	17.5	20.5	23.6	26.7	29.8	32.9
	SAWDUST	2.2	2.8	3.4	4.0	4.5	5.1	5.7
	RESIDUE	9.0	10.2	11.4	12.5	13.7	14.9	16.1
	GROSS TREE	25.8	30.8	35.8	40.8	45.7	50.7	55.7
17	LUMBER	16.6	20.1	23.7	27.3	30.9	34.4	38.0
	SAWDUST	2.6	3.2	3.8	4.5	5.1	5.7	6.4
	RESIDUE	9.8	11.1	12.4	13.7	15.0	16.4	17.7
	GROSS TREE	29.1	34.8	40.4	46.1	51.8	57.5	63.1
18	LUMBER	18.9	23.0	27.1	31.2	35.3	39.4	43.5
	SAWDUST	2.9	3.6	4.3	5.0	5.7	6.4	7.1
	RESIDUE	10.6	12.0	13.5	15.0	16.5	17.9	19.4
	GROSS TREE	32.5	39.0	45.4	51.8	58.2	64.6	71.1
19	LUMBER	21.3	26.0	30.6	35.3	39.9	44.6	49.2
	SAWDUST	3.2	4.0	4.8	5.6	6.3	7.1	7.9
	RESIDUE	11.4	13.0	14.7	16.3	17.9	19.6	21.2
	GROSS TREE	36.2	43.4	50.6	57.8	65.0	72.2	79.4
20	LUMBER	23.9	29.1	34.4	39.6	44.8	50.0	55.3
	SAWDUST	3.6	4.5	5.3	6.2	7.0	7.9	8.7
	RESIDUE	12.3	14.1	15.9	17.7	19.5	21.3	23.1
	GROSS TREE	40.0	48.0	56.1	64.1	72.2	80.2	88.2
21	LUMBER	26.6	32.5	38.3	44.1	50.0	55.8	61.6
	SAWDUST	4.0	5.0	5.9	6.8	7.7	8.7	9.6
	RESIDUE	13.2	15.2	17.2	19.2	21.2	23.2	25.2
	GROSS TREE	44.0	52.9	61.9	70.8	79.7	88.6	97.5
22	LUMBER	29.5	36.0	42.4	48.9	55.4	61.8	68.3
	SAWDUST	4.4	5.5	6.5	7.5	8.5	9.5	10.5
	RESIDUE	14.2	16.4	18.5	20.7	22.9	25.1	27.3
	GROSS TREE	48.3	58.1	67.9	77.8	87.6	97.4	107.2
23	LUMBER	32.5	39.6	46.7	53.9	61.0	68.1	75.3
	SAWDUST	4.9	6.0	7.1	8.2	9.3	10.4	11.5
	RESIDUE	15.2	17.6	20.0	22.3	24.7	27.1	29.5
	GROSS TREE	52.7	63.5	74.3	85.1	95.8	106.6	117.4
24	LUMBER	35.6	43.4	51.3	59.1	66.9	74.7	82.6
	SAWDUST	5.3	6.5	7.7	8.9	10.1	11.3	12.4
	RESIDUE	16.3	18.9	21.4	24.0	26.6	29.2	31.8
	GROSS TREE	57.3	69.1	80.9	92.7	104.5	116.3	128.0
25	LUMBER	38.8	47.4	56.0	64.5	73.1	81.6	90.2
	SAWDUST	5.8	7.1	8.4	9.6	10.9	12.2	13.5
	RESIDUE	17.4	20.2	23.0	25.8	28.6	31.4	34.2
	GROSS TREE	62.1	75.0	87.8	100.6	113.5	126.3	139.1
26	LUMBER	42.2	51.5	60.8	70.2	79.5	88.8	98.1
	SAWDUST	6.3	7.7	9.1	10.4	11.8	13.2	14.6
	RESIDUE	18.5	21.6	24.6	27.6	30.6	33.7	36.7
	GROSS TREE	67.1	81.1	95.0	108.9	122.8	136.7	150.7
27	LUMBER	45.7	55.8	65.9	76.0	86.1	96.2	106.3
	SAWDUST	6.8	8.3	9.8	11.3	12.7	14.2	15.7
	RESIDUE	19.7	23.0	26.2	29.5	32.8	36.0	39.3
	GROSS TREE	72.4	87.4	102.5	117.5	132.5	147.6	162.6
28	LUMBER	49.4	60.3	71.2	82.1	93.0	103.9	114.8
	SAWDUST	7.3	8.9	10.5	12.1	13.7	15.3	16.9
	RESIDUE	21.0	24.5	28.0	31.5	35.0	38.5	42.0
	GROSS TREE	77.8	94.0	110.2	126.4	142.6	158.9	175.1
29	LUMBER	53.2	64.9	76.7	88.4	100.2	111.9	123.7
	SAWDUST	7.9	9.6	11.3	13.0	14.7	16.4	18.1
	RESIDUE	22.3	26.0	29.8	33.5	37.3	41.0	44.8
	GROSS TREE	83.4	100.8	118.2	135.7	153.1	170.5	188.0
30	LUMBER	57.1	69.7	82.3	95.0	107.6	120.2	132.8
	SAWDUST	8.5	10.3	12.1	13.9	15.7	17.5	19.3
	RESIDUE	23.6	27.6	31.6	35.6	39.7	43.7	47.7
	GROSS TREE	89.2	107.9	126.6	145.2	163.9	182.6	201.3

TABLE 5.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM CHESTNUT OAK BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	5.3	4.4	3.5	2.6	1.7	0.8	-0.1
	SAWDUST	1.0	1.1	1.1	1.2	1.3	1.3	1.4
	RESIDUE	3.6	5.9	8.2	10.5	12.8	15.1	17.4
	GROSS TREE	9.3	11.0	12.7	14.3	16.0	17.7	19.4
11	LUMBER	6.5	6.0	5.5	5.0	4.5	4.0	3.5
	SAWDUST	1.2	1.3	1.4	1.5	1.6	1.7	1.9
	RESIDUE	4.1	6.5	8.8	11.1	13.4	15.7	18.0
	GROSS TREE	11.3	13.4	15.5	17.6	19.7	21.9	24.0
12	LUMBER	7.7	7.6	7.6	7.5	7.5	7.4	7.4
	SAWDUST	1.4	1.6	1.7	1.9	2.1	2.2	2.4
	RESIDUE	4.8	7.1	9.4	11.7	14.0	16.3	18.6
	GROSS TREE	13.4	16.0	18.6	21.2	23.8	26.4	29.0
13	LUMBER	9.0	9.5	9.9	10.3	10.7	11.2	11.6
	SAWDUST	1.6	1.8	2.1	2.3	2.5	2.6	2.8
	RESIDUE	5.4	7.7	10.1	12.4	14.7	17.0	19.3
	GROSS TREE	15.8	18.9	22.0	25.1	28.3	31.4	34.5
14	LUMBER	10.5	11.4	12.4	13.3	14.3	15.2	16.2
	SAWDUST	1.8	2.1	2.4	2.7	3.0	3.3	3.6
	RESIDUE	6.1	8.5	10.8	13.1	15.5	17.8	20.1
	GROSS TREE	18.3	22.0	25.7	29.4	33.1	36.8	40.5
15	LUMBER	12.0	13.5	15.0	16.5	18.1	19.6	21.1
	SAWDUST	2.1	2.5	2.8	3.2	3.6	4.0	4.3
	RESIDUE	6.9	9.2	11.6	13.9	16.3	18.6	20.9
	GROSS TREE	21.0	25.3	29.6	33.9	38.2	42.5	46.8
16	LUMBER	13.7	15.8	17.9	20.0	22.1	24.2	26.3
	SAWDUST	2.3	2.8	3.2	3.7	4.2	4.6	5.1
	RESIDUE	7.7	10.1	12.4	14.8	17.1	19.5	21.8
	GROSS TREE	23.9	28.9	33.8	38.8	43.7	48.7	53.7
17	LUMBER	15.4	18.2	20.9	23.7	26.4	29.2	31.9
	SAWDUST	2.6	3.1	3.7	4.2	4.8	5.3	5.9
	RESIDUE	8.6	11.0	13.3	15.7	18.0	20.4	22.7
	GROSS TREE	27.0	32.7	38.3	44.0	49.6	55.3	60.9
18	LUMBER	17.3	20.7	24.1	27.6	31.0	34.4	37.9
	SAWDUST	2.9	3.5	4.2	4.8	5.4	6.1	6.7
	RESIDUE	9.6	11.9	14.3	16.6	19.0	21.4	23.7
	GROSS TREE	30.3	36.7	43.1	49.5	55.8	62.2	68.6
19	LUMBER	19.3	23.4	27.6	31.7	35.8	40.0	44.1
	SAWDUST	3.2	3.9	4.7	5.4	6.1	6.9	7.6
	RESIDUE	10.5	12.9	15.3	17.6	20.0	22.4	24.8
	GROSS TREE	33.8	40.9	48.1	55.3	62.4	69.6	76.8
20	LUMBER	21.3	26.2	31.1	36.0	40.9	45.8	50.7
	SAWDUST	3.5	4.3	5.2	6.0	6.8	7.7	8.5
	RESIDUE	11.6	14.0	16.3	18.7	21.1	23.5	25.9
	GROSS TREE	37.4	45.4	53.4	61.4	69.4	77.3	85.3
21	LUMBER	23.5	29.2	34.9	40.6	46.3	52.0	57.7
	SAWDUST	3.9	4.8	5.7	6.7	7.6	8.6	9.5
	RESIDUE	12.7	15.1	17.4	19.8	22.2	24.6	27.0
	GROSS TREE	41.3	50.1	59.0	67.8	76.7	85.5	94.3
22	LUMBER	25.8	32.4	38.9	45.4	51.9	58.4	65.0
	SAWDUST	4.2	5.3	6.3	7.4	8.4	9.5	10.5
	RESIDUE	13.8	16.2	18.6	21.0	23.4	25.8	28.2
	GROSS TREE	45.3	55.1	64.8	74.6	84.3	94.0	103.8
23	LUMBER	28.2	35.6	43.0	50.4	57.8	65.2	72.6
	SAWDUST	4.6	5.7	6.9	8.1	9.3	10.4	11.6
	RESIDUE	15.0	17.4	19.8	22.3	24.7	27.1	29.5
	GROSS TREE	49.5	60.2	70.9	81.6	92.3	103.0	113.7
24	LUMBER	30.7	39.0	47.3	55.6	63.9	72.3	80.6
	SAWDUST	5.0	6.3	7.5	8.8	10.1	11.4	12.7
	RESIDUE	16.3	18.7	21.1	23.5	26.0	28.4	30.8
	GROSS TREE	53.9	65.6	77.3	89.0	100.7	112.3	124.0
25	LUMBER	33.4	42.6	51.9	61.1	70.4	79.6	88.9
	SAWDUST	5.4	6.8	8.2	9.6	11.0	12.5	13.9
	RESIDUE	17.6	20.0	22.4	24.9	27.3	29.8	32.2
	GROSS TREE	58.5	71.2	83.9	96.7	109.4	122.1	134.8
26	LUMBER	36.1	46.3	56.6	66.8	77.0	87.3	97.5
	SAWDUST	5.8	7.3	8.9	10.4	12.0	13.6	15.1
	RESIDUE	18.9	21.4	23.8	26.3	28.7	31.2	33.6
	GROSS TREE	63.3	77.1	90.9	104.7	118.4	132.2	146.0
27	LUMBER	38.9	50.2	61.4	72.7	84.0	95.2	106.5
	SAWDUST	6.2	7.9	9.6	11.3	13.0	14.7	16.4
	RESIDUE	20.3	22.8	25.3	27.7	30.2	32.7	35.1
	GROSS TREE	68.3	83.2	98.1	113.0	127.9	142.8	157.7
28	LUMBER	41.8	54.2	66.5	78.8	91.1	103.5	115.8
	SAWDUST	6.7	8.5	10.3	12.2	14.0	15.8	17.7
	RESIDUE	21.8	24.3	26.8	29.2	31.7	34.2	36.7
	GROSS TREE	73.4	89.5	105.5	121.6	137.7	153.7	169.8
29	LUMBER	44.9	58.3	71.7	85.2	98.6	112.0	125.5
	SAWDUST	7.1	9.1	11.1	13.1	15.1	17.1	19.0
	RESIDUE	23.3	25.8	28.3	30.8	33.3	35.8	38.3
	GROSS TREE	78.8	96.0	113.3	130.5	147.8	165.0	182.3
30	LUMBER	48.0	62.6	77.2	91.7	106.3	120.9	135.4
	SAWDUST	7.6	9.8	11.9	14.0	16.2	18.3	20.5
	RESIDUE	24.9	27.4	29.9	32.4	34.9	37.5	40.0
	GROSS TREE	84.3	102.8	121.3	139.8	158.3	176.8	195.3

