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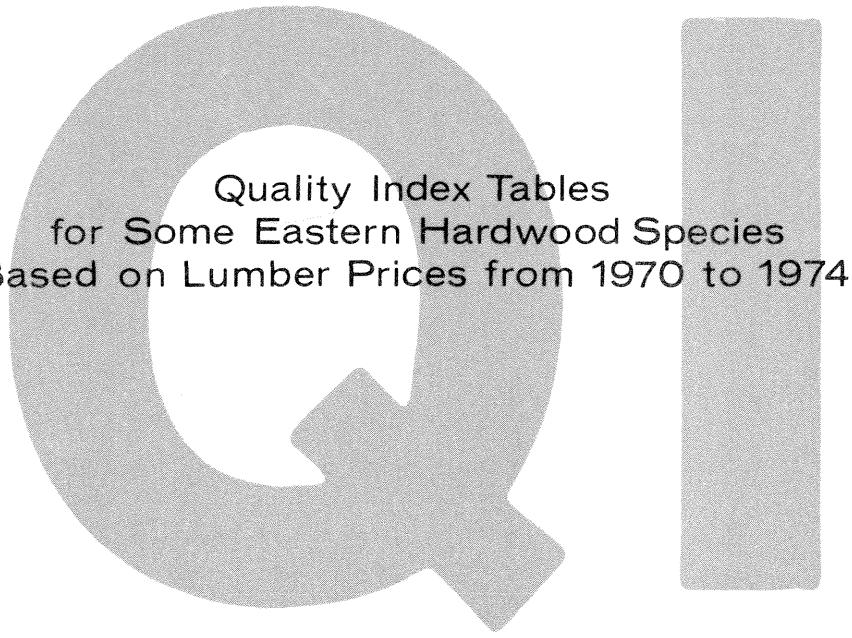

Quality Index Tables for Some Eastern Hardwood Species Based on Lumber Prices from 1970 to 1974

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ABSTRACT

Revised quality index (QI) tables for white ash, beech, black cherry, birch, hard maple, soft maple, red oak, white oak, and yellow-poplar are based on 1970-74 lumber prices for the Appalachian and northeastern marketing areas. Changes in QI since 1964-68 were greatest for white oak; there also were significant changes in QI for red oak, white ash, and yellow-poplar.

Keywords: hardwoods, value, sawtimber, prices.

AN UPDATING OF QI

IN THIS PAPER we have revised quality index (QI) tables that were reported in a previous study *(Mendel and Smith 1970).* The QI's in that study were based on lumber prices from 1964 to 1968; the updated quality indexes are based on lumber prices from 1970 to 1974. The QI changes periodically because of changes in price ratios for different grades of lumber. These changing ratios affect the value of the lumber that can be sawed from a log.

WHAT IS QI?

The QI is an index number similar to the U.S. Department of Commerce Consumer Price Index. All index numbers must have a base and the base for QI is the price of 4/4 No. 1 Common lumber; later we will use this base in calculating log value. The QI expresses the relative value of the lumber in a log based on the amount of different grades of 4/4 (per thousand board feet) lumber that can be sawed from a log. The formula for QI is:

$$QI = (\%\ FAS \times PR_{FAS}) + (\%\ SEL \times PR_{SEL}) + (\%\ No.\ 1C \times PR_{No.\ 1C}) + \ldots\ldots\ldots (\%\ No.\ 3B \times PR_{No.\ 3B})$$

where % FAS and % SEL are the percentages of the total volume of lumber that can be sawed from logs that will grade First and Second and Select, respectively. PR_{FAS} is the price relative for

$$\text{FAS lumber } \left(\frac{\text{Price 4/4 FAS lumber/M BM}}{\text{Price 4/4 No. 1 Common/M BM}}\right)$$

For this study, price relatives are 5-year average price relatives for different grades of lumber.

CALCULATING THE QI

Two sets of data are needed to calculate the QI: (1) lumber grade yields by diameter, log grade, and species, and (2) lumber prices for 4/4 lumber, by grade, to calculate the price relatives.

