

宮崎演習林航空写真材積表

木梨, 謙吉
九州大学農学部附属演習林 : 助教授

長, 正道
九州大学農学部附属演習林 : 教務員

中尾, 博美
九州大学農学部附属演習林 : 助手

石津, 一実
九州大学農学部附属演習林 : 事務員

他

<https://doi.org/10.15017/1456206>

出版情報 : 演習林研究経過報告. 昭和39年度, pp.88-95, 1965. 九州大学農学部附属演習林
バージョン :
権利関係 :

資 料

宮崎演習林航空写真材積表

木 梨 謙 吉 長 正 道
中 尾 博 美 石 津 一 実
白 水 善 子

はじめに

宮崎演習林に対する経営案編成の目的をもつて、その蓄積調査を航空写真によつて行なうため、昭和39年10月、同演習林2919.5ha全域の写真撮影を行ない、その後10月末現地調査を実施し、広葉樹林、アカマツ、モミ・ツガ、単木の材積表を作成した。

航空写真材積表、同材積式およびその分散分析表を掲げる。

- 注) CC : Crown Closuer (樹冠疎密度), 小数点
CD : Crown Diameter (樹冠直径), *m*
H : Tree Height (樹高), *m*
V : Volume (材積), *m*³

航空写真材積表 (天然林)

Table 1

航空写真回帰式 $V = -230.416 + 635.046CC + 25.815CD$

(単位: m³/ha)