TABLE 6.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM RED MAPLE BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	5.0	6.5	8.0	9.6	11.1	12.6	14.1
	SAWDUST	1.0	1.4	1.8	2.2	2.6	2.9	3.3
	RESIDUE	3.3	5.2	7.0	8.8	10.7	12.5	14.3
	GROSS TREE	9.3	12.9	16.5	20.1	23.7	27.3	30.9
11	LUMBER	6.5	8.2	9.9	11.6	13.3	15.0	16.8
	SAWDUST	1.3	1.7	2.1	2.5	2.9	3.3	3.7
	RESIDUE	4.0	5.9	7.7	9.4	11.2	13.0	14.8
	GROSS TREE	11.5	15.3	19.2	23.1	26.9	30.8	34.7
12	LUMBER	8.0	10.0	11.9	13.9	15.8	17.7	19.7
	SAWDUST	1.5	1.9	2.3	2.8	3.2	3.6	4.0
	RESIDUE	4.9	6.7	8.4	10.1	11.9	13.6	15.3
	GROSS TREE	13.9	18.0	22.2	26.4	30.5	34.7	38.8
13	LUMBER	9.7	11.9	14.1	16.3	18.5	20.7	22.9
	SAWDUST	1.7	2.2	2.6	3.1	3.5	4.0	4.4
	RESIDUE	5.8	7.5	9.2	10.9	12.5	14.2	15.9
	GROSS TREE	16.5	21.0	25.5	29.9	34.4	38.9	43.4
14	LUMBER	11.6	14.0	16.5	18.9	21.4	23.9	26.3
	SAWDUST	2.0	2.5	3.0	3.4	3.9	4.4	4.9
	RESIDUE	6.8	8.4	10.0	11.6	13.3	14.9	16.5
	GROSS TREE	19.4	24.2	29.0	33.8	38.6	43.4	48.3
15	LUMBER	13.5	16.3	19.0	21.8	24.5	27.3	30.0
	SAWDUST	2.3	2.8	3.3	3.8	4.3	4.8	5.3
	RESIDUE	7.9	9.4	11.0	12.5	14.0	15.6	17.1
	GROSS TREE	22.4	27.6	32.8	38.0	43.1	48.3	53.5
16	LUMBER	15.6	18.7	21.8	24.8	27.9	30.9	34.0
	SAWDUST	2.6	3.2	3.7	4.2	4.8	5.3	5.8
	RESIDUE	9.0	10.5	11.9	13.4	14.9	16.4	17.8
	GROSS TREE	25.7	31.2	36.8	42.4	48.0	53.5	59.1
17	LUMBER	17.9	21.3	24.7	28.0	31.4	34.8	38.2
	SAWDUST	3.0	3.5	4.1	4.7	5.2	5.8	6.3
	RESIDUE	10.2	11.6	13.0	14.4	15.8	17.2	18.6
	GROSS TREE	29.1	35.1	41.1	47.1	53.1	59.1	65.1
18	LUMBER	20.3	24.0	27.7	31.5	35.2	38.9	42.6
	SAWDUST	3.3	3.9	4.5	5.1	5.7	6.3	6.9
	RESIDUE	11.5	12.8	14.1	15.4	16.7	18.0	19.3
	GROSS TREE	32.8	39.3	45.7	52.1	58.6	65.0	71.4
19	LUMBER	22.8	26.9	31.0	35.1	39.2	43.3	47.4
	SAWDUST	3.7	4.4	5.0	5.6	6.2	6.9	7.5
	RESIDUE	12.8	14.0	15.3	16.5	17.7	18.9	20.2
	GROSS TREE	36.7	43.6	50.5	57.4	64.3	71.2	78.1
20	LUMBER	25.4	29.9	34.4	38.9	43.4	47.8	52.3
	SAWDUST	4.1	4.8	5.5	6.1	6.8	7.4	8.1
	RESIDUE	14.2	15.4	16.5	17.6	18.8	19.9	21.0
	GROSS TREE	40.8	48.2	55.6	63.0	70.4	77.8	85.2
21	LUMBER	28.2	33.1	38.0	42.9	47.8	52.7	57.6
	SAWDUST	4.6	5.3	6.0	6.7	7.4	8.1	8.8
	RESIDUE	15.7	16.8	17.8	18.9	19.9	20.9	22.0
	GROSS TREE	45.1	53.1	61.0	68.9	76.8	84.7	92.6
22	LUMBER	31.2	36.5	41.8	47.1	52.4	57.7	63.0
	SAWDUST	5.0	5.7	6.5	7.2	8.0	8.7	9.4
	RESIDUE	17.3	18.2	19.2	20.1	21.0	22.0	22.9
	GROSS TREE	49.7	58.1	66.6	75.0	83.5	92.0	100.4
23	LUMBER	34.2	40.0	45.7	51.5	57.3	63.0	68.8
	SAWDUST	5.5	6.2	7.0	7.8	8.6	9.4	10.2
	RESIDUE	18.9	19.8	20.6	21.4	22.3	23.1	23.9
	GROSS TREE	54.4	63.4	72.5	81.5	90.5	99.5	108.6
24	LUMBER	37.4	43.6	49.9	56.1	62.3	68.5	74.8
	SAWDUST	5.9	6.8	7.6	8.4	9.2	10.1	10.9
	RESIDUE	20.6	21.4	22.1	22.8	23.5	24.3	25.0
	GROSS TREE	59.3	69.0	78.6	88.2	97.8	107.5	117.1
25	LUMBER	40.8	47.5	54.2	60.9	67.6	74.3	81.0
	SAWDUST	6.5	7.3	8.2	9.1	9.9	10.8	11.7
	RESIDUE	22.4	23.0	23.6	24.3	24.9	25.5	26.1
	GROSS TREE	64.5	74.7	85.0	95.2	105.5	115.7	126.0
26	LUMBER	44.2	51.4	58.7	65.9	73.1	80.3	87.5
	SAWDUST	7.0	7.9	8.8	9.7	10.7	11.6	12.5
	RESIDUE	24.3	24.8	25.3	25.7	26.2	26.7	27.2
	GROSS TREE	69.9	80.8	91.6	102.5	113.4	124.3	135.2
27	LUMBER	47.8	55.6	63.3	71.1	78.8	86.5	94.3
	SAWDUST	7.5	8.5	9.5	10.4	11.4	12.4	13.3
	RESIDUE	26.2	26.6	26.9	27.3	27.7	28.0	28.4
	GROSS TREE	75.4	87.0	98.6	110.1	121.7	133.3	144.8
28	LUMBER	51.6	59.9	68.2	76.4	84.7	93.0	101.3
	SAWDUST	8.1	9.1	10.1	11.1	12.2	13.2	14.2
	RESIDUE	28.2	28.5	28.7	28.9	29.2	29.4	29.6
	GROSS TREE	81.2	93.5	105.7	118.0	130.3	142.5	154.8
29	LUMBER	55.5	64.3	73.2	82.0	90.9	99.7	108.6
	SAWDUST	8.7	9.8	10.8	11.9	13.0	14.0	15.1
	RESIDUE	30.3	30.4	30.5	30.6	30.7	30.8	30.9
	GROSS TREE	87.2	100.2	113.2	126.2	139.1	152.1	165.1
30	LUMBER	59.5	68.9	78.3	87.8	97.2	106.7	116.1
	SAWDUST	9.3	10.4	11.5	12.7	13.8	14.9	16.0
	RESIDUE	32.4	32.4	32.4	32.3	32.3	32.3	32.2
	GROSS TREE	93.4	107.2	120.9	134.6	148.3	162.1	175.8