For our calculations we obtained lumber grade yields from a study by Vaughn et al *(1966).*

The lumber price relatives were developed from prices reported from 1970 to 1974 in the *Hardwood Market Report* and in *The Commercial Bulletin.*

The PR's for No. 1 Common are always 1.00 because that grade is the base for the index (table 1A). The PR's for FAS and SEL grades are more than 1.00, and the PR's for No. 2 Common, No. 3A Common, and No. 3B Common are all less than 1.00. Prices for FAS and SEL lumber are higher than that for No. 1C, while the prices for No. 2C, No. 3A, and No. 3B lumber are lower than that for No. 1C. Table 1B shows the price relatives for 1970-74 compared to those for 1964-68.

To explain how the QI is calculated, let's use a 16-foot-long Grade 1 white ash log that is 16 inches in diameter inside bark (dib). Lumber grade yields are: 41.4 percent FAS, 11.0 percent SEL, 26.5 percent No. 1C, 12.3 percent No. 2C, 4.4 percent No. 3A, and 4.4 percent No. 3B. If we use the price relatives from table 1, our formula is:

$$QI = (.414 \times 1.51) + (.110 \times 1.47) + (.265 \times 1.00) + (.123 \times .50) + (.044 \times .42) + (.044 \times .37)$$

$$QI = 1.149 \text{ or } 1.15.$$

Table 1A.—*Lumber price relatives by grade and species, and market* (Basis: 4/4 No. 1 COMMON, the reference grade)

Species and market	Lumber grade							
	FAS	SEL	SAPS	No. 1C	No. 2C No. 2A	No. 2B	No. 3A	No. 3B
Market I [a]								
White ash	1.51	1.47	—	1.00	.50	—	.42	.37
Beech	1.22	1.15	—	1.00	.63	—	.50	.44
Black cherry	1.44	1.39	—	1.00	.51	—	.43	.41
Hard maple	1.48	1.43	—	1.00	.51	—	.46	.31
Soft maple	1.27	1.23	—	1.00	.49	—	.45	.31
Red oak	1.53	1.48	—	1.00	.57	—	.52	.33
White oak	1.52	1.46	—	1.00	.59	—	.53	.35
Yellow-poplar	1.33	1.28	1.23	1.00	.67	.47	.23	.23
Market II [b]								
White ash	1.51	1.46	—	1.00	.48	—	.38	.34
Beech	1.21	1.15	—	1.00	.52	—	.41	.37
Black cherry	1.43	1.39	—	1.00	.46	—	.26	.24
Hard maple	1.47	1.43	—	1.00	.55	—	.40	.29
Red oak	1.50	1.45	—	1.00	.58	—	.51	.33
White oak	1.49	1.43	—	1.00	.53	—	.46	.30
Yellow-poplar	1.32	1.28	1.22	1.00	.64	.44	.22	.22
Market III [c]								
White ash	1.46	1.40	—	1.00	.46	—	.36	.32
Beech	1.24	1.11	—	1.00	.53	—	.41	.37
Birch	1.72	1.62	—	1.00	.63	—	.47	.29
Hard maple	1.52	1.42	—	1.00	.64	—	.51	.40
Soft maple	1.36	1.23	—	1.00	.54	—	.39	.30
Oak	1.44	1.34	—	1.00	.61	—	.55	.40

[a] Based on 1970-74 lumber prices for Appalachian hardwoods, from the *Hardwood Market Report*, f.o.b. mills, Johnson City Tennessee, area.

[b] Based on 1970-74 prices for Appalachian hardwoods, from *The Commercial Bulletin*, for rough and air-dried lumber, f.o.b. mill, wholesale commission included.

[c] Based on 1970-74 prices for northeastern hardwoods, from *The Commercial Bulletin*, for rough and air-dried lumber, f.o.b. mill, wholesale commission included.

The QI that was based on 1964-68 prices for that log grade and size class of white ash was 1.21; therefore the QI has changed by -.06 between the two base periods (table 1C). Now let's see how this change affects the value of the lumber in the log.

