

Table S3. Numbers of individuals or pieces of lumber and mean wood stiffness measurements for each clone that were used to calculate Clonal values for wood stiffness.

Generation	Method		Stress-wave of Standing Tree				Dynamic Young's modulus of Lumber (size : 2000mm x 38mm x 89mm)							Equipment	Statistics	Clonal value	
	Tree age		22~29 years		30~39 years		30~39 years										
	Equipment		Fakopp		TreeSonic		FFT Analyser										
	Clone		N of Tree	time (μ s)	N of Tree	time (μ s)	Total		Juvenile point		Mature point						
							N of Tree	N of Lumber	N of Lumber	Wide of ring (mm)	Young (kN/mm ²)	N of Lumber	Wide of ring (mm)				Young (kN/mm ²)
G1	P3122_sag1				3	257	3	7	6	5.46	5.74	1	4.33	8.43	FFT	BLUP	-0.13
G1	P3123_sag2				5	292									TreeSonic	Mean	-0.18
G1	P3124_sag3				15	326	15	50	30	6.01	5.17	20	5.39	5.85	FFT	BLUP	-0.97
G1	P3126_fuj1				8	289	8	21	16	4.89	6.14	5	4.04	7.48	FFT	BLUP	-0.14
G1	P3127_fuj2				4	329	4	9	8	3.49	5.37	1	4.38	6.17	FFT	BLUP	-1.28
G1	P3129_fuj5				12	305	12	46	24	5.24	5.95	22	4.71	6.75	FFT	BLUP	-0.48
G1	P3130_fuj6				4	289									TreeSonic	Mean	-0.08
G1	P3132_fuj8				7	274									TreeSonic	Mean	0.41
G1	P3133_fuj9				12	267									TreeSonic	Mean	0.64
G1	P3134_fuj10				16	281	16	70	31	5.18	6.64	39	4.90	8.61	FFT	BLUP	0.82
G1	P3135_fuj11				5	295									TreeSonic	Mean	-0.29
G1	P3136_fuj12				5	283									TreeSonic	Mean	0.10
G1	P3138_fuj14				14	339	14	27	27	4.22	4.59				FFT	BLUP	-1.82
G1	P3139_fuj15				4	271	4	15	8	5.87	5.97	7	4.00	6.89	FFT	BLUP	-0.38
G1	P3140_fuj16				5	294									TreeSonic	Mean	-0.26
G1	P3141_fuj17				5	329	5	13	10	4.49	4.81	3	3.57	6.35	FFT	BLUP	-1.50
G1	P3143_fuj19				7	270									TreeSonic	Mean	0.54
G1	P3144_fuj20				7	314									TreeSonic	Mean	-0.91
G1	P3145_fuj21				5	262									TreeSonic	Mean	0.81
G1	P3146_fuj22				7	303									TreeSonic	Mean	-0.56
G1	P3147_fuj24				4	306									TreeSonic	Mean	-0.64
G1	P3148_fuj25				15	264	15	51	29	4.62	7.04	22	4.29	9.32	FFT	BLUP	1.07
G1	P3149_fuj26				4	295	4	12	6	5.86	5.21	6	3.48	7.67	FFT	BLUP	-0.49
G1	P3150_fuj27				5	269									TreeSonic	Mean	0.57
G1	P3151_fuj28				2	263	2	7	4	6.98	5.07	3	4.23	8.35	FFT	BLUP	0.03
G1	P3152_fuj29				8	296	8	25	16	4.90	6.14	9	4.18	7.90	FFT	BLUP	-0.02
G1	P3153_ima1				14	284	14	48	28	5.71	6.48	20	4.25	8.28	FFT	BLUP	0.53
G1	P3154_ima2				8	286	8	34	16	5.39	5.53	18	4.85	7.40	FFT	BLUP	-0.31
G1	P3155_kan1				7	277	7	29	14	6.17	6.09	15	4.35	8.05	FFT	BLUP	0.32
G1	P3156_kan2				5	285	5	25	10	5.68	5.75	15	4.34	8.31	FFT	BLUP	0.26
G1	P3157_kan3				6	286									TreeSonic	Mean	0.01
G1	P3158_kan4				2	295	2	7	4	6.24	4.98	3	5.00	6.67	FFT	BLUP	-0.71
G1	P3162_kar1				14	253	14	33	28	4.24	8.72	5	4.36	9.73	FFT	BLUP	2.18