TABLE 7.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM RED MAPLE BY CIRCULAR MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	2.1	3.9	5.6	7.4	9.2	11.0	12.8
	SAWDUST	0.9	1.4	1.9	2.5	3.0	3.5	4.1
	RESIDUE	3.3	5.2	7.0	8.8	10.7	12.5	14.3
	GROSS TREE	9.3	12.9	16.5	20.1	23.7	27.3	30.9
11	LUMBER	3.4	5.4	7.4	9.3	11.3	13.3	15.3
	SAWDUST	1.2	1.8	2.4	3.0	3.6	4.2	4.8
	RESIDUE	4.1	5.9	7.7	9.4	11.2	13.0	14.8
	GROSS TREE	11.5	15.3	19.2	23.1	26.9	30.8	34.7
12	LUMBER	4.8	7.0	9.2	11.4	13.6	15.9	18.1
	SAWDUST	1.6	2.3	2.9	3.6	4.2	4.9	5.5
	RESIDUE	4.9	6.7	8.4	10.1	11.9	13.6	15.3
	GROSS TREE	13.9	18.0	22.2	26.4	30.5	34.7	38.8
13	LUMBER	6.4	8.8	11.3	13.7	16.2	18.6	21.1
	SAWDUST	2.0	2.8	3.5	4.2	4.9	5.7	6.4
	RESIDUE	5.8	7.5	9.2	10.9	12.5	14.2	15.9
	GROSS TREE	16.5	21.0	25.5	29.9	34.4	38.9	43.4
14	LUMBER	8.1	10.8	13.5	16.2	18.9	21.6	24.3
	SAWDUST	2.5	3.3	4.1	4.9	5.7	6.5	7.3
	RESIDUE	6.8	8.4	10.0	11.6	13.3	14.9	16.5
	GROSS TREE	19.4	24.2	29.0	33.8	38.6	43.4	48.3
15	LUMBER	9.9	12.9	15.8	18.8	21.8	24.8	27.8
	SAWDUST	3.0	4.0	4.7	5.7	6.5	7.4	8.2
	RESIDUE	7.9	9.4	11.0	12.5	14.0	15.6	17.1
	GROSS TREE	22.4	27.6	32.8	38.0	43.1	48.3	53.5
16	LUMBER	11.8	15.1	18.4	21.6	24.9	28.2	31.5
	SAWDUST	3.5	4.5	5.4	6.4	7.4	8.3	9.3
	RESIDUE	9.0	10.5	11.9	13.4	14.9	16.4	17.8
	GROSS TREE	25.7	31.2	36.8	42.4	48.0	53.5	59.1
17	LUMBER	13.9	17.5	21.1	24.7	28.3	31.9	35.5
	SAWDUST	4.1	5.1	6.2	7.2	8.3	9.3	10.4
	RESIDUE	10.2	11.6	13.0	14.4	15.8	17.2	18.6
	GROSS TREE	29.1	35.1	41.1	47.1	53.1	59.1	65.1
18	LUMBER	16.0	20.0	23.9	27.8	31.8	35.7	39.7
	SAWDUST	4.6	5.8	6.9	8.1	9.2	10.4	11.5
	RESIDUE	11.5	12.8	14.1	15.4	16.7	18.0	19.3
	GROSS TREE	32.8	39.3	45.7	52.1	58.6	65.0	71.4
19	LUMBER	18.4	22.6	26.9	31.2	35.5	39.8	44.1
	SAWDUST	5.3	6.5	7.8	9.0	10.3	11.5	12.8
	RESIDUE	12.8	14.0	15.3	16.5	17.7	18.9	20.2
	GROSS TREE	36.7	43.6	50.5	57.4	64.3	71.2	78.1
20	LUMBER	20.8	25.5	30.1	34.8	39.4	44.1	48.8
	SAWDUST	5.9	7.3	8.6	10.0	11.4	12.7	14.1
	RESIDUE	14.2	15.4	16.5	17.6	18.8	19.9	21.0
	GROSS TREE	40.8	48.2	55.6	63.0	70.4	77.8	85.2
21	LUMBER	23.3	28.4	33.5	38.5	43.6	48.6	53.7
	SAWDUST	6.6	8.1	9.6	11.0	12.5	14.0	15.5
	RESIDUE	15.7	16.8	17.8	18.8	19.9	20.9	22.0
	GROSS TREE	45.1	53.1	61.0	68.9	76.8	84.7	92.6
22	LUMBER	26.0	31.5	37.0	42.4	47.9	53.4	58.8
	SAWDUST	7.3	8.9	10.5	12.1	13.7	15.3	16.9
	RESIDUE	17.3	18.2	19.2	20.1	21.0	22.0	22.9
	GROSS TREE	49.7	58.1	66.6	75.0	83.5	92.0	100.4
23	LUMBER	28.8	34.7	40.6	46.5	52.4	58.3	64.2
	SAWDUST	8.1	9.8	11.5	13.2	15.0	16.7	18.4
	RESIDUE	18.9	19.8	20.6	21.4	22.3	23.1	23.9
	GROSS TREE	54.4	63.4	72.5	81.5	90.5	99.5	108.6
24	LUMBER	31.8	38.1	44.5	50.8	57.2	63.5	69.9
	SAWDUST	8.9	10.7	12.6	14.4	16.3	18.1	20.0
	RESIDUE	20.6	21.4	22.1	22.8	23.5	24.3	25.0
	GROSS TREE	59.3	69.0	78.6	88.2	97.8	107.5	117.1
25	LUMBER	34.8	41.7	48.5	55.3	62.1	68.9	75.8
	SAWDUST	9.7	11.7	13.7	15.7	17.6	19.6	21.6
	RESIDUE	22.4	23.0	23.6	24.3	24.9	25.5	26.1
	GROSS TREE	64.5	74.7	85.0	95.2	105.5	115.7	126.0
26	LUMBER	38.0	45.3	52.6	59.9	67.3	74.6	81.9
	SAWDUST	10.6	12.7	14.8	16.9	19.0	21.2	23.3
	RESIDUE	24.3	24.8	25.3	25.7	26.2	26.7	27.2
	GROSS TREE	69.9	80.8	91.6	102.5	113.4	124.3	135.2
27	LUMBER	41.3	49.1	57.0	64.8	72.6	80.4	88.2
	SAWDUST	11.5	13.7	16.0	18.3	20.5	22.8	25.1
	RESIDUE	26.2	26.6	26.9	27.3	27.7	28.0	28.4
	GROSS TREE	75.4	87.0	98.6	110.1	121.7	133.3	144.8
28	LUMBER	44.8	53.1	61.4	69.8	78.1	86.5	94.8
	SAWDUST	12.4	14.8	17.2	19.6	22.1	24.5	26.9
	RESIDUE	28.2	28.5	28.7	28.9	29.2	29.4	29.6
	GROSS TREE	81.2	93.5	105.7	118.0	130.3	142.5	154.8
29	LUMBER	48.3	57.2	66.1	75.0	83.9	92.8	101.7
	SAWDUST	13.4	15.9	18.5	21.1	23.6	26.2	28.8
	RESIDUE	30.3	30.4	30.5	30.6	30.7	30.8	30.9
	GROSS TREE	87.2	100.2	113.2	126.2	139.1	152.1	165.1
30	LUMBER	52.0	61.5	70.9	80.4	89.8	99.3	108.7
	SAWDUST	14.3	17.1	19.8	22.6	25.3	28.0	30.8
	RESIDUE	32.4	32.4	32.4	32.3	32.3	32.3	32.2
	GROSS TREE	93.4	107.2	120.9	134.6	148.3	162.1	175.8