DETERMINING LOG VALUE FROM QI

Tables 2 to 22 show the QI's for some of the more important eastern hardwood species; these QI's are based on 1970-74 prices for the Appalachian marketing area as reported by the *Hardwood Market Report* and *The Commercial Bulletin*, and the northeastern marketing area as reported by the *The Commercial Bulletin*. These QI's are simply multiplied by the price of 4/4 No. 1 Common lumber to determine the value of lumber in a log. For example, the *Hardwood Market Report* of January 3, 1976, quoted a price of $290/M bm for 4/4 No. 1 Common white ash. Thus the expected value of lumber (4/4 basis) that can be sawed from our 16-inch Grade 1 white ash log would be calculated:

$$\text{Lumber value} = (\text{QI})\,(\text{Price 4/4 No. 1 Common}) \times \frac{\text{Volume of log}}{1000}$$

$$\text{Lumber value} = (1.15)\ (\$290) \times \frac{180}{1000}$$

$$\text{Lumber value} = \$60.03.$$

Table 1B.—*Changes in price relatives between time periods 1964-68 and 1970-74 by markets.*

Species and market	Lumber grade							
	FAS	SEL	SAPS	No. 1C	No. 2C No. 2A	No. 2B	No. 3A	No. 3B
Market I [a]								
White ash	-.12	-.09	—	—	-.03	—	-.02	-.02
Beech	-.03	-.03	—	—	+.09	—	+.08	+.06
Black cherry	-.01	-.01	—	—	+.05	—	+.16	+.16
Hard maple	-.05	-.04	—	—	+.07	—	+.08	+.04
Soft maple	-.01	.00	—	—	+.02	—	+.02	+.01
Red oak	-.12	-.09	—	—	-.07	—	-.04	-.04
White oak	-.30	-.28	—	—	-.07	—	-.05	-.04
Yellow-poplar	-.09	-.08	-.06	—	.00	+.02	.00	.00
Market II [b]								
White ash	-.10	-.06	—	—	-.02	—	-.02	-.01
Beech	-.03	-.03	—	—	-.01	—	-.01	-.01
Black cherry	+.01	+.01	—	—	-.01	—	.00	.00
Hard maple	-.02	-.02	—	—	+.09	—	.00	.00
Red oak	-.13	-.10	—	—	-.04	—	-.03	-.02
White oak	-.31	-.20	—	—	-.01	—	-.10	-.07
Yellow-poplar	-.09	-.06	-.07	—	-.03	-.01	-.01	-.01
Market III [c]								
White ash	-.07	.00	—	—	.00	—	.00	.00
Beech	-.09	-.06	—	—	-.03	—	-.02	-.02
Birch	+.02	+.02	—	—	+.09	—	+.01	+.01
Hard maple	-.05	-.02	—	—	+.04	—	-.01	-.01
Soft maple	+.03	.00	—	—	+.07	—	.00	.00
Oak	-.10	-.02	—	—	-.16	—	-.14	-.10

[a] Based on 1970-74 lumber prices for Appalachian hardwoods, from the *Hardwood Market Report*, f.o.b. mills, Johnson City, Tennessee, area.

[b] Based on 1970-74 prices for Appalachian hardwoods, from *The Commercial Bulletin*, for rough and air-dried lumber, f.o.b. mill, wholesale commission included.

[c] Based on 1970-74 prices for northeastern hardwoods, from *The Commercial Bulletin*, for rough and air-dried lumber, f.o.b. mill, wholesale commission included.

