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Tables of Whole-Tree Weight for Selected U.S. Tree Species

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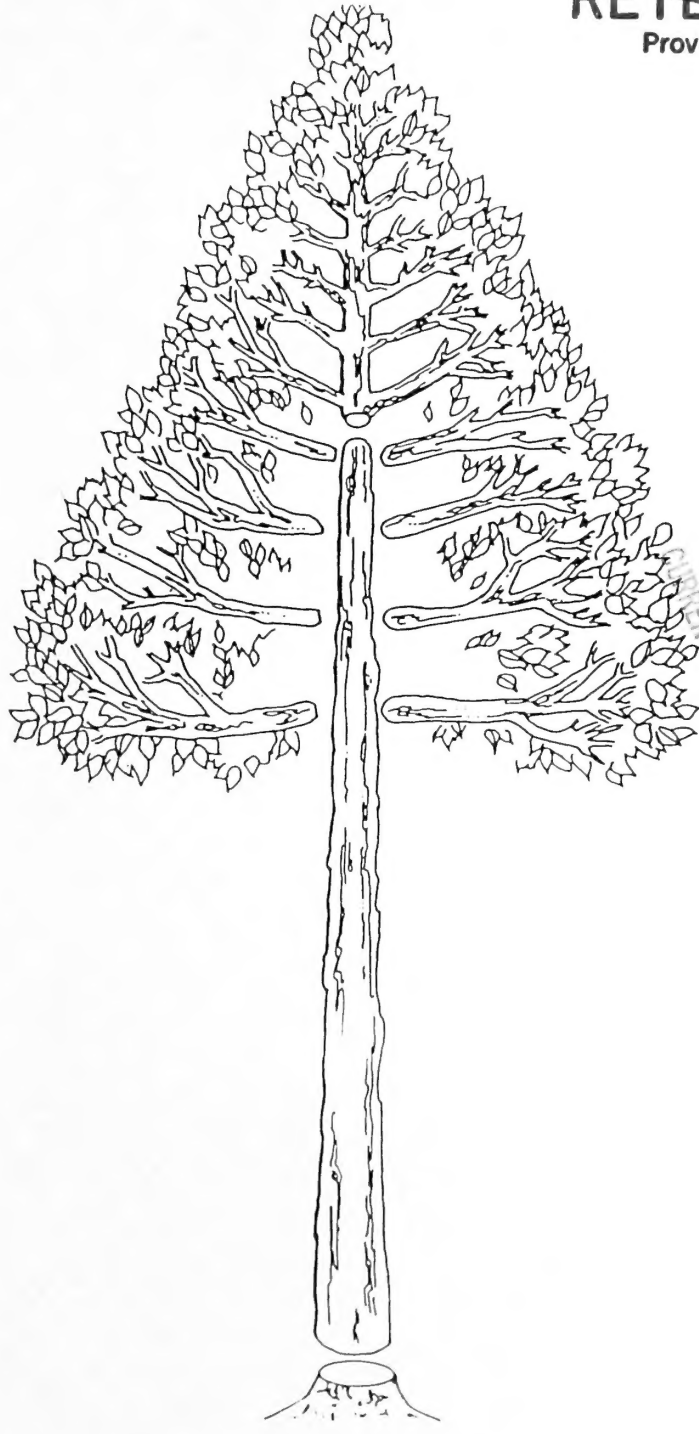


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United States
Department of
Agriculture

Forest
Service

General
Technical
Report WO-42

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Tables of Whole-Tree Weight
for Selected U.S. Tree Species

United States Department of Agriculture
Forest Service

General Technical Report WO-42

July 1984

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National Whole-Tree Weight Table
Steering Committee and Project Team

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INTRODUCTION

Decreasing timber size, increasing costs, development of new wood products, greater demands for wood products, and more recently the energy crisis are but a few of the reasons why the forest products industries of the Nation are looking at the whole tree above ground as the primary forest product rather than just the main stem of the tree. Interest in the utilization of all tree parts above ground, including branches and foliage, has increased considerably over the past two decades. It has been demonstrated that the crown component of the tree can be used in a variety of ways: (1) As fuel to generate energy, (2) as chips or particles in glued up composite products, (3) as fiber in pulp and paper products, and (4) as a soil amendment or mulch in agriculture and horticulture.

Total or whole-tree utilization is now recognized as a viable forestry practice option. For land managers, timber buyers, and sellers to be able to exercise this utilization option, information on the amount of wood and bark contained in the tree as a whole and the individual component parts (main stem and branches) is needed if they are to make logical decisions regarding the management and utilization of their forests.

In October 1978, the Forest Service Task Force on Whole-tree Assessment recommended the implementation of a national program for the development of whole-tree weight tables for the commercial species of the United States. An advisory steering committee and a project team with representatives from four research work units located in the Northeastern, Southeastern, Rocky Mountain, and Pacific Northwest Experiment Stations were appointed and charged with developing a manual of whole-tree weight tables for the commercial species of the United States.

The development of these tables was accomplished through a review of the biomass literature developed over the past 25 years. This literature review revealed that much of the information that is available on whole-tree biomass is very difficult to assess, compare, or combine because of the differences in the sampling methods, sample sizes, range in tree sizes, and many other procedural and reporting anomalies used by the different investigators.

The tables in this report were developed from regression equations found in the literature that contained the two basic volume-measuring parameters of a tree; namely, diameter at breast height (d.b.h.) and total tree height. If an equation did not contain these two parameters, it was excluded from this collection. This was done for the sake of uniformity, and to be able to compare different species on an equivalent basis or two different tables generated for a single species from different geographical locations. Because of these limitations placed on the selections, a rather small number of equations were found in the literature that could be incorporated in this listing.

Five table types identifying wood by green weight:

- Whole tree--wood, bark, and foliage.
- Whole tree--wood, and bark (no foliage).
- Whole tree--wood only (no bark or foliage).
- Main stem^{1/}--(to a 4-inch top) wood and bark.

^{1/} Main-stem weight tables are to a 4-inch top unless otherwise footnoted in the table. All tables are not always available for each species.

- Main stem--(to a 4-inch top) wood only (no bark).

The tables are first segregated into the two major wood categories--hardwoods and softwoods, with each subdivided into five categories as indicated above. Under each of the table types, species are arranged alphabetically by scientific name. If a single species has more than one table of the same type, then the tables within a species are arranged alphabetically by State or region. An index to the hardwood and softwood tables by species can be found at the end of the report.

"Whole tree" in this report is defined as all wood, bark, and foliage above ground, excluding stump. Tree d.b.h. is listed by 1-inch classes and tree height by 10-foot classes. Boxed-in areas indicate range of data used to develop the equation used.

The equations used to generate the respective tables are listed at the

base of the tables together with some statistical information regarding the average, maximum, and minimum values for the variables used in the equation. Some of the equations listed are for terms in metric units and result in metric answers that will be unlike those in the table, which are in pounds. To convert the pound values into kilograms, divide the values in the table by 2.2

Some tables were developed from a dry-weight equation and a moisture content factor applied to develop a green weight table. This procedure was used in the case of some of the western species where few green-weight equations were available. These tables reveal that in some cases the weight of the same species varies from one region to another. Although this is not always the case, the tables should be used within the region in which they were developed if one has a choice of tables to select from in order to be assured of better precision.

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Hardwoods

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HARDWOODS

WHOLE TREE

Wood, Bark, and Foliage

Carya spp. - Hickory^{1/}

Southern Illinois

Table 1--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	19	32										
3	39	69	95									
4	67	117	162	204								
5	102	177	245	308	369							
6		248	343	432	517	598						
7		330	457	575	688	796	900					
8		423	585	737	881	1019	1153	1283				
9		526	728	916	1095	1268	1434	1596				
10		640	885	1114	1332	1541	1743	1940	2131			
11			1056	1329	1589	1838	2080	2314	2543			
12			1241	1562	1867	2160	2444	2719	2988	3251		
13			1439	1811	2165	2506	2834	3154	3466	3771		
14			1651	2078	2484	2874	3252	3618	3976	4326	4668	
15			1876	2362	2823	3266	3695	4112	4518	4916	5305	
16				2662	3182	3681	4165	4634	5092	5540	5979	
17				2978	3560	4119	4660	5185	5698	6199	6690	
18				3311	3958	4580	5181	5765	6334	6892	7438	
19				3660	4375	5062	5727	6372	7002	7618	8222	
20				4025	4811	5567	6298	7008	7700	8378	9041	
21					5267	6094	6894	7671	8429	9170	9897	
22					5741	6642	7514	8362	9188	9996	10788	

^{1/}Myer et al. 1980

$$W = 0.81630 * D^{1.85320} * H^{0.80010}$$

Sample Size - 40 trees, Coefficient of Determination

Average DBH inches, Minimum 6 inches, Maximum 30 inches

Average Height feet, Minimum 40 feet, Maximum 96 feet

Average Age , Minimum , Maximum

Fraxinus americana - White Ash¹

Illinois

Table 2--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	12	17										
3	29	41	51									
4	56	79	97	112								
5	92	130	160	185	207							
6		196	241	278	311	342						
7		277	340	393	440	483	522					
8		374	459	530	594	651	704	753				
9		486	597	691	773	848	916	980				
10		616	756	875	979	1074	1161	1242	1318			
11			936	1083	1212	1329	1437	1538	1632			
12			1138	1316	1473	1616	1747	1869	1983	2092		
13			1362	1575	1763	1933	2090	2236	2373	2503		
14			1608	1860	2082	2283	2468	2640	2802	2956	3102	
15			1877	2171	2430	2665	2881	3082	3271	3450	3621	
16				2509	2808	3080	3329	3562	3780	3987	4184	
17				2874	3217	3528	3814	4080	4331	4568	4793	
18				3267	3657	4010	4335	4638	4923	5192	5449	
19				3688	4128	4527	4894	5236	5557	5862	6151	
20				4137	4632	5079	5491	5874	6235	6576	6901	
21					5167	5666	6125	6553	6955	7336	7698	
22					5735	6289	6799	7274	7720	8142	8545	

¹/Myers et al. 1980

$$W = 0.77560 * D ** 2.24202 * H ** 0.50569$$

Sample Size - 40 trees, Coefficient of Determination 0.97
 Average DBH inches, Minimum 6 inches, Maximum 24 inches
 Average Height feet, Minimum 48 feet, Maximum 96 feet
 Average Age years, Minimum years, Maximum years

Liriodendron tulipifera - Yellow-poplar^{1/}

Southern Illinois

Table 3--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	14										
3	13	29	47									
4	22	49	79	112								
5	32	73	119	167	218							
6		102	165	233	303	376						
7		135	218	307	401	497						
8		172	278	391	510	633	760	891				
9		213	344	484	631	784	941	1102				
10		258	417	586	764	948	1138	1334	1534			
11			495	696	908	1127	1353	1585	1823			
12			580	815	1062	1319	1584	1855	2134	2418		
13			670	942	1228	1525	1830	2145	2466	2795		
14			766	1078	1404	1743	2093	2452	2820	3196	3578	
15			868	1221	1591	1975	2372	2779	3195	3621	4054	
16				1372	1788	2220	2665	3123	3591	4069	4557	
17				1531	1996	2477	2975	3485	4008	4541	5085	
18				1698	2213	2747	3299	3865	4445	5036	5639	
19				1873	2441	3030	3638	4262	4902	5554	6219	
20				2055	2678	3325	3992	4677	5378	6094	6824	
21					2925	3632	4360	5109	5875	6657	7454	
22					3182	3951	4743	5558	6391	7242	8109	

^{1/}Myers et al. 1980

$$W = 0.11415 * D ** 1.80992 * H ** 1.18635$$

Sample Size - 40 trees, Coefficient of Determination

Average DBH inches, Minimum 6.0 inches, Maximum 22.5 inches

Average Height feet, Minimum 51.0 feet, Maximum 95.0 feet

Average Age years, Minimum years, Maximum years

Quercus alba - White Oak^{1/}

Southern Illinois

Table 4--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	16	22										
3	38	53	65									
4	73	101	123	141								
5	119	166	202	232	259							
6		249	303	348	388	423						
7		351	427	490	546	596	642					
8		472	574	660	735	802	864	921				
9		614	746	857	954	1042	1122	1197				
10		776	943	1083	1206	1317	1418	1512	1601			
11			1165	1338	1490	1627	1753	1869	1978			
12			1414	1624	1808	1974	2126	2268	2400	2525		
13			1689	1940	2160	2358	2540	2709	2867	3017		
14			1991	2287	2547	2781	2995	3194	3380	3557	3724	
15			2321	2666	2969	3241	3491	3723	3941	4146	4341	
16				3077	3426	3741	4029	4297	4548	4785	5010	
17				3521	3920	4280	4610	4917	5204	5475	5732	
18				3998	4451	4860	5235	5583	5908	6216	6508	
19				4508	5019	5480	5903	6295	6663	7010	7339	
20				5052	5625	6142	6615	7055	7467	7856	8225	
21					6269	6845	7373	7863	8322	8755	9167	
22					6952	7590	8176	8719	9228	9709	10165	

^{1/}Myers et al. 1980

$$W = 1.09890 * D ** 2.22180 * H ** 0.48180$$

Sample Size - 40 trees, Coefficient of Determination

Average DBH inches, Minimum 6.0 inches, Maximum 30.0 inches

Average Height feet, Minimum 40.0 feet, Maximum 96.0 feet

Average Age years, Minimum years, Maximum years

Quercus rubra - Northern Red Oak^{1/}

Southern Illinois

Table 5--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	8										
3	9	20	31									
4	18	38	59	82								
5	30	64	99	137	175							
6		97	151	208	266	325						
7		138	216	297	380	464	550					
8		188	294	404	517	632	749	867				
9		247	386	530	678	829	983	1138				
10		315	493	676	865	1058	1253	1452	1653			
11			614	843	1078	1318	1562	1809	2060			
12			751	1031	1318	1611	1909	2212	2519	2829		
13			903	1240	1585	1938	2297	2661	3030	3403		
14			1071	1471	1881	2300	2726	3158	3595	4038	4485	
15			1256	1725	2206	2697	3196	3703	4216	4735	5260	
16				2002	2561	3130	3710	4298	4894	5496	6105	
17				2303	2945	3601	4267	4944	5629	6322	7022	
18				2628	3361	4109	4869	5641	6423	7214	8013	
19				2978	3808	4655	5517	6391	7277	8173	9078	
20				3352	4286	5240	6210	7195	8192	9201	10220	
21					4797	5865	6951	8053	9169	10298	11438	
22					5341	6530	7739	8966	10209	11466	12735	

^{1/}Myers et al. 1980

$$W = 0.05700 * D ** 2.30890 * H ** 1.10200$$

Sample Size - 40 trees, Coefficient of Determination

Average DBH inches, Minimum 6.0 inches, Maximum 30.0 inches

Average Height feet, Minimum 40.0 feet, Maximum 94.0 feet

Average Age years, Minimum years, Maximum years

Quercus velutina - Black Oak^{1/}

Southern Illinois

Table 6--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	13										
3	17	33	47									
4	32	61	87	113								
5	53	98	142	184	225							
6		146	211	273	334	394						
7		204	294	382	467	550	632					
8		273	393	510	623	735	845	953				
9		352	507	658	805	949	1090	1230				
10		442	638	827	1011	1192	1370	1545	1719			
11			784	1016	1243	1466	1684	1900	2113			
12			947	1227	1501	1770	2034	2295	2552	2807		
13			1126	1460	1786	2105	2419	2729	3035	3338		
14			1322	1714	2097	2472	2841	3205	3565	3920	4272	
15			1536	1991	2435	2871	3299	3722	4140	4553	4962	
16				2290	2801	3302	3795	4281	4761	5236	5707	
17				2612	3194	3766	4328	4882	5430	5972	6508	
18				2956	3616	4263	4899	5526	6146	6760	7367	
19				3324	4065	4793	5508	6214	6911	7600	8283	
20				3715	4544	5356	6156	6945	7724	8494	9257	
21					5051	5954	6843	7719	8585	9442	10290	
22					5587	6586	7569	8538	9496	10444	11382	

^{1/}Myers et al. 1980

$$W = 0.20110 * D ** 2.16790 * H ** 0.90260$$

Sample Size - 40 trees, Coefficient of Determination

Average DBH inches, Minimum 6.0 inches, Maximum 30.0 inches

Average Height feet, Minimum 40.0 feet, Maximum 96.0 feet

Average Age years, Minimum years, Maximum years

HARDWOODS

WHOLE TREE

Wood and Bark

Acer rubrum - Red Maple 1/

Maine

Table 7--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	14	19										
3	34	46	55									
4	64	86	103	116								
5	104	140	166	188	207							
6		208	247	279	308	333						
7		290	345	390	430	464	496					
8		387	461	521	574	620	663	702				
9		500	595	673	741	801	856	906				
10		628	747	846	931	1006	1075	1139	1198			
11			919	1040	1144	1237	1322	1400	1473			
12			1110	1256	1382	1494	1597	1691	1778	1861		
13			1320	1494	1644	1777	1899	2011	2115	2213		
14			1550	1754	1930	2087	2230	2362	2484	2599	2707	
15			1800	2037	2242	2424	2590	2743	2885	3018	3144	
16				2343	2578	2788	2979	3154	3318	3471	3616	
17				2672	2940	3180	3397	3597	3784	3959	4124	
18				3024	3328	3599	3845	4072	4283	4481	4668	
19				3400	3742	4047	4323	4578	4816	5039	5249	
20				3800	4182	4523	4832	5117	5382	5631	5866	
21					4649	5027	5371	5688	5983	6259	6521	
22					5142	5561	5941	6291	6618	6924	7213	

1/Young et al. 1964

$$LNW = 0.1651 + 2.1679 * LN(D) + 0.4292 * LN(H)$$

Sample Size - 20 trees, Coefficient of Determination 0.96

Average DBH inches, Minimum 5.6 inches, Maximum 15.8 inches

Average Height feet, Minimum 36.5 feet, Maximum 71 feet

Average Age , Minimum , Maximum

Acer rubrum - Red Maple ^{1/}

West Virginia

Table 8--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	16	32	48									
4	28	57	86	115								
5	44	89	135	180	225							
6		129	195	260	326	391						
7		176	265	355	444	534	624					
8		231	348	465	582	699	817	935				
9		293	441	589	738	887	1036	1185				
10		362	545	729	913	1097	1281	1466	1651			
11			661	883	1106	1329	1553	1777	2001			
12			788	1053	1318	1585	1851	2118	2385	2653		
13			926	1237	1549	1862	2175	2489	2803	3117		
14			1075	1437	1799	2162	2526	2891	3255	3620	3985	
15			1235	1651	2068	2485	2904	3322	3741	4161	4581	
16				1881	2355	2831	3307	3784	4261	4739	5218	
17				2125	2662	3199	3738	4276	4816	5356	5896	
18				2385	2987	3590	4194	4799	5404	6010	6617	
19				2660	3331	4004	4678	5352	6027	6703	7379	
20				2950	3695	4441	5188	5936	6684	7434	8184	
21					4077	4900	5724	6549	7376	8203	9030	
22					4478	5382	6287	7194	8101	9010	9919	

^{1/}Wiant et al. 1979

$$W = 0.16955 * (H * D ** 2) ** 1.00866$$

Sample Size - 22 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 2 inches, Maximum 16 inches

Average Height feet, Minimum 8 feet, Maximum 94 feet

Average Age 46 years, Minimum years, Maximum years

Acer saccharum -Sugar Maple 1/

Michigan

Table 9--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	33	40										
3	41	56	72									
4	53	80	107	134								
5	68	110	152	194	236	278						
6		147	207	268	328	389						
7		191	273	355	437	520	602					
8		241	348	456	563	671	778	885				
9		298	434	570	706	842	978	1114				
10		362	530	697	865	1033	1201	1369	1536			
11			635	838	1041	1244	1447	1651	1854			
12			751	993	1234	1476	1718	1959	2201	2443		
13			877	1161	1444	1728	2011	2295	2578	2862		
14			1013	1342	1671	2000	2328	2657	2986	3315	3644	
15			1159	1536	1914	2292	2669	3047	3424	3802	4179	
16				1744	2174	2604	3033	3463	3892	4322	4751	
17				1966	2451	2936	3421	3906	4391	4876	5361	
18				2201	2745	3288	3832	4376	4919	5463	6007	
19				2449	3055	3661	4267	4872	5478	6084	6690	
20				2711	3382	4053	4725	5396	6067	6738	7409	
21					3726	4466	5206	5946	6686	7426	8166	
22					4087	4899	5711	6523	7336	8148	8960	

1/Steinhilb and Winsauer et al. 1976

$$W = 26.21 + 0.1678 * H * D ** 2$$

Sample Size - 137 trees, Coefficient of Determination

Average DBH inches, Minimum 5 inches, Maximum 24 inches

Average Height feet, Minimum 45 feet, Maximum 90 feet

Average Age years, Minimum years, Maximum years

Betula papyrifera - Paper Birch^{1/}

Maine

Table 10--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	16	22									
3	39	53	63								
4	74	99	118	134							
5	120	161	192	217	238						
6		239	284	322	354	383					
7		334	397	449	495	535	571				
8		446	531	600	661	714	763	808			
9		576	685	775	853	922	985	1043			
10		723	861	974	1072	1159	1238	1311	1379		
11			1058	1197	1318	1425	1522	1612	1696		
12			1278	1446	1591	1721	1838	1947	2048	2143	
13			1520	1720	1893	2047	2187	2316	2436	2549	
14			1785	2020	2223	2404	2568	2719	2860	2993	3118
15			2073	2345	2581	2791	2982	3158	3322	3476	3621
16				2698	2969	3211	3430	3632	3821	3998	4164
17				3077	3386	3661	3912	4143	4357	4559	4749
18				3482	3832	4144	4428	4689	4932	5160	5376
19				3916	4309	4660	4979	5272	5546	5802	6044
20				4376	4816	5208	5564	5892	6198	6485	6755
21					5353	5789	6185	6550	6889	7208	7509
22					5921	6403	6841	7245	7620	7973	8306

^{1/}Young et al. 1964

$$LNW = 0.3062 + 2.1679 * LN(D) + 0.4392 * LN(H)$$

Sample Size - 17 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 6.1 inches, Maximum 11.6 inches

Average Height feet, Minimum 47 feet, Maximum 77.5 feet

Average Age years, Minimum years, Maximum years

Carya spp. - Hickory^{1/}

West Virginia

Table 11--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	15	31	47									
4	27	56	84	112								
5	43	87	132	177	222							
6		127	192	257	322	388						
7		173	262	351	441	531	621					
8		228	344	461	579	697	815	934				
9		289	437	586	736	886	1036	1187				
10		359	542	726	912	1098	1284	1471	1659			
11			658	882	1107	1333	1559	1786	2014			
12			786	1053	1322	1591	1862	2133	2404	2677		
13			925	1239	1556	1873	2191	2510	2830	3150		
14			1075	1441	1809	2178	2548	2919	3291	3663	4037	
15			1238	1659	2082	2506	2932	3359	3787	4216	4646	
16				1892	2374	2858	3344	3831	4319	4808	5298	
17				2140	2686	3234	3783	4334	4887	5440	5994	
18				2404	3018	3633	4250	4869	5490	6111	6734	
19				2684	3369	4056	4745	5436	6129	6823	7518	
20				2980	3740	4502	5268	6035	6803	7574	8346	
21					4130	4973	5818	6665	7514	8365	9217	
22					4541	5467	6396	7327	8261	9196	10133	

^{1/}Wiant et al. 1979

$$W = 0.15625 * (H * D ** 2) ** 1.01813$$

Sample Size - 19 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2 inches, Maximum 16 inches

Average Height feet, Minimum 8 feet, Maximum 94 feet

Average Age 46 years, Minimum years, Maximum years

Liquidambar styraciflua - Sweetgum^{1/}

Georgia, Piedmont

Table 12--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	8									
3	9	19	30								
4	17	36	56	76							
5	27	58	91	124	158						
6		87	134	184	234	285					
7		121	188	257	327	399	471				
8		162	251	343	437	533	630	728			
9		209	324	443	564	688	813	940			
10		262	407	557	709	865	1022	1181	1342		
11			501	685	872	1063	1257	1453	1651		
12			605	827	1054	1284	1518	1755	1994	2236	
13			720	984	1254	1528	1806	2088	2372	2660	
14			846	1156	1472	1794	2121	2452	2786	3124	3464
15			982	1342	1710	2084	2464	2848	3236	3628	4024
16				1544	1967	2398	2834	3276	3723	4174	4629
17				1761	2244	2735	3233	3737	4246	4761	5280
18				1994	2540	3096	3660	4231	4807	5390	5977
19				2242	2857	3482	4116	4757	5406	6061	6721
20				2506	3193	3892	4600	5317	6042	6774	7512
21					3550	4326	5114	5911	6717	7531	8352
22					3927	4786	5657	6539	7431	8331	9239

^{1/}Clark et al. 1980

$$W = 0.06869 * (H * D **2) ** 1.08516$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.7 inches, Maximum 20.7 inches

Average Height 82 feet, Minimum 48.0 feet, Maximum 101.0 feet

Average Age 45 years, Minimum 33 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Georgia, Piedmont

Table 13--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1	1											
2	6	12										
3	13	26	40									
4	23	47	71	96								
5	37	74	112	151	189							
6		108	163	218	274	329						
7		147	223	298	374	451	527					
8		194	292	392	491	591	692	792				
9		246	371	497	624	751	879	1007				
10		305	460	616	773	931	1089	1247	1406			
11			558	748	939	1130	1322	1514	1706			
12			666	893	1120	1349	1577	1807	2037	2267		
13			784	1051	1318	1587	1856	2126	2397	2667		
14			912	1222	1533	1845	2158	2472	2786	3101	3417	
15			1049	1406	1764	2123	2483	2844	3206	3568	3932	
16				1603	2011	2421	2831	3243	3656	4069	4483	
17				1813	2275	2738	3203	3668	4135	4603	5071	
18				2037	2555	3076	3597	4121	4645	5170	5696	
19				2273	2852	3433	4016	4599	5185	5771	6358	
20				2523	3166	3810	4457	5105	5755	6405	7057	
21					3496	4208	4922	5638	6355	7073	7793	
22					3843	4625	5410	6197	6985	7775	8566	

^{1/}Clark and Phillips 1980

$$W = 0.13413 * (H * D ** 2) ** 1.01672$$

Sample Size - 26 trees, Coefficient of Determination 0.99

Average DBH 13.5 inches, Minimum 5.5 inches, Maximum 20.3 inches

Average Height 84 feet, Minimum 58.0 feet, Maximum 107.0 feet

Average Age 56 years, Minimum 30 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 14--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	15	30	44									
4	26	51	76	100								
5	41	79	116	153	190							
6		112	165	218	270	321	373	424				
7		150	222	293	363	432	501	570				
8		194	287	378	469	559	648	737				
9		244	360	475	588	701	812	924	1034	1145		
10		299	441	581	720	858	995	1131	1266	1401		
11			529	698	865	1030	1195	1358	1521	1683	1844	
12			626	825	1022	1218	1412	1605	1798	1989	2180	
13			730	962	1192	1420	1647	1872	2097	2320	2542	
14			841	1109	1374	1637	1899	2159	2417	2675	2931	
15			961	1266	1569	1870	2168	2465	2760	3054	3347	
16				1434	1776	2116	2454	2790	3124	3457	3789	
17				1611	1996	2378	2757	3135	3510	3884	4257	
18				1798	2227	2654	3077	3499	3918	4335	4751	
19				1994	2471	2944	3414	3882	4347	4810	5271	
20				2201	2727	3249	3768	4284	4797	5308	5817	
21					2995	3569	4138	4705	5268	5830	6388	
22					3275	3902	4525	5145	5761	6375	6986	

^{1/}Clark and Schroeder 1977

$$W = -0.69614 + 0.96067 * \text{Log} (H * D ** 2)$$

Sample Size - 39 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.8 inches, Maximum 28.4 inches