TABLE 8.—PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM SUGAR MAPLE BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	5.9	7.4	9.0	10.5	12.0	13.6	15.1
	SAWDUST	1.2	1.5	1.7	2.0	2.3	2.6	2.8
	RESIDUE	2.7	3.7	4.6	5.6	6.5	7.5	8.4
	GROSS TREE	10.0	12.8	15.6	18.4	21.2	24.0	26.8
11	LUMBER	7.0	8.7	10.5	12.2	13.9	15.7	17.4
	SAWDUST	1.3	1.6	1.9	2.2	2.5	2.8	3.1
	RESIDUE	3.9	4.5	5.5	6.5	7.5	8.5	9.5
	GROSS TREE	12.0	15.1	18.3	21.4	24.5	27.7	30.8
12	LUMBER	8.2	10.1	12.1	14.1	16.0	18.0	20.0
	SAWDUST	1.5	1.8	2.2	2.5	2.8	3.2	3.5
	RESIDUE	4.3	5.4	6.4	7.5	8.6	9.7	10.7
	GROSS TREE	14.2	17.7	21.2	24.7	28.2	31.6	35.1
13	LUMBER	9.5	11.7	13.9	16.1	18.3	20.5	22.7
	SAWDUST	1.7	2.1	2.4	2.8	3.1	3.5	3.9
	RESIDUE	5.2	6.3	7.5	8.6	9.7	10.9	12.0
	GROSS TREE	16.6	20.5	24.3	28.2	32.1	36.0	39.9
14	LUMBER	10.9	13.3	15.8	18.3	20.7	23.2	25.7
	SAWDUST	1.9	2.3	2.7	3.1	3.5	3.9	4.3
	RESIDUE	6.1	7.3	8.6	9.8	11.0	12.2	13.4
	GROSS TREE	19.1	23.4	27.7	32.1	36.4	40.7	45.0
15	LUMBER	12.4	15.1	17.9	20.6	23.4	26.1	28.8
	SAWDUST	2.1	2.5	3.0	3.4	3.9	4.3	4.7
	RESIDUE	7.2	8.5	9.7	11.0	12.3	13.6	14.9
	GROSS TREE	21.9	26.6	31.4	36.2	40.9	45.7	50.5
16	LUMBER	14.0	17.0	20.1	23.1	26.2	29.2	32.3
	SAWDUST	2.3	2.8	3.3	3.8	4.2	4.7	5.2
	RESIDUE	8.3	9.6	11.0	12.4	13.8	15.2	16.5
	GROSS TREE	24.8	30.1	35.3	40.6	45.8	51.1	56.3
17	LUMBER	15.7	19.1	22.4	25.8	29.1	32.5	35.9
	SAWDUST	2.5	3.1	3.6	4.1	4.7	5.2	5.7
	RESIDUE	9.4	10.9	12.4	13.8	15.3	16.8	18.2
	GROSS TREE	27.9	33.7	39.5	45.3	51.0	56.8	62.6
18	LUMBER	17.5	21.2	24.9	28.6	32.3	36.0	39.7
	SAWDUST	2.8	3.4	3.9	4.5	5.1	5.7	6.3
	RESIDUE	10.7	12.2	13.8	15.4	16.9	18.5	20.1
	GROSS TREE	31.3	37.6	43.9	50.2	56.6	62.9	69.2
19	LUMBER	19.4	23.5	27.5	31.6	35.7	39.7	43.8
	SAWDUST	3.1	3.7	4.3	4.9	5.6	6.2	6.8
	RESIDUE	12.0	13.6	15.3	17.0	18.7	20.3	22.0
	GROSS TREE	34.8	41.7	48.6	55.5	62.4	69.3	76.2
20	LUMBER	21.4	25.9	30.3	34.8	39.2	43.6	48.1
	SAWDUST	3.3	4.0	4.7	5.4	6.1	6.8	7.4
	RESIDUE	13.4	15.1	16.9	18.7	20.5	22.2	24.0
	GROSS TREE	38.5	46.0	53.5	61.0	68.6	76.1	83.6
21	LUMBER	23.6	28.4	33.2	38.1	42.9	47.7	52.6
	SAWDUST	3.6	4.4	5.1	5.8	6.6	7.3	8.1
	RESIDUE	14.8	16.7	18.6	20.5	22.4	24.3	26.1
	GROSS TREE	42.3	50.5	58.7	66.9	75.0	83.2	91.4
22	LUMBER	25.8	31.0	36.3	41.5	46.8	52.0	57.3
	SAWDUST	3.9	4.7	5.5	6.3	7.1	7.9	8.7
	RESIDUE	16.3	18.3	20.4	22.4	24.4	26.4	28.4
	GROSS TREE	46.4	55.3	64.1	73.0	81.8	90.7	99.5
23	LUMBER	28.1	33.8	39.5	45.2	50.9	56.6	62.2
	SAWDUST	4.2	5.1	6.0	6.8	7.7	8.6	9.4
	RESIDUE	17.9	20.1	22.2	24.3	26.5	28.6	30.7
	GROSS TREE	50.7	60.2	69.8	79.4	88.9	98.5	108.1
24	LUMBER	30.6	36.7	42.8	49.0	55.1	61.3	67.4
	SAWDUST	4.6	5.5	6.4	7.4	8.3	9.2	10.2
	RESIDUE	19.6	21.9	24.1	26.4	28.6	30.9	33.2
	GROSS TREE	55.1	65.4	75.7	86.0	96.3	106.6	117.0
25	LUMBER	33.1	39.7	46.3	52.9	59.6	66.2	72.8
	SAWDUST	4.9	5.9	6.9	7.9	8.9	9.9	10.9
	RESIDUE	21.3	23.7	26.1	28.5	30.9	33.3	35.7
	GROSS TREE	59.8	70.8	81.9	93.0	104.1	115.2	126.2
26	LUMBER	35.7	42.8	50.0	57.1	64.2	71.3	78.4
	SAWDUST	5.3	6.4	7.4	8.5	9.6	10.6	11.7
	RESIDUE	23.1	25.7	28.2	30.7	33.3	35.8	38.3
	GROSS TREE	64.6	76.5	88.4	100.2	112.1	124.0	135.9
27	LUMBER	38.5	46.1	53.7	61.3	69.0	76.6	84.2
	SAWDUST	5.7	6.8	8.0	9.1	10.2	11.4	12.5
	RESIDUE	25.0	27.7	30.4	33.1	35.7	38.4	41.1
	GROSS TREE	69.6	82.3	95.1	107.8	120.5	133.2	145.9
28	LUMBER	41.3	49.5	57.6	65.8	73.9	82.1	90.3
	SAWDUST	6.1	7.3	8.5	9.7	10.9	12.1	13.4
	RESIDUE	27.0	29.8	32.6	35.5	38.3	41.1	44.0
	GROSS TREE	74.8	88.4	102.0	115.6	129.2	142.8	156.3
29	LUMBER	44.3	53.0	61.7	70.4	79.1	87.8	96.5
	SAWDUST	6.5	7.8	9.1	10.4	11.7	12.9	14.2
	RESIDUE	29.0	32.0	35.0	38.0	40.9	43.9	46.9
	GROSS TREE	80.2	94.7	109.2	123.7	138.2	152.7	167.1
30	LUMBER	47.3	56.6	65.9	75.2	84.4	93.7	103.0
	SAWDUST	6.9	8.3	9.6	11.0	12.4	13.8	15.2
	RESIDUE	31.1	34.2	37.4	40.5	43.7	46.8	50.0
	GROSS TREE	85.8	101.2	116.7	132.1	147.5	162.9	178.3

TABLE 9.—PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM YELLOW-POPLAR BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	3.8	3.9	3.9	4.0	4.0	4.1	4.2
	SAWDUST	0.8	0.9	1.0	1.1	1.2	1.3	1.4
	RESIDUE	6.0	6.1	7.1	8.2	9.3	10.3	11.4
	GROSS TREE	10.3	11.7	13.0	14.3	15.7	17.0	18.4
11	LUMBER	5.5	5.9	6.2	6.6	6.9	7.3	7.6
	SAWDUST	1.1	1.2	1.4	1.5	1.7	1.8	2.0
	RESIDUE	5.3	6.4	7.5	8.6	9.8	10.9	12.0
	GROSS TREE	12.4	14.2	16.0	17.8	19.6	21.3	23.1
12	LUMBER	7.3	8.0	8.7	9.4	10.1	10.7	11.4
	SAWDUST	1.3	1.5	1.8	2.0	2.2	2.4	2.6
	RESIDUE	5.6	6.8	8.0	9.2	10.3	11.5	12.7
	GROSS TREE	14.8	17.0	19.3	21.5	23.8	26.0	28.3
13	LUMBER	9.3	10.3	11.4	12.4	13.5	14.5	15.5
	SAWDUST	1.6	1.9	2.2	2.7	3.0	3.2	3.2
	RESIDUE	8.0	10.2	11.5	13.7	15.5	17.2	18.9
	GROSS TREE	17.3	20.1	22.9	25.6	28.4	31.1	33.9
14	LUMBER	11.4	12.9	14.3	15.7	17.2	18.6	20.0
	SAWDUST	1.9	2.3	2.6	2.9	3.3	3.6	4.0
	RESIDUE	6.4	7.7	9.0	10.3	11.6	12.9	14.2
	GROSS TREE	20.1	23.4	26.7	30.0	33.3	36.6	39.9
15	LUMBER	13.7	15.6	17.4	19.3	21.1	23.0	24.8
	SAWDUST	2.3	2.7	3.1	3.5	3.9	4.3	4.7
	RESIDUE	6.8	8.2	9.5	10.9	12.3	13.7	15.1
	GROSS TREE	23.1	27.0	30.9	34.7	38.6	42.5	46.4
16	LUMBER	16.2	18.5	20.8	23.1	25.3	27.6	29.9
	SAWDUST	2.6	3.1	3.6	4.1	4.6	5.0	5.5
	RESIDUE	7.2	8.7	10.1	11.6	13.1	14.5	16.0
	GROSS TREE	26.2	30.8	35.3	39.8	44.3	48.8	53.4
17	LUMBER	18.8	21.6	24.3	27.1	29.8	32.6	35.4
	SAWDUST	3.0	3.6	4.1	4.7	5.3	5.8	6.4
	RESIDUE	7.7	9.2	10.8	12.3	13.9	15.4	17.0
	GROSS TREE	29.6	34.8	40.0	45.2	50.4	55.6	60.7
18	LUMBER	21.6	24.8	28.1	31.4	34.6	37.9	41.1
	SAWDUST	3.4	4.1	4.7	5.4	6.0	6.7	7.3
	RESIDUE	8.2	9.8	11.5	13.1	14.7	16.4	18.0
	GROSS TREE	33.2	39.1	45.0	50.9	56.8	62.7	68.6
19	LUMBER	24.5	28.3	32.1	35.9	39.7	43.5	47.3
	SAWDUST	3.9	4.6	5.3	6.1	6.8	7.5	8.3
	RESIDUE	8.7	10.4	12.2	13.9	15.6	17.4	19.1
	GROSS TREE	37.0	43.6	50.3	56.9	63.6	70.2	76.9
20	LUMBER	27.6	32.0	36.3	40.7	45.0	49.3	53.7
	SAWDUST	4.3	5.1	6.0	6.8	7.6	8.5	9.3
	RESIDUE	9.3	11.1	12.9	14.8	16.6	18.4	20.3
	GROSS TREE	40.9	48.4	55.8	63.3	70.7	78.2	85.6
21	LUMBER	30.9	35.8	40.7	45.7	50.6	55.5	60.5
	SAWDUST	4.8	5.7	6.6	7.6	8.5	9.4	10.4
	RESIDUE	9.9	11.8	13.7	15.7	17.6	19.5	21.5
	GROSS TREE	45.1	53.4	61.7	70.0	78.3	86.5	94.8
22	LUMBER	34.3	39.8	45.4	50.9	56.5	62.0	67.6
	SAWDUST	5.3	6.3	7.3	8.4	9.4	10.4	11.5
	RESIDUE	10.5	12.5	14.6	16.6	18.6	20.7	22.7
	GROSS TREE	49.5	58.7	67.8	77.0	86.1	95.3	104.4
23	LUMBER	37.8	44.0	50.2	56.4	62.6	68.8	75.0
	SAWDUST	5.8	6.9	8.1	9.2	10.4	11.5	12.7
	RESIDUE	11.1	13.3	15.4	17.6	19.7	21.9	24.1
	GROSS TREE	54.1	64.2	74.3	84.3	94.4	104.5	114.5
24	LUMBER	41.6	48.4	55.3	62.2	69.0	75.9	82.8
	SAWDUST	6.3	7.6	8.9	10.1	11.4	12.6	13.9
	RESIDUE	11.8	14.1	16.3	18.6	20.9	23.2	25.5
	GROSS TREE	58.9	70.0	81.0	92.0	103.0	114.0	125.1
25	LUMBER	45.4	53.0	60.6	68.1	75.7	83.3	90.8
	SAWDUST	6.9	8.3	9.7	11.0	12.4	13.8	15.2
	RESIDUE	12.5	14.9	17.3	19.7	22.1	24.5	26.9
	GROSS TREE	63.9	76.0	88.0	100.0	112.0	124.0	136.0
26	LUMBER	49.5	57.8	66.1	74.4	82.7	91.0	99.3
	SAWDUST	7.5	9.0	10.5	12.0	13.5	15.0	16.5
	RESIDUE	13.2	15.8	18.3	20.8	23.3	25.9	28.4
	GROSS TREE	69.1	82.2	95.3	108.3	121.4	134.4	147.5
27	LUMBER	53.7	62.7	71.8	80.9	89.9	99.0	108.0
	SAWDUST	8.1	9.8	11.4	13.0	14.6	16.3	17.9
	RESIDUE	14.0	16.6	19.3	22.0	24.6	27.3	30.0
	GROSS TREE	74.6	88.7	102.8	117.0	131.1	145.2	159.3
28	LUMBER	58.0	67.9	77.7	87.6	97.4	107.3	117.1
	SAWDUST	8.8	10.5	12.3	14.0	15.8	17.6	19.3
	RESIDUE	14.8	17.6	20.4	23.2	26.0	28.8	31.6
	GROSS TREE	80.2	95.4	110.7	125.9	141.2	156.4	171.7
29	LUMBER	62.6	73.2	83.9	94.5	105.2	115.9	126.5
	SAWDUST	9.4	11.3	13.2	15.1	17.0	18.9	20.8
	RESIDUE	15.6	18.8	21.5	24.4	27.3	30.3	33.3
	GROSS TREE	86.0	102.4	118.8	135.2	151.6	168.0	184.4
30	LUMBER	67.2	78.7	90.2	101.7	113.3	124.8	136.3
	SAWDUST	10.1	12.1	14.2	16.2	18.3	20.3	22.4
	RESIDUE	16.4	19.5	22.6	25.7	28.8	31.9	35.0
	GROSS TREE	92.0	109.6	127.2	144.8	162.5	180.1	197.7