G1	P3163_kar2				5	271									TreeSonic	Mean	0.52
G1	P3164_kar3				4	245	4	8	8	4.08	7.44				FFT	BLUP	0.83
G1	P3165_kar4				4	291	4	15	8	5.42	4.84	7	4.01	7.21	FFT	BLUP	-0.89
G1	P3166_kar5				5	282									TreeSonic	Mean	0.14
G1	P3167_kar6				9	331	9	21	18	4.01	4.58	3	3.74	6.07	FFT	BLUP	-1.89
G1	P3168_kar7				5	295	5	18	10	4.19	7.83	8	4.73	8.01	FFT	BLUP	0.89
G1	P3169_kar8				7	301	7	20	14	4.75	4.16	6	4.29	5.08	FFT	BLUP	-2.20
G1	P3170_kar10				4	277	4	13	6	5.82	5.61	7	5.92	7.14	FFT	BLUP	-0.13
G1	P3171_kar11				3	296									TreeSonic	Mean	-0.31
G1	P3172_kis1				8	331	8	21	16	5.03	4.88	5	4.72	5.66	FFT	BLUP	-1.39
G1	P3173_kis2				1	280	1	4	2	5.40	6.07	2	5.32	8.83	FFT	BLUP	0.63
G2	F1103_A-3		9	374											Fakopp	Mean	-0.82
G2	F1107_A-7		8	379											Fakopp	Mean	-0.96
G2	F1111_A-11		9	364											Fakopp	Mean	-0.55
G2	F1112_A-12		9	358	4	277	4	16	8	6.53	6.43	8	5.02	7.57	FFT	BLUP	0.42
G2	F1120_A-20		9	340	4	278	4	14	8	6.95	5.86	6	4.59	7.88	FFT	BLUP	0.31
G2	F1121_A-21		9	318	4	250	4	13	8	7.41	5.42	5	4.21	8.93	FFT	BLUP	0.49
G2	F1122_A-22		9	363											Fakopp	Mean	-0.52
G2	F1128_A-28		6	338											Fakopp	Mean	0.18
G2	F1130_A-30		9	337											Fakopp	Mean	0.20
G2	F1131_A-31		8	357											Fakopp	Mean	-0.35
G2	F1136_A-36		7	351											Fakopp	Mean	-0.19
G2	F1137_A-37		8	386	4	298	4	15	8	7.58	4.68	7	4.48	5.72	FFT	BLUP	-1.16
G2	F1140_A-40		8	379	4	287	4	11	8	5.39	5.22	3	3.91	6.75	FFT	BLUP	-0.85
G2	F1141_A-41		7	358											Fakopp	Mean	-0.38
G2	F1148_A-48		8	347	3	282	3	9	6	5.44	5.73	3	7.43	5.47	FFT	BLUP	-0.52
G2	F1149_A-49		9	374											Fakopp	Mean	-0.82
G2	F1163_A-63		9	366											Fakopp	Mean	-0.60
G2	F1166_A-66		9	330	4	269	4	11	8	6.01	6.85	3	3.91	8.76	FFT	BLUP	0.92
G2	F1171_A-71		9	369	3	298	3	12	6	7.03	5.24	6	4.28	7.54	FFT	BLUP	-0.17
G2	F1172_A-72		7	329											Fakopp	Mean	0.43
G2	F1176_A-76		9	354											Fakopp	Mean	-0.27
G2	F1210_B-10		6	348	4	282	4	12	8	6.27	6.11	4	4.33	7.00	FFT	BLUP	0.01
G2	F1214_B-14		9	322	4	257	4	10	8	4.89	6.78	2	3.31	8.79	FFT	BLUP	0.54
G2	F1216_B-16		5	318	2	281	2	8	4	6.06	6.30	4	5.10	8.08	FFT	BLUP	0.51
G2	F1218_B-18		9	358	4	304	4	16	8	6.67	5.21	8	4.48	5.93	FFT	BLUP	-1.01
G2	F1220_B-20		9	346	8	301	8	32	16	6.83	5.57	16	4.70	6.68	FFT	BLUP	-0.42

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	Tree age		22~29 years		30~39 years		30~39 years										
	Equipment		Fakopp		TreeSonic		FFT Analyser										
	Clone		N of Tree	time (μ s)	N of Tree	time (μ s)	Total		Juvenile point			Mature point					
							N of Tree	N of Lumber	N of Lumber	Wide of ring (mm)	Young (kN/mm ²)	N of Lumber	Wide of ring (mm)	Young (kN/mm ²)			
G2	F1221_B-21		9	345			4	13	8	4.90	7.23	5	4.05	8.22	Fakopp	Mean	-0.02