Average Height 99 feet, Minimum 53.0 feet, Maximum 147.0 feet

Average Age 56 years, Minimum 21 years, Maximum 81 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 15--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	8									
3	10	20	31								
4	18	37	56	76							
5	28	59	90	122	154						
6		86	132	179	227	276					
7		119	183	249	315	382	449				
8		158	243	330	418	506	596	687			
9		203	312	423	536	650	765	881			
10		254	390	529	670	812	956	1101	1247		
11			477	647	819	993	1169	1347	1526		
12			574	778	985	1194	1406	1619	1834	2050	
13			679	921	1166	1415	1665	1918	2172	2429	
14			795	1078	1365	1655	1948	2243	2541	2841	3142
15			920	1247	1579	1915	2254	2596	2941	3287	3636
16				1429	1810	2195	2584	2976	3371	3768	4168
17				1625	2058	2496	2938	3383	3832	4284	4739
18				1834	2322	2816	3315	3818	4325	4835	5348
19				2056	2604	3158	3717	4281	4849	5421	5996
20				2292	2902	3520	4143	4772	5405	6042	6683
21					3218	3902	4594	5291	5993	6699	7410
22					3551	4306	5069	5838	6613	7392	8177

^{1/}Clark and Schroeder 1980

$$W = 0.08176 * (H * D ** 2) ** 1.05793$$

Sample Size - 26 trees, Coefficient of Determination 0.99
 Average DBH 14.1 inches, Minimum 5.6 inches, Maximum 22.4 inches
 Average Height 95 feet, Minimum 51.0 feet, Maximum 128.0 feet
 Average Age 53 years, Minimum 16 years, Maximum 76 years

Liriodendron tulipifera - Yellow-poplar^{1/}

West Virginia

Table 16--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	8	14									
3	16	31	46								
4	28	54	79	103							
5	42	82	120	157	194						
6		115	169	222	274	325					
7		154	226	297	435	503					
8		198	291	382	471	559	647	734			
9		248	363	477	588	699	808	917			
10		302	443	581	718	852	986	1118	1250		
11			531	696	859	1020	1180	1339	1496		
12			625	820	1013	1203	1391	1578	1763	1947	
13			727	954	1178	1399	1618	1835	2051	2265	
14			836	1097	1354	1609	1861	2110	2358	2605	2850
15			953	1250	1543	1832	2119	2404	2686	2967	3247
16				1412	1743	2070	2394	2715	3034	3352	3667
17				1583	1954	2321	2684	3044	3402	3758	4112
18				1763	2176	2585	2990	3391	3790	4186	4580
19				1953	2410	2863	3311	3755	4197	4636	5072
20				2151	2655	3154	3647	4137	4624	5107	5587
21					2911	3458	3999	4536	5070	5599	6126
22					3178	3775	4366	4953	5535	6113	6689

^{1/}Wiant et al. 1979

$$W = 0.23199 * (H * D **2) ** 0.94364$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Platanus occidentalis - Sycamore^{1/}

Georgia Piedmont

Table 17--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2	7	14										
3	16	31	47									
4	28	55	83	110	138	165						
5	43	86	129	172	215	258	302					
6		124	186	248	310	372	434					
7		169	253	338	422	507	591	675				
8		221	331	441	551	662	772	882				
9		279	419	558	698	837	977	1117				
10		345	517	689	862	1034	1206	1378	1551			
11			625	834	1042	1251	1459	1668	1876			
12			744	993	1241	1489	1737	1985	2233	2481		
13			874	1165	1456	1747	2038	2330	2621	2912		
14			1013	1351	1689	2026	2364	2702	3040	3377	3715	
15			1163	1551	1938	2326	2714	3102	3489	3877	4265	
16				1764	2206	2647	3088	3529	3970	4411	4852	
17				1992	2490	2988	3486	3984	4482	4980	5478	
18				2233	2791	3350	3908	4466	5025	5583	6141	
19				2488	3110	3732	4354	4976	5598	6220	6842	
20				2757	3446	4135	4825	5514	6203	6892	7582	
21					3799	4559	5319	6079	6839	7599	8359	
22					4170	5004	5838	6672	7506	8340	9174	

^{1/}Belanger 1973

$$W = 0.17231 * H * D ** 2$$

Sample Size - 31 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 4 inches, Maximum 10 inches

Average Height feet, Minimum 45 feet, Maximum 80 feet

Average Age years, Minimum years, Maximum years

Populus termuloides - Quaking Aspen^{1/}

Maine

Table 18--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	15	20									
3	36	48	57								
4	67	90	107	121							
5	108	146	173	196	216						
6		216	257	291	321	347					
7		302	360	407	448	484	517				
8		404	480	543	598	647	691	732			
9		521	620	702	772	835	892	945			
10		655	779	882	970	1049	1121	1187	1248		
11			958	1084	1193	1290	1378	1459	1535		
12			1157	1309	1440	1558	1664	1762	1854	1939	
13			1376	1557	1713	1853	1980	2096	2205	2307	
14			1616	1828	2012	2176	2325	2462	2589	2709	2822
15			1877	2123	2337	2527	2700	2859	3007	3146	3277
16				2442	2687	2906	3105	3288	3459	3619	3770
17				2785	3065	3314	3541	3750	3944	4127	4299
18				3152	3469	3752	4008	4245	4465	4671	4866
19				3544	3901	4218	4507	4772	5020	5252	5471
20				3961	4359	4714	5037	5334	5610	5870	6115
21					4846	5240	5599	5929	6236	6525	6797
22					5360	5796	6193	6558	6898	7217	7518

^{1/}Young et al. 1964

$$LNW = 0.2066 + 2.1679 * LN(D) + 0.4292 * LN(H)$$

Sample Size - 14 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 5.8 inches, Maximum 9.8 inches

Average Height feet, Minimum 52.5 feet, Maximum 62.5 feet

Average Age years, Minimum years, Maximum years

Populus termuloides - Quaking Aspen^{1/}

Michigan

Table 19--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5	35	64	93	123	152						
6		149	191	233	275	317					
7		238	295	352	410	467	524				
8		331	406	481	556	631	706	781			
9		430	525	619	714	809	904	998			
10		533	650	767	884	1001	1118	1235	1352		
11			782	924	1065	1207	1349	1490	1632		
12			922	1090	1259	1427	1596	1764	1932	2101	
13			1068	1266	1463	1661	1859	2057	2254	2452	
14			1221	1451	1680	1909	2139	2368	2597	2827	3056
15			1382	1645	1908	2172	2435	2698	2961	3225	3488
16				1849	2148	2448	2747	3047	3346	3646	3945
17				2062	2400	2738	3076	3414	3752	4091	4429
18				2284	2663	3042	3421	3801	4180	4559	4938
19				2516	2938	3361	3783	4206	4628	5050	5473
20				2757	3225	3693	4161	4629	5097	5565	6033
21					3524	4040	4556	5072	5588	6104	6619
22					3834	4400	4966	5533	6099	6665	7232

^{1/} Steinhilb and Erickson 1970

$$W = -287.4 + 58.63 * D + 0.117 * H * D **2$$

Sample Size - 97 trees, Coefficient of Determination

Average DBH inches, Minimum 5.3 inches, Maximum 17.4 inches

Average Height feet, Minimum 28.3 feet, Maximum 77 feet

Average Age years, Minimum years, Maximum years

Prunus serotina - Black Cherry^{1/}

West Virginia

Table 20--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	9	17									
3	19	37	54								
4	33	64	94	123							
5	51	98	143	188	232						
6		138	202	266	328	390					
7		185	271	356	440	523	605				
8		238	349	458	566	673	779	884			
9		297	436	573	708	841	974	1105			
10		363	533	700	864	1027	1189	1349	1509		
11			638	838	1035	1231	1424	1616	1807		
12			753	988	1221	1451	1680	1906	2131	2355	
13			876	1150	1421	1689	1955	2218	2480	2741	
14			1008	1324	1635	1944	2249	2553	2854	3154	3452
15			1149	1509	1864	2215	2564	2909	3253	3594	3934
16				1705	2106	2503	2897	3288	3676	4062	4446
17				1912	2363	2808	3250	3688	4124	4557	4987
18				2131	2633	3130	3622	4110	4595	5078	5558
19				2361	2917	3467	4012	4554	5091	5626	6158
20				2602	3215	3821	4422	5019	5611	6200	6786
21					3526	4191	4850	5505	6155	6801	7444
22					3851	4578	5297	6012	6722	7428	8130

^{1/}Wiant et al. 1979

$$W = 0.27025 * (H * D ** 2) ** 0.94754$$

Sample Size - 21 trees, Coefficient of Determination 0.99
 Average DBH inches, Minimum 2 inches, Maximum 16 inches
 Average Height feet, Minimum 18 feet, Maximum 94 feet
 Average Age 46 years, Minimum years Maximum years

Quercus alba - White Oak^{1/}

Georgia, Piedmont

Table 21--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	16	33	50									
4	29	59	90	121								
5	46	94	143	193	243							
6		137	209	281	354	428						
7		189	287	387	488	589	692					
8		249	379	511	644	778	912	1048				
9		318	484	652	822	993	1165	1338				
10		395	602	811	1022	1235	1449	1644	1881			
11			733	988	1246	1505	1766	2028	2292			
12			879	1184	1492	1803	2115	2429	2745	3062		
13			1037	1398	1762	2128	2497	2868	3241	3615		
14			1210	1630	2054	2482	2912	3344	3779	4215	4653	
15			1396	1881	2370	2864	3360	3859	4360	4864	5369	
16				2150	2710	3274	3841	4412	4985	5560	6138	
17				2438	3073	3712	4356	5003	5652	6305	6960	
18				2745	3459	4179	4904	5632	6364	7099	7836	
19				3071	3870	4675	5486	6301	7119	7941	8766	
20				3415	4304	5200	6102	7008	7918	8832	9750	
21					4763	5754	6751	7754	8761	9773	10788	
22					5245	6337	7435	8539	9649	10762	11880	

^{1/}Clark and Phillips 1980

$$W = 0.14925 * (H * D ** 2) ** 1.03696$$

Sample Size - 23 trees, Coefficient of Determination 0.98

Average DBH 12.8 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 71 feet, Minimum 47.0 feet, Maximum 93.0 feet

Average Age 56 years, Minimum 37 years, Maximum 80 years

Quercus alba - White Oak^{1/}

Western North Carolina

Table 22--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	12										
3	13	28	43									
4	25	51	79	107								
5	40	82	127	172	217							
6		121	186	252	320	388						
7		168	258	350	443	537	632					
8		223	342	464	588	713	839	966				
9		286	439	595	754	914	1076	1239				
10		357	549	744	942	1143	1345	1549	1754			
11			671	910	1153	1398	1645	1895	2146			
12			807	1094	1386	1680	1978	2278	2580	2885		
13			956	1296	1641	1990	2343	2698	3057	3417		
14			1118	1516	1920	2328	2741	3157	3575	3997	4421	
15			1294	1754	2222	2694	3171	3653	4137	4625	5116	
16				2011	2547	3088	3635	4187	4743	5302	5864	
17				2286	2895	3511	4133	4760	5392	6027	6667	
18				2580	3267	3962	4664	5372	6085	6802	7524	
19				2893	3663	4443	5230	6023	6822	7627	8436	
20				3225	4083	4952	5829	6713	7604	8501	9403	
21					4527	5490	6463	7443	8431	9425	10425	
22					4996	6058	7131	8213	9303	10400	11504	

^{1/}Clark and Schroeder 1980

$$W = 0.11509 * (H * D ** 2) ** 1.05788$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.1 inches, Maximum 21.7 inches

Average Height 84 feet, Minimum 38.0 feet, Maximum 110.0 feet

Average Age 84 years, Minimum 54 years, Maximum 130 years

Quercus alba - White Oak^{1/}

West Virginia

Table 23--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	13										
3	14	29	44									
4	26	53	81	109								
5	41	84	128	173	218							
6		123	187	253	319	385						
7		169	258	348	439	530	622					
8		224	341	459	579	699	821	943				
9		286	435	586	739	893	1048	1204				
10		355	541	730	920	1111	1304	1498	1693			
11			660	889	1121	1354	1589	1826	2063			
12			790	1065	1343	1623	1904	2187	2472	2757		
13			933	1258	1586	1916	2248	2582	2918	3255		
14			1088	1467	1849	2234	2622	3012	3404	3797	4192	
15			1256	1693	2134	2578	3026	3476	3928	4382	4837	
16				1935	2440	2948	3460	3974	4491	5010	5531	
17				2195	2767	3343	3924	4507	5093	5681	6272	
18				2472	3116	3765	4418	5075	5735	6397	7062	
19				2765	3486	4212	4943	5677	6416	7157	7901	
20				3076	3877	4685	5498	6315	7136	7961	8789	
21					4291	5184	6084	6988	7897	8810	9726	
22					4726	5710	6701	7697	8698	9703	10712	

^{1/}Wiant et al. 1979

$$W = 0.13317 * (H * D ** 2) ** 1.03792$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus coccinea - Scarlet Oak^{1/}

Tennessee

Table 24--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	8	16										
3	18	36	55									
4	32	65	98	131								
5	51	102	154	206	258	310						
6		148	223	298	373	449						
7		202	304	407	510	613	716					
8		265	398	533	667	802	937	1072				
9		336	505	676	846	1018	1189	1360				
10		415	625	836	1047	1259	1471	1683	1896			
11			758	1013	1269	1526	1783	2040	2298			
12			903	1208	1513	1819	2125	2432	2739	3047		
13			1062	1420	1779	2138	2498	2859	3220	3581		
14			1233	1649	2066	2483	2902	3320	3740	4160	4580	
15			1418	1896	2375	2855	3335	3817	4299	4782	5265	
16				2160	2705	3252	3800	4348	4897	5447	5997	
17				2441	3058	3676	4295	4915	5535	6157	6779	
18				2739	3432	4125	4820	5516	6213	6910	7608	
19				3055	3828	4601	5376	6152	6929	7707	8486	
20				3389	4245	5104	5963	6824	7686	8548	9412	
21					4685	5632	6581	7530	8481	9433	10386	
22					5146	6187	7229	8272	9317	10363	11409	

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.19275 * (H * D ** 2) ** 1.00974$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 12.1 inches, Minimum 5.1 inches, Maximum 20.0 inches

Average Height 73 feet, Minimum 50.0 feet, Maximum 94.0 feet

Average Age 53 years, Minimum 37 years, Maximum 80 years

Quercus coccinea - Scarlet Oak^{1/}

West Virginia

Table 25--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	11	21										
3	23	44	65									
4	39	76	111	145								
5	60	115	169	221	273							
6		162	238	312	385	457						
7		217	318	417	514	610	706					
8		279	409	536	661	785	907	1029				
9		348	510	669	825	980	1133	1284				
10		425	622	816	1006	1195	1381	1566	1750			
11			744	976	1204	1429	1652	1874	2093			
12			877	1150	1418	1684	1946	2207	2466	2723		
13			1019	1336	1649	1957	2263	2566	2867	3165		
14			1172	1536	1895	2250	2602	2950	3296	3639	3981	
15			1335	1750	2158	2562	2962	3359	3753	4144	4532	
16				1975	2437	2893	3345	3793	4237	4679	5118	
17				2214	2732	3243	3749	4251	4749	5244	5736	
18				2466	3042	3611	4175	4734	5289	5840	6388	
19				2730	3368	3998	4622	5241	5855	6465	7072	
20				3006	3709	4403	5090	5772	6449	7121	7789	
21					4066	4827	5580	6327	7069	7805	8538	
22					4438	5268	6091	6906	7715	8520	9319	

^{1/}Wiant et al. 1979

$$W = 0.33261 * (H * D ** 2) ** 0.94101$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus falcata - Southern Red Oak^{1/}

Tennessee, Cumberland Plateau

Table 26--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	9										
3	10	21	34									
4	19	41	64	88								
5	31	67	105	144	185	226						
6		100	157	216	277	340	403					
7		141	221	305	391	479	568					
8		190	298	410	526	644	765	887				
9		247	387	533	684	837	994	1153				
10		312	490	674	864	1058	1256	1458	1662			
11			605	833	1068	1308	1553	1802	2054			
12			734	1011	1296	1588	1885	2187	2493	2803		
13			878	1209	1549	1897	2252	2613	2979	3349		
14			1035	1425	1827	2238	2656	3081	3513	3950	4391	
15			1207	1662	2130	2609	3097	3593	4096	4605	5120	
16				1918	2459	3012	3575	4147	4728	5316	5911	
17				2195	2814	3446	4091	4746	5411	6084	6764	
18				2493	3195	3914	4646	5390	6145	6909	7682	
19				2812	3604	4414	5240	6079	6930	7792	8663	
20				3152	4039	4948	5873	6814	7768	8734	9711	
21					4503	5515	6547	7595	8659	9735	10824	
22					4994	6117	7261	8424	9603	10797	12005	

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.06632 * (H * D ** 2) ** 1.11245$$

Sample Size - 29 trees, Coefficient of Determination 0.98

Average DBH 12.5 inches, Minimum 5.4 inches, Maximum 22.0 inches

Average Height 70 feet, Minimum 53.0 feet, Maximum 84.0 feet

Average Age 62 years, Minimum 37 years, Maximum 100 years

Quercus prinus - Chestnut Oak^{1/}

Western North Carolina

Table 27--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	12									
3	13	27	41								
4	24	49	76	102							
5	38	79	121	163	206						
6		116	177	239	302	366					
7		160	244	330	418	506	594				
8		211	323	437	553	669	786	905			
9		271	414	560	707	856	1007	1158			
10		338	516	698	882	1068	1256	1444	1634		
11			631	853	1078	1305	1534	1764	1996		
12			757	1023	1293	1566	1841	2117	2396	2676	
13			895	1211	1530	1852	2177	2504	2834	3165	
14			1046	1414	1787	2164	2543	2925	3310	3697	4086
15			1209	1634	2065	2500	2939	3381	3826	4273	4722
16				1871	2365	2863	3365	3871	4380	4892	5406
17				2125	2685	3251	3822	4396	4974	5555	6139
18				2396	3027	3665	4308	4956	5608	6263	6921
19				2683	3391	4105	4826	5551	6281	7015	7752
20				2988	3776	4572	5374	6182	6994	7812	8633
21					4183	5064	5953	6848	7748	8653	9563
22					4612	5583	6563	7550	8542	9540	10543

^{1/}Clark and Schroeder 1980

$$W = 0.11649 * (H * D ** 2) ** 1.04876$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 82 feet, Minimum 47.0 feet, Maximum 115.0 feet

Average Age 78 years, Minimum 46 years, Maximum 129 years

Quercus prinus - Chestnut Oak^{1/}

West Virginia

Table 28--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
Inches											
1											
2	6	12									
3	13	28	43								
4	25	52	80	109							
5	40	84	129	176	224						
6		124	191	260	331	402					
7		172	266	362	461	560	661				
8		229	354	483	614	746	881	1017			
9		295	457	622	790	961	1135	1310			
10		370	573	780	991	1206	1423	1642	1864		
11			703	957	1217	1480	1746	2016	2288		
12			847	1154	1467	1784	2105	2430	2758	3089	
13			1006	1371	1742	2119	2501	2886	3276	3668	
14			1180	1607	2043	2485	2932	3385	3841	4302	4765
15			1368	1864	2369	2882	3401	3925	4455	4989	5527
16				2141	2721	3310	3907	4509	5118	5731	6349
17				2439	3100	3771	4450	5137	5830	6529	7232
18				2758	3505	4264	5032	5808	6592	7382	8178
19				3098	3937	4789	5652	6524	7404	8291	9185
20				3459	4396	5347	6310	7284	8266	9257	10255
21					4882	5938	7008	8089	9180	10281	11389
22					5395	6563	7745	8939	10145	11361	12586

^{1/}Wiant et al. 1979

$$W = 0.10517 * (H * D ** 2) ** 1.07443$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus rubra - Northern Red Oak^{1/}

Western North Carolina

Table 29--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	8	15										
3	17	35	52									
4	31	62	93	124								
5	48	97	146	194	243	292						
6		140	210	281	351	422	493					
7		190	286	383	479	576	672					
8		249	375	501	627	753	879	1006				
9		316	475	635	795	955	1115	1275				
10		391	587	785	982	1180	1378	1576	1775			
11			712	951	1190	1430	1670	1910	2150	2391		
12			848	1133	1418	1703	1989	2276	2562	2849		
13			996	1331	1666	2001	2337	2673	3010	3347		
14			1156	1545	1934	2323	2713	3103	3494	3885	4276	
15			1329	1775	2222	2669	3117	3566	4015	4464	4913	
16				2021	2530	3040	3550	4061	4572	5083	5595	
17				2283	2858	3434	4011	4588	5165	5743	6321	
18				2562	3207	3853	4500	5147	5795	6443	7092	
19				2857	3576	4296	5017	5739	6461	7184	7908	
20				3167	3965	4763	5563	6363	7164	7966	8768	
21					4374	5255	6137	7020	7904	8788	9673	
22					4803	5771	6740	7709	8680	9651	10622	

^{1/}Clark, Phillips, and Schroeder 1980

$$W = 0.18579 * (H * D ** 2) ** 1.00655$$

Sample Size - 71 trees, Coefficient of Determination 0.99

Average DBH 13.0 inches, Minimum 5.9 inches, Maximum 24.7 inches

Average Height 84 feet, Minimum 53.0 feet, Maximum 118.0 feet

Average Age 76 years, Minimum 53 years, Maximum 114 years

Quercus rubra - Northern Red Oak^{1/}

West Virginia

Table 30--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	8	16										
3	18	35	53									
4	32	63	94	126								
5	49	98	147	197	246							
6		142	212	283	353	424						
7		193	289	385	481	577	673					
8		251	377	502	628	753	878	1003				
9		318	477	635	794	952	1111	1269				
10		393	588	784	980	1175	1371	1566	1762			
11			712	948	1185	1422	1658	1894	2131			
12			847	1128	1410	1691	1972	2254	2535	2816		
13			993	1324	1654	1984	2314	2644	2974	3304		
14			1152	1535	1918	2301	2683	3066	3448	3831	4213	
15			1322	1762	2201	2640	3079	3518	3957	4396	4835	
16				2004	2504	3003	3503	4002	4501	5001	5500	
17				2262	2826	3390	3953	4517	5081	5644	6207	
18				2535	3167	3799	4431	5063	5695	6326	6957	
19				2824	3528	4232	4936	5640	6344	7047	7750	
20				3128	3909	4689	5468	6248	7028	7807	8586	
21					4308	5168	6028	6887	7746	8605	9464	
22					4728	5671	6614	7557	8500	9443	10385	

^{1/}Wiant et al. 1979

$$W = 0.19916 * (H * D ** 2) ** 0.99809$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus velutina - Black Oak^{1/}

West Virginia

Table 31--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	9	18										
3	20	40	59									
4	36	70	103	136								
5	55	107	159	209	260							
6		152	226	298	370	441						
7		205	304	401	498	594	690					
8		266	393	520	645	769	893	1016				
9		334	494	653	810	966	1121	1276				
10		409	606	800	993	1184	1375	1564	1753			
11			728	962	1194	1424	1653	1881	2108			
12			862	1138	1413	1685	1956	2226	2494	2762		
13			1006	1329	1649	1967	2284	2598	2912	3224		
14			1161	1534	1903	2270	2635	2999	3361	3721	4080	
15			1327	1753	2175	2595	3012	3427	3840	4252	4663	
16				1986	2464	2940	3412	3883	4351	4818	5283	
17				2233	2771	3305	3837	4366	4892	5417	5940	
18				2494	3095	3692	4285	4876	5464	6050	6635	
19				2769	3436	4099	4758	5414	6067	6717	7366	
20				3058	3795	4526	5254	5978	6700	7418	8134	
21					4170	4974	5774	6570	7363	8152	8940	
22					4563	5443	6318	7188	8056	8920	9781	

^{1/}Wiant 1979

$$W = 0.2627 * (H * D ** 2) ** 0.96714$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18 feet, Maximum 94 feet

Average Age years, Minimum years, Maximum years

HARDWOODS

WHOLE TREE

Wood

Liquidambar styraciflua - Sweetgum^{1/}

Georgia, Piedmont

Table 32--Whole tree--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	3	6										
3	7	16	24									
4	14	29	46	63								
5	22	48	75	102	131							
6		71	111	153	195	238						
7		100	156	214	274	334	396					
8		134	209	287	367	448	531	615				
9		174	271	372	475	581	688	797				
10		219	342	469	599	732	867	1005	1143			
11			422	578	739	903	1070	1239	1410			
12			510	700	895	1093	1295	1500	1707	1916		
13			609	835	1067	1303	1544	1788	2035	2285		
14			716	982	1255	1534	1817	2104	2395	2689	2986	
15			833	1143	1461	1785	2115	2449	2787	3129	3474	
16				1318	1684	2057	2437	2822	3212	3606	4004	
17				1505	1924	2350	2784	3224	3669	4120	4574	
18				1707	2181	2665	3157	3655	4160	4671	5187	
19				1922	2456	3001	3555	4116	4685	5260	5841	
20				2151	2749	3359	3979	4608	5244	5888	6538	
21					3060	3739	4429	5129	5838	6554	7278	
22					3390	4142	4906	5681	6466	7260	8061	

^{1/}Clark and Phillips 1980

$$W = 0.0517 * (H * D ** 2) ** 1.09874$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.7 inches, Maximum 20.7 inches

Average Height 82 feet, Minimum 48.0 feet, Maximum 101.0 feet

Average Age 45 years, Minimum 33 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Georgia, Piedmont

Table 33--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	9										
3	10	20	30									
4	18	36	55	74								
5	28	58	88	118	149							
6		84	128	172	217	262						
7		116	176	237	298	360	422					
8		152	232	312	393	475	557	639				
9		194	296	398	501	605	710	815				
10		242	368	495	624	753	883	1014	1145			
11			448	603	759	917	1075	1235	1394			
12			536	722	909	1098	1287	1478	1669	1861		
13			633	852	1073	1295	1519	1744	1970	2197		
14			737	993	1250	1510	1771	2033	2296	2560	2826	
15			850	1145	1442	1741	2042	2345	2648	2953	3259	
16				1308	1648	1990	2334	2679	3026	3375	3724	
17				1483	1868	2256	2646	3037	3431	3825	4222	
18				1669	2103	2539	2977	3418	3861	4305	4751	
19				1867	2351	2839	3330	3823	4318	4815	5313	
20				2076	2614	3157	3702	4250	4801	5354	5908	
21					2892	3492	4095	4702	5311	5922	6535	
22					3184	3845	4509	5177	5847	6520	7195	

^{1/}Clark and Phillips 1980

$$W = 0.09335 * (H * D ** 2) ** 1.03400$$

Sample Size - 26 trees, Coefficient of Determination 0.99

Average DBH 13.5 inches, Minimum 5.5 inches, Maximum 20.3 inches

Average Height 84 feet, Minimum 58.0 feet, Maximum 107.0 feet

Average Age 56 years, Minimum 30 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 34--Whole tree--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	5	10										
3	12	23	34									
4	20	40	60	79								
5	32	62	92	122	151							
6		88	131	173	215	257	299	340				
7		119	177	234	291	347	403	459				
8		155	229	303	377	450	523	595				
9		194	288	381	474	566	657	749	840	930		
10		239	354	468	582	695	807	919	1031	1142		
11			426	564	700	836	972	1106	1241	1375		
12			505	668	830	990	1151	1310	1469	1628	1786	
13			590	780	969	1157	1345	1531	1717	1902	2087	
14			681	901	1120	1337	1553	1769	1983	2197	2411	
15			779	1031	1280	1529	1776	2023	2268	2513	2757	
16				1169	1452	1734	2014	2293	2572	2849	3126	
17				1315	1634	1951	2266	2581	2894	3206	3518	
18				1469	1826	2180	2533	2884	3234	3583	3931	
19				1632	2028	2422	2814	3204	3593	3981	4368	
20				1804	2241	2676	3109	3540	3970	4399	4826	
21					2464	2943	3419	3893	4365	4837	5306	
22					2698	3221	3742	4262	4779	5295	5809	

^{1/}Clark and Schroeder 1977

$$W = -0.83371 + 0.97283 * \text{Log} (H * D ** 2)$$

Sample Size - 39 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.8 inches, Maximum 28.4 inches