TABLE 10.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM YELLOW-POPLAR BY CIRCULAR MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	4.0	4.6	5.2	5.8	6.4	7.0	7.6
	SAWDUST	1.4	1.8	2.1	2.4	2.7	3.1	3.4
	RESIDUE	5.0	6.1	7.1	8.2	9.3	10.3	11.4
	GROSS TREE	10.3	11.7	13.0	14.3	15.7	17.0	18.4
11	LUMBER	5.4	6.3	7.2	8.1	8.9	9.8	10.7
	SAWDUST	1.8	2.2	2.6	3.0	3.4	3.8	4.2
	RESIDUE	5.3	6.4	7.5	8.6	9.8	10.9	12.0
	GROSS TREE	12.4	14.2	16.0	17.8	19.6	21.3	23.1
12	LUMBER	6.9	8.1	9.3	10.5	11.7	12.9	14.1
	SAWDUST	2.2	2.7	3.2	3.7	4.2	4.7	5.2
	RESIDUE	5.6	6.8	8.0	9.2	10.3	11.5	12.7
	GROSS TREE	14.8	17.0	19.3	21.5	23.8	26.0	28.3
13	LUMBER	8.6	10.1	11.6	13.1	14.7	16.2	17.7
	SAWDUST	2.6	3.2	3.8	4.4	5.0	5.6	6.2
	RESIDUE	6.0	7.2	8.5	9.7	10.9	12.2	13.4
	GROSS TREE	17.3	20.1	22.9	25.6	28.4	31.1	33.9
14	LUMBER	10.4	12.3	14.1	16.0	17.9	19.8	21.6
	SAWDUST	3.1	3.8	4.5	5.2	5.9	6.6	7.3
	RESIDUE	6.4	7.7	9.0	10.3	11.6	12.9	14.2
	GROSS TREE	20.1	23.4	26.7	30.0	33.3	36.6	39.9
15	LUMBER	12.3	14.6	16.8	19.1	21.3	23.6	25.9
	SAWDUST	3.6	4.4	5.2	6.0	6.8	7.6	8.4
	RESIDUE	6.8	8.2	9.5	10.9	12.3	13.7	15.1
	GROSS TREE	23.1	27.0	30.9	34.7	38.6	42.5	46.4
16	LUMBER	14.3	17.0	19.7	22.4	25.0	27.7	30.4
	SAWDUST	4.1	5.0	6.0	6.9	7.8	8.8	9.7
	RESIDUE	7.2	8.7	10.1	11.6	13.1	14.5	16.0
	GROSS TREE	26.2	30.8	35.3	39.3	44.3	48.8	53.4
17	LUMBER	16.5	19.6	22.7	25.9	29.0	32.1	35.2
	SAWDUST	4.7	5.7	6.8	7.9	8.9	10.0	11.0
	RESIDUE	7.7	9.2	10.8	12.3	13.9	15.4	17.0
	GROSS TREE	29.6	34.8	40.0	45.2	50.4	55.6	60.7
18	LUMBER	18.8	22.4	26.0	29.6	33.1	36.7	40.3
	SAWDUST	5.3	6.5	7.7	8.9	10.1	11.2	12.4
	RESIDUE	8.2	9.8	11.5	13.1	14.7	16.4	18.0
	GROSS TREE	33.2	39.1	45.0	50.9	56.8	62.7	68.6
19	LUMBER	21.3	25.4	29.4	33.5	37.6	41.6	45.7
	SAWDUST	5.9	7.3	8.6	9.9	11.3	12.6	13.9
	RESIDUE	8.7	10.4	12.2	13.9	15.6	17.4	19.1
	GROSS TREE	37.0	43.6	50.3	56.9	63.6	70.2	76.9
20	LUMBER	23.9	28.4	33.0	37.6	42.2	46.8	51.4
	SAWDUST	6.6	8.1	9.6	11.0	12.5	14.0	15.5
	RESIDUE	9.3	11.1	12.9	14.8	16.6	18.4	20.3
	GROSS TREE	40.9	48.4	55.8	63.3	70.7	78.2	85.6
21	LUMBER	26.6	31.7	36.8	42.0	47.1	52.2	57.3
	SAWDUST	7.3	8.9	10.6	12.2	13.9	15.5	17.2
	RESIDUE	9.9	11.8	13.7	15.7	17.6	19.5	21.5
	GROSS TREE	45.1	53.4	61.7	70.0	78.3	86.5	94.8
22	LUMBER	29.4	35.1	40.8	46.5	52.2	57.9	63.6
	SAWDUST	8.0	9.8	11.7	13.5	15.3	17.1	18.9
	RESIDUE	10.5	12.5	14.6	16.6	18.6	20.7	22.7
	GROSS TREE	49.5	58.7	67.8	77.0	86.1	95.3	104.4
23	LUMBER	32.4	38.7	45.0	51.3	57.6	63.9	70.2
	SAWDUST	8.8	10.8	12.8	14.8	16.8	18.7	20.7
	RESIDUE	11.1	13.3	15.4	17.6	19.7	21.9	24.1
	GROSS TREE	54.1	64.2	74.3	84.3	94.4	104.5	114.5
24	LUMBER	35.5	42.4	49.3	56.3	63.2	70.1	77.0
	SAWDUST	9.6	11.8	13.9	16.1	18.3	20.5	22.6
	RESIDUE	11.8	14.1	16.3	18.6	20.9	23.2	25.5
	GROSS TREE	58.9	70.0	81.0	92.0	103.0	114.0	125.1
25	LUMBER	38.7	46.3	53.9	61.5	69.0	76.6	84.2
	SAWDUST	10.5	12.8	15.2	17.5	19.9	22.2	24.6
	RESIDUE	12.5	14.9	17.3	19.7	22.1	24.5	26.9
	GROSS TREE	63.9	76.0	88.0	100.0	112.0	124.0	136.0
26	LUMBER	42.1	50.4	58.6	66.9	75.1	83.4	91.6
	SAWDUST	11.3	13.9	16.4	19.0	21.6	24.1	26.7
	RESIDUE	13.2	15.8	18.3	20.8	23.3	25.9	28.4
	GROSS TREE	69.1	82.2	95.3	108.3	121.4	134.4	147.5
27	LUMBER	45.6	54.6	63.5	72.5	81.4	90.4	99.3
	SAWDUST	12.2	15.0	17.8	20.5	23.3	26.0	28.8
	RESIDUE	14.0	16.6	19.3	22.0	24.6	27.3	30.0
	GROSS TREE	74.6	88.7	102.8	117.0	131.1	145.2	159.3
28	LUMBER	49.3	58.9	68.6	78.3	88.0	97.7	107.3
	SAWDUST	13.2	16.2	19.1	22.1	25.1	28.1	31.0
	RESIDUE	14.8	17.6	20.4	23.2	26.0	28.8	31.6
	GROSS TREE	80.2	95.4	110.7	125.9	141.2	156.4	171.7
29	LUMBER	53.0	63.5	73.9	84.3	94.8	105.2	115.6
	SAWDUST	14.2	17.4	20.6	23.7	26.9	30.1	33.3
	RESIDUE	15.6	18.5	21.5	24.4	27.4	30.3	33.3
	GROSS TREE	86.0	102.4	118.8	135.2	151.6	168.0	184.4
30	LUMBER	56.9	68.1	79.4	90.6	101.8	113.0	124.2
	SAWDUST	15.2	18.6	22.0	25.4	28.9	32.3	35.7
	RESIDUE	16.4	19.5	22.6	25.7	28.8	31.9	35.0
	GROSS TREE	92.0	109.6	127.2	144.8	162.5	180.1	197.7