Table 1C.—*Changes in WHITE OAK quality index between 1964-68 and 1970-74*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	-.04
9	—	—	-.05
10	—	-.05	-.04
11	—	-.05	-.05
12	—	-.07	-.04
13	-.11	-.06	-.04
14	-.12	-.06	-.05
15	-.12	-.06	-.04
16	-.13	-.06	-.05
17	-.14	-.07	-.05
18	-.15	-.06	-.04
19	-.15	-.07	-.05
20	-.15	-.06	-.04
21	-.16	-.07	-.05
22	-.16	-.07	-.05
23	-.17	-.07	-.05
24	-.17	-.08	-.06
25	-.18	-.08	-.08

CHANGES IN QI SINCE 1964-68

Changes in QI's since 1964-68 were greatest for white oak (table 1C). There also were significant changes in QI for red oak, white ash, and yellow-poplar. These changes are the result of fluctuating supply of and demand for the different grades and species of lumber, and consequent changes in lumber prices. When demand for the higher grades of lumber is great and the supply is low, prices for higher grades increase. During periods of high lumber prices, industries often use a greater proportion of lower grade lumber: this tends to raise prices for lower lumber grades and to lower prices for higher quality lumber grades. Therefore price relatives must be updated frequently to maintain accurate QI's.

For the white oak species we found changes of -.30 and -.28 in the price relatives for the FAS and SEL grades, respectively. The greatest changes in QI for white oak logs were in Grade No. 1C and in the larger diameter classes because these logs yield the greatest percentage of FAS and SEL lumber.

Each change of 0.10 in QI represents a change in the value of a log equal to 1/10 of the price of 4/4 No. 1 Common lumber multiplied by the amount of lumber (of all grades) in the log divided by 1,000. For example, let's assume that the QI changed by 0.1 between the two base periods but that the price of 4/4 No. 1 Common remains unchanged at $220 per M bm, and that the volume is 1,000 board feet: the change in value would be $22.

$$\text{Change} = 1/10 \times (\text{Price No. 1C}) \times \frac{\text{Vol.}}{1000}$$

$$= 1/10 \times \$220 \times \frac{1000}{1000}$$

$$= \$22.$$

To provide a more general summary of changes in QI we classified logs into three groups on the basis of diameter class and log grade (LG):

Large — 24 inches in dib (23 inches in dib for red maple), LG 1.
Medium — 18 inches in dib, LG 2.
Small — 12 inches in dib, LG 3.

The changes in QI for these log classes—by species—between the two base periods were:

Species	*Large*	*Medium*	*Small*
White ash	-.09	-.05	-.03
Beech	+.01	+.03	+.06
Black cherry	+.01	+.02	+.07
Hard maple	-.01	+.02	+.04
Soft maple	.00	.00	+.03
Red oak	-.07	-.04	-.04
White oak	-.17	-.06	-.04
Yellow-poplar	-.03	.00	.00

In general, QI's increased for small logs, remained about the same for medium logs, and decreased for large logs; the greatest decrease was -0.17 for large white oak logs, the greatest increase was +0.07 for small black cherry logs. The average change in QI for all species and log classes was -0.0142.

We can gain better perspective of the importance of these changes in QI by translating them into dollars. At $200 per M bm No. 1C lumber, the maximum error from using QI's for 1964-68 would be (+) $34 per M bm for large white oak logs, and (-) $14 for small black cherry logs; the average error for the eight species and all log grades would be (-) $2.84 per M bm.

These revised QI tables will enable users of this log valuing system to update their log assessment procedures.

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APPENDIX

Tables 2 to 9 are based on 1970-74 lumber prices from the *Hardwood Market Report* for the Appalachian area; tables 10 to 16 are based on 1970-74 lumber prices from *The Commercial Bulletin* for the Appalachian area; and tables 17 to 22 are based on 1970-74 lumber prices from *The Commercial Bulletin* for the northeastern area.