Average Height 99 feet, Minimum 53.0 feet, Maximum 147.0 feet

Average Age 56 years, Minimum 21 years, Maximum 81 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 35--Whole tree--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	3	7										
3	8	17	26									
4	15	31	47	64								
5	24	49	75	102	129							
6		72	111	150	190	230						
7		100	153	208	263	319	375					
8		132	203	275	349	423	498	573				
9		170	261	353	447	543	639	736				
10		212	326	442	559	678	798	919	1041			
11			399	540	684	830	977	1125	1274			
12			479	649	822	997	1174	1352	1531	1712		
13			567	769	974	1181	1390	1601	1814	2028		
14			664	900	1139	1382	1626	1873	2122	2372	2623	
15			768	1041	1318	1599	1882	2167	2455	2744	3035	
16				1194	1511	1833	2157	2484	2814	3146	3479	
17				1357	1718	2083	2452	2824	3199	3576	3955	
18				1531	1939	2351	2768	3187	3610	4036	4464	
19				1717	2174	2636	3103	3574	4048	4525	5005	
20				1914	2423	2938	3458	3983	4511	5043	5578	
21					2686	3258	3834	4416	5002	5592	6185	
22					2964	3594	4231	4873	5519	6170	6824	

^{1/}Clark and Schroeder 1980

$$W = 0.06846 * (H * D ** 2) ** 1.05763$$

Sample Size - 26 trees, Coefficient of Determination 0.99

Average DBH 14.1 inches, Minimum 5.6 inches, Maximum 22.4 inches

Average Height 95 feet, Minimum 51.0 feet, Maximum 128.0 feet

Average Age 53 years, Minimum 16 years, Maximum 76 years

Quercus alba - White Oak^{1/}

Georgia, Piedmont

Table 36--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	5	11										
3	12	25	39									
4	22	47	72	97								
5	36	75	115	155	197							
6		110	169	228	289	350						
7		152	233	316	400	485	571					
8		202	309	419	530	643	756	871				
9		259	397	537	680	824	970	1117				
10		323	496	671	849	1030	1211	1395	1579			
11			606	821	1039	1259	1481	1705	1931			
12			728	986	1248	1513	1780	2049	2320	2593		
13			862	1168	1478	1791	2107	2426	2747	3070		
14			1008	1365	1728	2094	2464	2837	3212	3589	3969	
15			1166	1579	1998	2422	2850	3281	3715	4152	4591	
16				1810	2290	2775	3266	3760	4257	4758	5262	
17				2056	2602	3154	3711	4273	4838	5407	5979	
18				2320	2936	3559	4187	4820	5458	6100	6745	
19				2600	3291	3989	4693	5403	6118	6837	7560	
20				2898	3667	4444	5229	6020	6817	7619	8424	
21					4064	4926	5796	6673	7556	8445	9338	
22					4484	5434	6394	7362	8336	9316	10301	

^{1/}Clark and Phillips 1980

$$W = 0.10634 * (H * D ** 2) ** 1.05500$$

Sample Size - 23 trees, Coefficient of Determination 0.98

Average DBH 12.8 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 71 feet, Minimum 47.0 feet, Maximum 93.0 feet

Average Age 56 years, Minimum 37 years, Maximum 80 years

Quercus alba - White Oak^{1/}

Western North Carolina

Table 37--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	5	10										
3	11	23	36									
4	21	43	66	90								
5	33	69	106	144	182							
6		102	156	212	268	325						
7		141	216	293	371	451	530					
8		187	287	389	493	598	704	810				
9		240	368	499	632	767	903	1040				
10		300	460	624	790	958	1128	1299	1472			
11			563	764	967	1173	1380	1590	1801			
12			677	918	1162	1410	1659	1911	2165	2420		
13			802	1087	1377	1670	1966	2264	2565	2867		
14			938	1272	1611	1953	2300	2649	3000	3354	3710	
15			1086	1472	1864	2261	2661	3065	3472	3881	4293	
16				1687	2137	2591	3051	3514	3980	4449	4921	
17				1918	2429	2946	3468	3995	4525	5058	5595	
18				2165	2742	3325	3914	4508	5107	5709	6315	
19				2427	3074	3728	4389	5055	5726	6401	7080	
20				2706	3426	4156	4892	5634	6382	7135	7892	
21					3799	4608	5424	6247	7076	7911	8750	
22					4192	5084	5985	6894	7809	8729	9656	

^{1/}Clark and Schroeder 1980

$$W = 0.0963 * (H * D ** 2) ** 1.05817$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.1 inches, Maximum 21.7 inches

Average Height 84 feet, Minimum 38.0 feet, Maximum 110.0 feet

Average Age 84 years, Minimum 54 years, Maximum 130 years

Quercus coccinea - Scarlet Oak^{1/}

Tennessee

Table 38--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	13										
3	15	30	45									
4	27	54	81	109								
5	42	85	128	171	215	259						
6		123	185	248	311	374						
7		168	253	339	425	512	599					
8		220	332	445	558	671	785	899				
9		280	422	565	708	852	997	1141				
10		346	522	700	877	1055	1234	1413	1592			
11			634	849	1064	1281	1497	1714	1932			
12			756	1013	1270	1528	1786	2046	2305	2565		
13			890	1191	1494	1797	2101	2406	2712	3017		
14			1034	1384	1736	2089	2442	2797	3151	3507	3863	
15			1189	1592	1997	2403	2809	3217	3625	4034	4443	
16				1815	2276	2739	3202	3667	4132	4598	5065	
17				2053	2574	3097	3621	4147	4673	5200	5728	
18				2305	2891	3478	4067	4656	5247	5839	6432	
19				2572	3226	3881	4538	5196	5856	6516	7178	
20				2854	3580	4307	5036	5766	6498	7231	7965	
21					3952	4755	5560	6366	7174	7983	8794	
22					4343	5225	6110	6996	7884	8773	9664	

^{1/}Clark, Phillips, and Hitchcock 1980

$W = 0.15519 * (H * D ** 2) ** 1.01440$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 12.1 inches, Minimum 5.1 inches, Maximum 20.0 inches

Average Height 73 feet, Minimum 50.0 feet, Maximum 94.0 feet

Average Age 53 years, Minimum 37 years, Maximum 80 years

Quercus falcata - Southern Red Oak^{1/}

Tennessee, Cumberland Plateau

Table 39—Whole tree--wood--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2	3	7										
3	8	17	27									
4	15	33	51	70								
5	25	53	84	116	149	182						
6		80	126	174	223	273	324					
7		113	178	245	314	385	457					
8		152	240	330	423	519	616	715				
9		198	311	429	550	674	801	929				
10		251	394	543	696	853	1012	1175	1340			
11			487	671	861	1054	1252	1453	1657			
12			591	815	1045	1280	1520	1764	2011	2262		
13			707	974	1249	1530	1817	2108	2404	2703		
14			834	1149	1473	1805	2143	2487	2835	3188	3546	
15			972	1340	1718	2105	2499	2900	3307	3718	4135	
16				1547	1983	2430	2885	3348	3818	4294	4775	
17				1771	2270	2782	3303	3833	4370	4915	5465	
18				2011	2579	3159	3752	4353	4964	5582	6208	
19				2269	2909	3564	4232	4911	5599	6297	7002	
20				2543	3261	3996	4744	5505	6277	7059	7850	
21					3636	4455	5289	6138	6998	7870	8752	
22					4033	4941	5867	6808	7763	8730	9708	

^{1/}Clark, Phillips, and Hitchcock. 1980

$$W = 0.05262 * (H * D ** 2) ** 1.11420$$

Sample Size - 29 trees, Coefficient of Determination 0.98

Average DBH 12.5 inches, Minimum 5.4 inches, Maximum 22.0 inches

Average Height 70 feet, Minimum 53.0 feet, Maximum 84.0 feet

Average Age 62 years, Minimum 37 years, Maximum 100 years

Quercus prinus - Chestnut Oak^{1/}

Western North Carolina

Table 40--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	9									
3	10	21	32								
4	18	38	59	79							
5	30	61	94	127	161						
6		90	138	187	236	287					
7		125	191	259	327	397	467				
8		165	253	343	434	525	618	712			
9		212	324	439	556	674	792	912			
10		264	405	549	694	841	990	1139	1290		
11			495	671	849	1028	1210	1393	1577		
12			595	806	1019	1235	1453	1673	1894	2117	
13			704	954	1207	1463	1721	1981	2243	2506	
14			823	1115	1411	1710	2012	2316	2622	2930	3239
15			952	1290	1632	1978	2327	2678	3032	3388	3747
16				1478	1870	2266	2666	3069	3474	3882	4293
17				1679	2125	2575	3029	3487	3948	4412	4878
18				1894	2397	2905	3417	3934	4454	4977	5503
19				2123	2686	3255	3830	4408	4991	5578	6167
20				2365	2993	3627	4267	4912	5561	6215	6871
21					3317	4020	4729	5444	6164	6888	7616
22					3659	4434	5217	6005	6799	7598	8401

^{1/}Clark and Schroeder 1980

$$W = 0.08751 * (H * D ** 2) ** 1.05417$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 82 feet, Minimum 47.0 feet, Maximum 98.0 feet

Average Age 78 years, Minimum 46 years, Maximum 129 years

Quercus rubra - Northern Red Oak^{1/}

Western North Carolina

Table 41--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	13										
3	14	29	43									
4	25	51	77	103								
5	40	80	121	162	203							
6		116	175	235	294	354	414					
7		159	240	321	402	483	565					
8		208	314	420	527	634	741	848				
9		264	399	533	669	804	940	1077				
10		327	493	660	828	996	1164	1333	1502			
11			599	801	1004	1208	1412	1617	1822	2027		
12			714	955	1198	1441	1684	1928	2173	2418		
13			840	1124	1409	1695	1981	2268	2555	2843		
14			976	1306	1637	1969	2302	2636	2970	3304	3639	
15			1122	1502	1883	2265	2647	3031	3415	3800	4185	
16				1712	2146	2581	3017	3454	3892	4331	4770	
17				1935	2426	2918	3412	3906	4401	4897	5393	
18				2173	2724	3277	3831	4386	4941	5498	6055	
19				2424	3039	3656	4274	4893	5514	6135	6757	
20				2690	3372	4057	4742	5429	6117	6807	7497	
21					3723	4478	5235	5993	6753	7514	8276	
22					4091	4921	5753	6586	7421	8257	9094	

^{1/}Clark, Phillips, and Schroeder 1980

$$W = 0.14803 * (H * D ** 2) ** 1.01315$$

Sample Size - 71 trees, Coefficient of Determination 0.99

Average DBH 13.0 inches, Minimum 5.9 inches, Maximum 24.7 inches

Average Height 84 feet, Minimum 53.0 feet, Maximum 118.0 feet

Average Age 76 years, Minimum 53 years, Maximum 114 years

HARDWOODS

MAIN STEM

Wood and Bark

Acer rubrum - Red Maple^{1/}

Maine

Table 42--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	20	40	59	77								
5	32	62	92	121	151							
6		90	133	176	218	260						
7		123	181	240	297	355	412					
8		161	238	314	390	465	539	614				
9		204	302	398	494	590	684	779				
10		252	373	493	612	730	847	964	1080			
11			453	598	742	885	1027	1168	1309			
12			540	713	884	1055	1224	1393	1561	1729		
13			634	838	1040	1240	1439	1638	1835	2032		
14			737	973	1208	1440	1672	1902	2132	2361	2588	
15			847	1119	1388	1656	1922	2187	2451	2714	2976	
16				1275	1582	1887	2190	2492	2793	3092	3391	
17				1441	1788	2133	2476	2817	3157	3495	3833	
18				1617	2007	2394	2779	3162	3543	3923	4302	
19				1804	2239	2670	3100	3527	3952	4376	4799	
20				2001	2483	2962	3438	3912	4384	4855	5323	
21					2741	3269	3795	4318	4839	5358	5875	
22					3011	3592	4169	4744	5316	5886	6454	

^{1/}Young et al. 1964

$$LNW = -2.0214 + 2.0215 * LN(D) + 0.9670 * LN(H)$$

Sample Size - 20 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 5.6 inches, Maximum 15.8 inches

Average Height feet, Minimum 36.5 feet, Maximum 71 feet

Average Age years, Minimum years, Maximum years

Acer rubrum - Red Maple^{1/}

West Virginia

Table 43--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	17	35	54	74								
5	27	57	88	120	153							
6		84	130	178	227	276						
7		117	182	249	316	385	455					
8		157	243	332	422	514	608	702				
9		202	314	428	545	664	784	906				
10		254	394	538	684	834	985	1138	1292			
11			484	661	841	1024	1210	1398	1588			
12			584	798	1015	1237	1461	1688	1917	2148		
13			695	948	1207	1470	1737	2007	2279	2554		
14			816	1113	1417	1726	2039	2356	2676	2999	3324	
15			947	1292	1645	2004	2367	2735	3106	3481	3859	
16				1486	1891	2304	2722	3144	3572	4003	4437	
17				1694	2156	2626	3103	3585	4072	4563	5059	
18				1917	2440	2972	3511	4057	4608	5164	5725	
19				2155	2743	3341	3947	4560	5179	5804	6435	
20				2408	3065	3733	4410	5095	5787	6485	7190	
21					3406	4148	4901	5662	6431	7207	7990	
22					3766	4587	5419	6261	7112	7970	8836	

^{1/}Wiant et al. 1979

$$W = 0.06842 * (H * D ** 2) ** 1.08142$$

Sample Size - 22 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 2 inches, Maximum 16 inches

Average Height feet, Minimum 18 feet, Maximum 94 feet

Average Age 46 years, Minimum years, Maximum years

Alnus rubra - Red Alder^{1/}

Western Oregon

Table 44--Main stem^{2/}--wood and bark--green weight (pounds)

DBH inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	22	44	66	88								
5	34	69	103	137	170							
6		99	147	196	244	293						
7		134	200	266	331	396	461					
8		174	261	346	431	515	598	681				
9		220	329	436	542	647	751	854				
10		271	404	536	665	793	920	1044	1167			
11			487	645	800	952	1102	1250	1395			
12			577	763	945	1123	1298	1470	1638	1802		
13			674	890	1100	1305	1506	1702	1893	2079		
14			778	1025	1264	1498	1725	1945	2159	2366	2567	
15			888	1167	1438	1700	1953	2198	2434	2661	2881	
16				1317	1619	1910	2189	2457	2715	2961	3196	
17				1474	1808	2127	2432	2723	2999	3262	3511	
18				1638	2003	2350	2679	2991	3285	3561	3820	
19				1806	2203	2577	2930	3260	3569	3855	4119	
20				1981	2408	2808	3182	3528	3847	4140	4405	
21					2617	3041	3433	3792	4118	4411	4671	
22					2828	3274	3682	4049	4377	4665	4914	

^{1/}Zavitovski and Stevens 1972

$$W = (0.02 + 1.6 * (H*D**2)/100 - 0.0005 * ((H*D**2)/100)**2) * 1.98 - \text{METRIC}$$

Sample Size -91 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 1.3 inches, Maximum 152.4 inches

Average Height feet, Minimum feet, Maximum feet

Average Age years, Minimum 1 year, Maximum 65 years

^{2/}Green weight conversion factor 1.98 applied to equation to convert oven dry weight to green weight.

Betula papyrifera - Paper Birch^{1/}

Maine

Table 45--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	23	45	66	88							
5	36	70	104	138	171						
6		102	151	199	247	295					
7		139	206	272	337	402	467				
8		182	270	356	442	527	612	696			
9		231	342	452	560	668	776	883			
10		286	423	559	693	827	960	1092	1224		
11			513	678	841	1003	1164	1325	1484		
12			612	808	1003	1196	1388	1579	1770	1960	
13			719	950	1179	1406	1632	1857	2081	2303	
14			835	1103	1369	1633	1896	2157	2417	2676	2935
15			960	1268	1574	1877	2179	2480	2779	3077	3374
16				1445	1793	2139	2483	2825	3166	3505	3844
17				1634	2027	2418	2807	3193	3579	3963	4345
18				1834	2275	2714	3150	3585	4017	4448	4877
19				2046	2538	3028	3514	3999	4481	4962	5441
20				2269	2816	3358	3898	4435	4971	5504	6035
21					3107	3706	4302	4895	5486	6074	6661
22					3414	4072	4726	5378	6027	6673	7317

^{1/}Young et al. 1964

$$LNW = -1.8959 + 2.0215 * LN(D) + 0.967 * LN(H)$$

Sample Size - 17 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 6.1 inches, Maximum 11.6 inches

Average Height feet, Minimum 47 feet, Maximum 77.5 feet

Average Age years, Minimum years, Maximum years

Carya spp. - Hickory^{1/}

West Virginia

Table 46--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2												
3												
4	9	22	35	50								
5	16	37	61	87	115							
6		58	96	136	179	224						
7		85	140	199	261	327	395					
8		118	194	276	363	453	548	645				
9		157	259	368	484	605	731	861				
10		204	335	477	627	784	947	1115	1288			
11			423	602	792	990	1196	1409	1628			
12			524	745	980	1225	1480	1744	2015	2292		
13			637	907	1193	1491	1801	2122	2452	2790		
14			765	1088	1430	1788	2160	2545	2940	3345	3760	
15			905	1288	1694	2118	2559	3014	3482	3962	4453	
16				1509	1984	2481	2997	3531	4079	4641	5217	
17				1751	2302	2879	3478	4096	4733	5385	6053	
18				2015	2649	3312	4001	4713	5445	6196	6964	
19				2300	3024	3782	4568	5381	6217	7074	7951	
20				2609	3429	4288	5180	6102	7050	8022	9016	
21					3865	4833	5839	6877	7946	9042	10162	
22					4332	5417	6544	7708	8906	10134	11390	

^{1/}Wiant et al. 1979

$$W = 0.01828 * (H * D ** 2) ** 1.22604$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2 inches, Maximum 16 inches

Average Height feet, Minimum 18 feet, Maximum 94 feet

Average Age 46 years, Minimum years, Maximum years

Liquidambar styraciflua - Sweetgum^{1/}

Georgia, Piedmont

Table 47--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	10	22	35	48							
5	17	37	58	81	104						
6		56	88	123	159	195					
7		79	126	175	226	278	332				
8		107	171	237	307	378	451	526			
9		141	224	311	402	495	591	688			
10		179	285	396	511	630	752	876	1003		
11			354	493	636	784	936	1090	1248		
12			433	601	777	957	1142	1331	1523	1719	
13			520	723	933	1150	1372	1599	1830	2065	
14			616	856	1106	1363	1626	1895	2169	2447	2730
15			721	1003	1295	1596	1905	2220	2541	2867	3198
16				1163	1502	1851	2209	2574	2946	3324	3707
17				1336	1726	2127	2538	2957	3385	3819	4260
18				1523	1967	2425	2893	3371	3859	4354	4856
19				1724	2227	2744	3275	3816	4368	4928	5497
20				1940	2505	3087	3683	4292	4912	5543	6183
21					2801	3452	4119	4800	5494	6199	6914
22					3116	3840	4582	5340	6112	6896	7692

^{1/}Clark and Phillips 1980

$$W = 0.02950 * (H * D ** 2) ** 1.14599$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.7 inches, Maximum 20.7 inches

Average Height 82 feet, Minimum 48.0 feet, Maximum 101.0 feet

Average Age 45 years, Minimum 33 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Georgia, Piedmont

Table 48--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	14	29	46	63							
5	23	48	74	102	130						
6		71	111	151	193	235					
7		100	155	211	269	329	388				
8		133	207	283	360	439	519	600			
9		172	267	365	465	567	671	776			
10		216	336	459	585	713	844	975	1109		
11			413	565	720	878	1038	1200	1364		
12			499	682	870	1061	1254	1450	1648	1848	
13			594	812	1035	1262	1492	1726	1961	2199	
14			698	954	1216	1483	1753	2027	2304	2584	2866
15			811	1109	1413	1723	2037	2355	2677	3002	3330
16				1276	1626	1982	2344	2710	3080	3454	3831
17				1455	1855	2262	2674	3092	3514	3941	4371
18				1648	2100	2561	3028	3501	3980	4463	4950
19				1854	2362	2880	3406	3938	4476	5019	5567
20				2072	2641	3220	3808	4403	5004	5611	6224
21					2937	3581	4234	4895	5564	6239	6921
22					3249	3962	4685	5417	6156	6904	7657

^{1/}Clark and Phillips 1980

$$W = 0.0557 * (H * D ** 2) ** 1.08717$$

Sample Size - 26 trees, Coefficient of Determination 0.99

Average DBH 13.5 inches, Minimum 5.5 inches, Maximum 20.3 inches

Average Height 84 feet, Minimum 58.0 feet, Maximum 107.0 feet

Average Age 56 years, Minimum 30 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 49--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	11										
3	12	24	36									
4	22	43	64	84								
5	34	66	99	131	162							
6		95	141	187	232	277	322					
7		128	190	252	314	375	436	496				
8		166	247	327	407	486	565	644				
9		209	311	412	512	612	712	811	910			
10		257	382	506	629	752	874	996	1118	1239		
11			460	610	758	906	1053	1200	1346	1492		
12			546	723	899	1074	1249	1423	1596	1769	1942	
13			638	845	1051	1256	1460	1663	1866	2068	2270	
14			737	977	1215	1451	1687	1922	2157	2391	2624	
15			844	1118	1390	1661	1931	2200	2468	2736	3003	
16				1268	1577	1884	2190	2496	2800	3103	3406	
17				1427	1775	2121	2466	2809	3152	3494	3835	
18				1596	1985	2372	2757	3141	3524	3907	4288	
19				1774	2206	2636	3064	3491	3917	4342	4765	
20				1961	2438	2914	3387	3859	4330	4800	5268	
21					2682	3205	3726	4245	4763	5280	5795	
22					2938	3510	4081	4649	5216	5782	6346	

^{1/}Clark and Schroeder 1977

$$W = -0.81474 + 0.97694 * \text{Log} (H * D ** 2)$$

Sample Size - 39 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.8 inches, Maximum 28.4 inches

Average Height 99 feet, Minimum 53.0 feet, Maximum 147.0 feet

Average Age 56 years, Minimum 21 years, Maximum 81 years

^{2/}Main stem to a 2-inch top, d.o.b.

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 50—Main stem—wood and bark—green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	11	24	38	52							
5	18	39	62	85	109						
6		59	93	128	164	201					
7		83	131	180	231	283	337				
8		112	176	243	312	382	453	526			
9		146	229	316	405	496	589	684			
10		185	290	399	512	627	745	865	986		
11			359	494	633	776	921	1069	1219		
12			435	600	769	942	1118	1298	1480	1664	
13			520	717	919	1126	1337	1551	1768	1989	
14			614	845	1084	1328	1577	1829	2086	2346	2608
15			715	986	1264	1548	1838	2133	2432	2735	3042
16				1138	1459	1788	2123	2463	2808	3158	3512
17				1303	1670	2046	2430	2819	3215	3615	4020
18				1480	1897	2324	2760	3202	3651	4106	4566
19				1669	2140	2622	3113	3612	4118	4631	5150
20				1871	2399	2939	3490	4049	4617	5192	5773
21					2674	3277	3890	4514	5147	5788	6436
22					2966	3634	4315	5007	5709	6420	7139

^{1/}Clark and Schroeder 1980

$$W = -0.03884 * (H * D ** 2) ** 1.11386$$

Sample Size - 26 trees, Coefficient of Determination 0.98

Average DBH 14.1 inches, Minimum 5.6 inches, Maximum 22.4 inches

Average Height 95 feet, Minimum 51.0 feet, Maximum 128.0 feet

Average Age 53 years, Minimum 16 years, Maximum 76 years

Liriodendron tulipifera - Yellow-poplar^{1/}

West Virginia

Table 51--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		25	73	121	169	217					
7		60	125	191	256	322	387				
8		100	185	271	356	442	527	613			
9		145	253	362	470	578	687	795			
10		196	330	463	597	731	864	998	1132		
11			414	576	737	899	1061	1223	1384		
12			506	699	891	1084	1276	1469	1661	1854	
13			606	832	1058	1284	1510	1736	1962	2188	
14			715	977	1239	1501	1763	2025	2287	2549	2811
15			831	1132	1432	1733	2034	2335	2635	2936	3237
16				1297	1640	1982	2324	2666	3008	3351	3693
17				1474	1860	2246	2633	3019	3405	3792	4178
18				1661	2094	2527	2960	3393	3826	4260	4693
19				1859	2341	2824	3306	3789	4272	4754	5237
20				2067	2602	3137	3671	4206	4741	5275	5810
21					2876	3466	4055	4645	5234	5824	6413
22					3163	3810	4457	5104	5751	6398	7045

^{1/}Wiant et al. 1979

$$W = -71.346 + 0.13367 * H * D ** 2$$

Sample Size - 22 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Platanus occidentalis - Sycamore^{1/}

Georgia, Piedmont

Table 52--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4		17	42	67	92	117						
5		45	84	123	162	201	240					
6		80	136	191	247	303	359					
7		120	196	272	348	425	501					
8		167	266	366	465	565	664	764				
9		219	345	471	597	723	849	975				
10		279	434	589	745	900	1056	1211	1367			
11			532	720	908	1096	1284	1472	1660			
12			639	863	1087	1311	1534	1758	1982	2206		
13			756	1018	1281	1544	1807	2069	2332	2595		
14			882	1186	1491	1796	2100	2405	2710	3014	3319	
15			1017	1367	1716	2066	2416	2766	3115	3465	3815	
16				1559	1957	2355	2753	3151	3549	3947	4345	
17				1765	2214	2663	3112	3561	4011	4460	4909	
18				1982	2486	2989	3493	3997	4500	5004	5508	
19				2212	2773	3334	3896	4457	5018	5579	6140	
20				2455	3076	3698	4320	4942	5563	6185	6807	
21					3395	4081	4766	5452	6137	6823	7508	
22					3729	4482	5234	5986	6739	7491	8243	

^{1/}Belanger 1973

$$W = -32.35109 + 0.15544 * H * D ** 2$$

Sample Size - 31 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 4 inches, Maximum 10 inches

Average Height feet, Minimum 45 feet, Maximum 80 feet

Average Age years, Minimum years, Maximum years

^{2/}Main stem to a 3-inch top

Populus tremuloides - Quaking Aspen^{1/}

Maine

Table 53--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	21	42	61	81							
5	33	65	96	127	158						
6		94	139	184	229	273					
7		129	190	252	312	372	432				
8		169	250	330	409	488	566	644			
9		214	317	418	519	619	718	817			
10		265	392	517	642	766	889	1011	1133		
11			475	627	778	929	1078	1226	1374		
12			566	748	928	1107	1285	1462	1639	1814	
13			666	879	1091	1302	1511	1719	1926	2133	
14			773	1021	1267	1512	1755	1997	2238	2478	2717
15			889	1174	1457	1738	2018	2296	2573	2848	3123
16				1338	1660	1980	2299	2615	2931	3245	3559
17				1512	1877	2239	2598	2956	3313	3669	4023
18				1698	2107	2513	2917	3319	3719	4118	4515
19				1894	2350	2803	3253	3702	4148	4593	5037
20				2101	2607	3109	3609	4106	4602	5095	5587
21					2877	3431	3983	4532	5079	5623	6166
22					3160	3770	4376	4979	5580	6178	6774

^{1/}Young et al. 1964

$$LNW = -1.9730 + 2.0215 * LN(D) + 0.9670 * LN(H)$$

Sample Size - 14 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 5.8 inches, Maximum 9.8 inches

Average Height feet, Minimum 52.5 feet, Maximum 62.5 feet

Average Age , Minimum , Maximum

Prunus serotina - Black Cherry^{1/}

West Virginia

Table 54--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	13	29	45	63								
5	22	48	76	105	136							
6		72	115	160	206	254						
7		103	164	227	293	361	431					
8		140	222	308	398	490	585	682				
9		183	291	404	521	642	766	892				
10		233	370	514	663	817	975	1136	1299			
11			460	639	825	1016	1212	1412	1616			
12			561	780	1007	1240	1479	1723	1972	2224		
13			674	937	1209	1489	1777	2070	2368	2672		
14			799	1110	1432	1765	2105	2452	2806	3165	3530	
15			935	1299	1677	2066	2465	2871	3285	3706	4133	
16				1506	1944	2395	2857	3328	3808	4296	4791	
17				1730	2233	2751	3282	3823	4375	4935	5503	
18				1972	2545	3136	3740	4357	4986	5624	6272	
19				2232	2880	3548	4233	4931	5642	6365	7098	
20				2509	3239	3990	4760	5545	6345	7157	7982	
21					3622	4461	5322	6200	7094	8002	8924	
22					4028	4962	5919	6896	7891	8901	9926	