TABLE 11.—PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM PAPER BIRCH BY CIRCULAR MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	4.7	5.6	6.5	7.3	8.2	9.1	10.0
	SAWDUST	1.6	2.0	2.3	2.7	3.0	3.4	3.7
	RESIDUE	4.7	5.8	6.9	8.0	9.0	10.1	11.2
	GROSS TREE	11.0	13.3	15.7	18.0	20.3	22.6	24.9
11	LUMBER	5.7	6.9	8.0	9.2	10.3	11.5	12.6
	SAWDUST	1.9	2.4	2.8	3.2	3.6	4.1	4.5
	RESIDUE	5.3	6.5	7.7	8.9	10.1	11.3	12.5
	GROSS TREE	13.0	15.8	18.5	21.3	24.0	26.8	29.5
12	LUMBER	6.9	8.3	9.7	11.2	12.6	14.0	15.5
	SAWDUST	2.3	2.8	3.3	3.8	4.3	4.8	5.3
	RESIDUE	6.1	7.4	8.7	10.0	11.2	12.5	13.8
	GROSS TREE	15.2	18.4	21.7	24.9	28.1	31.4	34.6
13	LUMBER	8.1	9.8	11.6	13.3	15.1	16.8	18.6
	SAWDUST	2.6	3.2	3.8	4.4	5.0	5.6	6.2
	RESIDUE	6.8	8.3	9.7	11.1	12.5	13.9	15.3
	GROSS TREE	17.6	21.3	25.1	28.8	32.6	36.4	40.1
14	LUMBER	9.4	11.5	13.6	15.7	17.8	19.9	21.9
	SAWDUST	3.0	3.7	4.4	5.1	5.8	6.5	7.2
	RESIDUE	7.7	9.2	10.8	12.3	13.8	15.4	16.9
	GROSS TREE	20.1	24.4	28.8	33.1	37.4	41.8	46.1
15	LUMBER	10.8	13.3	15.7	18.2	20.7	23.1	25.6
	SAWDUST	3.4	4.2	5.0	5.9	6.7	7.5	8.3
	RESIDUE	8.6	10.3	11.9	13.6	15.3	17.0	18.7
	GROSS TREE	22.9	27.8	32.7	37.7	42.6	47.6	52.5
16	LUMBER	12.4	15.2	18.0	20.9	23.7	26.6	29.4
	SAWDUST	3.8	4.8	5.7	6.6	7.6	8.5	9.4
	RESIDUE	9.5	11.4	13.2	15.0	16.8	18.7	20.5
	GROSS TREE	25.8	31.4	37.0	42.6	48.2	53.8	59.4
17	LUMBER	14.0	17.2	20.5	23.8	27.0	30.3	33.5
	SAWDUST	4.3	5.4	6.4	7.5	8.5	9.6	10.7
	RESIDUE	10.6	12.6	14.5	16.5	18.5	20.5	22.5
	GROSS TREE	28.9	35.2	41.5	47.8	54.1	60.4	66.7
18	LUMBER	15.7	19.4	23.1	26.8	30.5	34.2	37.9
	SAWDUST	4.8	6.0	7.2	8.4	9.6	10.8	11.9
	RESIDUE	11.7	13.8	16.0	18.1	20.2	22.4	24.5
	GROSS TREE	32.2	39.2	46.3	53.3	60.3	67.4	74.4
19	LUMBER	17.5	21.7	25.8	30.0	34.2	38.3	42.5
	SAWDUST	5.3	6.7	8.0	9.3	10.6	12.0	13.3
	RESIDUE	12.8	14.1	17.5	19.3	22.1	24.4	26.7
	GROSS TREE	35.7	43.5	51.3	59.1	67.0	74.8	82.6
20	LUMBER	19.4	24.1	28.7	33.4	38.0	42.7	47.4
	SAWDUST	5.9	7.4	8.8	10.3	11.8	13.3	14.7
	RESIDUE	14.0	16.5	19.0	21.5	24.0	26.6	29.1
	GROSS TREE	39.4	48.0	56.7	65.3	73.9	82.6	91.2
21	LUMBER	21.4	26.6	31.8	36.9	42.1	47.3	52.5
	SAWDUST	6.5	8.1	9.7	11.4	13.0	14.6	16.2
	RESIDUE	15.3	18.0	20.7	23.4	26.1	28.8	31.5
	GROSS TREE	43.3	52.8	62.3	71.8	81.3	90.8	100.3
22	LUMBER	23.5	29.2	35.0	40.7	46.4	52.1	57.8
	SAWDUST	7.1	8.9	10.7	12.5	14.2	16.0	17.8
	RESIDUE	16.6	19.5	22.4	25.3	28.2	31.1	34.1
	GROSS TREE	47.3	57.7	68.1	78.6	89.0	99.4	109.8
23	LUMBER	25.7	32.0	38.3	44.6	50.9	57.2	63.4
	SAWDUST	7.7	9.7	11.6	13.6	15.6	17.5	19.5
	RESIDUE	18.0	21.2	24.3	27.4	30.5	33.6	36.7
	GROSS TREE	51.6	62.9	74.3	85.7	97.0	108.4	119.7
24	LUMBER	28.0	34.9	41.8	48.7	55.5	62.4	69.3
	SAWDUST	8.4	10.5	12.7	14.8	16.9	19.1	21.2
	RESIDUE	19.5	22.8	26.2	29.5	32.8	36.2	39.5
	GROSS TREE	56.0	68.4	80.7	93.1	105.4	117.8	130.1
25	LUMBER	30.4	37.9	45.4	52.9	60.4	67.9	75.4
	SAWDUST	9.1	11.4	13.7	16.1	18.4	20.7	23.0
	RESIDUE	21.0	24.6	28.2	31.7	35.3	38.9	42.4
	GROSS TREE	60.6	74.0	87.4	100.8	114.2	127.6	141.0
26	LUMBER	32.9	41.1	49.2	57.3	65.5	73.6	81.8
	SAWDUST	9.8	12.3	14.8	17.4	19.9	22.4	24.9
	RESIDUE	22.6	26.4	30.2	34.0	37.8	41.7	45.5
	GROSS TREE	65.5	79.9	94.4	108.9	123.3	137.8	152.2
27	LUMBER	35.5	44.3	53.1	61.9	70.7	79.6	88.4
	SAWDUST	10.6	13.3	16.0	18.7	21.4	24.1	26.8
	RESIDUE	24.3	28.3	32.4	36.4	40.5	44.6	48.6
	GROSS TREE	70.5	86.1	101.6	117.2	132.8	148.4	164.0
28	LUMBER	38.2	47.7	57.2	66.7	76.2	85.7	95.2
	SAWDUST	11.4	14.3	17.2	20.1	23.0	25.9	28.8
	RESIDUE	26.0	30.3	34.6	38.9	43.2	47.6	51.9
	GROSS TREE	75.7	92.4	109.2	125.9	142.6	159.4	176.1
29	LUMBER	41.0	51.2	61.5	71.7	81.9	92.1	102.3
	SAWDUST	12.2	15.3	18.4	21.6	24.7	27.8	30.9
	RESIDUE	27.8	32.3	36.9	41.5	46.1	50.7	55.3
	GROSS TREE	81.0	99.0	116.9	134.9	152.8	170.8	188.7
30	LUMBER	43.9	54.9	65.8	76.8	87.7	98.7	109.7
	SAWDUST	13.0	16.4	19.7	23.1	26.4	29.8	33.1
	RESIDUE	29.6	34.5	39.3	44.2	49.0	53.9	58.8
	GROSS TREE	86.6	105.8	125.0	144.2	163.4	182.6	201.8

TABLE 12.--PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM YELLOW BIRCH BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	3.9	4.3	4.7	5.1	5.5	5.9	6.3
	SAWDUST	0.9	0.9	1.0	1.0	1.0	1.1	1.1
	RESIDUE	4.7	5.8	7.0	8.1	9.3	10.5	11.6
	GROSS TREE	9.8	11.8	13.9	16.0	18.1	20.2	22.2
11	LUMBER	5.1	5.8	6.5	7.2	7.8	8.5	9.2
	SAWDUST	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	RESIDUE	5.2	6.4	7.6	8.8	10.0	11.3	12.5
	GROSS TREE	11.7	14.2	16.6	19.0	21.5	23.9	26.3
12	LUMBER	6.4	7.4	8.4	9.4	10.4	11.4	12.4
	SAWDUST	1.2	1.4	1.5	1.7	1.9	2.0	2.2
	RESIDUE	5.7	7.0	8.3	9.6	10.9	12.1	13.4
	GROSS TREE	13.9	16.7	19.5	22.3	25.1	28.0	30.8
13	LUMBER	7.8	9.1	10.4	11.8	13.1	14.4	15.8
	SAWDUST	1.4	1.7	1.9	2.1	2.3	2.6	2.8
	RESIDUE	6.4	7.7	9.1	10.4	11.7	13.1	14.4
	GROSS TREE	16.2	19.4	22.7	25.9	29.2	32.4	35.7
14	LUMBER	9.3	11.0	12.7	14.4	16.1	17.8	19.5
	SAWDUST	1.7	2.0	2.3	2.5	2.8	3.1	3.4
	RESIDUE	7.0	8.5	9.9	11.3	12.7	14.1	15.5
	GROSS TREE	18.7	22.4	26.1	29.8	33.5	37.2	40.9
15	LUMBER	10.9	13.0	15.1	17.2	19.3	21.3	23.4
	SAWDUST	1.9	2.3	2.6	3.0	3.4	3.8	4.1
	RESIDUE	7.8	9.3	10.7	12.2	13.7	15.2	16.7
	GROSS TREE	21.4	25.6	29.8	34.0	38.2	42.4	46.5
16	LUMBER	12.6	15.1	17.6	20.1	22.7	25.2	27.7
	SAWDUST	2.2	2.6	3.1	3.5	4.0	4.4	4.9
	RESIDUE	8.5	10.1	11.7	13.3	14.8	16.4	18.0
	GROSS TREE	24.3	29.0	33.7	38.3	43.1	47.9	52.6
17	LUMBER	14.4	17.4	20.3	23.3	26.3	29.2	32.2
	SAWDUST	2.4	3.0	3.5	4.0	4.6	5.1	5.7
	RESIDUE	9.3	11.0	12.7	14.3	16.0	17.7	19.3
	GROSS TREE	27.3	32.6	37.9	43.2	48.4	53.7	59.0
18	LUMBER	16.4	19.8	23.2	26.7	30.1	33.5	37.0
	SAWDUST	2.7	3.3	4.0	4.6	5.2	5.9	6.5
	RESIDUE	10.2	12.0	13.7	15.5	17.3	19.0	20.8
	GROSS TREE	30.6	36.5	42.3	48.2	54.1	59.9	65.8
19	LUMBER	18.4	22.4	26.3	30.2	34.2	38.1	42.0
	SAWDUST	3.0	3.7	4.5	5.2	5.9	6.7	7.4
	RESIDUE	11.7	13.0	14.8	16.7	18.6	20.4	22.3
	GROSS TREE	34.0	40.5	47.0	53.5	60.0	66.5	73.0
20	LUMBER	20.6	25.1	29.5	34.0	38.4	42.9	47.4
	SAWDUST	3.3	4.2	5.0	5.8	6.7	7.5	8.3
	RESIDUE	12.1	14.1	16.0	18.0	20.0	21.9	23.9
	GROSS TREE	37.7	44.8	52.0	59.1	66.3	73.4	80.6
21	LUMBER	22.9	27.9	32.9	37.9	42.9	48.0	53.0
	SAWDUST	3.7	4.6	5.6	6.5	7.4	8.4	9.3
	RESIDUE	13.1	15.2	17.3	19.3	21.4	23.5	25.6
	GROSS TREE	41.5	49.3	57.2	65.0	72.9	80.7	88.6
22	LUMBER	25.3	30.9	36.5	42.1	47.7	53.3	58.9
	SAWDUST	4.0	5.1	6.1	7.2	8.2	9.3	10.4
	RESIDUE	14.2	16.4	18.6	20.7	22.9	25.1	27.3
	GROSS TREE	45.5	54.0	62.6	71.2	79.8	88.3	96.9
23	LUMBER	27.8	34.0	40.2	46.4	52.6	58.8	65.0
	SAWDUST	4.4	5.6	6.7	7.9	9.1	10.3	11.4
	RESIDUE	15.3	17.6	19.9	22.2	24.5	26.8	29.1
	GROSS TREE	49.6	59.0	68.3	77.7	87.0	96.3	105.7
24	LUMBER	30.4	37.2	44.1	50.9	57.8	64.6	71.4
	SAWDUST	4.8	6.1	7.4	8.7	10.0	11.3	12.6
	RESIDUE	16.5	18.9	21.3	23.8	26.2	28.6	31.1
	GROSS TREE	54.0	64.1	74.3	84.4	94.5	104.7	114.8
25	LUMBER	33.1	40.6	48.1	55.6	63.1	70.6	78.1
	SAWDUST	5.2	6.6	8.0	9.5	10.9	12.3	13.7
	RESIDUE	17.7	20.2	22.8	25.4	27.9	30.5	33.1
	GROSS TREE	58.6	69.5	80.5	91.5	102.4	113.4	124.3
26	LUMBER	35.9	44.1	52.3	60.5	68.7	76.9	85.1
	SAWDUST	5.6	7.2	8.7	10.3	11.8	13.4	15.0
	RESIDUE	18.9	21.6	24.3	27.0	29.7	32.4	35.1
	GROSS TREE	63.3	75.1	87.0	98.8	110.6	122.4	134.3
27	LUMBER	38.9	47.8	56.7	65.6	74.5	83.5	92.4
	SAWDUST	6.1	7.7	9.4	11.1	12.8	14.5	16.2
	RESIDUE	20.3	23.1	25.9	28.8	31.6	34.5	37.3
	GROSS TREE	68.2	81.0	93.7	106.4	119.1	131.8	144.6
28	LUMBER	41.9	51.6	61.2	70.9	80.6	90.2	99.9
	SAWDUST	6.5	8.3	10.2	12.0	13.9	15.7	17.5
	RESIDUE	21.4	24.6	27.6	30.6	33.6	36.6	39.6
	GROSS TREE	73.3	87.0	100.6	114.3	128.0	141.6	155.3
29	LUMBER	45.1	55.5	65.9	76.4	86.8	97.3	107.7
	SAWDUST	7.0	9.0	11.0	12.9	14.9	16.9	18.9
	RESIDUE	23.0	26.2	29.3	32.5	35.6	38.7	41.9
	GROSS TREE	78.6	93.3	107.9	122.5	137.1	151.7	166.4
30	LUMBER	48.3	59.6	70.8	82.1	93.3	104.5	115.8
	SAWDUST	7.5	9.6	11.8	13.9	16.0	18.2	20.3
	RESIDUE	24.5	27.8	31.1	34.4	37.7	41.0	44.3
	GROSS TREE	84.1	99.7	115.4	131.0	146.6	162.2	177.8