CD \ CC	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95
1.0			17.66	49.41	81.17	112.93	144.74	176.43	208.18	239.93	271.68	303.44	335.19	366.94	398.69
1.2			22.83	54.58	86.33	118.09	149.84	181.59	213.34	245.09	276.85	308.60	340.35	371.62	403.86
1.4			27.99	59.74	91.50	123.25	145.05	186.75	218.50	250.25	282.00	313.76	345.51	377.27	409.02
1.6			33.15	64.91	96.66	128.41	160.16	191.91	223.67	255.42	287.17	318.92	350.68	382.43	414.18
1.8			38.32	70.07	101.82	133.57	165.33	197.08	228.83	260.58	292.34	324.09	355.84	387.59	419.34
2.0			43.48	75.23	106.98	138.74	170.49	202.24	233.99	265.75	297.50	329.25	361.00	392.76	424.51
2.2		16.89	48.64	80.40	112.15	143.90	175.65	207.40	239.16	270.91	302.66	334.41	366.17	397.92	429.67
2.4		22.50	53.81	85.56	117.31	149.06	180.82	212.57	244.32	276.07	307.82	339.58	371.33	403.08	434.83
2.6		27.22	58.97	90.72	122.47	154.23	185.98	217.73	249.48	281.24	312.99	344.74	376.49	408.24	439.99
2.8		32.38	64.13	95.88	127.64	159.39	191.14	222.89	254.65	286.40	318.15	349.90	381.66	413.41	445.16
3.0		37.54	69.30	101.05	132.80	164.55	196.30	228.06	259.81	291.56	323.31	355.07	386.82	418.57	450.32
3.2		42.71	74.46	106.21	137.96	169.72	201.47	233.22	264.97	296.72	328.48	360.23	391.98	423.73	455.49
3.4	16.07	47.87	79.62	111.37	143.13	174.88	206.63	238.38	270.13	301.89	333.64	365.66	397.14	428.90	460.65
3.6	21.28	53.03	84.78	116.54	148.29	180.04	211.79	243.55	275.30	307.05	338.80	370.55	402.31	434.06	465.81
3.8	26.44	58.20	89.95	121.70	153.45	185.20	216.96	248.71	280.46	312.21	343.97	375.72	407.47	439.22	470.97
4.0	31.61	63.36	95.11	126.86	158.61	190.37	222.12	253.87	285.62	317.38	349.13	380.88	412.63	444.39	476.14
4.2	36.77	68.52	100.27	132.03	163.78	195.53	227.28	259.03	290.79	322.54	354.29	386.04	417.80	449.55	481.30
4.4	41.93	73.68	105.44	137.19	168.94	200.69	232.45	264.20	295.95	327.70	359.45	391.21	422.96	454.71	486.46
4.6	47.10	78.85	110.60	142.35	174.10	205.86	237.61	269.36	301.11	332.87	364.17	396.37	428.12	459.87	491.63
4.8	52.26	84.01	115.76	147.51	179.27	211.02	242.77	274.52	306.27	338.03	369.78	401.53	433.29	465.04	496.79
5.0	57.42	89.17	120.93	152.68	184.43	216.18	274.93	279.69	311.44	343.19	374.94	406.70	438.45	470.20	501.95
5.2	62.58	94.34	126.09	157.84	189.59	221.35	253.10	284.85	316.60	348.35	380.11	411.86	443.61	475.36	507.12
5.4	67.75	99.50	131.25	163.00	194.76	226.51	258.26	290.01	321.76	353.52	385.27	417.02	448.77	480.53	512.28
5.6	72.91	104.66	136.41	168.17	199.92	231.67	263.42	295.18	326.93	358.68	390.43	422.18	453.94	485.69	517.44
5.8	78.07	109.83	141.58	173.33	205.08	236.83	268.59	300.34	332.09	363.84	395.60	427.35	459.10	490.85	522.60
6.0	83.24	114.99	146.74	178.49	210.24	242.00	273.75	305.50	337.25	369.01	400.76	432.73	464.26	496.26	527.77
6.2	88.40	120.15	151.90	183.66	215.41	247.16	278.91	310.66	342.42	374.17	405.92	437.67	469.43	501.18	532.93
6.4	93.56	125.31	157.07	188.82	220.57	252.32	284.07	315.83	347.58	379.33	411.08	442.84	474.59	506.34	538.09
6.6	98.73	130.48	162.23	193.98	225.73	257.49	289.24	320.99	352.74	384.50	416.25	448.00	479.75	511.50	543.26
6.8	103.88	135.64	167.39	199.14	230.94	262.65	294.40	326.15	357.91	389.66	421.41	453.16	484.92	516.67	548.42
7.0	109.05	140.80	172.56	204.31	236.06	267.81	299.56	331.32	363.07	394.82	426.57	458.33	490.08	521.83	553.58
7.2	114.21	145.97	177.72	209.47	241.22	272.98	304.73	336.48	368.23	399.98	431.74	463.49	495.24	526.99	558.75
7.4	119.38	151.13	182.88	214.63	246.39	278.14	309.89	341.64	373.39	405.15	436.90	468.65	500.40	532.16	563.91
7.6	124.54	156.29	189.04	219.80	251.55	283.30	315.05	346.81	378.56	410.31	442.06	473.81	505.57	537.32	569.07
7.8	129.70	161.46	193.21	224.96	256.76	288.46	320.22	351.97	383.72	415.47	447.23	478.98	510.73	542.48	574.23
8.0	134.86	166.62	198.37	230.12	261.87	293.63	325.38	357.13	388.88	420.64	452.39	484.14	515.89	547.65	579.40

アカマツ 航空写真材積式 (単木)

Table. 2

$$V = -0.7096 + 0.1195CD + 0.0590H$$

(単位: m³)