^{1/}Wiant et al. 1979

$$W = 0.03897 * (H * D ** 2) ** 1.14384$$

Sample Size - 21 trees, Coefficient of Determination 0.978

Average DBH inches, Minimum 2 inches, Maximum 16 inches

Average Height feet, Minimum 18 feet, Maximum 94 feet

Average Age 46 years, Minimum years, Maximum years

Quercus alba - White Oak^{1/}

Georgia, Piedmont

Table 55--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2												
3												
4	16	34	53	72								
5	26	55	85	116	148							
6		81	126	172	219	267						
7		114	176	240	306	373	440					
8		152	235	321	408	497	588	679				
9		196	303	414	527	642	758	876				
10		246	381	520	662	806	952	1099	1249			
11			468	639	813	990	1169	1351	1534			
12			565	771	981	1195	1411	1630	1852	2075		
13			672	916	1166	1420	1678	1938	2201	2467		
14			788	1076	1369	1667	1969	2275	2584	2896	3210	
15			915	1249	1589	1935	2286	2641	2999	3361	3726	
16				1436	1827	2225	2628	3036	3448	3864	4283	
17				1637	2083	2536	2996	3461	3931	4405	4883	
18				1852	2357	2870	3390	3916	4448	4985	5525	
19				2081	2649	3226	3810	4402	4999	5602	6210	
20				2325	2959	3604	4257	4918	5586	6259	6938	
21					3289	4005	4731	5465	6207	6955	7710	
22					3636	4428	5231	6043	6863	7691	8525	

^{1/}Clark and Phillips 1980

$$W = 0.06656 * (H * D ** 2) ** 1.08067$$

Sample Size - 23 trees, Coefficient of Determination 0.99

Average DBH 12.8 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 71 feet, Minimum 47.0 feet, Maximum 93.0 feet

Average Age 56 years, Minimum 37 years, Maximum 80 years

Quercus alba - White Oak^{1/}

Western North Carolina

Table 56--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	16	34	53	71								
5	26	55	84	115	146							
6		81	125	170	217	263						
7		113	174	237	302	367	433					
8		150	232	316	402	489	577	666				
9		193	299	407	518	630	744	859				
10		243	375	511	650	790	933	1077	1222			
11			460	627	797	970	1145	1322	1500			
12			555	756	962	1170	1381	1594	1809	2026		
13			659	898	1142	1390	1640	1893	2149	2407		
14			773	1054	1339	1630	1923	2220	2520	2823	3127	
15			897	1222	1554	1890	2231	2576	2923	3274	3627	
16				1404	1785	2172	2563	2959	3359	3762	4168	
17				1600	2034	2474	2920	3371	3826	4285	4748	
18				1809	2300	2798	3302	3812	4327	4846	5369	
19				2032	2583	3143	3709	4282	4860	5444	6031	
20				2269	2885	3509	4142	4782	5427	6078	6734	
21					3204	3898	4600	5311	6028	6751	7479	
22					3541	4308	5084	5869	6662	7461	8266	

^{1/}Clark and Schroeder 1980

$$W = 0.0684 * (H * D ** 2) ** 1.07533$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.1 inches, Maximum 21.7 inches

Average Height 84 feet, Minimum 38.0 feet, Maximum 110.0 feet

Average Age 84 years, Minimum 54 years, Maximum 130 years

Quercus alba - White Oak^{1/}

West Virginia

Table 57--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	15	33	52	71								
5	25	54	85	118	151							
6		81	128	177	228	279						
7		115	181	251	322	395	470					
8		155	245	338	434	533	634	736				
9		202	319	440	566	694	825	959				
10		256	404	558	717	879	1045	1214	1386			
11			500	691	888	1089	1295	1504	1717			
12			608	840	1079	1324	1574	1828	2087	2349		
13			728	1005	1291	1584	1884	2188	2497	2811		
14			860	1187	1525	1871	2224	2584	2949	3319	3694	
15			1004	1386	1780	2185	2597	3017	3443	3875	4313	
16				1602	2058	2525	3002	3487	3980	4479	4985	
17				1835	2358	2893	3439	3995	4560	5132	5711	
18				2087	2680	3289	3910	4542	5184	5834	6493	
19				2356	3026	3713	4414	5128	5853	6587	7331	
20				2643	3395	4166	4953	5754	6567	7391	8225	
21					3788	4648	5526	6419	7326	8246	9177	
22					4205	5160	6134	7126	8133	9153	10186	

^{1/}Wiant et al. 1979

$$W = 0.05066 * (H * D ** 2) ** 1.12211$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus coccinea - Scarlet Oak^{1/}

Tennessee

Table 58--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	19	40	61	82							
5	31	64	97	132	167	202					
6		93	143	194	245	297					
7		129	198	268	339	411	484				
8		171	262	355	450	545	641	738			
9		219	336	456	577	699	822	946			
10		274	420	569	720	872	1026	1182	1338		
11			514	696	880	1067	1255	1444	1635		
12			617	836	1057	1281	1507	1735	1965	2196	
13			731	989	1252	1517	1785	2054	2326	2599	
14			854	1157	1463	1773	2086	2402	2719	3039	3360
15			988	1338	1692	2051	2413	2778	3145	3514	3886
16				1533	1939	2350	2765	3183	3603	4027	4452
17				1742	2204	2670	3142	3617	4095	4576	5059
18				1965	2486	3012	3544	4080	4619	5162	5707
19				2202	2786	3376	3972	4572	5177	5785	6396
20				2453	3104	3762	4426	5094	5768	6445	7127
21					3440	4169	4905	5646	6393	7144	7899
22					3795	4599	5410	6228	7052	7880	8713

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.09079 * (H * D ** 2) ** 1.05414$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 12.1 inches, Minimum 5.1 inches, Maximum 20.0 inches

Average Height 73 feet, Minimum 50.0 feet, Maximum 94.0 feet

Average Age 53 years, Minimum 37 years, Maximum 80 years

Quercus coccinea - Scarlet Oak^{1/}

West Virginia

Table 59--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		44	105	167	228	290					
7		88	172	255	339	423	506				
8		139	249	358	467	576	686	795			
9		197	336	474	612	751	889	1027			
10		262	433	604	774	945	1116	1287	1457		
11			541	747	954	1160	1367	1573	1780		
12			658	904	1150	1396	1642	1887	2133	2379	
13			786	1075	1363	1652	1940	2229	2517	2806	
14			925	1259	1594	1928	2263	2598	2932	3267	3601
15			1073	1457	1841	2225	2610	2994	3378	3762	4146
16				1669	2106	2543	2980	3417	3854	4291	4728
17				1894	2388	2881	3374	3868	4361	4854	5348
18				2133	2686	3239	3793	4346	4899	5452	6005
19				2386	3002	3618	4235	4851	5467	6083	6700
20				2652	3335	4018	4701	5384	6066	6749	7432
21					3685	4438	5191	5943	6696	7449	8202
22					4052	4878	5705	6531	7357	8183	9009

^{1/}Wiant et al. 1979

$$W = -79.149 + 0.17071 * H * D ** 2$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus falcata - Southern Red Oak^{1/}

Tennessee, Cumberland Plateau

Table 60--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	11	24	39	55							
5	18	41	66	92	119	147					
6		63	100	140	181	224	267				
7		90	143	200	259	320	382				
8		122	195	272	353	436	521	608			
9		160	256	358	464	573	685	799			
10		205	327	457	592	731	874	1020	1169		
11			408	570	738	912	1090	1272	1458		
12			500	697	903	1115	1333	1556	1784	2016	
13			601	839	1087	1343	1605	1874	2148	2427	
14			714	996	1291	1594	1906	2225	2550	2881	3218
15			838	1169	1514	1870	2236	2610	2992	3381	3775
16				1358	1759	2172	2597	3032	3475	3926	4385
17				1563	2024	2500	2989	3489	3999	4518	5046
18				1784	2310	2854	3412	3983	4566	5158	5761
19				2022	2619	3235	3868	4515	5175	5847	6530
20				2277	2949	3643	4356	5085	5828	6585	7354
21					3303	4079	4877	5693	6526	7373	8234
22					3678	4544	5432	6341	7269	8213	9171

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.03062 * (H * D ** 2) ** 1.15873$$

Sample Size - 29 trees, Coefficient of Determination 0.98

Average DBH 12.5 inches, Minimum 5.4 inches, Maximum 22.0 inches

Average Height 70 feet, Minimum 53.0 feet, Maximum 84.0 feet

Average Age 62 years, Minimum 37 years, Maximum 100 years

Quercus prinus - Chestnut Oak^{1/}

Western North Carolina

Table 61--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	17	36	56	76							
5	28	58	90	122	154						
6		86	132	179	227	276					
7		119	183	249	315	383	451				
8		158	243	330	419	508	598	690			
9		203	313	424	538	652	769	886			
10		254	391	531	672	816	961	1108	1255		
11			479	650	823	999	1177	1356	1537		
12			576	782	990	1202	1416	1632	1849	2068	
13			682	926	1174	1425	1678	1934	2192	2451	
14			799	1084	1374	1668	1964	2264	2565	2869	3175
15			925	1255	1591	1931	2274	2621	2970	3322	3676
16				1440	1825	2215	2609	3006	3406	3810	4216
17				1638	2076	2519	2967	3419	3875	4333	4795
18				1849	2343	2844	3350	3860	4375	4893	5414
19				2074	2629	3190	3758	4330	4907	5488	6073
20				2313	2931	3557	4190	4829	5472	6120	6772
21					3251	3946	4648	5356	6069	6788	7511
22					3589	4356	5130	5912	6700	7493	8291

^{1/}Clark and Schroeder 1980

$$W = 0.07933 * (H * D ** 2) ** 1.06198$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 82 feet, Minimum 47.0 feet, Maximum 115.0 feet

Average Age 78 years, Minimum 46 years, Maximum 129 years

Quercus prinus - Chestnut Oak^{1/}

West Virginia

Table 62--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	13	29	46	65								
5	21	48	78	110	144							
6		75	121	170	222	276						
7		108	174	245	320	397	477					
8		148	240	337	439	546	655	768				
9		196	317	446	581	722	867	1016				
10		251	407	573	747	927	1113	1305	1501			
11			510	718	936	1163	1396	1636	1882			
12			628	883	1151	1430	1717	2012	2314	2622		
13			759	1068	1392	1729	2076	2433	2799	3172		
14			905	1274	1660	2062	2476	2902	3337	3782	4235	
15			1066	1501	1956	2429	2917	3418	3932	4456	4990	
16				1749	2280	2831	3400	3985	4583	5194	5816	
17				2020	2633	3270	3927	4602	5293	5998	6717	
18				2314	3016	3745	4498	5271	6062	6871	7694	
19				2631	3430	4259	5114	5993	6893	7812	8748	
20				2972	3874	4811	5777	6770	7786	8824	9882	
21					4350	5402	6487	7602	8743	9909	11096	
22					4858	6033	7245	8490	9765	11066	12393	

^{1/}Wiant et al. 1979

$$W = 0.03019 * (H * D ** 2) ** 1.18769$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus rubra - Northern Red Oak^{1/}

Western North Carolina

Table 63--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	23	46	70	93							
5	36	72	109	146	183						
6		105	158	211	264	317	371				
7		143	215	288	360	433	506				
8		187	282	377	472	567	662	758			
9		237	357	477	598	719	840	961			
10		294	442	591	740	889	1039	1188	1338		
11			536	716	897	1078	1259	1440	1622	1804	
12			638	853	1069	1284	1500	1717	1933	2150	
13			750	1003	1256	1509	1763	2018	2272	2527	
14			871	1164	1458	1753	2048	2343	2639	2935	3231
15			1001	1338	1676	2015	2354	2693	3033	3373	3713
16				1524	1909	2295	2681	3067	3454	3842	4230
17				1723	2158	2593	3030	3467	3904	4342	4780
18				1933	2421	2910	3400	3890	4381	4872	5364
19				2156	2701	3246	3792	4339	4886	5434	5982
20				2391	2995	3600	4205	4812	5419	6026	6635
21					3305	3972	4640	5309	5979	6650	7321
22					3630	4363	5097	5832	6568	7304	8041

^{1/}Clark, Phillips, and Schroeder 1980

$$W = 0.13724 * (H * D ** 2) ** 1.00877$$

Sample Size - 71 trees, Coefficient of Determination 0.99

Average DBH 13.0 inches, Minimum 5.9 inches, Maximum 24.7 inches

Average Height 84 feet, Minimum 53.0 feet, Maximum 118.0 feet

Average Age 76 years, Minimum 53 years, Maximum 114 years

Quercus rubra - Northern Red Oak^{1/}

West Virginia

Table 64--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4		15	40	65								
5		43	82	121	160							
6		77	134	190	246	302						
7		118	194	271	347	423	500					
8		165	264	364	464	564	663	763				
9		218	344	470	596	723	849	975				
10		277	433	589	744	900	1056	1212	1368			
11			531	720	908	1097	1285	1474	1662			
12			638	863	1087	1312	1536	1761	1985	2210		
13			755	1019	1282	1546	1809	2072	2336	2599		
14			882	1187	1493	1798	2104	2409	2715	3020	3326	
15			1017	1368	1719	2069	2420	2771	3121	3472	3823	
16				1561	1960	2359	2758	3157	3556	3955	4354	
17				1767	2217	2668	3118	3569	4019	4470	4920	
18				1985	2490	2995	3500	4005	4510	5015	5520	
19				2216	2778	3341	3904	4466	5029	5592	6154	
20				2459	3082	3706	4329	4953	5576	6200	6823	
21					3402	4089	4777	5464	6151	6839	7526	
22					3737	4491	5246	6000	6754	7509	8263	

^{1/}Wiant et al. 1979

$$W = -34.823 + 0.15586 * H * D ** 2$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

Quercus velutina - Black Oak^{1/}

West Virginia

Table 65--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	19	40	61	83								
5	31	64	98	133	168							
6		94	144	196	247	300						
7		130	200	271	343	415	489					
8		173	265	359	454	551	648	746				
9		221	340	460	582	706	831	957				
10		277	424	575	728	882	1038	1195	1353			
11			519	703	890	1079	1269	1461	1655			
12			624	845	1069	1296	1525	1756	1988	2222		
13			738	1000	1266	1535	1806	2079	2354	2631		
14			863	1170	1480	1794	2112	2431	2753	3077	3403	
15			999	1353	1712	2076	2443	2812	3185	3559	3936	
16				1551	1962	2379	2799	3223	3650	4079	4511	
17				1762	2230	2704	3181	3663	4148	4636	5126	
18				1988	2516	3050	3589	4133	4680	5230	5784	
19				2229	2821	3419	4023	4632	5246	5863	6483	
20				2484	3143	3810	4483	5162	5846	6533	7225	
21					3484	4224	4970	5722	6480	7242	8008	
22					3844	4659	5483	6313	7148	7989	8835	

^{1/}Wiant et al. 1979

$$W = 0.09067 * (H * D ** 2) ** 1.05554$$

Sample Size - 22 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.0 inches, Maximum 16.0 inches

Average Height feet, Minimum 18.0 feet, Maximum 94.0 feet

Average Age 46 years, Minimum years, Maximum years

HARDWOODS

MAIN STEM

Wood

Liquidambar styraciflua - Sweetgum^{1/}

Georgia, Piedmont

Table 66--Main stem--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	8	18	30	41								
5	14	31	50	69	90							
6		47	76	106	137	169						
7		68	108	151	196	242	290					
8		92	148	206	267	330	395	461				
9		121	194	271	351	434	519	606				
10		155	248	346	449	554	663	774	887			
11			309	432	560	691	827	965	1107			
12			379	529	685	846	1012	1181	1354	1530		
13			456	636	825	1019	1218	1422	1631	1843		
14			541	756	979	1210	1447	1689	1937	2189	2445	
15			635	887	1149	1420	1698	1983	2273	2569	2869	
16				1030	1335	1649	1973	2303	2640	2984	3333	
17				1186	1537	1899	2271	2651	3039	3434	3836	
18				1354	1755	2168	2593	3027	3470	3922	4380	
19				1535	1989	2458	2939	3432	3934	4446	4966	
20				1729	2241	2768	3311	3866	4432	5008	5593	
21					2509	3100	3708	4329	4963	5608	6264	
22					2795	3454	4130	4822	5529	6248	6978	

^{1/}Clark and Phillips 1980

$$W = 0.0229 * (H * D ** 2) ** 1.16031$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.7 inches, Maximum 20.7 inches

Average Height 82 feet, Minimum 48.0 feet, Maximum 101.0 feet

Average Age 45 years, Minimum 33 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

North Carolina, Piedmont

Table 67--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	11	23	37	50							
5	18	38	60	82	105						
6		57	90	123	158	193					
7		81	126	173	222	271	321				
8		108	169	233	298	364	431	500			
9		140	220	302	386	472	559	648			
10		177	277	381	487	596	706	818	932		
11			342	470	601	735	871	1010	1150		
12			414	569	728	891	1056	1223	1393	1565	
13			495	679	869	1063	1260	1460	1662	1867	
14			582	800	1023	1252	1484	1719	1958	2199	2443
15			678	932	1192	1457	1728	2002	2280	2561	2845
16				1074	1374	1680	1992	2308	2629	2953	3280
17				1228	1571	1921	2277	2639	3005	3376	3750
18				1393	1782	2179	2584	2994	3409	3830	4254
19				1570	2008	2456	2911	3373	3841	4315	4794
20				1758	2249	2750	3260	3778	4302	4832	5368
21					2504	3063	3631	4207	4791	5382	5979
22					2775	3394	4023	4662	5309	5964	6625

^{1/} Clark and Phillips 1980

$$W = 0.04031 * (H * D ** 2) ** 1.10358$$

Sample Size - 26 trees, Coefficient of Determination 0.99

Average DBH 13.5 inches, Minimum 5.5 inches, Maximum 20.3 inches

Average Height 84 feet, Minimum 58.0 feet, Maximum 107.0 feet

Average Age 56 years, Minimum 30 years, Maximum 83 years

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 68--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	9									
3	10	20	29								
4	18	35	52	69							
5	27	54	80	107	133						
6		77	115	153	191	228	265				
7		105	156	207	258	309	360	410			
8		136	203	270	336	402	468	534			
9		172	256	340	424	507	590	673	756		
10		211	315	419	521	624	726	829	931	1032	
11			380	505	629	753	877	1000	1123	1246	
12			451	599	747	894	1040	1187	1333	1479	1624
13			529	702	874	1047	1218	1390	1561	1731	1902
14			612	812	1012	1211	1410	1608	1806	2003	2201
15			701	931	1159	1388	1615	1842	2069	2295	2521
16				1057	1317	1576	1834	2092	2350	2607	2863
17				1191	1484	1776	2067	2358	2648	2937	3227
18				1333	1661	1987	2313	2639	2963	3288	3611
19				1483	1847	2211	2573	2935	3297	3657	4017
20				1640	2044	2446	2847	3248	3647	4046	4445
21					2250	2693	3135	3575	4015	4455	4893
22					2466	2951	3435	3919	4401	4882	5363

^{1/}Clark and Schroeder 1977

$$W = 0.92750 + 0.98533 * \text{Log } 10 (H * D ** 2)$$

Sample Size - 39 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.8 inches, Maximum 28.4 inches

Average Height 99 feet, Minimum 53.0 feet, Maximum 147.0 feet

Average Age 56 years, Minimum 21 years, Maximum 81 years

^{2/}Main stem to a 2-inch top, d.o.b.

Liriodendron tulipifera - Yellow-poplar^{1/}

Western North Carolina

Table 69--Main stem--wood--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2												
3												
4	10	21	33	45								
5	16	34	53	74	94							
6		51	80	110	141	173						
7		72	113	155	199	244	289					
8		97	152	209	268	328	389	452				
9		126	197	272	348	426	506	587				
10		159	249	343	440	539	639	742	845			
11			308	424	544	666	790	917	1045			
12			374	515	660	808	959	1112	1268	1425		
13			447	615	788	965	1145	1329	1515	1703		
14			527	725	929	1138	1351	1567	1786	2008	2232	
15			614	845	1083	1327	1574	1826	2082	2341	2602	
16				976	1250	1531	1817	2108	2403	2702	3003	
17				1116	1431	1752	2080	2412	2750	3091	3437	
18				1268	1625	1990	2361	2739	3122	3510	3902	
19				1430	1832	2244	2663	3089	3521	3958	4401	
20				1602	2053	2515	2985	3462	3946	4437	4932	
21					2289	2803	3326	3859	4398	4945	5497	
22					2538	3108	3689	4279	4877	5483	6096	

^{1/}Clark and Schroeder 1980

$$W = 0.03404 * (H * D ** 2) ** 1.11147$$

Sample Size - 26 trees, Coefficient of Determination 0.98

Average DBH 14.1 inches, Minimum 5.6 inches, Maximum 22.4 inches

Average Height 95 feet, Minimum 51.0 feet, Maximum 128.0 feet

Average Age 53 years, Minimum 16 years, Maximum 76 years

Quercus alba - White Oak^{1/}

Georgia, Piedmont

Table 70--Main stem--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	13	28	44	61								
5	22	46	72	99	127							
6		69	108	148	189	231						
7		97	151	208	265	324	383					
8		130	203	278	355	434	514	595				
9		168	263	360	460	562	666	771				
10		212	331	454	580	708	839	971	1105			
11			408	560	715	873	1034	1197	1362			
12			494	677	865	1057	1251	1449	1649	1851		
13			589	807	1031	1260	1492	1727	1965	2206		
14			693	950	1213	1482	1755	2032	2313	2596	2882	
15			806	1105	1412	1724	2042	2364	2691	3020	3353	
16				1273	1626	1987	2353	2724	3100	3480	3864	
17				1454	1858	2269	2688	3112	3541	3975	4413	
18				1649	2106	2573	3047	3528	4014	4506	5003	
19				1857	2372	2897	3431	3972	4520	5074	5633	
20				2078	2654	3242	3839	4445	5059	5679	6305	
21					2954	3608	4273	4948	5630	6320	7017	
22					3272	3996	4733	5480	6236	7000	7771	

^{1/}Clark and Phillips 1980

$$W = 0.05064 * (H * D ** 2) ** 1.09728$$

Sample Size - 23 trees, Coefficient of Determination 0.99

Average DBH 12.8 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 71 feet, Minimum 47.0 feet, Maximum 93.0 feet

Average Age 56 years, Minimum 37 years, Maximum 80 years

Quercus alba - White Oak^{1/}

Western North Carolina

Table 71--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	14	30	46	63							
5	23	48	74	101	129						
6		71	110	150	191	232					
7		99	153	209	265	323	381				
8		132	204	278	354	430	508	586			
9		170	263	358	456	554	654	755			
10		213	330	450	571	695	820	947	1075		
11			405	552	701	853	1007	1162	1319		
12			488	665	846	1029	1214	1402	1591	1782	
13			580	790	1004	1222	1442	1665	1889	2116	
14			680	927	1178	1433	1691	1952	2216	2482	2749
15			789	1075	1366	1662	1962	2265	2570	2878	3189
16				1235	1570	1910	2254	2602	2953	3307	3664
17				1407	1788	2175	2567	2964	3364	3767	4174
18				1591	2022	2460	2903	3351	3804	4260	4720
19				1787	2271	2763	3261	3765	4273	4785	5301
20				1995	2536	3085	3641	4203	4771	5343	5920
21					2817	3426	4044	4668	5299	5934	6574
22					3113	3787	4470	5159	5856	6558	7266

^{1/}Clark and Schroeder 1980

$$W = 0.06031 * (H * D ** 2) ** 1.07504$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.1 inches, Maximum 21.7 inches

Average Height 84 feet, Minimum 38.0 feet, Maximum 110.0 feet

Average Age 84 years, Minimum 54 years, Maximum 130 years

Quercus coccinea - Scarlet Oak^{1/}

Tennessee

Table 72--Main stem--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	16	33	51	70								
5	26	54	83	112	142							
6		79	122	165	209	254						
7		110	169	229	290	352	415					
8		146	224	304	385	467	550	634				
9		187	288	390	495	600	707	814				
10		234	360	488	619	751	884	1019	1154			
11			440	598	757	919	1082	1247	1413			
12			530	719	911	1105	1302	1500	1700	1901		
13			628	852	1080	1310	1543	1778	2015	2253		
14			735	997	1263	1533	1806	2081	2358	2637	2918	
15			851	1154	1463	1775	2091	2409	2730	3053	3378	
16				1324	1678	2036	2398	2763	3131	3501	3874	
17				1506	1908	2315	2727	3142	3561	3982	4406	
18				1700	2154	2614	3079	3547	4020	4495	4974	
19				1907	2416	2932	3453	3979	4509	5042	5579	
20				2126	2694	3269	3850	4437	5027	5622	6221	
21					2988	3626	4270	4921	5576	6236	6900	
22					3298	4002	4714	5431	6155	6883	7616	

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.07333 * (H * D ** 2) ** 1.06140$$

Sample Size - 28 trees, Coefficient of Determination 0.99

Average DBH 12.1 inches, Minimum 5.1 inches, Maximum 20.0 inches

Average Height 73 feet, Minimum 50.0 feet, Maximum 94.0 feet

Average Age 53 years, Minimum 37 years, Maximum 80 years

Quercus falcata - Southern Red Oak^{1/}

Tennessee, Cumberland Plateau

Table 73--Main stem--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4	9	20	32	44								
5	15	33	53	74	96	119						
6		51	81	114	148	183	219					
7		73	117	163	212	262	314					
8		99	159	223	289	358	429	501				
9		131	210	294	381	471	564	660				
10		167	268	375	487	603	722	844	968			
11			335	469	609	753	902	1054	1210			
12			411	575	746	923	1106	1292	1483	1677		
13			495	693	900	1113	1333	1558	1788	2022		
14			589	824	1070	1324	1585	1852	2126	2404	2687	
15			692	968	1257	1555	1862	2176	2498	2825	3157	
16				1126	1461	1808	2165	2531	2904	3285	3671	
17				1297	1684	2084	2495	2916	3346	3784	4230	
18				1483	1924	2381	2851	3333	3824	4325	4835	
19				1682	2184	2702	3235	3781	4339	4908	5486	
20				1897	2462	3046	3647	4263	4892	5532	6184	
21					2759	3414	4087	4778	5482	6200	6931	
22					3076	3806	4557	5326	6112	6912	7727	

^{1/}Clark, Phillips, and Hitchcock 1980

$$W = 0.02324 * (H * D ** 2) ** 1.16832$$

Sample Size - 29 trees, Coefficient of Determination 0.98

Average DBH 12.5 inches, Minimum 5.4 inches, Maximum 22.0 inches

Average Height 70 feet, Minimum 53.0 feet, Maximum 84.0 feet

Average Age 62 years, Minimum 37 years, Maximum 100 years

Quercus prinus - Chestnut Oak^{1/}

Western North Carolina

Table 74--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	14	29	44	61							
5	22	46	72	98	124						
6		69	106	144	183	223					
7		96	148	201	255	310	366				
8		127	196	267	339	413	487	562			
9		164	253	344	437	531	627	723			
10		205	317	431	548	666	785	906	1028		
11			389	529	672	817	963	1111	1261		
12			468	637	809	984	1161	1339	1519	1701	
13			556	757	961	1168	1378	1590	1804	2019	
14			651	887	1126	1369	1615	1864	2114	2367	2621
15			755	1028	1306	1587	1872	2160	2451	2744	3039
16				1180	1499	1823	2150	2481	2815	3151	3490
17				1344	1707	2076	2448	2825	3205	3588	3974
18				1519	1930	2346	2767	3193	3623	4056	4492
19				1706	2167	2634	3107	3585	4068	4554	5043
20				1904	2419	2940	3468	4002	4540	5083	5629
21					2685	3265	3851	4443	5041	5643	6250
22					2967	3607	4254	4909	5569	6235	6905

^{1/}Clark and Schroeder 1980

$$W = 0.05958 * (H * D ** 2) ** 1.07148$$

Sample Size - 24 trees, Coefficient of Determination 0.98

Average DBH 13.1 inches, Minimum 5.6 inches, Maximum 20.9 inches

Average Height 82 feet, Minimum 47.0 feet, Maximum 115.0 feet

Average Age 78 years, Minimum 46 years, Maximum 129 years

Quercus rubra - Northern Red Oak^{1/}

Western North Carolina

Table 75--Main stem--wood--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	19	39	59	79							
5	30	61	93	124	156						
6		89	135	180	226	272	319				
7		122	184	247	310	373	436				
8		160	242	324	404	489	572	656			
9		203	307	412	516	622	727	833			
10		252	381	510	640	770	901	1032	1164		
11			462	619	777	935	1094	1253	1413	1573	
12			551	739	927	1116	1306	1496	1686	1877	
13			649	870	1091	1314	1537	1760	1985	2209	
14			755	1011	1269	1528	1787	2047	2308	2569	2830
15			868	1164	1460	1758	2056	2356	2655	2956	3257
16				1327	1665	2005	2345	2686	3028	3371	3714
17				1501	1884	2268	2653	3039	3426	3813	4202
18				1686	2116	2547	2980	3414	3848	4284	4720
19				1882	2362	2844	3327	3811	4296	4782	5269
20				2090	2622	3156	3692	4230	4768	5308	5848
21					2896	3486	4078	4671	5266	5862	6459
22					3183	3832	4483	5135	5789	6444	7100

^{1/}Clark, Phillips, and Schroeder 1980

$$W = 0.11034 * (H * D ** 2) ** 1.01741$$

Sample Size - 71 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 5.9 inches, Maximum 24.7 inches

Average Height feet, Minimum 53.0 feet, Maximum 118.0 feet

Average Age years, Minimum 53 years, Maximum 114 years

SOFTWOODS

WHOLE TREE

Wood, Bark, and Foliage

Abies amabilis - Pacific Silver Fir^{1/}

Pacific Northwest

Table 76--Whole tree^{2/}--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4												
5	668	692	715	738	762							
6		712	746	780	813	847						
7		737	782	828	874	920	966					
8		765	825	884	944	1004	1064	1124				
9		796	872	948	1024	1100	1175	1251				
10		832	926	1019	1113	1206	1300	1394	1487			
11			985	1098	1211	1324	1428	1551	1664			
12			1049	1184	1319	1453	1588	1723	1858	1993		
13			1119	1278	1436	1594	1752	1910	2068	2227		
14			1195	1379	1562	1745	1929	2112	2296	2479	2663	
15			1277	1487	1698	1908	2119	2329	2540	2751	2961	
16				1603	1843	2082	2322	2562	2801	3041	3280	
17				1727	1997	2268	2538	2809	3079	3350	3620	
18				1858	2161	2464	2768	3071	3374	3677	3980	
19				1996	2334	2672	3010	3348	3686	4024	4361	
20				2142	2517	2891	3265	3640	4014	4389	4763	
21					2709	3121	3534	3947	4360	4772	5185	
22					2910	3363	3816	4269	4722	5175	5628	

^{1/}Shaw 1977

$$W = 0.818 + 0.01117 * H * D ** 2 \text{ (metric)}$$

Sample Size - 26 trees, Coefficient of Determination

Average DBH centimeters, Minimum 0.2 centimeter, Maximum 119.2 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.66 applied to equation to convert oven dry weight to green weight.