Table 2.—*Quality index for WHITE ASH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.58
9	—	—	.59
10	—	0.81	.61
11	—	.83	.63
12	1.06	.86	.66
13	1.08	.88	.69
14	1.11	.90	.73
15	1.13	.93	.77
16	1.15	.96	.80
17	1.16	.98	.84
18	1.18	1.00	.88
19	1.20	1.03	.91
20	1.22	1.06	.95
21	1.23	1.09	.99
22	1.25	1.12	1.03
23	1.27	1.15	1.06
24	1.28	1.18	1.09

Table 3.—*Quality index for BEECH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.55
9	—	—	.56
10	—	0.69	.57
11	—	.70	.58
12	—	.71	.59
13	0.84	.72	.61
14	.87	.74	.62
15	.89	.77	.64
16	.90	.78	.65
17	.91	.79	.67
18	.91	.80	.69
19	.92	.81	.71
20	.92	.82	.73
21	.93	.83	.75
22	.93	.84	.77
23	.93	.84	.79
24	.93	.85	.82
25	.94	.85	.83

Table 4.—*Quality index for BLACK CHERRY by log grade or class and size class* [a]

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.52
9	—	—	.56
10	—	0.80	.60
11	—	.82	.63
12	—	.84	.66
13	1.11	.87	.69
14	1.12	.90	.73
15	1.12	.93	.77
16	1.13	.94	.82
17	1.14	.96	.86
18	1.15	.98	.89
19	1.16	1.00	.91
20	1.18	1.02	.92
21	1.19	1.04	.93
22	1.22	1.06	.94
23	1.24	1.09	.95
24	1.26	1.12	.96
25	1.28	1.15	.97

[a] Yield data from Hanks *(1965)*.

Table 5.—*Quality index for HARD MAPLE by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.49
9	—	—	.50
10	—	0.66	.50
11	—	.68	.50
12	—	.69	.50
13	0.99	.71	.51
14	.99	.73	.51
15	.99	.76	.51
16	1.00	.78	.52
17	1.01	.80	.53
18	1.02	.81	.55
19	1.03	.83	.57
20	1.04	.85	.59
21	1.06	.87	.61
22	1.08	.90	.63
23	1.10	.92	.65
24	1.12	.94	.67
25	1.14	.96	.69
26	1.15	.98	.71

Table 6.—*Quality index for RED OAK by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.50
9	—	—	.50
10	—	0.73	.51
11	—	.74	.51
12	—	.75	.51
13	0.96	.77	.51
14	1.03	.78	.51
15	1.06	.78	.51
16	1.08	.78	.52
17	1.09	.79	.53
18	1.09	.79	.54
19	1.10	.79	.56
20	1.09	.79	.59
21	1.10	.79	.61
22	1.09	.79	.64
23	1.10	.80	.68
24	1.10	.80	.72
25	1.11	.81	.76
26	1.11	.81	.76
27	1.12	.82	.77
28	1.14	.82	.77
29	1.14	.83	.78
30	1.16	.83	.78

Table 7.—*Quality index for SOFT MAPLE by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.50
9	—	—	.52
10	—	0.73	.54
11	—	.74	.56
12	—	.76	.59
13	0.92	.78	.62
14	.95	.79	.64
15	.97	.82	.67
16	.98	.84	.70
17	1.00	.86	.74
18	1.01	.88	.77
19	1.02	.91	.80
20	1.04	.93	.83
21	1.05	.96	.86
22	1.06	.99	.89
23	1.07	1.02	.92

Table 8.—*Quality index for WHITE OAK by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.46
9	—	—	.47
10	—	0.64	.49
11	—	.66	.50
12	—	.67	.52
13	0.90	.69	.53
14	.95	.71	.54
15	.99	.73	.56
16	1.02	.74	.57
17	1.05	.76	.59
18	1.07	.78	.62
19	1.09	.79	.64
20	1.10	.81	.67
21	1.11	.82	.69
22	1.13	.84	.72
23	1.15	.86	.75
24	1.18	.87	.77
25	1.21	.89	.80
26	1.24	.91	.82
27	1.27	.93	.84
28	1.30	.96	.86

Table 9.—*Quality index for YELLOW-POPLAR by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.51
9	—	—	.53
10	—	0.73	.54
11	—	.73	.56
12	—	.74	.57
13	0.87	.74	.59
14	.89	.75	.60
15	.91	.76	.62
16	.92	.77	.63
17	.93	.78	.65
18	.94	.79	.66
19	.96	.80	.68
20	.96	.80	.69
21	.98	.81	.71
22	.98	.82	.72
23	1.00	.82	—
24	1.00	.83	—
25	1.02	.84	—
26	1.02	.85	—
27	1.02	.85	—
28	1.03	.86	—
29	1.03	.87	—
30	1.03	.87	—