H \ CD	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
4								.004	.064	.124	.184	.243	.303	.363	.423	.482	.542	.602	.662	.721	.781	.841	.901	.960	1020	1080
5							.004	.063	.123	.183	.243	.302	.362	.422	.482	.541	.601	.661	.721	.780	.840	.900	.960	1019	1079	1139
6						.003	.063	.122	.182	.242	.302	.361	.421	.481	.541	.600	.660	.720	.780	.839	.899	.959	1019	1078	1138	1198
7				.002	.062	.122	.181	.241	.301	.361	.420	.480	.540	.600	.659	.719	.779	.839	.898	.958	1018	1078	1137	1197	1257	
8			.001	.061	.121	.181	.240	.300	.360	.420	.479	.539	.599	.659	.718	.778	.838	.898	.957	1017	1077	1137	1196	1256	1316	
9		.001	.060	.120	.180	.240	.300	.359	.419	.479	.538	.598	.658	.718	.777	.837	.897	.957	1016	1076	1136	1196	1255	1315	1375	
10		.060	.119	.179	.239	.299	.358	.418	.478	.538	.597	.657	.717	.777	.836	.896	.956	1016	1075	1135	1195	1255	1314	1374	1434	
11		.059	.119	.178	.238	.298	.358	.417	.477	.537	.597	.656	.716	.776	.836	.895	.955	1015	1075	1134	1194	1254	1314	1374	1433	1493
12	.058	.118	.178	.237	.297	.357	.417	.476	.536	.596	.656	.716	.775	.835	.895	.954	1014	1074	1134	1193	1253	1313	1373	1433	1492	1552
13	.117	.177	.237	.296	.356	.416	.476	.535	.595	.655	.715	.774	.834	.894	.954	1013	1073	1133	1193	1252	1312	1372	1432	1491	1551	1611
14	.176	.236	.296	.355	.415	.475	.535	.594	.654	.714	.774	.834	.893	.953	1013	1072	1132	1192	1252	1311	1371	1431	1491	1550	1610	1670
15	.235	.295	.355	.414	.474	.534	.594	.654	.715	.773	.833	.892	.952	1012	1072	1131	1191	1251	1311	1370	1430	1490	1550	1609	1669	1729
16	.294	.354	.414	.473	.533	.593	.653	.712	.772	.832	.892	.951	1011	1071	1131	1190	1250	1310	1370	1430	1489	1549	1609	1668	1728	1788
17	.353	.413	.473	.532	.592	.652	.712	.771	.831	.891	.951	1010	1070	1130	1190	1249	1309	1369	1429	1488	1548	1608	1668	1727	1787	1847
18	.412	.472	.532	.591	.651	.710	.771	.831	.890	.950	1010	1070	1129	1189	1249	1308	1368	1428	1488	1547	1607	1667	1727	1786	1846	1906
19	.471	.531	.591	.650	.710	.770	.830	.890	.949	1009	1069	1128	1188	1248	1308	1367	1427	1487	1547	1606	1666	1726	1786	1845	1905	1965
20	.530	.590	.650	.709	.769	.829	.889	.948	1008	1068	1128	1187	1247	1307	1367	1426	1486	1546	1606	1665	1725	1785	1845	1904	1964	2024
21	.539	.649	.709	.768	.828	.888	.948	1007	1067	1127	1187	1246	1306	1366	1426	1485	1545	1605	1665	1724	1784	1844	1904	1963	2023	2083
22	.648	.708	.768	.827	.887	.947	1007	1066	1126	1186	1246	1305	1365	1425	1485	1544	1604	1664	1724	1783	1843	1903	1963	2022	2082	2142
23	.707	.767	.827	.886	.946	1006	1066	1125	1185	1245	1305	1365	1424	1484	1544	1603	1663	1723	1783	1842	1902	1962	2022	2081	2141	2201
24	.766	.826	.886	.945	1005	1065	1125	1184	1244	1304	1364	1424	1483	1543	1603	1662	1722	1782	1842	1901	1961	2021	2081	2140	2200	2260
25	.825	.885	.945	1004	1064	1124	1184	1244	1303	1363	1423	1482	1542	1602	1662	1721	1781	1841	1901	1960	2020	2080	2140	2199	2259	2319
26	.884	.944	1004	1063	1123	1183	1243	1302	1362	1422	1482	1541	1601	1661	1721	1780	1840	1900	1960	2019	2079	2139	2199	2258	2318	2378
27	.943	1003	1063	1122	1182	1242	1302	1361	1421	1481	1541	1600	1660	1720	1780	1839	1899	1959	2019	2078	2138	2198	2258	2317	2377	2437
28	1002	1062	1122	1181	1241	1301	1361	1420	1480	1540	1600	1659	1719	1779	1839	1898	1958	2018	2078	2137	2197	2257	2317	2376	2436	2496
29	1061	1121	1181	1240	1300	1360	1420	1479	1539	1599	1659	1718	1778	1838	1898	1957	2017	2077	2137	2196	2256	2316	2376	2435	2495	2555
30	1120	1180	1240	1299	1359	1419	1479	1538	1598	1658	1718	1777	1837	1897	1957	2016	2076	2136	2196	2255	2315	2375	2435	2494	2554	2614