TABLE 13.—PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM YELLOW BIRCH BY CIRCULAR MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	3.8	5.1	6.3	7.6	8.9	10.2	11.4
	SAWDUST	1.6	2.0	2.4	2.9	3.3	3.7	4.1
	RESIDUE	4.7	5.8	7.0	8.1	9.3	10.5	11.6
	GROSS TREE	9.8	11.8	13.9	16.0	18.1	20.2	22.2
11	LUMBER	4.9	6.4	7.8	9.3	10.8	12.2	13.7
	SAWDUST	1.9	2.4	2.8	3.3	3.8	4.3	4.8
	RESIDUE	5.2	6.4	7.6	8.8	10.0	11.3	12.5
	GROSS TREE	11.7	14.2	16.6	19.0	21.5	23.9	26.3
12	LUMBER	6.2	7.8	9.5	11.1	12.8	14.5	16.1
	SAWDUST	2.2	2.7	3.3	3.8	4.4	4.9	5.5
	RESIDUE	7.7	7.0	8.3	9.6	10.9	12.1	13.4
	GROSS TREE	13.9	16.7	19.5	22.3	25.1	28.0	30.8
13	LUMBER	7.6	9.4	11.3	13.2	15.0	16.9	18.8
	SAWDUST	2.6	3.2	3.8	4.4	5.0	5.6	6.2
	RESIDUE	6.4	7.7	9.1	10.4	11.7	13.1	14.4
	GROSS TREE	16.2	19.4	22.7	25.9	29.2	32.4	35.7
14	LUMBER	9.0	11.1	13.2	15.3	17.4	19.5	21.6
	SAWDUST	2.9	3.6	4.3	5.0	5.7	6.4	7.0
	RESIDUE	7.0	8.5	9.9	11.3	12.7	14.1	15.5
	GROSS TREE	18.7	22.4	26.1	29.8	33.5	37.2	40.9
15	LUMBER	10.6	13.0	15.3	17.7	20.0	22.4	24.7
	SAWDUST	3.3	4.1	4.9	5.6	6.4	7.2	7.9
	RESIDUE	7.8	9.3	10.7	12.2	13.7	15.2	16.7
	GROSS TREE	21.4	25.6	29.8	34.0	38.2	42.4	46.5
16	LUMBER	12.3	14.9	17.5	20.2	22.8	25.4	28.0
	SAWDUST	3.8	4.6	5.5	6.3	7.2	8.0	8.9
	RESIDUE	8.5	10.1	11.7	13.3	14.8	16.4	18.0
	GROSS TREE	24.3	29.0	33.7	38.4	43.1	47.9	52.6
17	LUMBER	14.1	17.0	19.9	22.8	25.7	28.6	31.5
	SAWDUST	4.2	5.2	6.1	7.1	8.0	8.9	9.9
	RESIDUE	9.3	11.0	12.7	14.3	16.0	17.7	19.3
	GROSS TREE	27.3	32.6	37.9	43.2	48.4	53.7	59.0
18	LUMBER	16.0	19.2	22.4	25.6	28.8	32.0	35.2
	SAWDUST	4.7	5.8	6.8	7.8	8.9	9.9	11.0
	RESIDUE	10.2	12.0	13.7	15.5	17.3	19.0	20.8
	GROSS TREE	30.6	36.5	42.3	48.2	54.1	59.9	65.8
19	LUMBER	18.1	21.6	25.1	28.6	32.1	35.7	39.2
	SAWDUST	5.2	6.4	7.5	8.7	9.8	10.9	12.1
	RESIDUE	11.1	13.0	14.8	16.7	18.6	20.4	22.3
	GROSS TREE	34.0	40.5	47.0	53.5	60.0	66.5	73.0
20	LUMBER	20.2	24.0	27.9	31.8	35.6	39.5	43.3
	SAWDUST	5.8	7.0	8.3	9.5	10.8	12.0	13.3
	RESIDUE	12.1	14.1	16.0	18.0	20.0	21.9	23.9
	GROSS TREE	37.7	44.8	52.0	59.1	66.3	73.4	80.6
21	LUMBER	22.4	26.6	30.8	35.1	39.3	43.5	47.7
	SAWDUST	6.4	7.7	9.1	10.4	11.8	13.2	14.5
	RESIDUE	13.1	15.2	17.3	19.3	21.4	23.5	25.6
	GROSS TREE	41.5	49.3	57.2	65.0	72.9	80.7	88.6
22	LUMBER	24.8	29.4	33.9	38.5	43.1	47.7	52.2
	SAWDUST	7.0	8.4	9.9	11.4	12.9	14.4	15.8
	RESIDUE	14.2	16.4	18.6	20.7	22.9	25.1	27.3
	GROSS TREE	45.5	54.0	62.6	71.2	79.8	88.3	96.9
23	LUMBER	27.2	32.2	37.2	42.1	47.1	52.1	57.0
	SAWDUST	7.6	9.2	10.8	12.4	14.0	15.6	17.2
	RESIDUE	15.3	17.6	19.9	22.2	24.5	26.8	29.1
	GROSS TREE	49.6	59.0	68.3	77.7	87.0	96.3	105.7
24	LUMBER	29.8	35.2	40.6	45.9	51.3	56.7	62.0
	SAWDUST	8.3	10.0	11.7	13.5	15.2	16.9	18.6
	RESIDUE	16.5	18.9	21.3	23.8	26.2	28.6	31.1
	GROSS TREE	54.0	64.1	74.3	84.4	94.5	104.7	114.8
25	LUMBER	32.5	38.3	44.1	49.9	55.7	61.4	67.2
	SAWDUST	8.9	10.8	12.7	14.5	16.4	18.3	20.1
	RESIDUE	17.7	20.2	22.8	25.4	27.9	30.5	33.1
	GROSS TREE	58.6	69.5	80.5	91.5	102.4	113.4	124.3
26	LUMBER	35.3	41.5	47.7	54.0	60.2	66.4	72.7
	SAWDUST	9.7	11.7	13.7	15.7	17.7	19.7	21.7
	RESIDUE	18.9	21.6	24.3	27.0	29.7	32.4	35.1
	GROSS TREE	63.3	75.1	87.0	98.8	110.6	122.4	134.3
27	LUMBER	38.2	44.9	51.6	58.2	64.9	71.6	78.3
	SAWDUST	10.4	12.6	14.7	16.9	19.0	21.2	23.3
	RESIDUE	20.3	23.1	25.9	28.8	31.6	34.5	37.3
	GROSS TREE	68.2	81.0	93.7	106.4	119.1	131.8	144.6
28	LUMBER	41.2	48.4	55.5	62.7	69.8	77.0	84.1
	SAWDUST	11.2	13.5	15.8	18.1	20.4	22.7	25.0
	RESIDUE	21.6	24.6	27.6	30.6	33.6	36.6	39.6
	GROSS TREE	73.3	87.0	100.6	114.3	128.0	141.6	155.3
29	LUMBER	44.3	52.0	59.6	67.3	74.9	82.5	90.2
	SAWDUST	12.0	14.4	16.9	19.4	21.8	24.3	26.7
	RESIDUE	23.0	26.2	29.3	32.5	35.6	38.7	41.9
	GROSS TREE	78.6	93.3	107.9	122.5	137.1	151.7	166.4
30	LUMBER	47.5	55.7	63.8	72.0	80.2	88.3	96.5
	SAWDUST	12.8	15.4	18.0	20.7	23.3	25.9	28.5
	RESIDUE	24.5	27.8	31.1	34.4	37.7	41.0	44.3
	GROSS TREE	84.1	99.7	115.4	131.0	146.6	162.2	177.8

TABLE 14.—PREDICTED YIELDS OF SAWMILL PRODUCTS OBTAINED FROM BASSWOOD BY BAND MILLS (CUBIC FEET)

