SAWLOG SIZES:
A COMPARISON IN TWO APPALACHIAN AREAS

Abstract. Frequency distributions of log diameter and length were prepared for eight Appalachian hardwood species. Data obtained in Ohio, Kentucky, and Tennessee, were compared with information collected previously from West Virginia and New England. With the exception of red oak, significant regional differences were found.

The decision to replace a piece of logging or milling equipment, compete in a new market for timbers, or initiate an economic study of mill operations, involves many factors. One of the factors should be a knowledge of the characteristics of the basic input—logs. In some instances, an “eyeball” estimate is adequate; however, there are times when better information is needed.

Tables and graphs of the frequency distributions of the most commonly used Appalachian hardwood species have been published.¹ These data show the percentage of sawlogs of each diameter, length, and grade. Field reports indicate that these distributions are reliable when used where the data were collected: primarily West Virginia and New England (Region 1). To determine their applicability in other areas, we sampled log deliveries at six sawmills in Ohio, Kentucky, and Tennessee (Region 2). Mills in both regions were producing primarily grade lumber, although one mill in Region 2 also produced pallet material.

Log grade data from Region 2 were inadequate for a comparison of grade distribution with the original sample. However, sufficient information was available to make valid comparisons of diameter and length distribution.

Comparing Diameter Distributions

A plot of scaling diameters by frequency of occurrence shows both similarities and differences between the two regions (fig. 1). There are noticeable differences between regions in the curves for some species, particularly in individual diameter percentages. Tests showed that distributions for maple and red oak from Region 2 compared favorably with those from Region 1. Distributions for the other species showed considerably less agreement.²

The diameter frequency distributions for both regions were concentrated heavily in the 11- through 15-inch diameter classes. The plotted frequencies for Region 1 rise abruptly, peak at 12 to 14 inches, and decline rapidly. Distributions for Region 2 follow a similar


Figure 1. Comparison of distribution of log diameters between Regions 1 and 2.
Figure 2. Comparison of distribution of log lengths between Regions 1 and 2.
pattern; however, they peak at 11 to 13 inches, or generally 1 inch less than those for Region 1.

Comparing Length Distributions

Log length distribution curves (fig. 2) for Region 1 show a steady increase from 8- to 12-foot logs, a decline in 14-foot logs, and a slight increase in the 16-foot category. The length distribution of red oak from Region 2 is very similar to that from Region 1.

However, not all length distributions exhibit such close agreement. Indeed, there is considerable variation between regions in length distributions for most species. The greatest variations are in the distributions of beech, chestnut oak, and white oak. Percentages of some log lengths vary as much as 20 percent between the two regions. Elimination of data from the mill sawing pallet material had little or no effect on the distributions.

Discussion

In our opinion, only the red oak distributions (diameter and length) can be used reliably outside of Region 1. Of course, the data from Region 2 (shown on figs. 1 and 2) can be used in Ohio, Kentucky, and Tennessee. Log length distributions, however, can be modified to some extent by individual mill operators to meet their needs.

The analysis of diameter distributions from both regions shows that with the exception of chestnut oak and beech:

- At least 50 percent of all delivered logs are 13 inches or less in diameter.
- 75 percent are 15 inches or less.
- 90 percent are 19 inches or less.

This extremely high percentage of small diameter logs confirms the opinions of most mill operators. Increased efficiency in the processing of small logs may require changes in mill design, and these changes may be influenced by these distributions. Technological advances in logging techniques may also result from this information.

In conclusion, although some similarities have been uncovered between regions, in general there appear to be significant regional differences. This suggests that additional surveys are needed in other areas of the country; and that the geographical regions should probably be made smaller.

Perhaps the information from Regions 1 and 2 should be subdivided by state or some other area. It would also be desirable to have periodic surveys so that changes in log sizes could be observed over time.

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