Abies balsamea - Balsam Fir^{1/}

Michigan

Table 77--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	20	26									
3	44	59	69								
4	79	104	123	138							
5	123	163	192	215	235						
6		235	276	309	338	364					
7		319	375	421	461	495	527				
8		417	490	550	602	647	688	726			
9		528	621	696	761	819	871	919			
10		651	766	860	940	1011	1075	1134	1189		
11			927	1040	1137	1223	1301	1373	1439		
12			1103	1238	1353	1456	1548	1633	1712	1786	
13			1295	1453	1588	1700	1817	1917	2009	2096	
14			1502	1685	1842	1982	2108	2223	2331	2431	2525
15			1724	1934	2115	2275	2419	2552	2675	2791	2899
16				2201	2406	2588	2753	2904	3044	3175	3298
17				2484	2716	2992	3108	3278	3436	3584	3724
18				2785	3045	3276	3484	3675	3852	4018	4174
19				3103	3393	3650	3882	4095	4292	4477	4651
20				3439	3760	4044	4301	4537	4756	4961	5154
21					4145	4459	4742	5002	5244	5469	5682
22					4549	4893	5205	5490	5755	6003	6236

^{1/}Steinhilb and Erickson 1970

$$W = 10 ** 0.2935 * D ** 2 * H ** 0.4$$

Sample Size - 71 trees, Coefficient of Determination

Average DBH inches, Minimum 5.0 inches, Maximum 13.2 inches

Average Height feet, Minimum 30.4 feet, Maximum 62 feet

Average Age , Minimum , Maximum

Picea engelmannii - Englemann Spruce^{1/}

British Columbia

Table 78--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	22	28									
3	29	43	56								
4	40	63	87	110							
5	53	90	127	164	200						
6		122	175	229	282	335					
7		161	233	305	378	450	522				
8		205	299	394	488	583	677	772			
9		255	375	494	614	733	853	972			
10		311	459	606	754	902	1049	1197	1344		
11			552	730	909	1088	1266	1445	1623		
12			654	866	1079	1291	1504	1716	1929	2141	
13			764	1014	1263	1513	1762	2012	2261	2510	
14			884	1173	1462	1752	2041	2330	2620	2909	3198
15			1012	1344	1676	2009	2341	2673	3005	3337	3669
16				1527	1905	2283	2661	3039	3417	3795	4172
17				1722	2149	2575	3002	3429	3855	4282	4708
18				1929	2407	2885	3364	3842	4320	4798	5276
19				2147	2680	3213	3746	4279	4812	5344	5877
20				2378	2968	3558	4149	4739	5330	5920	6510
21					3271	3921	4572	5223	5874	6525	7176
22					3588	4302	5017	5731	6445	7160	7874

^{1/}Adamovich 1975

$$W = 16.0 + 0.1476 * H * D ** 2$$

Sample Size - 47 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 0.8 inches, Maximum 15.8 inches

Average Height feet, Minimum 6.5 feet, Maximum 92.4 feet

Average Age , Minimum , Maximum

Picea glauca - White Spruce^{1/}

Michigan

Table 79--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5	180	183	186	189	192						
6		300	304	308	312	317					
7		438	443	449	455	461	466				
8		597	604	612	619	627	634	642			
9		777	786	796	805	815	824	834			
10		978	990	1002	1014	1025	1037	1049	1060		
11			1215	1229	1244	1258	1272	1286	1300		
12			1462	1479	1496	1512	1529	1546	1563	1580	
13			1730	1750	1769	1789	1809	1829	1849	1868	
14			2019	2042	2065	2088	2111	2134	2157	2180	2203
15			2330	2357	2383	2409	2436	2462	2488	2515	2541
16				2693	2723	2752	2782	2812	2842	2872	2902
17				3050	3084	3118	3152	3185	3219	3253	3287
18				3430	3467	3505	3543	3581	3619	3657	3695
19				3831	3873	3915	3957	4000	4042	4084	4126
20				4253	4300	4347	4394	4440	4487	4534	4581
21					4749	4801	4852	4904	4956	5007	5059
22					5220	5277	5334	5390	5447	5503	5560

^{1/}Steinhilb and Erickson 1972

W = -81.94 + 10.37 * D ** 2 + 0.0117 * H * D ** 2
 Sample Size - 58 trees, Coefficient of Determination
 Average DBH meters, Minimum 6.2 meters, Maximum 16.2 meters
 Average Height feet, Minimum 31.2 feet, Maximum 68 feet
 Average Age , Minimum , Maximum

Pinus clausa var. immuginata - Choctawhatchee Sand Pine^{1/}

Florida

Table 80--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	9	18									
3	21	40	59								
4	36	69	102	135							
5	55	106	157	206	256	304					
6		151	222	293	362	431					
7		202	298	393	487	579	671				
8		261	385	507	628	748	867	985			
9		327	483	636	787	937	1086	1234			
10		401	591	778	963	1147	1329	1510	1690		
11			709	934	1156	1376	1595	1812	2029		
12			837	1103	1365	1625	1884	2141	2396	2650	
13			976	1285	1591	1895	2196	2495	2793	3089	
14			1125	1481	1834	2183	2530	2875	3219	3560	3900
15			1283	1690	2093	2492	2888	3281	3673	4063	4451
16				1912	2368	2819	3267	3713	4156	4597	5036
17				2148	2659	3166	3669	4170	4667	5162	5655
18				2396	2967	3532	4094	4652	5207	5759	6309
19				2657	3290	3917	4540	5159	5775	6387	6997
20				2932	3629	4321	5008	5691	6370	7046	7719
21					3985	4744	5499	6248	6994	7736	8475
22					4356	5186	6011	6830	7645	8456	9264

^{1/}Taras 1980

$$\text{Log } W = -0.55650 + 0.95706 * \text{Log } (H^*D^{**2})$$

Sample Size - 36 trees, Coefficient of Determination 0.99

Average DBH 9.1 inches, Minimum 4.2 inches, Maximum 14.7 inches

Average Height 52 feet, Minimum 24 feet, Maximum 67 feet

Average Age 57 years, Minimum 37 years, Maximum 88 years

Pinus echinata - Shortleaf Pine^{1/}

Georgia

Table 81--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4												
5												
6		83	152	220	289	358	427					
7		132	226	320	413	507	601					
8		190	312	434	557	679	801	923				
9		255	409	564	719	874	1028	1183				
10		327	518	709	900	1092	1283	1474	1665			
11			639	870	1101	1332	1563	1795	2026			
12			771	1046	1321	1596	1871	2146	2421	2696		
13			914	1237	1560	1882	2205	2528	2851	3174		
14			1069	1443	1818	2192	2566	2941	3315	3690	4064	
15			1235	1665	2095	2524	2954	3384	3814	4244	4674	
16				1902	2391	2880	3369	3858	4347	4836	5325	
17				2154	2706	3258	3810	4362	4914	5467	6019	
18				2421	3040	3659	4278	4897	5516	6135	6754	
19				2704	3394	4083	4773	5463	6152	6842	7532	
20				3002	3766	4530	5295	6059	6823	7587	8351	
21					4158	5000	5843	6685	7528	8371	9213	
22					4569	5493	6418	7343	8267	9192	10117	

^{1/}Saucier, Phillips, and Williams 1981

$$W = -54.75468 + 0.19105 * H * D^{**2}$$

Sample Size - 228 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus echinata - Shortleaf Pine^{1/}

Mississippi

Table 82--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	8									
3	10	21	33								
4	18	39	62	85							
5	30	65	102	141	181						
6		97	153	212	272	333					
7		138	217	299	384	471	559				
8		186	292	403	518	635	754	876			
9		242	380	525	674	826	982	1140			
10		306	482	664	853	1046	1243	1443	1647		
11			596	822	1056	1295	1539	1787	2038		
12			724	999	1283	1573	1870	2171	2477	2787	
13			866	1195	1535	1882	2236	2597	2963	3334	
14			1023	1411	1812	2222	2640	3066	3498	3935	4378
15			1193	1647	2114	2593	3081	3578	4082	4593	5110
16				1903	2443	2996	3560	4134	4716	5306	5904
17				2179	2798	3431	4077	4735	5402	6078	6762
18				2477	3180	3899	4634	5381	6139	6907	7685
19				2796	3589	4401	5230	6073	6929	7796	8674
20				3136	4025	4937	5866	6812	7772	8745	9729
21					4490	5506	6543	7598	8669	9754	10852
22					4983	6111	7262	8432	9620	10825	12043

^{1/}Clark and Taras 1976

$$\text{Log } W = -1.20938 + 1.11931 * \text{Log } (H * D^{**2})$$

Sample Size - 34 trees, Coefficient of Determination 0.99

Average DBH 12.3 inches, Minimum 6.1 inches, Maximum 19.7 inches

Average Height 72 feet, Minimum 48 feet, Maximum 87 feet

Average Age 70 years, Minimum 28 years, Maximum 110 years

Pinus elliottii - Slash Pine^{1/}

Alabama

Table 83--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	12									
3	14	28	42								
4	25	50	76	102							
5	39	79	120	162	204						
6		115	175	236	297	358					
7		159	241	324	408	492	577				
8		209	317	427	537	648	759	871			
9		266	404	544	684	826	968	1110			
10		331	502	676	850	1026	1202	1380	1558		
11			611	822	1035	1248	1463	1679	1896		
12			713	984	1238	1493	1751	2009	2268	2528	
13			862	1160	1460	1761	2064	2369	2674	2981	
14			1005	1351	1700	2052	2405	2760	3116	3473	3831
15			1158	1558	1960	2365	2772	3181	3591	4003	4416
16				1779	2239	2702	3166	3633	4102	4572	5044
17				2016	2537	3061	3588	4117	4648	5181	5715
18				2268	2854	3443	4036	4631	5229	5828	6429
19				2535	3190	3849	4512	5177	5845	6515	7187
20				2818	3546	4278	5015	5754	6496	7241	7988
21					3921	4731	5545	6363	7183	8007	8833
22					4315	5207	6103	7003	7906	8812	9721

^{1/}Taras and Phillips 1978

$$\text{Log } W = -0.88096 + 1.03014 * \text{Log } (H * D^{**2})$$

Sample Size - 43 trees, Coefficient of Determination 0.99

Average DBH 12.9 inches, Minimum 6.0 inches, Maximum 21.0 inches

Average Height 73 feet, Minimum 47 feet, Maximum 99 feet

Average Age 51 years, Minimum 28 years, Maximum 68 years

Pinus elliotii - Slash Pine^{1/}

Georgia

Table 84--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6	109	177	244	312	379						
7	158	250	342	433	525	617					
8	214	334	454	574	694	814	934				
9	278	430	581	733	885	1037	1188				
10	349	536	724	911	1098	1286	1473	1660			
11		654	881	1108	1335	1561	1788	2015			
12		784	1053	1323	1593	1863	2133	2402	2672		
13		924	1241	1557	1874	2191	2507	2824	3140		
14		1076	1443	1810	2178	2545	2912	3279	3646	4013	
15		1239	1660	2082	2504	2925	3347	3768	4190	4611	
16			1893	2372	2852	3332	3811	4291	4770	5250	
17			2140	2681	3223	3764	4306	4847	5389	5930	
18			2402	3009	3616	4223	4830	5437	6044	6651	
19			2680	3356	4032	4709	5385	6061	6737	7414	
20			2972	3721	4471	5220	5969	6719	7468	8217	
21				4105	4931	5758	6584	7410	8236	9062	
22				4508	5415	6321	7228	8135	9042	9948	

^{1/}Saucier, Phillips, and Williams 1981

$$W = -25.58159 + 0.18734 * H * D ** 2$$

Sample Size - 208 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus palustris - Longleaf Pine^{1/}

Alabama

Table 85--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	8	16									
3	18	35	53								
4	31	62	93	124							
5	49	97	145	193	241						
6		139	208	277	346	415					
7		189	283	377	470	563	656				
8		247	369	491	612	734	855	976			
9		312	466	620	774	927	1080	1233			
10		384	574	764	953	1142	1331	1520	1708		
11			694	923	1152	1380	1608	1836	2064		
12			825	1097	1369	1640	1911	2182	2452	2722	
13			967	1286	1604	1923	2240	2557	2874	3191	
14			1120	1490	1859	2227	2595	2962	3330	3696	4063
15			1284	1708	2131	2554	2976	3397	3818	4239	4659
16				1941	2422	2902	3382	3861	4340	4818	5295
17				2189	2732	3273	3814	4354	4894	5433	5972
18				2452	3060	3666	4272	4877	5482	6086	6689
19				2730	3406	4082	4756	5430	6102	6775	7447
20				3022	3771	4519	5265	6011	6756	7500	8244
21					4155	4978	5801	6622	7443	8263	9082
22					4556	5459	6361	7262	8162	9062	9960

^{1/}Taras and Clark 1977

$$\text{Log } W = -0.68988 + 0.99194 * \text{Log } (H * D^{***2})$$

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH 13.2 inches, Minimum 5.9 inches, Maximum 18.9 inches

Average Height 80 feet, Minimum 56 feet, Maximum 97 feet

Average Age 50 years, Minimum 32 years, Maximum 69 years

Pinus palustris - Longleaf Pine^{1/}

Georgia

Table 86--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6	102	175	248	321	394	467					
7	154	254	353	453	552	652					
8	215	345	475	605	735	865	995				
9	284	449	613	778	942	1106	1271				
10	362	564	767	970	1173	1376	1579	1782			
11		692	938	1184	1429	1675	1920	2166			
12		832	1125	1417	1709	2002	2294	2586	2878		
13		985	1328	1671	2014	2357	2700	3043	3386		
14		1149	1547	1945	2343	2740	3138	3536	3934	4332	
15		1326	1782	2239	2696	3152	3609	4066	4522	4979	
16			2034	2554	3073	3593	4112	4632	5152	5671	
17			2302	2888	3475	4062	4648	5235	5821	6408	
18			2586	3244	3901	4559	5217	5874	6532	7189	
19			2886	3619	4352	5085	5817	6550	7283	8016	
20			3203	4015	4827	5639	6451	7263	8074	8886	
21				4431	5326	6221	7116	8011	8907	9802	
22				4867	5850	6832	7815	8797	9779	10762	

^{1/}Saucier, Phillips, and Williams 1981

$$W = -44.418879 + 0.20297 * H * D^{**2}$$

Sample Size - 73 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 95 feet

Average Age years, Minimum years, Maximum years

Pinus resinosa - Red Pine^{1/}

Michigan

Table 87--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4												
5	41	82	123	164	205							
6		129	194	259	323	388	452					
7		181	272	362	453	544	634					
8		238	357	475	594	713	832	951				
9		299	448	598	747	896	1046	1195				
10		364	547	729	911	1093	1276	1458	1640			
11			652	870	1087	1304	1522	1739	1957			
12			765	1019	1274	1529	1784	2039	2294	2548		
13			884	1178	1473	1768	2062	2357	2651	2946		
14			1010	1347	1683	2020	2356	2693	3030	3366	3703	
15			1143	1524	1905	2286	2667	3048	3429	3810	4191	
16				1711	2138	2566	2993	3421	3849	4276	4704	
17				1906	2383	2860	3336	3813	4289	4766	5242	
18				2111	2639	3167	3695	4223	4751	5278	5806	
19				2326	2907	3488	4070	4651	5233	5814	6395	
20				2549	3186	3823	4461	5098	5735	6372	7010	
21					3477	4172	4868	5563	6259	6954	7649	
22					3779	4535	5291	6047	6803	7558	8314	

^{1/}Steinhilb and Erickson 1972

$$W = 0.115 * H * D ** 2 + 1.1 * H * D - 4.276 * H$$

Sample Size - 58 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 14 inches

Average Height feet, Minimum 50 feet, Maximum 73 feet

Average Age years, Minimum years, Maximum years

Pinus taeda - Loblolly Pine^{1/}

Alabama

Table 88--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	13										
3	15	30	45									
4	27	53	80	107								
5	41	83	125	167	209							
6		120	180	241	301	362						
7		164	246	328	410	493	575					
8		214	321	429	537	644	752	860				
9		271	407	543	680	816	953	1090				
10		335	503	671	840	1008	1177	1346	1515			
11			609	813	1017	1221	1426	1630	1835			
12			725	968	1211	1454	1698	1941	2185	2429		
13			852	1137	1422	1708	1994	2280	2566	2853		
14			988	1319	1650	1982	2314	2646	2978	3310	3643	
15			1135	1515	1896	2277	2658	3039	3420	3802	4184	
16				1725	2158	2592	3025	3459	3894	4328	4763	
17				1948	2437	2927	3417	3907	4398	4889	5379	
18				2185	2734	3283	3833	4383	4933	5483	6034	
19				2436	3047	3660	4272	4885	5498	6112	6726	
20				2700	3378	4057	4736	5415	6095	6775	7455	
21					3726	4474	5223	5973	6722	7472	8223	
22					4091	4912	5735	6557	7381	8204	9028	

^{1/}Taras and Clark 1975

$$\text{Log } W = -0.78974 + 1.00404 * \text{Log } (H * D^{**2})$$

Sample Size - 41 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.6 inches, Maximum 20.4 inches

Average Height 80 feet, Minimum 48 feet, Maximum 107 feet

Average Age 42 years, Minimum 37 years, Maximum 47 years

Pinus taeda - Loblolly Pine^{1/}

Georgia

Table 89--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4												
5												
6		118	182	247	311	375	440					
7		164	252	340	427	515	602					
8		218	332	447	561	676	790	904				
9		279	424	568	713	858	1003	1147				
10		347	525	704	883	1062	1240	1419	1598			
11			638	854	1071	1287	1503	1719	1936			
12			761	1019	1276	1534	1791	2048	2306	2563		
13			895	1197	1500	1802	2104	2406	2708	3010		
14			1040	1391	1741	2091	2442	2792	3142	3493	3843	
15			1196	1598	2000	2402	2804	3207	3609	4011	4413	
16				1820	2277	2735	3192	3650	4107	4565	5023	
17				2055	2572	3089	3605	4122	4638	5155	5671	
18				2306	2885	3464	4043	4622	5201	5780	6359	
19				2570	3215	3861	4506	5151	5796	6442	7087	
20				2849	3564	4279	4994	5709	6424	7139	7854	
21					3930	4719	5507	6295	7083	7872	8660	
22					4315	5180	6045	6910	7775	8640	9505	

^{1/}Saucier, Phillips, and Williams 1981

$$W = -10.79364 + 0.17874 * H * D^{**2}$$

Sample Size - 448 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus taeda - Loblolly Pine^{1/}

Georgia

Table 90--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	15	30	46									
4	27	54	81	108								
5	42	84	127	169	211							
6		122	183	243	304	365						
7		166	248	331	414	497	580					
8		216	324	433	541	649	757	865				
9		274	411	548	684	821	958	1095				
10		338	507	676	845	1014	1183	1352	1521			
11			613	818	1022	1227	1431	1636	1840			
12			730	973	1217	1460	1704	1947	2190	2434		
13			857	1142	1428	1714	1999	2285	2570	2856		
14			994	1325	1656	1987	2319	2650	2981	3312	3644	
15			1141	1521	1901	2281	2662	3042	3422	3802	4183	
16				1731	2163	2596	3028	3461	3894	4326	4759	
17				1954	2442	2930	3419	3907	4396	4884	5373	
18				2190	2738	3285	3833	4380	4928	5476	6023	
19				2440	3050	3661	4271	4881	5491	6101	6711	
20				2704	3380	4056	4732	5408	6084	6760	7436	
21					3726	4472	5217	5962	6708	7453	8198	
22					4090	4908	5726	6544	7362	8180	8998	

^{1/}Quillian 1976

$W = 0.169 (H * D^{**2})$

Sample Size - 226 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 2.2 inches, Maximum 24.0 inches

Average Height feet, Minimum 17 feet, Maximum 108 feet

Average Age years, Minimum years, Maximum years

Pinus virginiana - Virginia Pine^{1/}

North Georgia

Table 91--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	10	19										
3	21	41	60									
4	36	71	104	137								
5	56	108	160	211	261	311						
6		154	227	299	371	442						
7		207	305	402	498	594	689					
8		267	394	520	644	768	890	1012				
9		335	495	652	808	963	1116	1269				
10		410	606	798	989	1179	1367	1554	1740			
11			727	959	1188	1416	1642	1866	2090			
12			860	1133	1404	1673	1940	2206	2470	2733		
13			1003	1322	1638	1951	2263	2573	2881	3188		
14			1156	1524	1889	2250	2609	2967	3322	3676	4028	
15			1320	1740	2156	2569	2979	3387	3793	4197	4600	
16				1970	2441	2908	3373	3834	4294	4751	5207	
17				2213	2743	3268	3789	4308	4824	5338	5850	
18				2470	3061	3647	4229	4808	5384	5958	6529	
19				2741	3396	4046	4692	5335	5974	6610	7244	
20				3025	3748	4466	5178	5887	6593	7295	7995	
21					4116	4905	5687	6466	7241	8012	8781	
22					4501	5363	6219	7071	7918	8762	9602	

^{1/}Saucier and Boyd 1982

$$W = 0.27621 * (H * D^{**2})^{**} 0.96083$$

Sample Size - 25 trees, Coefficient of Determination 0.98

Average DBH 10.0 inches, Minimum 5.5 inches, Maximum 14.3 inches

Average Height 66 feet, Minimum 50 feet, Maximum 77 feet

Average Age 37 years, Minimum 24 years, Maximum 60 years

Tsuga canadensis - Eastern Hemlock^{1/}

Maine

Table 92--Whole tree--wood, bark, and foliage--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	14	19									
3	35	47	56								
4	65	87	104	118							
5	105	142	169	191	210						
6		211	251	284	312	337					
7		294	350	396	436	471	504				
8		393	468	529	582	630	673	712			
9		507	604	683	752	813	868	920			
10		637	759	858	944	1021	1091	1156	1215		
11			933	1055	1161	1256	1342	1421	1494		
12			1126	1274	1402	1516	1620	1716	1805	1888	
13			1340	1516	1668	1804	1927	2041	2147	2246	
14			1573	1780	1959	2118	2263	2397	2521	2637	2748
15			1827	2067	2275	2460	2628	2783	2927	3063	3191
16				2377	2616	2829	3023	3201	3367	3523	3670
17				2711	2984	3227	3447	3651	3840	4018	4185
18				3069	3377	3652	3902	4132	4347	4548	4738
19				3451	3797	4107	4387	4646	4887	5113	5327
20				3856	4244	4590	4903	5193	5462	5715	5953
21					4718	5102	5451	5772	6071	6352	6617
22					5218	5643	6029	6385	6716	7026	7320

^{1/}Young et al. 1964

$$LNW = 0.1798 + 2.1679 * LN(D) + 0.4292 * LN(H)$$

Sample Size - 28 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 5.6 inches, Maximum 15.1 inches

Average Height feet, Minimum 31.5 feet, Maximum 61 feet

Average Age , Minimum , Maximum

SOFTWOODS

WHOLE TREE

Wood and Bark

Abies balsamea - Balsam Fir^{1/}

Maine

Table 93--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2	13	17										
3	31	41	49									
4	57	77	91	104								
5	93	125	148	168	185							
6		185	220	249	274	297						
7		259	308	348	383	414	443					
8		345	411	465	512	554	591	626				
9		446	531	600	661	715	763	809				
10		560	667	755	830	898	959	1016	1069			
11			820	928	1021	1104	1180	1249	1314			
12			990	1120	1233	1333	1425	1509	1587	1660		
13			1178	1333	1467	1586	1694	1794	1887	1975		
14			1383	1565	1722	1862	1990	2107	2216	2319	2416	
15			1606	1817	2000	2163	2311	2447	2574	2693	2805	
16				2090	2300	2488	2658	2815	2960	3097	3227	
17				2384	2623	2837	3031	3210	3376	3532	3680	
18				2698	2970	3211	3431	3633	3822	3998	4165	
19				3034	3339	3611	3858	4085	4297	4496	4683	
20				3391	3732	4035	4311	4566	4802	5025	5234	
21					4148	4486	4792	5075	5338	5585	5818	
22					4588	4961	5301	5614	5905	6178	6436	

^{1/}Young et al. 1964

$$LNW = 0.0511 + 2.1679 LN(D) + 0.4292 LN(H)$$

Sample Size - 23 trees, Coefficient of Determination 0.96

Average DBH inches, Minimum 6.2 inches, Maximum 13.4 inches

Average Height feet, Minimum 41.5 feet, Maximum 65 feet

Average Age , Minimum , Maximum

Picea rubens - Red Spruce^{1/}

Maine

Table 94--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	15	20									
3	35	47	56								
4	66	89	105	119							
5	107	144	171	193	213						
6		213	254	287	316	342					
7		298	354	401	441	477	510				
8		398	473	536	589	637	681	721			
9		514	611	691	761	823	879	931			
10		645	768	869	956	1034	1105	1170	1231		
11			944	1068	1176	1271	1358	1439	1513		
12			1140	1290	1420	1535	1640	1737	1827	1912	
13			1356	1535	1689	1826	1951	2066	2173	2274	
14			1593	1802	1983	2145	2291	2426	2552	2670	2782
15			1850	2093	2303	2491	2661	2818	2964	3101	3231
16				2407	2649	2865	3061	3241	3409	3567	3716
17				2745	3021	3267	3490	3696	3888	4068	4238
18				3107	3420	3698	3951	4184	4401	4604	4797
19				3494	3845	4158	4442	4704	4948	5177	5393
20				3905	4297	4647	4965	5257	5530	5786	6028
21					4776	5165	5519	5844	6147	6431	6700
22					5283	5713	6104	6464	6799	7114	7411

