

Specific Gravity Values of Sweetgum Topwood and Bolewood¹

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THE STUDY REPORTED here explored variations in the specific gravity of sweetgum (*Liquidambar styraciflua* L.) in the Mississippi Delta. Sweetgum reaches optimum development in this region, and large trees are harvested extensively for saw logs and veneer bolts. Tops of such trees contain much wood salvable for pulpwood bolts. As density helps determine pulp yield, one purpose of the study was to learn how specific gravity of tops compared with that of boles.

Procedure

Sawtimber trees were sampled in three stands. Stand 1 was near Vicksburg and stand 2 near Greenville, Miss. They were both on a level phase of Sharkey clay, a slackwater soil.

Stand 3, north of Clarksdale, Miss., was on Mhoon silty clay, a recent natural-levee soil.

Fifty-year site indexes for sweetgum were 83, 80, and 89 feet, respectively.

In each area, 10 dominant or codominant trees, free of serious defect, were selected from even-aged stands. They were not buttressed, fluted, or flanged. After diameter at breast height had been recorded, trees were felled and increment cores (12.077 millimeters diameter) were extracted from the bole at the base of the butt log, top of the butt log, and midpoint of the crown. Two cores were taken to the pith at each point, one at a 90-degree angle to the other. Cores were measured for length (to the nearest 0.5 millimeter) immediately after extraction.

Soil type was determined from samples taken at 1-, 2-, 3-, and 4-foot depths beneath each stand.

¹The data are from a thesis presented to the Graduate Faculty of Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Master of Forestry.

Site indexes were estimated from height and age of the sample trees.

Specific gravities for the 90 paired cores were determined on the basis of oven-dry weight and green volume. Analysis of variance followed a randomized, split-plot design.

Results

Mean specific gravities of cores from individual trees ranged from 0.456 to 0.573, and specific gravities of paired cores ranged from 0.428 to 0.607. The average was 0.510 (Table 1), notably higher than the mean value of 0.460 in the Wood Handbook of the U.S. Department of Agriculture.

The range in density among stands was considerably less for topwood than for bolewood; the 2-foot position had the greatest range. Overall results indicated no reason why pulpwood cutters should discriminate against topwood on the basis of density.

As the table shows, specific gravity averaged higher in stands 1 and 2 than in stand 3. The difference between soils suggests a relationship that should be explored further.

Table 1. — AVERAGE SPECIFIC GRAVITY, BY STAND AND POSITION IN TREE

Stand	Trees			Site index	Core specific gravity			
	D.b.h.	Ht.	Age		2 feet	18 feet	Crown	Average
	In.	Ft.	Yr.					
1	19	86	55	83	0.515	0.498	0.512	0.508
2	16	76	47	80	.543	.513	.521	.526
3	20	96	61	89	.475	.488	.522	.495
Average					.511	.500	.518	.510