Table 10.—*Quality index for WHITE ASH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.56
9	—	—	.58
10	—	0.79	.59
11	—	.82	.61
12	1.05	.84	.64
13	1.08	.87	.68
14	1.10	.89	.71
15	1.12	.92	.75
16	1.14	.94	.79
17	1.16	.97	.83
18	1.18	1.00	.87
19	1.19	1.02	.90
20	1.21	1.05	.93
21	1.23	1.08	—
22	1.25	1.10	—
23	1.26	1.13	—
24	1.28	1.15	—

Table 11.—*Quality index for BEECH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.48
9	—	—	.49
10	—	0.63	.50
11	—	.64	.51
12	—	.66	.52
13	0.81	.67	.53
14	.83	.69	.55
15	.86	.72	.57
16	.87	.73	.58
17	.88	.74	.60
18	.88	.76	.62
19	.89	.77	.64
20	.89	.78	.67
21	.90	.79	.69
22	.90	.80	.72
23	.90	.80	.75
24	.91	.81	.78
25	.92	.82	—

Table 12.—*Quality index for BLACK CHERRY by log grade or class and size class* [a]

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.40
9	—	—	.46
10	—	0.74	.51
11	—	.77	.55
12	—	.79	.59
13	1.07	.82	.62
14	1.08	.86	.67
15	1.08	.89	.72
16	1.09	.91	.77
17	1.10	.93	.81
18	1.12	.95	.85
19	1.13	.97	.87
20	1.14	.99	.88
21	1.16	1.02	.90
22	1.18	1.04	.90
23	1.21	1.07	—
24	1.23	1.09	—
25	1.26	1.12	—

[a] Yield data from Hanks *(1965)*

Table 13.—*Quality index for HARD MAPLE by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
10	—	0.66	0.49
11	—	.67	.49
12	—	.69	.50
13	1.00	.71	.50
14	1.00	.73	.50
15	1.00	.76	.51
16	1.02	.78	.52
17	1.02	.80	.53
18	1.03	.81	.54
19	1.04	.83	.56
20	1.05	.85	.59
21	1.07	.87	.61
22	1.09	.89	.63
23	1.10	.92	.65
24	1.12	.94	—
25	1.14	.97	—
26	1.16	.99	—

Table 14.—*Quality index for RED OAK by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.50
9	—	—	.50
10	—	0.73	.50
11	—	.73	.51
12	—	.74	.51
13	0.95	.75	.51
14	1.02	.76	.51
15	1.04	.78	.52
16	1.07	.78	.52
17	1.08	.78	.53
18	1.08	.78	.54
19	1.08	.78	.56
20	1.08	.79	.59
21	1.08	.79	.62
22	1.08	.79	.65
23	1.09	.79	.68
24	1.09	.80	.72
25	1.09	—	.76
26	1.10	—	—
27	1.11	—	—
28	1.12	—	—
29	1.13	—	—
30	1.14	—	—

Table 15.—*Quality index for WHITE OAK by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.40
9	—	—	.42
10	—	0.59	.43
11	—	.61	.45
12	—	.63	.46
13	0.87	.65	.48
14	.92	.67	.49
15	.96	.69	.51
16	.99	.71	.53
17	1.02	.73	.55
18	1.04	.75	.57
19	1.06	.76	.60
20	1.07	.78	.62
21	1.08	.79	.65
22	1.10	.81	.68
23	1.12	.83	.71
24	1.15	.84	.74
25	1.18	.86	.77
26	1.21	.88	.80
27	1.24	.90	—
28	1.27	.94	—