^{1/}Young et al. 1964

$$\text{LNW} + 0.1922 + 2.1679 * \text{LN}(D) + 0.4292 * \text{LN}(H)$$

Sample Size - 25 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 5.7 meters, Maximum 14.7 meters

Average Height feet, Minimum 32 feet, Maximum 71 feet

Average Age , Minimum , Maximum

Pinus clausa var. immuginata - Choctawhatchee Sand Pine^{1/}

Northwest Florida

Table 95--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	9	17										
3	19	37	55									
4	33	64	95	126								
5	51	99	147	194	241	288						
6		141	209	277	344	410						
7		191	282	373	464	553	642					
8		247	366	484	601	717	832	947				
9		310	460	608	755	901	1046	1191				
10		381	564	746	926	1105	1283	1461	1637			
11			679	897	1114	1329	1544	1757	1970			
12			803	1062	1319	1574	1828	2080	2332	2583		
13			938	1241	1540	1838	2135	2430	2724	3017		
14			1084	1432	1778	2122	2465	2806	3145	3483	3821	
15			1239	1637	2033	2426	2818	3207	3595	3982	4368	
16				1856	2304	2750	3193	3635	4075	4513	4951	
17				2087	2592	3093	3592	4089	4584	5077	5568	
18				2332	2896	3456	4013	4568	5121	5672	6221	
19				2590	3216	3838	4457	5073	5687	6299	6909	
20				2861	3552	4240	4923	5604	6282	6958	7632	
21					3905	4660	5412	6160	6906	7649	8390	
22					4274	5101	5923	6742	7558	8371	9182	

^{1/}Taras 1980

$$\text{Log } W = -0.62122 + 0.96994 * \text{Log } (H * D^{**2})$$

Sample Size - 36 trees, Coefficient of Determination 0.99

Average DBH 9.1 inches, Minimum 4.2 inches, Maximum 14.7 inches

Average Height 52 feet, Minimum 24 feet, Maximum 67 feet

Average Age 57 years, Minimum 37 years, Maximum 88 years

Pinus echinata - Shortleaf Pine^{1/}

Mississippi

Table 96--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	8										
3	9	19	30									
4	17	37	58	80								
5	28	61	96	132	170							
6		91	144	199	256	315						
7		129	204	282	363	445	530					
8		175	276	381	490	601	715	831				
9		228	359	497	639	784	933	1084				
10		289	456	630	809	994	1182	1374	1568			
11			565	780	1003	1232	1465	1702	1943			
12			687	949	1220	1498	1782	2070	2364	2661		
13			822	1137	1461	1794	2133	2479	2830	3187		
14			971	1343	1726	2119	2520	2929	3344	3765	4191	
15			1135	1568	2016	2475	2944	3421	3906	4397	4895	
16				1813	2331	2862	3404	3956	4516	5085	5660	
17				2079	2672	3280	3901	4534	5176	5828	6488	
18				2364	3039	3730	4437	5156	5887	6628	7378	
19				2670	3432	4213	5011	5823	6649	7485	8333	
20				2996	3852	4728	5624	6536	7462	8401	9352	
21					4298	5277	6277	7294	8328	9376	10438	
22					4773	5860	6969	8099	9247	10411	11589	

^{1/}Clark and Taras 1976

$$\text{Log } W = -1.25376 + 1.12517 * \text{Log } (H * D^{**2})$$

Sample Size - 34 trees, Coefficient of Determination 0.99

Average DBH 12.3 inches, Minimum 6.1 inches, Maximum 19.7 inches

Average Height 72 feet, Minimum 48 feet, Maximum 87 feet

Average Age 70 years, Minimum 28 years, Maximum 110 years

Pinus elliottii - Slash Pine^{1/}

Alabama

Table 97--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	5	11									
3	12	25	39								
4	23	46	71	95							
5	36	74	112	151	191						
6		108	164	221	279	337					
7		148	226	305	384	464	545				
8		196	298	402	507	613	720	827			
9		250	381	514	648	783	919	1056			
10		311	474	640	807	975	1144	1315	1486		
11			578	780	983	1188	1395	1603	1811		
12			693	934	1178	1424	1671	1920	2170	2421	
13			818	1103	1391	1682	1974	2268	2563	2860	
14			955	1287	1623	1962	2303	2646	2990	3336	3683
15			1102	1486	1873	2264	2658	3053	3451	3850	4251
16				1699	2142	2589	3039	3492	3947	4403	4862
17				1927	2430	2937	3448	3961	4477	4995	5515
18				2170	2737	3308	3882	4460	5041	5625	6210
19				2428	3062	3701	4344	4991	5641	6294	6949
20				2702	3407	4118	4833	5552	6276	7002	7731
21					3770	4557	5349	6145	6945	7749	8556
22					4153	5020	5892	6769	7650	8536	9425

^{1/}Taras and Phillips 1978

$$\text{Log } W = -0.93767 + 1.03929 * \text{Log } (H*D^{**2})$$

Sample Size - 43 trees, Coefficient of Determination 0.99

Average DBH 12.9 inches, Minimum 6.0 inches, Maximum 21.0 inches

Average Height 73 feet, Minimum 47 feet, Maximum 99 feet

Average Age 51 years, Minimum 28 years, Maximum 68 years

Pinus palustris - Longleaf Pine^{1/}

Alabama

Table 98--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	7	14										
3	16	32	48									
4	29	57	86	114								
5	45	89	134	179	223							
6		129	193	257	322	386						
7		175	263	350	438	525	613					
8		229	343	457	572	686	800	915				
9		290	434	579	724	868	1013	1157				
10		357	536	715	893	1072	1250	1429	1607			
11			649	865	1081	1297	1513	1729	1945			
12			772	1029	1286	1543	1800	2057	2314	2571		
13			906	1207	1509	1811	2112	2414	2715	3017		
14			1050	1400	1750	2100	2450	2799	3149	3499	3848	
15			1206	1607	2009	2410	2812	3213	3615	4016	4418	
16				1829	2285	2742	3199	3656	4112	4569	5026	
17				2064	2580	3096	3611	4127	4642	5158	5673	
18				2314	2892	3470	4048	4626	5204	5782	6360	
19				2578	3222	3866	4510	5154	5798	6442	7086	
20				2856	3570	4284	4997	5711	6424	7138	7851	
21					3936	4723	5509	6296	7082	7869	8655	
22					4319	5183	6046	6909	7772	8636	9499	

^{1/}Taras and Clark 1977

$$\text{Log } W = -0.74607 + 0.99947 * \text{Log } (H * D^{**2})$$

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH 13.2 inches, Minimum 5.9 inches, Maximum 18.9 inches

Average Height 80 feet, Minimum 56 feet, Maximum 97 feet

Average Age 50 years, Minimum 32 years, Maximum 69 years

Pinus strobus - Eastern White Pine^{1/}

Maine

Table 99--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2	15	20										
3	36	49	58									
4	67	91	108	122								
5	103	147	175	198	218							
6		218	260	294	323	350						
7		305	363	410	451	488	522					
8		407	484	548	603	652	697	738				
9		525	625	707	779	842	899	953				
10		660	786	889	978	1058	1130	1197	1259			
11			966	1093	1203	1301	1390	1472	1548			
12			1167	1320	1453	1571	1678	1777	1869	1956		
13			1388	1570	1728	1868	1996	2114	2224	2326		
14			1629	1844	2029	2194	2344	2482	2611	2732	2846	
15			1892	2141	2356	2548	2722	2883	3032	3173	3305	
16				2463	2710	2931	3131	3316	3488	3649	3801	
17				2808	3091	3342	3571	3782	3978	4162	4335	
18				3179	3498	3783	4042	4280	4502	4711	4907	
19				3574	3933	4254	4545	4813	5062	5296	5518	
20				3995	4396	4754	5079	5379	5658	5919	6167	
21					4887	5284	5646	5979	6289	6580	6854	
22					5405	5845	6245	6613	6956	7278	7582	

^{1/}Young et al. 1964

$$LNW + 0.2150 + 2.1679 * LN(D) + 0.4292 * LN(H)$$

Sample Size - 27 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 5.8 meters, Maximum 14.6 meters

Average Height feet, Minimum 46 feet, Maximum 79 feet

Average Age , Minimum , Maximum

Pinus taeda - Loblolly Pine^{1/}

Alabama

Table 100--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	12									
3	14	28	42								
4	25	50	75	100							
5	39	78	118	158	197						
6		113	170	228	285	343					
7		154	233	311	390	469	548				
8		202	305	408	511	614	718	822			
9		257	387	517	648	779	911	1043			
10		318	478	640	802	964	1127	1290	1453		
11			580	776	973	1170	1367	1564	1762		
12			692	925	1160	1395	1630	1866	2102	2338	
13			813	1088	1364	1640	1916	2193	2471	2749	
14			945	1264	1584	1905	2226	2548	2871	3193	3516
15			1086	1453	1821	2190	2560	2930	3300	3671	4043
16				1656	2075	2496	2917	3338	3761	4183	4607
17				1872	2346	2821	3297	3774	4251	4729	5208
18				2102	2634	3167	3701	4236	4772	5309	5846
19				2344	2938	3533	4129	4726	5324	5922	6522
20				2601	3259	3919	4580	5243	5906	6570	7235
21					3597	4326	5055	5786	6518	7251	7985
22					3952	4752	5554	6357	7162	7967	8773

^{1/}Taras and Clark 1975

$$\text{Log } W = -0.83678 + 1.01136 * \text{Log } (H * D^{**2})$$

Sample Size - 41 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.6 inches, Maximum 20.4 inches

Average Height 80 feet, Minimum 48 feet, Maximum 107 feet

Average Age 42 years, Minimum 37 years, Maximum 47 years

Pinus virginiana - Virginia Pine^{1/}

North Georgia

Table 101--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2	9	18										
3	20	38	57									
4	34	67	99	131								
5	53	103	153	202	250	299						
6		147	217	287	356	425						
7		198	293	387	480	573	665					
8		256	379	501	622	742	861	980				
9		322	476	629	781	932	1082	1231				
10		394	584	772	958	1142	1326	1509	1691			
11			702	928	1152	1374	1595	1815	2034			
12			831	1098	1363	1626	1888	2148	2407	2666		
13			971	1282	1591	1898	2204	2508	2811	3112		
14			1120	1480	1837	2191	2544	2895	3244	3593	3940	
15			1280	1691	2099	2504	2907	3308	3708	4106	4503	
16				1917	2379	2838	3294	3749	4201	4652	5102	
17				2155	2675	3191	3704	4215	4724	5231	5737	
18				2407	2988	3564	4138	4708	5277	5843	6408	
19				2673	3317	3957	4594	5228	5859	6488	7115	
20				2952	3663	4370	5074	5774	6471	7165	7858	
21					4026	4803	5576	6346	7112	7875	8636	
22					4406	5256	6102	6943	7782	8617	9450	

^{1/}Saucier and Boyd 1982

$$W = 0.25185 \cdot (H \cdot D^{**2})^{**} 0.96785$$

Sample Size - 25 trees, Coefficient of Determination 0.98

Average DBH 10.0 inches, Minimum 5.5 inches, Maximum 14.3 inches

Average Height 66 feet, Minimum 50 feet, Maximum 77 feet

Average Age 37 years, Minimum 24 years, Maximum 60 years

Pseudotsuga menziesii - Douglas-fir^{1/}

Pacific Northwest

Table 102--Whole tree--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	11									
3	12	23	34								
4	21	40	60	80							
5	32	63	94	125	155						
6		90	134	179	223	268					
7		122	183	243	304	364	425				
8		159	238	317	397	476	555	634			
9		201	301	401	502	602	702	802			
10		248	372	495	619	743	866	990	1114		
11			450	599	749	899	1048	1198	1347		
12			535	713	891	1069	1247	1425	1603	1781	
13			628	837	1046	1255	1464	1673	1881	2090	
14			728	970	1213	1455	1697	1940	2182	2424	2667
15			835	1114	1392	1670	1948	2226	2505	2783	3061
16				1267	1583	1900	2217	2533	2850	3166	3483
17				1430	1787	2145	2502	2859	3217	3574	3931
18				1603	2004	2404	2805	3206	3606	4007	4407
19				1786	2233	2679	3125	3572	4018	4464	4911
20				1979	2474	2968	3463	3957	4452	4946	5441
21					2727	3272	3818	4363	4908	5453	5999
22					2993	3591	4190	4788	5387	5985	6583

^{1/}Shaw 1977

$$W = 0.408 + 0.02858 * H * D ** 2 \text{ (metric)}$$

Sample Size - 120 trees, Coefficient of Determination

Average DBH centimeters, Minimum 1 centimeter, Maximum 221 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age , Minimum , Maximum

Thuja plicata - Western Red Cedar^{1/}

Pacific Northwest

Table 103--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	5	6									
3	7	9	12								
4	9	14	19	25							
5	12	20	28	37	45						
6		27	39	51	63	75					
7		36	52	68	84	100	117				
8		46	67	88	109	130	151	172			
9		57	84	110	137	164	190	217			
10		69	102	135	168	201	234	267	300		
11			123	163	203	243	283	323	363		
12			146	193	241	288	336	383	431	478	
13			171	226	282	338	394	449	505	561	
14			197	262	327	391	456	520	585	650	714
15			226	300	374	449	523	597	671	745	819
16				341	425	510	594	679	763	847	932
17				385	480	575	670	766	861	956	1051
18				431	538	644	751	858	965	1072	1178
19				408	599	718	837	956	1075	1194	1313
20				513	663	795	927	1058	1190	1322	1454
21					730	876	1021	1167	1312	1457	1603
22					801	961	1120	1280	1439	1599	1759

^{1/}Shaw 1977

$$W = 1.611 + 0.00762 * H * D ** 2 \text{ (metric)}$$

Sample Size - 26 trees, Coefficient of Determination

Average DBH centimeters, Minimum 0.2 centimeter, Maximum 119.4 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age , Minimum , Maximum

Tsuga heterophylla - Western Hemlock^{1/}

Pacific Northwest

Table 104--Whole tree--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	10									
3	12	23	34								
4	20	40	60	79							
5	31	62	93	123	154						
6		89	133	177	221	265					
7		121	181	241	301	361	421				
8		158	236	315	393	471	550	628			
9		199	299	398	497	597	696	795			
10		246	368	491	614	736	859	981	1104		
11			446	594	742	891	1039	1187	1336		
12			530	707	883	1060	1236	1413	1590	1766	
13			622	829	1037	1244	1451	1658	1865	2073	
14			722	962	1202	1442	1683	1923	2163	2404	2644
15			828	1104	1380	1656	1932	2207	2483	2759	3035
16				1256	1570	1884	2198	2512	2825	3139	3453
17				1418	1772	2127	2481	2835	3190	3544	3898
18				1590	1987	2384	2781	3178	3576	3973	4370
19				1771	2214	2656	3099	3541	3984	4427	4869
20				1962	2453	2943	3434	3924	4414	4905	5395
21					2704	3245	3785	4326	4867	5407	5948
22					2968	3561	4154	4748	5341	5935	6528

^{1/}Shaw 1977

$$W = 0.306 + 0.02834 * H * D ** 2 \text{ (metric)}$$

Sample Size - 47 trees, Coefficient of Determination

Average DBH centimeters, Minimum 0.3 centimeter, Maximum 116.8 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

Tsuga mertensiana - Mountain Hemlock^{1/}

Pacific Northwest

Table 105--Whole tree^{2/}--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4				1241							
5				1274	1297						
6				1314	1347	1380					
7				1362	1407	1452	1497				
8				1417	1476	1534	1593	1652			
9				1479	1554	1628	1702	1777			
10				1549	1641	1733	1825	1916	2008		
11			1515	1626	1737	1848	1960	2071	2182		
12			1578	1711	1843	1975	2107	2240	2372	2504	
13			1647	1803	1958	2113	2268	2423	2579	2734	
14			1722	1902	2082	2262	2442	2622	2802	2982	3162
15			1802	2008	2215	2421	2628	2835	3041	3248	3455
16				2122	2357	2592	2827	3062	3298	3533	3768
17				2243	2509	2774	3039	3305	3570	3836	4101
18				2372	2669	2967	3264	3562	3860	4157	4455
19				2508	2839	3171	3502	3834	4165	4497	4828
20				2651	3018	3386	3753	4120	4488	4855	5222
21					3207	3612	4017	4422	4827	5231	5636
22					3404	3849	4293	4737	5182	5626	6071

^{1/}Krumlik 1974

$$W = (331.585 + 128.830 * H * [D/100] ** 2) * 1.62 \text{ (metric)}$$

Sample Size - 5 trees, Coefficient of Determination 0.99

Average DBH centimeters, Minimum 15.2 centimeters, Maximum 76.2 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.62 applied to equation to convert oven dry weight to green weight.

SOFTWOODS

WHOLE TREE

Wood

Pinus clausa var. immuginata - Choctawhatchee Sand Pine^{1/}

Florida

Table 106--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	13										
3	15	29	44									
4	26	52	78	104								
5	40	81	121	162	203	243						
6		117	175	234	292	351						
7		159	238	318	398	477	557					
8		208	312	416	520	624	728	832				
9		263	394	526	658	790	922	1054				
10		325	487	650	813	976	1139	1302	1465			
11			590	787	984	1181	1378	1576	1773			
12			702	937	1171	1406	1641	1876	2111	2346		
13			824	1100	1375	1651	1927	2202	2478	2754		
14			956	1276	1595	1915	2235	2555	2875	3195	3515	
15			1098	1465	1832	2199	2566	2934	3301	3669	4037	
16				1667	2085	2503	2921	3339	3757	4176	4594	
17				1882	2354	2826	3298	3770	4243	4715	5187	
18				2111	2640	3169	3698	4228	4757	5287	5817	
19				2353	2942	3532	4122	4712	5302	5892	6483	
20				2607	3261	3914	4568	5222	5876	6530	7184	
21					3595	4316	5037	5758	6479	7201	7922	
22					3947	4738	5529	6321	7113	7904	8697	

^{1/}Taras 1980

$$\text{Log } W = -0.76939 + 1.00201 * \text{Log } (H * D^{**2})$$

Sample Size - 36 trees, Coefficient of Determination 0.99

Average DBH 9.1 inches, Minimum 4.2 inches, Maximum 14.7 inches

Average Height 52 feet, Minimum 24 feet, Maximum 67 feet

Average Age 57 years, Minimum 37 years, Maximum 88 years

Pinus contorta - Lodgepole Pine^{1/}

Alberta

Table 107--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	6	13									
3	14	28	42								
4	25	49	73	97							
5	38	76	113	150	187						
6		109	162	215	267	320					
7		147	219	291	362	433	504				
8		191	285	378	470	563	654	746			
9		241	359	476	593	709	825	940			
10		297	442	586	729	872	1014	1156	1297		
11			532	706	879	1051	1222	1393	1564		
12			632	837	1042	1246	1450	1652	1855	2056	
13			739	980	1219	1458	1696	1933	2170	2406	
14			855	1133	1410	1686	1961	2235	2509	2782	3054
15			978	1297	1614	1930	2245	2559	2872	3184	3496
16				1472	1832	2191	2548	2904	3259	3613	3967
17				1658	2063	2467	2869	3270	3670	4069	4467
18				1855	2308	2759	3209	3658	4105	4551	4996
19				2062	2566	3068	3568	4066	4563	5059	5554
20				2280	2837	3392	3945	4496	5046	5594	6141
21					3122	3732	4340	4947	5551	6155	6757
22					3420	4088	4755	5419	6081	6742	7401

^{1/}Johnstone 1970

LOG W = ((-0.9878 + 0.9853 * LOG (H*D**2)) - (-2.9508 + 1.1480 * LOG (H*D**2)))*1.65
 Sample Size - 85 trees, Coefficient of Determination 0.98
 Average DBH 7.1 inches, Minimum 4.0 inches, Maximum 13.2 inches
 Average Height 60 feet, Minimum 45 feet, Maximum 82 feet
 Average Age 92 years, Minimum 75 years, Maximum 100 years

Pinus echinata - Shortleaf Pine^{1/}

Mississippi

Table 108--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	3	6										
3	7	16	25									
4	14	31	49	68								
5	23	51	81	113	146							
6		78	123	171	221	272						
7		110	175	244	314	387	461					
8		150	238	330	426	525	626	729				
9		196	311	432	558	687	819	954				
10		249	396	550	709	873	1041	1213	1387			
11			492	683	882	1086	1295	1508	1725			
12			600	834	1075	1324	1579	1839	2104	2372		
13			721	1001	1291	1590	1896	2208	2525	2848		
14			853	1185	1529	1883	2245	2615	2991	3373	3761	
15			999	1387	1790	2204	2628	3061	3501	3949	4402	
16				1608	2074	2554	3045	3547	4057	4575	5101	
17				1846	2382	2933	3497	4073	4659	5255	5858	
18				2104	2714	3342	3985	4641	5309	5987	6675	
19				2380	3070	3781	4508	5250	6006	6773	7552	
20				2676	3452	4250	5068	5903	6752	7615	8490	
21					3859	4751	5665	6598	7548	8512	9490	
22					4291	5284	6300	7337	8393	9466	10554	

^{1/}Clark and Taras 1976

$$\text{Log } W = -1.37140 + 1.14146 * \text{Log } (H*D**2)$$

Sample Size - 34 trees, Coefficient of Determination 0.99

Average DBH 12.3 inches, Minimum 6.1 inches, Maximum 19.7 inches

Average Height 72 feet, Minimum 48 feet, Maximum 87 feet

Average Age 70 years, Minimum 28 years, Maximum 110 years

Pinus elliotii - Slash Pine^{1/}

Alabama

Table 109--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	4	8									
3	9	20	30								
4	17	36	56	76							
5	28	58	90	122	155						
6		86	133	181	230	279					
7		120	185	252	319	388	458				
8		159	246	335	425	516	609	703			
9		205	317	431	547	664	784	904			
10		257	397	539	685	832	982	1132	1284		
11			486	662	840	1021	1204	1389	1575		
12			586	797	1012	1230	1450	1673	1897	2124	
13			695	946	1201	1459	1721	1985	2252	2520	
14			815	1108	1407	1710	2017	2326	2639	2953	3270
15			944	1284	1631	1982	2337	2696	3058	3423	3791
16				1475	1872	2276	2683	3096	3511	3930	4352
17				1679	2132	2591	3055	3524	3998	4474	4955
18				1897	2409	2928	3453	3983	4518	5057	5599
19				2130	2704	3287	3876	4471	5072	5677	6286
20				2377	3018	3668	4326	4990	5660	6335	7015
21					3350	4072	4802	5539	6283	7032	7787
22					3701	4498	5304	6119	6940	7768	8602

^{1/}Taras and Phillips 1978

$\text{Log } W = -1.12148 + 1.06979 * \text{Log } (H * D^{**2})$

Sample Size - 43 trees, Coefficient of Determination 0.99

Average DBH 12.9 inches, Minimum 6.0 inches, Maximum 21.0 inches

Average Height 73 feet, Minimum 47 feet, Maximum 99 feet

Average Age 51 years, Minimum 28 years, Maximum 68 years

Pinus palustris - Longleaf Pine^{1/}

Alabama

Table 110--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	11										
3	13	26	39									
4	23	47	71	95								
5	36	74	112	150	189							
6		107	162	218	274	330						
7		147	223	299	375	452	529					
8		193	292	392	493	593	695	796				
9		246	372	499	627	755	883	1013				
10		305	461	619	777	936	1096	1256	1416			
11			560	752	944	1137	1331	1526	1721			
12			669	898	1128	1358	1590	1822	2055	2289		
13			788	1057	1328	1600	1872	2146	2420	2695		
14			917	1230	1545	1861	2178	2497	2816	3136	3456	
15			1056	1416	1779	2143	2508	2875	3242	3610	3979	
16				1616	2029	2445	2861	3280	3699	4119	4540	
17				1829	2297	2767	3239	3712	4186	4662	5139	
18				2055	2581	3110	3640	4172	4705	5239	5775	
19				2295	2883	3473	4065	4659	5254	5851	6449	
20				2549	3201	3856	4514	5173	5835	6498	7162	
21					3537	4260	4987	5716	6446	7179	7912	
22					3889	4685	5484	6285	7089	7894	8701	

^{1/}Taras and Clark 1977

$\text{Log } W = -0.88747 + 1.02133 * \text{Log } (H * D^{**2})$

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH 13.2 inches, Minimum 5.9 inches, Maximum 18.9 inches

Average Height 80 feet, Minimum 56 feet, Maximum 97 feet

Average Age 53 years, Minimum 32 years, Maximum 69 years

Pinus taeda - Loblolly Pine^{1/}

Alabama

Table 111--Whole tree--wood--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	5	10									
3	11	23	34								
4	20	41	62	84							
5	32	65	98	133	167						
6		94	144	193	243	294					
7		130	197	266	335	404	474				
8		171	260	350	441	532	624	717			
9		218	332	447	563	679	796	914			
10		271	413	555	699	844	990	1137	1284		
11			502	676	852	1028	1206	1384	1563		
12			601	809	1019	1231	1443	1657	1871	2086	
13			709	955	1203	1452	1703	1955	2208	2461	
14			827	1113	1402	1692	1984	2278	2573	2869	3166
15			954	1284	1617	1952	2289	2627	2967	3308	3651
16				1467	1847	2230	2615	3002	3390	3780	4172
17				1663	2094	2528	2964	3403	3843	4285	4728
18				1871	2356	2845	3336	3829	4325	4822	5321
19				2092	2635	3181	3730	4282	4836	5392	5950
20				2326	2929	3536	4147	4761	5377	5995	6615
21					3240	3912	4587	5266	5947	6631	7317
22					3567	4306	5050	5797	6547	7300	8055

^{1/}Taras and Clark 1975

$$\text{Log } W = -0.97711 + 1.03321 * \text{Log } (H * D^{**2})$$

Sample Size - 41 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.6 inches, Maximum 20.4 inches

Average Height 80 feet, Minimum 48 feet, Maximum 107 feet

Average Age 42 years, Minimum 37 years, Maximum 47 years

SOFTWOODS

MAIN STEM

Wood and Bark

Abies amabilis - Pacific Silver^{1/}

Pacific Northwest

Table 112--Main stem^{2/}--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5	378	398	418	438	458						
6		416	444	473	502	531					
7		436	475	515	554	593	632				
8		460	511	562	614	665	716	767			
9		487	552	617	681	746	811	875			
10		518	598	677	757	837	917	996	1076		
11			648	744	841	937	1034	1131	1227		
12			703	818	933	1048	1162	1277	1392	1507	
13			763	898	1032	1167	1302	1437	1572	1707	
14			827	984	1140	1297	1453	1609	1766	1922	2078
15			897	1076	1256	1435	1615	1794	1974	2153	2333
16				1175	1379	1584	1788	1992	2197	2401	2605
17				1281	1511	1742	1972	2203	2434	2664	2895
18				1392	1651	1909	2168	2426	2685	2943	3202
19				1510	1798	2086	2374	2663	2951	3239	3527
20				1635	1954	2273	2592	2911	3231	3550	3869
21					2118	2469	2821	3173	3525	3877	4229
22					2289	2675	3061	3448	3834	4220	4606

^{1/}Krumlik 1974

$$W = (98.077 + 109.241 * H * [D/100] ** 2) * 1.66 \text{ (metric)}$$

Sample Size - 7 trees, Coefficient of Determination 0.99

Average DBH centimeters, Minimum 15.2 centimeters, Maximum 76.2 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.66 applied to equation to convert oven dry weight to green weight.

