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CORDWOOD VOLUME TABLES FOR SECOND-GROWTH DOUGLAS-FIR

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The increasing harvest of second-growth Douglas-fir for pulpwood makes cordwood volume tables, based on the conventional measures of tree diameter and height, useful tools for the pulpwood operators and forest managers seeking to determine the merchantable contents of their stands. Recent investigations in the Puget Sound vicinity into the cubic-foot content of a cord of 8-foot bolts of Douglas-fir make it possible to construct such tables.

Table 1 shows the number of cords in trees of different diameters and heights. (These are stacked cords of unpeeled 8-foot bolts.) It is assumed that the tree will be utilized to a 4-inch top inside the bark, and that stump height equals the d.b.h. of the tree. It is simply a conventional volume table using cords as the unit of measure and may be conventionally applied.

Table 2, giving the number of trees required to make a cord, is useful in visualizing second-growth trees and stands in terms of cords.

These tables were derived from two sources of basic data. Cubic-foot content of trees was taken from "Cubic-foot volume table for second-growth Douglas-fir on forest survey standard,"^{1/} which gives the volume

^{1/} Douglas-fir Second-Growth Management Committee. Management of second-growth forests in the Douglas-fir region. Pac. N. W. For. & Range Exp. Sta. December 1947. 151 p. Processed. (Table 6A.)

of the tree stem exclusive of bark and limbs between the stump and a 4-inch top. The cubic feet per cord was taken from a local study of the solid contents of stacked cords of 8-foot wood^{2/} having different average bolt diameters. Diameter of the average bolt that might be taken from trees of different sizes was estimated by first finding in taper tables the length of the stem between the stump and a 4-inch top. This length divided into the cubic-foot volume taken from the volume table^{3/} gave the basal area of the average bolt which, when translated into diameter, made it possible to find for each tree size class the cubic feet per cord from the table of cordwood converting factors. Cubic-foot volume of the tree divided by the corresponding cubic feet per cord gave the cords per tree shown in table 1.

^{2/} Worthington, Norman P. and Melvin P. Twerdal. Contents of a cord of eight-foot pulpwood. Pac. N. W. For. & Range Exp. Sta. February 28, 1949. Unpublished report.

^{3/} See footnote 1.

Table 1.--Cordwood volume in second-growth Douglas-fir trees

D.b.h. (in.)	Total height of tree in feet												
	30	40	50	60	70	80	90	100	110	120	130	140	150
	<u>Cords per tree</u>												
6	.024	.034	.042	.051	.060	.070							
8	.052	.068	.085	.100	.119	.139	.151						
10	.081	.107	.131	.159	.186	.212	.232	.259	.286	.310			
12	.120	.156	.191	.229	.263	.300	.328	.363	.406	.441			
14	.156	.205	.251	.302	.353	.405	.448	.494	.538	.593	.640	.696	
16		.263	.323	.384	.449	.511	.570	.624	.673	.744	.799	.876	.948
18			.400	.478	.551	.624	.696	.772	.826	.902	.976	1.070	1.171
20			.482	.573	.661	.746	.828	.916	.983	1.073	1.171	1.280	1.390
22			.566	.660	.765	.863	.955	1.047	1.133	1.241	1.349	1.458	1.602
24				.756	.871	.975	1.083	1.169	1.274	1.393	1.500	1.631	1.786

Note: Volume of unpeeled stem between stump height equal to d.b.h. and a 4-inch top d.i.b.; cordwood assumed to be cut in 8-foot lengths.

Table 2.--Number of second-growth Douglas-fir trees per cord

D.b.h. (in.)	Total height of tree in feet												
	30	40	50	60	70	80	90	100	110	120	130	140	150
	<u>Trees per cord</u>												
6	41.2	29.6	23.5	19.5	16.7	14.3							
8	19.4	14.8	11.8	10.0	8.4	7.2	6.6						
10	12.3	9.3	7.6	6.3	5.4	4.7	4.3	3.9	3.5	3.2			
12	8.3	6.4	5.2	4.4	3.8	3.3	3.0	2.8	2.5	2.3			
14	6.4	4.9	4.0	3.3	2.8	2.5	2.2	2.0	1.9	1.7	1.6	1.4	
16		3.8	3.1	2.6	2.2	2.0	1.8	1.6	1.5	1.3	1.3	1.1	1.1
18			2.5	2.1	1.8	1.6	1.4	1.3	1.2	1.1	1.0	0.9	0.9
20			2.1	1.7	1.5	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7
22			1.8	1.5	1.3	1.2	1.0	1.0	0.9	0.8	0.7	0.7	0.6
24				1.3	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6

Note: Volume of unpeeled stem between stump height equal to d.b.h. and a 4-inch top d.i.b.; cordwood assumed to be cut into 8-foot lengths.