Table 16.—*Quality index for YELLOW-POPLAR by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.49
9	—	—	.50
10	—	0.72	.52
11	—	.72	.54
12	—	.72	.55
13	0.86	.72	.57
14	.88	.73	.58
15	.90	.75	.60
16	.91	.76	.62
17	.92	.77	.63
18	.94	.78	.65
19	.95	.78	.66
20	.96	.79	—
21	.97	.80	—
22	.98	.80	—
23	.99	.81	—
24	1.00	.81	—
25	1.00	.82	—
26	1.01	.82	—
27	1.02	.83	—
28	1.02	.84	—
29	1.02	.85	—
30	1.03	.86	—

Table 17.—*Quality index for ASH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.50
9	—	—	.51
10	—	0.77	.53
11	—	.80	.55
12	1.02	.82	.58
13	1.05	.85	.62
14	1.07	.87	.66
15	1.09	.90	.70
16	1.11	.92	.74
17	1.13	.95	.78
18	1.14	.97	.82
19	1.16	1.00	.85
20	1.18	1.02	.89
21	1.19	1.05	.92
22	1.21	1.07	.95
23	1.22	1.09	.98
24	1.24	1.11	1.01

Table 18.—*Quality index for BEECH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.48
9	—	—	.49
10	—	0.63	.50
11	—	.64	.51
12	—	.66	.52
13	0.81	.67	.54
14	.83	.70	.55
15	.86	.72	.57
16	.87	.73	.59
17	.88	.75	.61
18	.89	.76	.62
19	.89	.77	.65
20	.90	.78	.67
21	.91	.79	.69
22	.91	.80	.72
23	.91	.81	.75
24	.92	.81	.78
25	.93	.82	.80

Table 19.—*Quality index for BIRCH by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.48
9	—	—	.48
10	—	0.68	.48
11	—	.70	.48
12	—	.73	.48
13	0.97	.75	.49
14	1.00	.77	.49
15	1.03	.78	.49
16	1.07	.81	.50
17	1.14	.84	.51
18	1.18	.86	.52
19	1.24	.88	—
20	1.28	.90	—
21	1.32	.93	—
22	1.36	.95	—
23	1.38	.97	—
24	1.40	1.00	—

Table 20.—*Quality index for HARD MAPLE by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.57
9	—	—	.57
10	—	0.72	.58
11	—	.74	.58
12	—	.75	.58
13	1.03	.77	.59
14	1.03	.79	.59
15	1.03	.81	.60
16	1.04	.84	.60
17	1.05	.85	.61
18	1.06	.86	.63
19	1.07	.88	.64
20	1.08	.90	.67
21	1.10	.92	.68
22	1.12	.94	.70
23	1.13	.96	.71
24	1.16	.98	.73
25	1.17	1.00	.74
26	1.19	1.02	.76

Table 21.—*Quality index for SOFT MAPLE by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.54
9	—	—	.56
10	—	0.75	.57
11	—	.77	.59
12	—	.78	.62
13	0.96	.80	.64
14	.98	.82	.67
15	1.00	.84	.70
16	1.02	.86	.72
17	1.04	.89	.76
18	1.05	.91	.79
19	1.07	.94	.81
20	1.08	.96	.84
21	1.10	.99	.87
22	1.11	1.01	.89
23	1.12	1.04	—

Table 22.—*Quality index for OAK by log grade or class and size class*

Log diameter inside bark (inches)	Quality index		
	Log grade No. 1	Log grade No. 2	Log grade No. 3
8	—	—	0.55
9	—	—	.55
10	—	0.75	.55
11	—	.75	.55
12	—	.76	.56
13	0.94	.77	.56
14	1.00	.78	.56
15	1.03	.79	.56
16	1.05	.80	.56
17	1.06	.80	.57
18	1.06	.80	.59
19	1.06	.80	.60
20	1.06	.80	.62
21	1.06	.80	.65
22	1.06	.81	.68
23	1.07	.81	.71
24	1.07	.81	.74
25	1.08	.81	.78
26	1.09	.81	—
27	1.09	.81	—
28	1.10	.82	—
29	1.11	.82	—
30	1.12	.82	—