Abies balsamea - Balsam Fir^{1/}

Maine

Table 113--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	19	37	55	73							
5	30	58	86	114	141						
6		84	125	165	204	244					
7		115	170	225	279	333	386				
8		151	223	294	365	436	506	575			
9		191	283	374	464	553	642	730			
10		236	350	462	574	684	794	904	1013		
11			424	560	695	829	963	1095	1228		
12			506	668	829	989	1148	1306	1464	1621	
13			595	786	975	1163	1350	1536	1721	1905	
14			691	913	1132	1351	1568	1784	1999	2213	2427
15			794	1049	1302	1553	1802	2051	2298	2545	2790
16				1195	1483	1769	2053	2336	2618	2899	3179
17				1351	1677	2000	2321	2641	2960	3277	3594
18				1517	1882	2245	2606	2965	3322	3679	4034
19				1692	2099	2504	2906	3307	3706	4103	4500
20				1877	2329	2777	3224	3668	4111	4552	4991
21					2570	3065	3558	4049	4537	5024	5509
22					2823	3368	3909	4448	4984	5519	6052

^{1/}Young et al. 1964

$$LNW = -2.0858 + 2.0215 * LN(D) + 0.9670 * LN(H)$$

Sample Size - 23 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 6.2 inches, Maximum 13.4 inches

Average Height feet, Minimum 41.5 feet, Maximum 65 feet

Average Age , Minimum , Maximum

Picea engelmannii - Englemann Spruce^{1/}

British Columbia

Table 114--Main stem^{2/}--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	15	20									
3	21	32	43								
4	30	49	69	88							
5	41	71	102	132	163						
6		98	142	186	230	274					
7		130	190	250	310	370	429				
8		167	245	323	401	480	558	636			
9		208	307	406	505	604	703	803			
10		255	377	499	621	744	866	988	1111		
11			454	602	750	898	1046	1194	1342		
12			538	714	891	1067	1243	1419	1595	1771	
13			630	837	1043	1250	1457	1663	1870	2077	
14			729	969	1209	1448	1688	1928	2167	2407	2647
15			836	1111	1386	1661	1936	2211	2487	2762	3037
16				1262	1575	1889	2202	2515	2828	3141	3454
17				1424	1777	2131	2484	2838	3191	3544	3898
18				1595	1991	2388	2784	3180	3576	3973	4369
19				1776	2218	2659	3101	3542	3984	4425	4867
20				1967	2456	2945	3434	3924	4413	4902	5391
21					2707	3246	3785	4325	4864	5403	5943
22					2970	3562	4154	4745	5337	5929	6521

^{1/}Adamovich 1975

$$W = 10.0 + 0.1223 * H * D **2$$

Sample Size - 47 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 0.8 inches, Maximum 15.8 inches

Average Height feet, Minimum 6.5 feet, Maximum 92.4 feet

Average Age , Minimum , Maximum

^{2/}Total stem

Picea rubens - Red Spruce^{1/}

Maine

Table 115--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	20	39	58	77							
5	32	62	91	121	150						
6		89	132	175	217	258					
7		122	181	238	296	353	410				
8		160	236	312	388	462	537	611			
9		203	300	396	492	587	681	775			
10		251	371	490	608	726	842	959	1074		
11			450	595	738	880	1021	1162	1302		
12			537	709	880	1049	1218	1386	1553	1719	
13			631	833	1034	1233	1432	1629	1826	2021	
14			733	968	1201	1433	1663	1892	2121	2348	2575
15			843	1113	1381	1647	1912	2176	2438	2700	2960
16				1268	1573	1877	2178	2479	2778	3076	3373
17				1433	1779	2121	2463	2802	3140	3477	3812
18				1609	1996	2381	2764	3145	3525	3903	4279
19				1795	2227	2656	3083	3508	3932	4353	4774
20				1991	2470	2947	3420	3892	4361	4829	5295
21					2726	3252	3775	4295	4813	5329	5844
22					2995	3573	4147	4719	5288	5855	6420

^{1/}Young et al. 1964

$$LNW = -2.0267 + 2.0215 * LN(D) + .967 * LN(H)$$

Sample Size - 25 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 5.7 inches, Maximum 14.7 inches

Average Height feet, Minimum 32 feet, Maximum 71 feet

Average Age , Minimum , Maximum

Pinus clausa var. immuginata Choctawhatchee Sand Pine^{1/}

Florida

Table 116--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3	12	24	36								
4	21	43	66	88							
5	33	68	104	140	176	212					
6		99	151	203	256	309					
7		137	208	279	351	424	497				
8		180	273	368	463	558	655	751			
9		229	348	469	590	712	834	958			
10		285	433	582	733	885	1037	1190	1343		
11			527	709	892	1077	1262	1448	1635		
12			631	848	1067	1288	1510	1733	1956	2180	
13			744	1000	1259	1519	1781	2043	2307	2572	
14			866	1165	1467	1770	2074	2380	2688	2996	3305
15			999	1343	1691	2040	2391	2744	3098	3454	3810
16				1534	1931	2330	2732	3135	3539	3945	4352
17				1739	2188	2641	3095	3552	4010	4470	4932
18				1956	2462	2971	3482	3996	4512	5029	5548
19				2187	2752	3321	3893	4467	5044	5622	6202
20				2431	3059	3691	4327	4965	5606	6249	6894
21					3383	4082	4785	5490	6199	6910	7623
22					3723	4493	5266	6043	6823	7605	8390

^{1/}Taras 1980

$$\text{Log } W = -0.94689 + 1.03056 * \text{Log } (H*D^{**2})$$

Sample Size - 36 trees, Coefficient of Determination 0.99

Average DBH 9.1 inches, Minimum 4.2 inches, Maximum 14.7 inches

Average Height 52 feet, Minimum 24 feet, Maximum 67 feet

Average Age 57 years, Minimum 37 years, Maximum 88 years

^{2/}Main stem to 3-inch top

Pinus contorta - Lodgepole Pine^{1/}

Alberta

Table 117--Main stem^{2/}--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	7	13									
3	15	28	41								
4	25	48	70	91							
5	38	73	106	139	171						
6		102	149	196	241	286					
7		136	200	261	322	382	442				
8		175	256	336	414	491	568	643			
9		219	320	419	516	613	708	802			
10		266	390	510	629	747	863	978	1092		
11			466	610	752	893	1032	1169	1306		
12			549	719	886	1051	1215	1377	1538	1697	
13			637	835	1029	1221	1411	1600	1787	1972	
14			733	959	1183	1404	1622	1838	2053	2266	2478
15			834	1092	1346	1598	1846	2092	2337	2580	2821
16				1233	1520	1803	2084	2362	2638	2912	3184
17				1381	1703	2020	2335	2646	2955	3263	3568
18				1538	1896	2249	2599	2946	3290	3632	3972
19				1702	2098	2489	2877	3260	3641	4020	4396
20				1874	2310	2741	3167	3590	4009	4426	4840
21					2531	3003	3471	3934	4393	4850	5303
22					2762	3277	3787	4293	4794	5292	5787

^{1/}Johnstone 1970

$$\text{LOG W} = (-0.8887 + 0.9381 * \text{LOG } 10 (H*D^{**2})) * 1.65$$

Sample Size - 85 trees, Coefficient of Determination 0.98

Average DBH 7.1 inches, Minimum 4.0 inches, Maximum 13.2 inches

Average Height 60 feet, Minimum 45 feet, Maximum 82 feet

Average Age 92 years, Minimum 75 years, Maximum 100 years

^{2/}Total stem

Pinus contorta - Lodgepole Pine^{1/}

British Columbia

Table 118--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	44	64	84	104							
5	55	86	117	148	180						
6		114	158	203	248	293					
7		146	207	268	329	390	451				
8		183	263	343	422	502	582	661			
9		226	327	427	528	629	730	831			
10		273	397	522	646	771	895	1020	1144		
11			476	627	777	928	1079	1229	1380		
12			562	741	920	1100	1279	1458	1638	1817	
13			655	866	1076	1286	1497	1707	1918	2128	
14			756	1000	1244	1488	1732	1976	2220	2464	2708
15			864	1144	1425	1705	1985	2265	2545	2825	3105
16				1299	1618	1936	2255	2574	2892	3211	3530
17				1463	1823	2183	2543	2902	3262	3622	3982
18				1638	2041	2444	2848	3251	3654	4058	4461
19				1822	2271	2721	3170	3620	4069	4518	4968
20				2016	2514	3012	3510	4008	4506	5004	5502
21					2769	3318	3867	4416	4965	5514	6063
22					3037	3639	4242	4845	5447	6050	6652

^{1/}Adamovich 1975

$$W = 24.0 + 0.1245 * H * D ** 2$$

Sample Size - 51 trees, Coefficient of Determination 0.97

Average DBH inches, Minimum 1 inches, Maximum 15.2 inches

Average Height feet, Minimum 6.9 feet, Maximum 85.2 feet

Average Age years, Minimum 64 years, Maximum 177 years

Pinus echinata - Shortleaf Pine^{1/}

Georgia

Table 119--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4												
5												
6		53	111	169	226	284	342					
7		95	173	252	330	409	487					
8		143	245	348	450	553	655	758				
9		197	327	457	587	716	846	976				
10		258	418	579	739	899	1059	1219	1379			
11			519	713	907	1101	1294	1488	1682			
12			630	860	1091	1322	1552	1783	2014	2244		
13			750	1021	1291	1562	1833	2103	2374	2644		
14			880	1194	1507	1821	2135	2449	2763	3077	3391	
15		1019	1379	1740	2100	2460	2821	3181	3541	3902		
16			1578	1988	2398	2808	3218	3628	4038	4448		
17			1789	2252	2715	3178	3641	4103	4566	5029		
18			2014	2532	3051	3570	4089	4608	5127	5646		
19			2251	2829	3407	3985	4563	5141	5719	6298		
20			2500	3141	3782	4422	5063	5703	6344	6985		
21				3469	4176	4882	5588	6294	7001	7707		
22				3814	4589	5364	6139	6914	7689	8464		

^{1/}Saucier, Phillips, and Williams 1981

$$W = -62.03804 + 0.16015 * (D^{**2}*H)$$

Sample Size - 228 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus echinata - Shortleaf Pine^{1/}

Mississippi

Table 120--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	8										
3	9	19	30									
4	17	36	57	77								
5	28	59	92	126	160							
6		88	137	187	239	291						
7		123	191	262	334	407	481					
8		165	256	350	446	544	644	744				
9		213	331	452	577	703	832	962				
10		267	416	569	725	884	1046	1210	1375			
11			512	700	892	1088	1287	1489	1692			
12			619	846	1079	1315	1556	1799	2045	2294		
13			736	1007	1284	1566	1852	2142	2435	2730		
14			865	1183	1509	1840	2176	2517	2861	3208	3559	
15			1005	1375	1753	2138	2529	2924	3324	3728	4136	
16				1583	2018	2461	2910	3365	3826	4291	4760	
17				1806	2302	2808	3321	3840	4366	4896	5431	
18				2045	2607	3180	3761	4349	4944	5545	6151	
19				2301	2933	3577	4231	4892	5562	6238	6919	
20				2572	3280	4000	4730	5470	6219	6975	7737	
21					3647	4448	5261	6084	6916	7756	8604	
22					4036	4922	5821	6732	7653	8583	9521	

^{1/}Clark and Taras 1976

$$\text{Log } W = -1.16592 + 1.08852 * \text{Log } (H * D^{**2})$$

Sample Size - 34 trees, Coefficient of Determination 0.99

Average DBH 12.3 inches, Minimum 6.1 inches, Maximum 19.7 inches

Average Height 72 feet, Minimum 48 feet, Maximum 87 feet

Average Age 70 years, Minimum 28 years, Maximum 110 years

^{2/}Main stem to a 2-inch top

Pinus elliottii - Slash Pine^{1/}

Alabama

Table 121--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	5	11									
3	12	24	37								
4	22	44	66	89							
5	34	69	105	140	176						
6		100	152	204	256	308					
7		138	208	279	350	421	493				
8		181	273	366	459	553	647	742			
9		230	347	465	584	703	823	943			
10		285	430	577	724	872	1020	1169	1318		
11			522	700	879	1059	1239	1419	1600		
12			624	836	1050	1264	1479	1695	1911	2127	
13			734	984	1236	1488	1741	1995	2249	2504	
14			854	1145	1437	1731	2025	2320	2616	2913	3210
15			983	1318	1654	1992	2331	2671	3011	3353	3695
16				1503	1887	2272	2659	3046	3435	3824	4214
17				1701	2135	2571	3008	3447	3886	4327	4768
18				1911	2399	2889	3380	3873	4367	4862	5357
19				2133	2678	3225	3774	4324	4875	5428	5982
20				2369	2973	3581	4190	4800	5413	6026	6641
21					3284	3955	4628	5302	5979	6656	7335
22					3611	4348	5088	5830	6573	7318	8065

^{1/}Taras and Phillips 1978

$$\text{Log } W = -0.91006 + 1.01913 * \text{Log } (H * D^{**2})$$

Sample Size - 43 trees, Coefficient of Determination 0.99

Average DBH 12.9 inches, Minimum 6.0 inches, Maximum 21.0 inches

Average Height 73 feet, Minimum 47 feet, Maximum 99 feet

Average Age 51 years, Minimum 28 years, Maximum 68 years

^{2/}Main stem to a 2-inch top

Pinus elliottii - Slash Pine^{1/}

Georgia

Table 122--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		54	109	164	218	273					
7		94	168	243	317	392	467				
8		139	237	334	432	529	627	724			
9		191	314	438	561	685	808	931			
10		249	401	554	706	858	1010	1163	1315		
11			497	681	866	1050	1234	1419	1603		
12			602	822	1041	1260	1480	1699	1918	2138	
13			716	974	1231	1489	1746	2004	2261	2518	
14			840	1138	1437	1736	2034	2333	2631	2930	3228
15			972	1315	1658	2001	2343	2686	3029	3371	3714
16				1504	1894	2284	2674	3064	3454	3844	4234
17				1705	2145	2585	3026	3466	3906	4346	4786
18				1918	2412	2905	3399	3892	4386	4879	5373
19				2144	2694	3243	3793	4343	4893	5443	5993
20				2381	2991	3600	4209	4818	5428	6037	6646
21					3303	3975	4646	5318	5990	6662	7333
22					3630	4368	5105	5842	6579	7317	8054

^{1/}Saucier, Phillips, and Williams 1981

$$W = -55.76662 + 0.15232 * H * D^{**2}$$

Sample Size - 208 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus palustris - Longleaf Pine^{1/}

Alabama

Table 123--Main stem^{2/}--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	8	15										
3	17	33	49									
4	29	57	85	112								
5	45	88	130	172	213							
6		125	185	244	302	360						
7		168	248	328	406	484	561					
8		217	321	424	525	625	725	825				
9		273	403	531	658	784	910	1034				
10		334	493	650	806	961	1114	1267	1418			
11			592	781	968	1154	1338	1521	1704			
12			700	924	1145	1364	1582	1798	2014	2229		
13			817	1077	1335	1591	1845	2098	2349	2600		
14			942	1242	1540	1834	2128	2419	2709	2998	3286	
15			1076	1418	1758	2095	2429	2762	3093	3423	3752	
16				1606	1990	2372	2750	3127	3502	3875	4247	
17				1804	2236	2665	3090	3514	3935	4355	4773	
18				2014	2496	2974	3450	3922	4392	4861	5327	
19				2235	2770	3300	3827	4352	4874	5393	5911	
20				2466	3057	3642	4224	4803	5379	5952	6523	
21					3357	4001	4640	5275	5908	6538	7165	
22					3671	4375	5074	5769	6461	7149	7836	

^{1/}Taras and Clark 1977

Log W = -0.65002 + 0.96146 * Log 10 (H*D**2)

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH 13.2 inches, Minimum 5.9 inches, Maximum 18.9 inches

Average Height 80 feet, Minimum 56 feet, Maximum 97 feet

Average Age 53 years, Minimum 32 years, Maximum 69 years

^{2/}Main stem to a 2-inch top

Pinus palustris - Longleaf Pine^{1/}

Georgia

Table 124--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		76	132	188	244	300	356				
7		116	193	269	346	422	499				
8		163	263	363	463	563	662	762			
9		216	342	469	595	722	848	975			
10		275	431	587	744	900	1056	1212	1368		
11			530	719	907	1096	1285	1474	1663		
12			637	862	1087	1312	1536	1761	1986	2211	
13			754	1018	1282	1546	1810	2073	2337	2601	
14			881	1187	1493	1799	2105	2411	2716	3022	3328
15			1017	1368	1719	2070	2421	2773	3124	3475	3826
16				1561	1961	2361	2760	3160	3559	3959	4358
17				1767	2219	2670	3121	3572	4023	4474	4925
18				1986	2492	2997	3503	4009	4514	5020	5526
19				2217	2780	3344	3907	4471	5034	5598	6161
20				2460	3085	3709	4333	4958	5582	6206	6831
21					3405	4093	4781	5470	6158	6846	7535
22					3740	4496	5251	6007	6762	7517	8273

^{1/}Saucier, Phillips, and Williams 1981

$$W = -36.83043 + 0.15608 *(H*D**2)$$

Sample Size - 73 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 95 feet

Average Age years, Minimum years, Maximum years

Pinus strobus - White Pine^{1/}

Maine

Table 125--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	22	44	65	85							
5	35	69	101	134	166						
6		99	147	194	240	287					
7		135	200	264	328	391	454				
8		177	262	346	430	513	595	677			
9		225	333	440	545	651	755	859			
10		278	412	544	675	805	934	1063	1191		
11			499	659	818	976	1133	1289	1445		
12			595	786	976	1164	1351	1537	1722	1907	
13			700	924	1147	1368	1588	1807	2025	2242	
14			813	1074	1332	1589	1845	2099	2352	2604	2856
15			935	1234	1532	1827	2121	2413	2704	2994	3283
16				1406	1745	2082	2416	2749	3081	3411	3741
17				1590	1973	2353	2731	3108	3483	3856	4229
18				1785	2214	2641	3066	3488	3909	4329	4746
19				1991	2470	2946	3420	3891	4361	4828	5295
20				2208	2740	3268	3794	4316	4837	5356	5873
21					3024	3607	4187	4764	5339	5911	6482
22					3322	3963	4600	5234	5865	6494	7121

^{1/}Young et al. 1964

$$LNW = -1.9231 + 2.0215 * LN(D) + 0.9670 * LN(H)$$

Sample Size - 27 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 5.8 inches, Maximum 14.6 inches

Average Height feet, Minimum 46 feet, Maximum 79 feet

Average Age , Minimum , Maximum

Pinus taeda - Loblolly Pine^{1/}

Alabama

Table 126--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	11										
3	13	26	38									
4	23	46	68	91								
5	36	71	107	142	178							
6		102	153	205	256	307						
7		139	209	278	348	417	487					
8		182	273	363	454	545	636	726				
9		230	345	460	575	689	804	919				
10		284	426	568	709	851	993	1134	1276			
11			515	687	858	1029	1201	1372	1544			
12			613	817	1021	1225	1429	1633	1837	2040		
13			719	959	1198	1437	1677	1916	2155	2394		
14			834	1112	1389	1667	1944	2222	2499	2776	3054	
15			957	1276	1594	1913	2232	2550	2868	3187	3505	
16				1451	1814	2176	2539	2901	3263	3625	3988	
17				1638	2048	2457	2866	3275	3683	4092	4501	
18				1837	2295	2754	3212	3671	4129	4587	5046	
19				2046	2557	3068	3579	4089	4600	5111	5621	
20				2267	2833	3399	3965	4531	5096	5662	6228	
21					3123	3747	4371	4995	5618	6242	6866	
22					3427	4112	4797	5481	6166	6850	7534	

^{1/}Taras and Clark 1975

$$\text{Log } W = -0.84452 + 0.99901 * \text{Log } (H * D^{**2})$$

Sample Size - 41 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.6 inches, Maximum 20.4 inches

Average Height 80 feet, Minimum 40 feet, Maximum 107 feet

Average Age 42 years, Minimum 37 years, Maximum 47 years

^{2/}Main stem weights to a 2-inch top

Pinus taeda - Loblolly Pine^{1/}

Georgia

Table 127--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4												
5												
6		63	116	169	222	276	329					
7		101	174	246	319	391	463					
8		146	240	335	429	524	619	713				
9		196	316	435	555	675	795	914				
10		252	400	548	696	843	991	1139	1287			
11			493	672	851	1030	1209	1388	1566			
12			595	808	1021	1234	1447	1660	1873	2085		
13			706	956	1206	1456	1705	1955	2205	2455		
14			826	1116	1405	1695	1985	2275	2565	2854	3144	
15			954	1287	1620	1952	2285	2618	2950	3283	3616	
16				1470	1849	2227	2606	2984	3363	3742	4120	
17				1666	2093	2520	2947	3375	3802	4229	4657	
18				1873	2352	2831	3310	3789	4268	4747	5226	
19				2091	2625	3159	3693	4226	4760	5294	5828	
20				2322	2913	3505	4096	4688	5279	5871	6462	
21					3217	3869	4521	5173	5825	6477	7129	
22					3535	4250	4966	5681	6397	7113	7828	

^{1/}Saucier, Phillips, and Williams 1981

$$W = -43.71191 + 0.14786 *(D^{**2}*H)$$

Sample Size - 448 trees, Coefficient of Determination

Average DBH inches, Minimum 5.6 inches, Maximum 19.5 inches

Average Height feet, Minimum 40 feet, Maximum 105 feet

Average Age years, Minimum years, Maximum years

Pinus taeda - Loblolly Pine^{1/}

North Carolina, Virginia

Table 128--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		40	92	144	196	248					
7		77	148	219	290	360	431				
8		121	213	305	398	490	583	675			
9		170	287	404	521	638	754	871			
10		225	369	513	658	802	947	1091	1235		
11			460	635	809	984	1159	1333	1508		
12			560	767	975	1183	1391	1599	1807	2015	
13			668	912	1156	1400	1644	1888	2132	2376	
14			785	1068	1351	1634	1917	2200	2483	2766	3049
15			910	1235	1560	1885	2210	2535	2860	3185	3509
16				1414	1784	2154	2523	2893	3263	3632	4002
17				1605	2022	2439	2857	3274	3691	4109	4526
18				1807	2275	2743	3211	3678	4146	4614	5082
19				2021	2542	3063	3585	4106	4627	5148	5669
20				2246	2824	3401	3979	4556	5134	5711	6289
21					3120	3756	4393	5030	5667	6303	6940
22					3430	4129	4828	5527	6225	6924	7623

^{1/}Burkhart et al. 1972

$$W = -64.22742 + 0.14439 * (H*D^{**2})$$

Sample Size - 121 trees, Coefficient of Determination 0.99

Average DBH , Minimum , Maximum

Average Height , Minimum , Maximum

Average Age , Minimum 13 years, Maximum 77 years

Pinus virginiana - Virginia Pine^{1/}

North Georgia

Table 129--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5		75	109	142	175	207					
6		118	172	224	276	327					
7		166	242	316	389	460	531				
8		220	320	418	514	609	702	795			
9		279	406	531	652	772	891	1008			
10		344	500	653	803	951	1097	1241	1384		
11			602	786	967	1144	1320	1494	1666		
12			712	929	1143	1353	1560	1766	1970	2172	
13			829	1083	1331	1576	1818	2057	2295	2530	
14			954	1246	1532	1814	2093	2368	2641	2912	3181
15			1087	1420	1745	2067	2384	2698	3009	3317	3624
16				1603	1971	2334	2692	3047	3398	3746	4092
17				1796	2209	2615	3017	3414	3808	4198	4585
18				1999	2459	2911	3358	3800	4238	4673	5104
19				2212	2720	3221	3716	4205	4690	5170	5648
20				2435	2994	3545	4089	4628	5161	5691	6216
21					3280	3883	4479	5069	5654	6233	6809
22					3577	4235	4885	5529	6166	6798	7426

^{1/}Saucier and Boyd 1982

$$W = 0.31201 * (H * D^{**2}) ** 0.92641 * (1 - 19.3777 / D^{**2.72502})$$

Sample Size - 25 trees, Coefficient of Determination

Average DBH 10.0 inches, Minimum 5.5 inches, Maximum 14.3 inches

Average Height 66 feet, Minimum 50 feet, Maximum 77 feet

Average Age 37 years, Minimum 24 years, Maximum 60 years

Pseudotsuga menziesii - Douglas-fir^{1/}

Pacific Northwest

Table 130--Main stem--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	19	38	57	76							
5	29	59	89	119	149						
6		86	129	172	215	258					
7		117	175	234	293	351	410				
8		153	229	306	382	459	535	612			
9		193	290	387	484	581	678	775			
10		239	358	478	598	717	837	957	1076		
11			434	579	723	868	1013	1158	1303		
12			516	689	861	1033	1206	1378	1550	1723	
13			606	808	1011	1213	1415	1617	1819	2022	
14			703	938	1172	1407	1641	1876	2110	2345	2579
15			807	1076	1346	1615	1884	2153	2423	2692	2961
16				1225	1531	1837	2144	2450	2756	3063	3369
17				1383	1728	2074	2420	2766	3112	3458	3803
18				1550	1938	2326	2713	3101	3489	3876	4264
19				1727	2159	2591	3023	3455	3887	4319	4751
20				1914	2393	2871	3350	3829	4307	4786	5264
21					2638	3166	3693	4221	4749	5276	5804
22					2895	3474	4053	4633	5212	5791	6370

^{1/}Shaw 1977

$$W = -0.267 + 0.02766 * H * D ** 2 \text{ (metric)}$$

Sample Size - 120 trees, Coefficient of Determination

Average DBH centimeters, Minimum 1 centimeter, Maximum 221 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age years, Minimum years, Maximum years

Thuja plicata - Western Red Cedar^{1/}

Pacific Northwest

Table 131--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	11	20	28	36							
5	16	29	42	55	68						
6		40	59	78	97	115					
7		54	79	105	130	156	181				
8		70	103	136	169	202	236	269			
9		87	129	171	213	255	297	340			
10		107	159	211	263	315	366	418	470		
11			192	254	317	380	443	506	568		
12			227	302	377	452	526	601	676	751	
13			266	354	442	530	617	705	793	880	
14			308	410	512	614	715	817	919	1021	1122
15			354	470	587	704	821	938	1054	1171	1288
16				535	668	800	933	1066	1199	1332	1465
17				603	753	903	1053	1203	1353	1503	1653
18				676	844	1012	1180	1349	1517	1685	1853
19				753	940	1128	1315	1502	1690	1877	2065
20				834	1041	1249	1457	1664	1872	2080	2287
21					1148	1377	1606	1835	2064	2292	2521
22					1259	1511	1762	2013	2264	2516	2767

^{1/}Shaw 1977

$W = 1.413 + 0.012 * H * D ** 2$ (metric)

Sample Size - 26 trees, Coefficient of Determination

Average DBH centimeters, Minimum 0.2 centimeter, Maximum 119.4 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age years, Minimum years, Maximum years

Tsuga canadensis - Eastern Hemlock^{1/}

Maine

Table 132--Main stem--wood and bark--green weight (pounds)

DBH Inches	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4	20	39	58	77							
5	31	61	91	120	149						
6		89	132	174	216	257					
7		121	180	237	294	351	408				
8		159	235	311	386	460	534	607			
9		202	298	394	489	583	677	771			
10		250	369	488	605	722	838	954	1069		
11			448	591	734	875	1016	1156	1296		
12			534	705	875	1044	1212	1379	1545	1710	
13			628	829	1029	1227	1424	1621	1816	2011	
14			729	963	1195	1425	1654	1883	2110	2336	2561
15			838	1107	1374	1639	1902	2164	2425	2686	2945
16				1261	1565	1867	2167	2466	2763	3060	3355
17				1426	1769	2110	2450	2787	3124	3459	3793
18				1601	1986	2369	2750	3129	3506	3882	4257
19				1785	2215	2643	3067	3490	3911	4331	4749
20				1981	2457	2931	3403	3871	4339	4804	5268
21					2712	3235	3755	4273	4788	5302	5814
22					2980	3554	4125	4694	5260	5825	6387

^{1/}Young et al. 1964

$$LNW = -2.0319 + 2.0215 * LN(D) + 0.9670 * LN(H)$$

Sample Size - 28 trees, Coefficient of Determination 0.83

Average DBH inches, Minimum 5.6 inches, Maximum 15.1 inches

Average Height feet, Minimum 31.5 feet, Maximum 61 feet

Average Age , Minimum , Maximum

Tsuga mertensiana - Mountain Hemlock^{1/}

Pacific Northwest

Table 133--Main stem^{2/}--wood and bark--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
Inches											
1											
2											
3											
4				1207							
5				1235	1255						
6				1270	1298	1327					
7				1311	1350	1388	1427				
8				1358	1409	1459	1510	1560			
9				1412	1476	1540	1603	1667			
10				1472	1551	1630	1708	1787	1866		
11			1443	1538	1633	1729	1824	1920	2015		
12			1497	1611	1724	1838	1951	2065	2178	2292	
13			1556	1689	1823	1956	2089	2222	2355	2489	
14			1620	1775	1929	2084	2238	2392	2547	2701	2856
15			1689	1866	2043	2221	2398	2575	2753	2930	3107
16				1964	2165	2367	2569	2771	2973	3174	3376
17				2068	2296	2523	2751	2979	3207	3434	3662
18				2178	2433	2689	2944	3200	3455	3710	3966
19				2295	2579	2864	3148	3433	3717	4002	4287
20				2418	2733	3048	3364	3679	3994	4309	4625
21					2895	3242	3590	3937	4285	4633	4980
22					3064	3446	3827	4208	4590	4971	5353

^{1/}Krumlik 1974

$$W = (324.519 + 110.578 * H * [D/100] ** 2) * 1.62 \text{ (metric)}$$

Sample Size - 5 trees, Coefficient of Determination 0.99

Average DBH centimeters, Minimum 15.2 centimeters, Maximum 76.2 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.62 applied to equation to convert oven dry weight to green weight.