モミ・ツガ 航空写真材積表 (単木)

Table. 3

$$V = -0.7958 + 0.0662CD + 0.0793H$$

(単位: m³)

H \ CD	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
4															.018	.051	.084	.117	.150	.183	.216	.250	.283	.316	.349	.382
5													.031	.064	.097	.130	.163	.196	.230	.263	.296	.329	.362	.395	.428	.461
6										.011	.044	.077	.110	.143	.176	.210	.243	.276	.309	.342	.375	.408	.441	.474	.508	.541
7							.024	.057	.090	.123	.156	.190	.223	.256	.289	.322	.355	.388	.421	.454	.487	.521	.554	.587	.620	.654
8					.037	.070	.103	.136	.169	.203	.236	.269	.302	.335	.368	.401	.434	.467	.501	.534	.567	.600	.633	.666	.699	.733
9		.017	.050	.083	.116	.149	.183	.216	.249	.282	.315	.348	.381	.414	.447	.481	.514	.547	.580	.613	.646	.679	.712	.745	.778	.812
10	.030	.063	.096	.129	.163	.196	.229	.262	.295	.328	.361	.394	.427	.460	.494	.527	.560	.593	.626	.659	.692	.725	.758	.792	.825	.858
11	.109	.143	.176	.209	.242	.275	.308	.341	.374	.407	.440	.474	.507	.540	.573	.606	.639	.672	.705	.738	.771	.805	.838	.871	.904	.937
12	.189	.222	.255	.288	.321	.354	.387	.420	.454	.487	.520	.553	.586	.619	.652	.685	.718	.751	.785	.818	.851	.884	.917	.950	.983	1.016
13	.268	.301	.334	.367	.400	.434	.467	.500	.533	.566	.599	.632	.665	.698	.731	.765	.798	.831	.864	.897	.930	.963	.996	1.029	1.062	1.096
14	.347	.380	.413	.447	.480	.513	.546	.579	.612	.645	.678	.711	.745	.778	.811	.844	.877	.910	.943	.976	1.009	1.042	1.076	1.109	1.142	1.175
15	.427	.460	.493	.526	.559	.592	.625	.658	.691	.724	.758	.791	.824	.857	.890	.923	.956	.989	1.022	1.056	1.089	1.122	1.155	1.188	1.221	1.254
16	.506	.539	.572	.605	.638	.671	.704	.738	.771	.804	.837	.870	.903	.936	.969	1.002	1.035	1.069	1.102	1.135	1.168	1.201	1.234	1.267	1.300	1.333
17	.585	.618	.651	.684	.716	.751	.784	.817	.850	.883	.916	.949	.982	1.015	1.049	1.082	1.115	1.148	1.181	1.214	1.247	1.280	1.313	1.346	1.380	1.413
18	.664	.698	.731	.764	.797	.830	.863	.896	.929	.962	.995	1.029	1.062	1.095	1.128	1.161	1.194	1.227	1.260	1.293	1.326	1.360	1.393	1.426	1.459	1.492
19	.744	.777	.810	.843	.876	.909	.942	.975	1.009	1.042	1.075	1.108	1.141	1.174	1.207	1.240	1.273	1.306	1.340	1.373	1.406	1.439	1.472	1.505	1.538	1.571
20	.823	.856	.889	.922	.955	.988	1.022	1.055	1.088	1.121	1.154	1.187	1.220	1.253	1.286	1.320	1.353	1.386	1.419	1.452	1.485	1.518	1.551	1.584	1.617	1.651
21	.902	.935	.968	1.002	1.035	1.068	1.101	1.134	1.167	1.200	1.233	1.266	1.299	1.333	1.366	1.399	1.432	1.465	1.498	1.531	1.564	1.597	1.631	1.664	1.697	1.730
22	.982	1.015	1.048	1.081	1.114	1.147	1.180	1.213	1.246	1.279	1.313	1.346	1.379	1.412	1.445	1.478	1.511	1.544	1.577	1.611	1.644	1.677	1.710	1.743	1.776	1.809
23	1.061	1.094	1.127	1.160	1.193	1.226	1.259	1.293	1.326	1.359	1.392	1.425	1.458	1.491	1.524	1.557	1.590	1.624	1.657	1.690	1.723	1.756	1.789	1.822	1.855	1.888
24	1.140	1.173	1.206	1.239	1.273	1.306	1.339	1.372	1.405	1.438	1.471	1.504	1.537	1.570	1.604	1.637	1.670	1.703	1.736	1.769	1.802	1.835	1.868	1.901	1.935	1.966
25	1.219	1.253	1.286	1.319	1.352	1.385	1.418	1.451	1.484	1.517	1.550	1.584	1.617	1.650	1.683	1.716	1.749	1.782	1.815	1.848	1.881	1.915	1.948	1.981	2.014	2.047
26	1.299	1.332	1.365	1.398	1.431	1.464	1.497	1.530	1.564	1.597	1.630	1.663	1.696	1.729	1.762	1.795	1.828	1.861	1.895	1.928	1.961	1.994	2.027	2.060	2.093	2.126
27	1.378	1.411	1.444	1.477	1.510	1.543	1.577	1.610	1.643	1.676	1.709	1.742	1.775	1.808	1.841	1.875	1.908	1.941	1.974	2.007	2.040	2.073	2.106	2.139	2.172	2.206
28	1.457	1.490	1.523	1.557	1.590	1.623	1.656	1.689	1.722	1.755	1.788	1.821	1.854	1.888	1.921	1.954	1.987	2.020	2.053	2.086	2.119	2.152	2.186	2.219	2.252	2.285
29	1.537	1.570	1.603	1.636	1.669	1.702	1.735	1.768	1.801	1.834	1.868	1.901	1.934	1.967	2.000	2.033	2.066	2.099	2.132	2.165	2.199	2.232	2.265	2.298	2.331	2.364
30	1.616	1.649	1.682	1.715	1.748	1.781	1.814	1.848	1.881	1.914	1.947	1.980	2.013	2.046	2.079	2.112	2.145	2.179	2.212	2.245	2.278	2.311	2.344	2.377	2.410	2.443