DBH (INCHES)	PRODUCT	MERCHANTABLE HEIGHT (FEET)						
		24	32	40	48	56	64	72
10	LUMBER	2.7	5.4	8.1	10.7	13.4	16.0	18.7
	SAWDUST	0.5	1.0	1.6	2.2	2.7	3.3	3.8
	RESIDUE	4.3	4.5	4.7	5.0	5.2	5.4	5.6
	GROSS TREE	7.2	11.0	14.7	18.5	22.2	25.9	29.7
11	LUMBER	4.1	6.9	9.7	12.5	15.3	18.1	20.9
	SAWDUST	0.7	1.3	1.9	2.4	3.0	3.6	4.2
	RESIDUE	4.9	5.3	5.6	5.9	6.3	6.6	6.9
	GROSS TREE	9.6	13.6	17.5	21.5	25.5	29.5	33.4
12	LUMBER	5.6	8.5	11.5	14.4	17.4	20.3	23.3
	SAWDUST	0.9	1.6	2.2	2.8	3.4	4.0	4.6
	RESIDUE	5.6	6.1	6.5	7.0	7.4	7.9	8.3
	GROSS TREE	12.1	16.4	20.6	24.9	29.1	33.3	37.6
13	LUMBER	7.2	10.3	13.4	16.5	19.6	22.7	25.8
	SAWDUST	1.2	1.8	2.5	3.1	3.7	4.4	5.0
	RESIDUE	6.4	7.0	7.6	8.1	8.7	9.3	9.8
	GROSS TREE	14.9	19.4	24.0	28.5	33.0	37.5	42.1
14	LUMBER	8.9	12.2	15.5	18.8	22.0	25.3	28.6
	SAWDUST	1.5	2.2	2.8	3.5	4.1	4.8	5.5
	RESIDUE	7.2	7.9	8.7	9.4	10.1	10.8	11.5
	GROSS TREE	17.9	22.7	27.6	32.4	37.2	42.1	46.9
15	LUMBER	10.7	14.2	17.7	21.2	24.7	28.1	31.6
	SAWDUST	1.8	3.0	3.2	3.6	4.0	4.3	4.9
	RESIDUE	8.1	9.0	9.8	10.7	11.5	12.4	13.3
	GROSS TREE	21.1	26.3	31.5	36.6	41.8	46.9	52.1
16	LUMBER	12.7	16.4	20.1	23.8	27.5	31.1	34.8
	SAWDUST	2.1	2.9	3.6	4.3	5.0	5.7	6.5
	RESIDUE	9.1	10.1	11.1	12.1	13.1	14.1	15.2
	GROSS TREE	24.6	30.1	35.6	41.1	46.6	52.2	57.7
17	LUMBER	14.8	18.7	22.6	26.5	30.4	34.3	38.2
	SAWDUST	2.5	3.2	4.0	4.7	5.5	6.3	7.0
	RESIDUE	10.1	11.3	12.4	13.6	14.8	16.0	17.2
	GROSS TREE	28.2	34.1	40.0	45.9	51.8	57.7	63.6
18	LUMBER	17.1	21.2	25.3	29.5	33.6	37.7	41.8
	SAWDUST	2.9	3.6	4.4	5.2	6.0	6.8	7.6
	RESIDUE	11.1	12.5	13.9	15.2	16.6	17.9	19.3
	GROSS TREE	32.1	38.4	44.7	51.0	57.3	63.6	69.9
19	LUMBER	19.4	23.8	28.2	32.6	36.9	41.3	45.7
	SAWDUST	3.2	4.1	4.9	5.7	6.6	7.4	8.2
	RESIDUE	12.3	13.8	15.4	16.9	18.5	20.0	21.6
	GROSS TREE	36.2	42.9	49.7	56.4	63.1	69.8	76.5
20	LUMBER	21.9	26.6	31.2	35.8	40.4	45.1	49.7
	SAWDUST	3.7	4.5	5.4	6.3	7.1	8.0	8.9
	RESIDUE	13.5	15.2	17.0	18.7	20.5	22.2	24.0
	GROSS TREE	40.6	47.7	54.9	62.0	69.2	76.4	83.5
21	LUMBER	24.6	29.5	34.3	39.2	44.1	49.0	53.9
	SAWDUST	4.1	5.0	5.9	6.8	7.7	8.7	9.6
	RESIDUE	14.7	16.7	18.6	20.6	22.5	24.5	26.5
	GROSS TREE	45.1	52.7	60.4	68.0	75.6	83.3	90.9
22	LUMBER	27.3	32.5	37.7	42.8	48.0	53.2	58.4
	SAWDUST	4.5	5.5	6.5	7.5	8.4	9.3	10.3
	RESIDUE	16.0	18.2	20.4	22.5	24.7	26.9	29.1
	GROSS TREE	49.9	58.0	66.1	74.2	82.4	90.5	98.6
23	LUMBER	30.2	35.7	41.1	46.6	52.1	57.6	63.0
	SAWDUST	5.0	6.0	7.0	8.0	9.0	10.0	11.0
	RESIDUE	17.4	19.8	22.2	24.6	27.0	29.4	31.8
	GROSS TREE	54.9	63.5	72.1	80.8	89.4	98.0	106.7
24	LUMBER	33.2	39.0	44.8	50.5	56.3	62.1	67.9
	SAWDUST	5.5	6.6	7.6	8.7	9.7	10.8	11.8
	RESIDUE	18.8	21.5	24.1	26.8	29.4	32.1	34.7
	GROSS TREE	60.1	69.3	78.4	87.6	96.8	105.9	115.1
25	LUMBER	36.3	42.4	48.5	54.6	60.7	66.8	72.9
	SAWDUST	6.0	7.1	8.2	9.4	10.5	11.6	12.7
	RESIDUE	20.3	23.2	26.1	29.0	31.9	34.8	37.7
	GROSS TREE	65.5	75.3	85.0	94.7	104.5	114.2	123.9
26	LUMBER	39.6	46.0	52.5	58.9	65.3	71.8	78.2
	SAWDUST	6.6	7.7	8.9	10.0	11.2	12.4	13.5
	RESIDUE	21.9	25.0	28.2	31.3	34.5	37.7	40.8
	GROSS TREE	71.2	81.5	91.8	102.1	112.4	122.8	133.1
27	LUMBER	43.0	49.8	56.6	63.3	70.1	76.9	83.7
	SAWDUST	7.1	8.4	9.6	10.8	12.0	13.2	14.4
	RESIDUE	23.5	26.9	30.3	33.8	37.2	40.6	44.1
	GROSS TREE	77.1	88.0	98.9	109.8	120.7	131.7	142.6
28	LUMBER	46.5	53.7	60.8	67.9	75.1	82.2	89.4
	SAWDUST	7.7	9.0	10.3	11.5	12.8	14.1	15.3
	RESIDUE	25.2	28.9	32.6	36.3	40.0	43.7	47.4
	GROSS TREE	83.2	94.7	106.3	117.8	129.4	140.9	152.4
29	LUMBER	50.2	57.7	65.2	72.7	80.2	87.7	95.3
	SAWDUST	8.3	9.7	11.0	12.3	13.6	15.0	16.3
	RESIDUE	26.9	30.9	34.9	38.9	42.9	46.9	50.9
	GROSS TREE	89.5	101.7	113.9	126.1	138.3	150.5	162.7
30	LUMBER	53.9	61.8	69.7	77.6	85.5	93.4	101.3
	SAWDUST	9.0	10.3	11.7	13.1	14.5	15.9	17.3
	RESIDUE	28.7	33.0	37.3	41.6	45.9	50.2	54.5
	GROSS TREE	96.1	108.9	121.8	134.7	147.5	160.4	173.3

Sawmill Residue Volume

A portion of the sawmill residue volume is not useable because of rot; the remainder is useable for chips. Averages for rot in the sample trees are:

<i>Species</i>	<i>Average rot (percent)</i>
Northern red oak	4
White oak	2
Black oak	2
Chestnut oak	4
Red maple	3
Sugar maple	3
Yellow-poplar	2
Yellow birch	4
Paper birch	5
Basswood	4

If the percentage of rot in your area is greater than the percentages that we calculated, the volumes of lumber and sawdust will decrease and the volume of sawmill residue will increase.

Weight-Volume Relationships

Chips and sawdust are not marketed on a cubic-foot basis; however conversion to weight is possible if the density of the wood is known. Species averages are shown below (*U.S. Forest Products Laboratory 1974*), but it should be

recognized that actual density varies by location. To obtain a better estimate of density for a given location, wood samples should be collected and standard techniques should be used.

<i>Species</i>	<i>Density⁴ (lb/ft³)</i>
Northern red oak	34.9
White oak	37.4
Black oak	34.9
Chestnut oak	35.5
Red maple	30.6
Sugar maple	34.9
Yellow-poplar	25.0
Yellow birch	34.3
Paper birch	30.0
Basswood	20.0

Phillips and others (1974) predicted recovery percentages for lumber, chippable residue, bark residue, and sawdust—on a weight basis—for 40 of the 224 black oak trees that were used for this study. With the exception of bark residue, we have predicted similar recovery percentages on a cubic-foot volume basis (table 15). We adjusted the percentages in Phillips' report so that bark residue could be removed from the table.

⁴ Based on specific gravity at oven-dry weight and green volume.

Table 15.—Percentage recovery of lumber, chippable residue, and sawdust from 40 black oak trees, computed by weight and by volume

Dbh	Number of trees	Lumber		Chippable residue		Sawdust	
		Weight	Volume	Weight	Volume	Weight	Volume
12	2	59	58	29	31	12	10
13	2	62	64	24	25	14	11
14	1	58	59	28	31	14	10
15	3	61	57	26	32	13	10
16	5	58	56	29	34	13	10
17	5	64	63	23	26	13	11
18	4	60	56	27	35	13	10
19	0	—	—	—	—	—	—
20	3	66	65	22	24	12	11
21	4	65	64	22	25	13	11
22	5	66	65	22	25	12	10
23	1	70	73	18	16	11	11
24	1	66	68	21	21	12	11
25	2	68	66	20	24	12	10
26	2	69	66	20	23	12	10
Weighted average		65	64	24	26	12	10

The small differences between figures for weight and volume were probably caused by differences in kerf or lumber sizing between the actual and the estimated sizes. We believe that the closeness of these recovery percentages indicates that the weight of chippable residue and sawdust can be successfully estimated with the cubic-foot volume equations or tables.

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