SOFTWOODS

MAIN STEM

Wood

Abies amabilis - Pacific Silver Fir^{1/}

Pacific Northwest

Table 134--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2												
3												
4												
5	310	326	343	359	376							
6		341	365	389	412	436						
7		358	390	423	455	488	520					
8		378	420	463	505	547	589	632				
9		400	454	507	561	615	668	722				
10		426	492	558	624	690	756	822	888			
11			533	613	693	773	853	933	1013			
12			579	674	769	864	959	1055	1150	1245		
13			628	740	852	963	1075	1187	1298	1410		
14			682	811	941	1071	1200	1330	1459	1589	1718	
15			739	888	1037	1185	1334	1483	1632	1780	1929	
16				970	1139	1308	1478	1647	1816	1985	2154	
17				1057	1248	1439	1630	1821	2012	2203	2394	
18				1150	1364	1578	1792	2006	2220	2435	2649	
19				1248	1486	1725	1963	2202	2440	2679	2918	
20				1351	1615	1879	2144	2408	2672	2937	3201	
21					1751	2042	2333	2625	2916	3208	3499	
22					1893	2212	2532	2852	3172	3492	3812	

^{1/}Krumlik 1974

$$W = (80.324 + 90.578 * H * [D/100] ** 2) * 1.66 \text{ (metric)}$$

Sample Size - 7 trees, Coefficient of Determination 0.99

Average DBH centimeters, Minimum 15.2 centimeters, Maximum 76.2 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.66 applied to equation to convert oven dry weight to green weight.

Abies lasiocarpa - Subalpine Fir^{1/}

British Columbia

Table 135--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5	61	85	110	134	159						
6		107	142	178	213	249					
7		132	181	229	277	325	374				
8		162	225	288	351	414	477	540			
9		195	275	355	435	514	594	674			
10		233	331	430	528	626	725	823	922		
11			393	512	631	750	869	989	1108		
12			461	603	744	886	1028	1170	1311	1453	
13			535	701	867	1034	1200	1366	1533	1699	
14			615	807	1000	1193	1386	1579	1772	1965	2158
15			700	922	1143	1364	1586	1807	2029	2250	2471
16				1044	1296	1547	1799	2051	2303	2555	2807
17				1174	1458	1742	2027	2311	2595	2880	3164
18				1311	1630	1949	2268	2587	2905	3224	3543
19				1457	1812	2167	2523	2878	3233	3588	3943
20				1610	2004	2398	2791	3185	3578	3972	4366
21					2206	2640	3074	3508	3941	4375	4809
22					2417	2894	3370	3846	4322	4799	5275

^{1/}Adamovich 1975

$$W = 36.0 + 0.0984 * H * D ** 2$$

Sample Size - 12 trees, Coefficient of Determination 0.93

Average DBH inches, Minimum 0.8 inches, Maximum 15.9 inches

Average Height feet, Minimum 6.1 feet, Maximum 92.6 feet

Average Age years, Minimum 83 years, Maximum 231 years

^{2/}Total stem

Picea engelmannii - Englemann Spruce^{1/}

British Columbia

Table 136--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	Inches	10	20	30	40	50	60	70	80	90	100	110
1												
2												
3												
4	23	41	58	76								
5	33	60	87	115	142							
6		84	123	162	201	241						
7		112	166	219	272	325	378					
8		145	215	284	354	423	493	562				
9		182	270	358	446	534	622	710				
10		223	332	440	549	658	766	875	983			
11			400	532	663	794	926	1057	1189			
12			475	632	788	944	1101	1257	1413	1570		
13			557	740	924	1107	1291	1474	1658	1841		
14			645	857	1070	1283	1496	1709	1922	2135	2347	
15			739	983	1228	1472	1716	1961	2205	2449	2694	
16				1118	1396	1674	1952	2230	2508	2786	3064	
17				1261	1575	1889	2203	2517	2831	3145	3458	
18				1413	1765	2117	2469	2821	3173	3525	3877	
19				1574	1966	2358	2750	3142	3534	3926	4319	
20				1744	2178	2612	3047	3481	3916	4350	4784	
21					2401	2880	3358	3837	4316	4795	5274	
22					2634	3160	3685	4211	4737	5262	5788	

^{1/}Adamovich 1975

$$W = 6.0 + 0.1086 * H * D ** 2$$

Sample Size - 15 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 0.8 inches, Maximum 15.8 inches

Average Height feet, Minimum 6.5 feet, Maximum 92.4 feet

Average Age , Minimum , Maximum

^{2/}Total stem

Pinus clausa var. immuginata - Choctawhatchee Sand Pine^{1/}

Florida

Table 137--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3	10	20	30									
4	18	36	56	76								
5	28	58	90	121	154	186						
6		86	132	178	226	274						
7		119	182	247	313	379	446					
8		158	242	328	415	503	591	681				
9		202	310	420	532	644	758	873				
10		252	387	525	664	805	947	1091	1235			
11			474	642	812	985	1159	1334	1511			
12			569	771	976	1183	1392	1603	1815	2029		
13			674	913	1156	1401	1649	1898	2150	2403		
14			788	1068	1352	1638	1928	2220	2514	2810	3107	
15			912	1235	1564	1895	2230	2568	2908	3251	3595	
16				1416	1792	2172	2556	2943	3333	3725	4120	
17				1609	2037	2469	2905	3345	3788	4234	4682	
18				1815	2298	2786	3278	3774	4274	4777	5283	
19				2035	2576	3123	3674	4231	4791	5355	5922	
20				2268	2870	3480	4095	4715	5339	5968	6599	
21					3182	3857	4539	5227	5919	6615	7316	
22					3510	4256	5008	5766	6530	7298	8071	

^{1/}Taras 1980

$$\text{Log } W = -1.08343 + 1.05588 * \text{Log } 10 (H * D^{**2})$$

Sample Size - 36 trees, Coefficient of Determination 0.98

Average DBH 9.1 inches, Minimum 4.2 inches, Maximum 14.7 inches

Average Height 52 feet, Minimum 24 feet, Maximum 67 feet

Average Age 57 years, Minimum 37 years, Maximum 88 years

^{2/}Main stem to 3-inch top

Pinus contorta - Lodgepole Pine^{1/}

Alberta

Table 138--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2	7	13									
3	14	27	39								
4	24	46	67	87							
5	36	69	101	132	163						
6		97	142	185	228	270					
7		130	189	247	303	359	414				
8		166	242	316	388	460	530	599			
9		207	301	393	483	571	659	745			
10		251	366	477	586	694	800	905	1009		
11			436	569	699	827	954	1079	1202		
12			512	668	821	971	1120	1266	1411	1555	
13			594	775	952	1126	1297	1467	1635	1801	
14			681	888	1091	1290	1487	1681	1873	2064	2252
15			774	1009	1239	1465	1688	1908	2126	2342	2556
16				1136	1395	1650	1901	2149	2394	2637	2878
17				1270	1560	1844	2125	2402	2676	2947	3216
18				1411	1732	2048	2360	2667	2971	3272	3571
19				1559	1913	2262	2606	2945	3281	3613	3942
20				1713	2102	2485	2863	3235	3604	3969	4330
21					2299	2718	3131	3538	3940	4339	4734
22					2504	2960	3409	3852	4290	4724	5154

^{1/}Johnstone 1970

$$\text{LOG } W = ((-0.8887 + 0.9381 * \text{LOG } (H*D^{**2})) - (-2.5841 + 1.1395 * \text{LOG } (H*D^{**2}))) * 1.65$$

Sample Size - 85 trees, Coefficient of Determination 0.98

Average DBH 7.1 inches, Minimum 4.0 inches, Maximum 13.2 inches

Average Height 60 feet, Minimum 45 feet, Maximum 82 feet

Average Age 92 years, Minimum 75 years, Maximum 100 years

^{2/}Total stem

Pinus contorta - Lodgepole Pine^{1/}

British Columbia

Table 139--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	10	15										
3	16	27	38									
4	25	44	64	83								
5	36	66	97	127	158							
6		93	137	181	225	269						
7		125	185	245	305	365	424					
8		162	240	318	396	475	553	631				
9		203	302	401	500	599	698	798				
10		250	372	494	616	739	861	983	1106			
11			449	597	745	893	1041	1189	1337			
12			533	709	886	1062	1238	1414	1590	1766		
13			625	832	1038	1245	1452	1658	1865	2072		
14			724	964	1204	1443	1683	1923	2162	2402	2642	
15			831	1106	1381	1656	1931	2206	2482	2757	3032	
16				1257	1570	1884	2197	2510	2823	3136	3449	
17				1419	1772	2126	2479	2833	3186	3539	3893	
18				1590	1986	2383	2779	3175	3571	3968	4364	
19				1771	2213	2654	3096	3537	3979	4420	4862	
20				1962	2451	2940	3429	3919	4408	4897	5386	
21					2702	3241	3780	4320	4859	5398	5938	
22					2965	3557	4149	4740	5332	5924	6516	

^{1/}Adamovich 1975

$$W = 5.0 + 0.1223 * H * D ** 2$$

Sample Size - 14 trees, Coefficient of Determination 0.98

Average DBH inches, Minimum 1 inch, Maximum 15.2 inches

Average Height feet, Minimum 6.9 feet, Maximum 85.2 feet

Average Age years, Minimum 64 years, Maximum 177 years

^{2/}Total stem

Pinus echinata - Shortleaf Pine^{1/}

Mississippi

Table 140--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	3	7										
3	8	16	25									
4	14	31	48	66								
5	23	50	79	109	139							
6		75	118	163	208	255						
7		106	166	229	293	359	426					
8		143	224	308	394	483	573	664				
9		185	291	400	512	627	744	863				
10		234	367	505	647	792	940	1090	1242			
11			454	624	799	979	1161	1347	1534			
12			550	757	970	1187	1408	1633	1861	2092		
13			657	904	1158	1418	1682	1951	2223	2499		
14			775	1066	1365	1671	1983	2299	2620	2945	3274	
15			903	1242	1591	1947	2311	2680	3054	3432	3815	
16				1433	1836	2247	2666	3092	3524	3961	4402	
17				1640	2100	2571	3050	3537	4031	4531	5036	
18				1861	2384	2918	3463	4016	4576	5143	5717	
19				2098	2688	3290	3904	4527	5159	5799	6446	
20				2351	3012	3687	4375	5073	5781	6498	7223	
21					3356	4108	4875	5653	6442	7241	8048	
22					3721	4555	5405	6268	7143	8028	8923	

^{1/}Clark and Taras 1976

$$\text{Log } W = -1.29252 + 1.10935 * \text{Log } (H * D^{**2})$$

Sample Size - 34 trees, Coefficient of Determination 0.99

Average DBH 12.3 inches, Minimum 6.1 inches, Maximum 19.7 inches

Average Height 72 feet, Minimum 48 feet, Maximum 87 feet

Average Age 70 years, Minimum 28 years, Maximum 110 years

^{2/}Main stem to a 2-inch top

Pinus elliottii - Slash Pine^{1/}

Alabama

Table 141--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	4	8										
3	9	19	29									
4	17	35	54	73								
5	27	56	86	117	147							
6		83	126	171	216	261						
7		114	175	236	298	361	425					
8		151	231	312	395	478	562	647				
9		193	296	400	506	612	720	828				
10		241	369	499	631	764	898	1033	1169			
11			451	610	771	933	1097	1262	1428			
12			541	732	925	1120	1317	1515	1714	1915		
13			640	866	1094	1325	1558	1792	2028	2265		
14			748	1011	1278	1548	1820	2094	2369	2646	2924	
15			864	1169	1478	1789	2103	2420	2738	3058	3380	
16				1339	1692	2049	2409	2771	3135	3502	3871	
17				1520	1922	2327	2735	3147	3561	3977	4396	
18				1714	2167	2623	3084	3548	4015	4484	4956	
19				1920	2427	2939	3455	3974	4497	5023	5552	
20				2138	2703	3273	3847	4426	5009	5594	6183	
21					2994	3626	4262	4904	5549	6198	6850	
22					3301	3998	4700	5407	6118	6833	7552	

^{1/}Taras and Phillips 1978

$$\text{Log } W = -1.08221 + 1.04952 * \text{Log } (H * D^{**2})$$

Sample Size - 43 trees, Coefficient of Determination 0.99

Average DBH 12.9 inches, Minimum 6.0 inches, Maximum 21.0 inches

Average Height 73 feet, Minimum 47 feet, Maximum 99 feet

Average Age 51 years, Minimum 28 years, Maximum 68 years

^{2/}Main stem to a 2-inch top

Pinus palustris - Longleaf Pine^{1/}

Alabama

Table 142--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	6	12										
3	14	27	41									
4	24	48	72	95								
5	38	75	111	148	184							
6		107	159	211	263	315						
7		145	216	286	357	427	497					
8		188	281	373	464	556	647	738				
9		237	354	470	586	701	816	931				
10		292	436	579	721	863	1005	1146	1287			
11			526	698	870	1041	1212	1383	1553			
12			624	829	1033	1236	1439	1642	1844	2045		
13			731	971	1209	1448	1685	1922	2159	2395		
14			846	1123	1400	1675	1950	2224	2498	2772	3045	
15			969	1287	1604	1919	2234	2548	2862	3175	3488	
16				1462	1821	2180	2537	2894	3251	3606	3961	
17				1647	2052	2456	2859	3262	3663	4064	4464	
18				1844	2297	2749	3200	3651	4100	4549	4997	
19				2051	2555	3059	3560	4061	4561	5060	5559	
20				2269	2827	3384	3939	4493	5046	5599	6150	
21					3113	3726	4337	4947	5556	6164	6771	
22					3412	4083	4753	5422	6090	6756	7421	

^{1/}Taras and Clark 1977

$$\text{Log } W = -0.78784 + 0.98563 * \text{Log } (H * D^{**2})$$

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH 13.2 inches, Minimum 5.9 inches, Maximum 18.9 inches

Average Height 80 feet, Minimum 56 feet, Maximum 97 feet

Average Age 53 years, Minimum 32 years, Maximum 69 years

^{2/}Main stem to a 2-inch top

Pinus taeda - Loblolly Pine^{1/}

Alabama

Table 143--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2	5	9										
3	11	21	32									
4	19	38	58	78								
5	30	60	91	123	154							
6		88	133	178	223	269						
7		120	181	243	305	368	430					
8		158	238	319	401	482	564	647				
9		200	303	406	509	613	718	822				
10		248	375	503	631	760	889	1019	1149			
11			456	611	767	923	1080	1237	1395			
12			544	729	915	1102	1289	1477	1665	1854		
13			640	858	1077	1297	1518	1739	1960	2182		
14			745	998	1253	1508	1765	2022	2280	2538	2797	
15			857	1149	1442	1736	2031	2327	2624	2921	3219	
16				1310	1644	1980	2317	2654	2992	3331	3671	
17				1482	1861	2240	2621	3003	3386	3769	4153	
18				1665	2090	2517	2945	3374	3804	4235	4666	
19				1859	2334	2810	3288	3766	4247	4728	5209	
20				2064	2591	3119	3650	4181	4714	5248	5783	
21					2861	3445	4031	4618	5207	5797	6388	
22					3146	3788	4432	5077	5724	6373	7022	

^{1/}Taras and Clark 1975

$$\text{Log } W = -0.96714 + 1.01849 * \text{Log } 10 (H*D**2)$$

Sample Size - 41 trees, Coefficient of Determination 0.99

Average DBH 13.9 inches, Minimum 5.6 inches, Maximum 20.4 inches

Average Height 80 feet, Minimum 48 feet, Maximum 107 feet

Average Age 42 years, Minimum 37 years, Maximum 47 years

^{2/}Main stem to a 2-inch top

Pinus taeda - Loblolly Pine^{1/}

North Carolina, Virginia

Table 144--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5											
6		32	80	127	174	222					
7		67	131	196	260	325	389				
8		106	190	274	359	443	527	611			
9		151	257	364	471	577	684	790			
10		201	332	464	596	727	859	990	1122		
11			415	575	734	893	1052	1212	1371		
12			506	696	885	1075	1264	1454	1643	1833	
13			605	827	1050	1272	1495	1717	1939	2162	
14			711	969	1227	1485	1743	2001	2259	2517	2775
15			826	1122	1418	1714	2010	2307	2603	2899	3195
16				1285	1622	1959	2296	2633	2970	3307	3644
17				1459	1839	2220	2600	2980	3361	3741	4121
18				1643	2070	2496	2922	3349	3775	4202	4628
19				1838	2313	2788	3263	3738	4214	4689	5164
20				2043	2570	3096	3623	4149	4676	5202	5728
21					2840	3420	4000	4581	5161	5742	6322
22					3123	3760	4397	5034	5671	6308	6944

^{1/}Burkhart et al. 1972

$$W = -62.42195 + 0.13161 * (H*D**2)$$

Sample Size - 121 trees, Coefficient of Determination 0.99

Average DBH , Minimum , Maximum

Average Height , Minimum , Maximum

Average Age , Minimum 13 years, Maximum 77 years

Pinus virginiana - Virginia Pine^{1/}

North Georgia

Table 145--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3											
4											
5		66	97	128	158	187					
6		105	154	202	249	296					
7		148	217	285	353	419	485				
8		196	289	379	468	557	645	732			
9		250	368	483	597	709	821	932			
10		309	454	597	737	877	1015	1151	1288		
11			549	721	891	1059	1225	1391	1555		
12			651	855	1057	1256	1454	1650	1845	2039	
13			761	999	1235	1468	1699	1928	2156	2383	
14			878	1154	1426	1695	1961	2226	2489	2751	3011
15			1003	1318	1629	1936	2241	2543	2844	3143	3440
16				1492	1844	2192	2537	2880	3220	3558	3895
17				1677	2072	2463	2851	3235	3618	3998	4376
18				1871	2312	2748	3181	3610	4037	4461	4883
19				2075	2564	3048	3527	4003	4477	4947	5415
20				2289	2828	3362	3891	4416	4938	5457	5973
21					3104	3690	4271	4847	5420	5989	6556
22					3392	4032	4667	5297	5923	6545	7164

^{1/}Saucier and Boyd 1982

$$W = 0.23714 * (H * D^{**2}) ** 0.94829 * (1 - 19.8322 / D^{**2.76646})$$

Sample Size - 25 trees, Coefficient of Determination

Average DBH 10.0 inches, Minimum 5.5 inches, Maximum 14.3 inches

Average Height 66 feet, Minimum 50 feet, Maximum 77 feet

Average Age 37 years, Minimum 24 years, Maximum 60 years

Pseudotsuga menziesii - Douglas-fir^{1/}

Pacific Northwest

Table 146--Main stem--wood--green weight (pounds)

DBH	Total height (feet)										
	10	20	30	40	50	60	70	80	90	100	110
1											
2											
3			24								
4	14	29	43	58							
5	22	45	68	90	113						
6		65	97	130	162	195					
7		88	132	177	221	265	309				
8		115	173	231	289	346	404	462			
9		146	219	292	365	438	511	584			
10		180	270	361	451	541	631	721	812		
11			327	436	546	655	764	873	982		
12			390	519	649	779	909	1039	1169	1299	
13			457	610	762	915	1067	1219	1372	1524	
14			530	707	884	1061	1237	1414	1591	1768	1945
15			609	812	1015	1218	1421	1623	1826	2029	2232
16				924	1154	1385	1616	1847	2078	2309	2540
17				1043	1303	1564	1825	2085	2346	2607	2867
18				1169	1461	1753	2046	2338	2630	2922	3215
19				1302	1628	1954	2279	2605	2930	3256	3582
20				1443	1804	2165	2525	2886	3247	3608	3969
21					1989	2387	2784	3182	3580	3978	4375
22					2183	2619	3056	3492	3929	4366	4802

^{1/}Shaw 1977

$W = -0.049 - 0.02085 * H * D **2$ (metric)

Sample Size - 120 trees, Coefficient of Determination

Average DBH centimeters, Minimum 1 centimeter, Maximum 221 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age years, Minimum years, Maximum years

Thuja plicata - Western Red Cedar^{1/}

Pacific Northwest

Table 147--Main stem--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4	10	17	25	33								
5	14	26	38	50	62							
6		37	54	71	89	106						
7		49	73	97	120	144	168					
8		64	95	126	156	187	218	249				
9		80	119	158	198	237	276	315				
10		98	147	195	243	292	340	388	437			
11			177	236	294	353	411	470	528			
12			211	280	350	419	489	558	628	698		
13			247	328	410	492	573	655	737	818		
14			286	381	475	570	665	759	854	949	1044	
15			328	437	545	654	763	872	980	1089	1198	
16				497	620	744	868	991	1115	1239	1363	
17				560	700	840	979	1119	1259	1398	1538	
18				628	785	941	1098	1254	1411	1567	1724	
19				700	874	1048	1223	1397	1572	1746	1921	
20				775	968	1162	1355	1548	1741	1935	2128	
21					1067	1280	1494	1707	1920	2133	2346	
22					1171	1405	1639	1873	2107	2341	2574	

^{1/}Shaw 1977

$$W = -0.818 - 0.01117 * H * D **2 \text{ (metric)}$$

Sample Size - 26 trees, Coefficient of Determination

Average DBH centimeters, Minimum 0.2 centimeter, Maximum 119.2 centimeters

Average Height meters, Minimum 3 meters, Maximum 52 meters

Average Age years, Minimum years, Maximum years

Tsuga heterophylla - Western Hemlock^{1/}

Pacific Northwest

Table 148--Main stem^{2/}--wood--green weight (pounds)

DBH	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
Inches												
1												
2												
3												
4	16	31	47	63								
5	25	49	74	98	123							
6		71	106	142	177	212						
7		96	145	193	241	289	337					
8		126	189	252	315	378	441	504				
9		159	239	319	398	478	558	637				
10		197	295	393	492	590	689	787	885			
11			357	476	595	714	833	952	1071			
12			425	567	708	850	992	1133	1275	1417		
13			499	665	831	998	1164	1330	1496	1663		
14			578	771	964	1157	1350	1543	1735	1928	2121	
15			664	885	1107	1328	1549	1771	1992	2213	2435	
16				1007	1259	1511	1763	2015	2267	2518	2770	
17				1137	1422	1706	1990	2274	2559	2843	3127	
18				1275	1594	1912	2231	2550	2869	3187	3506	
19				1421	1776	2131	2486	2841	3196	3551	3906	
20				1574	1967	2361	2754	3148	3541	3935	4328	
21					2169	2603	3037	3471	3904	4338	4772	
22					2381	2857	3333	3809	4285	4761	5237	

^{1/}Kurucz 1969

$$W = (0.056537 * H * D **2) * 1.74$$

Sample Size - 47 trees, Coefficient of Determination 0.99

Average DBH inches, Minimum 7.0 inches, Maximum 35.5 inches

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.74 used to convert oven dry weight to green weight.

Tsuga mertensiana - Mountain Hemlock^{1/}

Pacific Northwest

Table 149--Main stem^{2/}--wood--green weight (pounds)

DBH Inches	Total height (feet)											
	10	20	30	40	50	60	70	80	90	100	110	
1												
2												
3												
4												
5				1010	1025							
6				1037	1059	1081						
7				1069	1099	1129	1160					
8				1106	1145	1185	1224	1264				
9				1148	1198	1248	1297	1347				
10				1195	1256	1318	1379	1441	1502			
11			1172	1246	1321	1395	1470	1544	1618			
12			1214	1303	1391	1480	1569	1657	1746	1834		
13			1260	1364	1468	1572	1676	1780	1884	1988		
14			1310	1431	1551	1672	1792	1913	2034	2154	2275	
15			1364	1502	1641	1779	1917	2056	2194	2333	2471	
16				1578	1736	1893	2051	2208	2366	2523	2681	
17				1660	1837	2015	2193	2371	2548	2726	2904	
18				1746	1945	2144	2344	2543	2742	2941	3141	
19				1837	2059	2281	2503	2725	2947	3169	3391	
20				1933	2179	2425	2671	2917	3163	3409	3655	
21					2305	2576	2847	3119	3390	3661	3932	
22					2437	2735	3033	3330	3628	3926	4223	

^{1/}Krumlik 1974

$$W = (266.16 + 86.292 * H * [D/100] ** 2) * 1.62 \text{ (metric)}$$

Sample Size - 5 trees, Coefficient of Determination 0.99

Average DBH centimeters, Minimum 15.2 centimeters, Maximum 76.2 centimeters

Average Height , Minimum , Maximum

Average Age , Minimum , Maximum

^{2/}Green weight conversion factor 1.62 applied to equation to convert oven dry weight to green weight.

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Hardwood Table Index

Species	Whole tree			Main stem	
	Wood, bark, and foliage	Wood and bark	Wood	Wood and bark	Wood
<u>Acer rubrum</u>	--	7,8	--	42,43	--
<u>Acer saccharum</u>	--	9	--	--	--
<u>Alnus rubra</u>	--	--	--	44	--
<u>Betula papyrifera</u>	--	10	--	45	--
<u>Carya spp.</u>	1	11	--	46	--
<u>Fraxinus americana</u>	2	--	--	--	--
<u>Liquidambar styraciflua</u>	--	12	32	47	66
<u>Liriodendron tulipifera</u>	3	13,14,15,16	33,34,35	48,49,50,51	67,68,69
<u>Platanus occidentalis</u>	--	17	--	52	--
<u>Populus tremuloides</u>	--	18,19	--	53	--
<u>Prunus serotina</u>	--	20	--	54	--
<u>Quercus alba</u>	4	21,22,23	36,37	55,56,57	70,71
<u>Quercus coccinea</u>	--	24,25	38	58,59	72
<u>Quercus falcata</u>	--	26	39	60	73
<u>Quercus prinus</u>	--	27,28	40	61,62	74
<u>Quercus rubra</u>	5	29,30	41	63,64	75
<u>Quercus velutina</u>	6	31	--	65	--

Softwood Table Index

Species	Whole tree			Main stem	
	Wood, bark, and foliage	Wood and bark	Wood	Wood and bark	Wood
<u>Abies amabilis</u>	76	--	--	112	134
<u>Abies balsamea</u>	77	93	--	113	--
<u>Abies lasiocarpa</u>	--	--	--	--	135
<u>Picea englemannii</u>	78	--	--	114	136
<u>Picea glauca</u>	79	--	--	--	--
<u>Picea rubens</u>	--	94	--	115	--
<u>Pinus clausa</u>					
var. <u>immuginata</u>	80	95	106	116	137
<u>Pinus contorta</u>	--	--	107	117,118	138,139
<u>Pinus echinata</u>	81,82	96	108	119,120	140
<u>Pinus elliotii</u>	83,84	97	109	121,122	141
<u>Pinus palustris</u>	85,86	98	110	123,124	142
<u>Pinus resinosa</u>	87	--	--	--	--
<u>Pinus strobus</u>	--	99	--	125	--
<u>Pinus taeda</u>	88,89,90	100	111	126,127,128	143,144
<u>Pinus virginiana</u>	91	101		129	145
<u>Pseudotsuga menziesii</u>	--	102	--	130	146
<u>Thuja plicata</u>	--	103	--	131	147
<u>Tsuga canadensis</u>	92	--	--	132	--
<u>Tsuga heterophylla</u>	--	104	--	--	148
<u>Tsuga mertensiana</u>	--	105	--	133	149