広葉樹材積式 (ha当)

$$V = -230.416 + 635046 \text{ CC} + 25815 \text{ CD}$$

$$Y = (-162838 + 448796 X_1 + 18244 X_2) / 0.07\text{ha}$$

Table 4 分散分析 (広葉樹)

	SS	df	MS	F
X ₁	55855956	1		325.85**
X ₂	2334815	1		13.62**
const.	208.9211	1		12.19**
Error	805.6633	47	17.1418	
Total	6833.6615	50		

アカマツ材積式 (単木)

$$V = -0.7096 + 0.1195 \text{ CD} + 0.0590 \text{ H}$$

$$Y = -0.7096 + 0.1195 X_1 + 0.0590 X_2$$

Table 5 分散分析 (アカマツ)

	SS	df	MS	F
X ₁	53.4586	1		487.76**
X ₂	9.2575	1		84.47**
const.	2.4298	1		22.17**
Error	120.607	110	0.1096	
Total	77.2066	113		

モミ・ツガ材積式 (単木)

$$V = -0.7958 + 0.0662 \text{ CD} + 0.0793 \text{ H}$$

$$Y = -0.7958 + 0.0662 X_1 + 0.0793 X_2$$

Table 6 分散分析 (モミ・ツガ)

	SS	df	MS	F
X ₁	35320	1		186.09**
X ₂	12186	1		64.21**
const.	9.643	1		50.81**
Error	29.608	156	0.1898	
Total	86.757	159		