G2	F1222_B-22		9	324	4	264	4		8						FFT	BLUP	0.72
G2	F1226_B-26		9	374											Fakopp	Mean	-0.82
G2	F1227_B-27		9	352	4	283	4	9	8	5.57	5.57	1	4.71	5.51	FFT	BLUP	-0.55
G2	F1229_B-29		9	329											Fakopp	Mean	0.43
G2	F1230_B-30		7	370											Fakopp	Mean	-0.71
G2	F1238_B-38		7	342											Fakopp	Mean	0.06
G2	F1240_B-40		9	357	4	321	4	18	8	6.55	5.17	10	5.57	6.08	FFT	BLUP	-0.84
G2	F1250_B-50		9	347											Fakopp	Mean	-0.07
G2	F1254_B-54		17	351	8	279	8	29	16	6.10	7.87	13	4.42	8.90	FFT	BLUP	1.64
G2	F1255_B-55		9	350											Fakopp	Mean	-0.16
G2	F1256_B-56		9	317	4	273	4	16	8	6.10	5.79	8	4.22	8.43	FFT	BLUP	0.31
G2	F1259_B-59		9	344	4	293	4	18	8	7.10	7.52	10	4.93	7.39	FFT	BLUP	0.83
G2	F1261_B-61		9	321	4	291	4	17	8	5.80	6.24	9	4.96	8.21	FFT	BLUP	0.50
G2	F1265_B-65		8	349	6	306	6	27	12	6.57	7.03	15	5.99	6.99	FFT	BLUP	0.53
G2	F1274_B-74		9	323	16	278	16	63	32	7.57	6.69	31	4.53	9.05	FFT	BLUP	1.40
G2	F1275_B-75		9	333											Fakopp	Mean	0.31
G2	F1282_B-82		7	342	3	275	3	7	6	5.32	8.16	1	3.45	10.61	FFT	BLUP	1.95
G2	F1293_B-93		9	339	4	262	4	14	8	7.22	6.09	6	4.22	8.61	FFT	BLUP	0.72
G2	F1294_B-94		9	341	7	289	7	24	14	6.08	5.86	10	4.19	7.51	FFT	BLUP	-0.08
G2	F1303_ima_33-11				7	309									TreeSonic	Mean	-0.76
G2	F1304_ima_24-5				6	286									TreeSonic	Mean	0.02
G2	F1306_oom_05-06		9	353											Fakopp	Mean	-0.25
G2	F1307_oom_07-07		9	389											Fakopp	Mean	-1.23
G2	F1308_oom_31-03		9	405											Fakopp	Mean	-1.67
G2	F1309_oom_24-12		9	390											Fakopp	Mean	-1.26
G2	F1310_oom_20-04		9	402											Fakopp	Mean	-1.60
G2	F1312_oom_05-08		9	418											Fakopp	Mean	-2.04
G2	F1313_oom_05-03		9	385											Fakopp	Mean	-1.14
G2	F1314_oom_08-04		9	378											Fakopp	Mean	-0.92
G2	F1315_tar_11-01		9	342											Fakopp	Mean	0.06
G2	F1316_tar_11-03		9	375											Fakopp	Mean	-0.86
G2	F1317_tar_08-12		9	352											Fakopp	Mean	-0.21
G2	F1318_tar_10-01		9	395											Fakopp	Mean	-1.40
G2	F1319_tar_08-06		9	357											Fakopp	Mean	-0.34
G2	F1320_tar_08-02		9	357											Fakopp	Mean	-0.34
G2	F1321_tar_13-10		9	358											Fakopp	Mean	-0.39
G2	F1322_tar_10-07		9	352											Fakopp	Mean	-0.21
G2	F1323_tar_08-09		9	386											Fakopp	Mean	-1.16
G2	F1324_tar_08-11		9	388											Fakopp	Mean	-1.20
G2	F1325_tar_10-06		9	375											Fakopp	Mean	-0.85
G2	F1326_ima-1		9	357											Fakopp	Mean	-0.35
G2	F1327_ima-2		9	338	4	298	4	18	8	5.45	4.86	10	3.62	7.83	FFT	BLUP	-0.59
G2	F1328_ima-3		3	361											Fakopp	Mean	-0.46
G2	F1329_ima-4		4	409											Fakopp	Mean	-1.80
G2	F1330_ima-5		7	348											Fakopp	Mean	-0.10
G2	F1331_ima-6		9	388	5	311	5	24	10	7.44	3.80	14	4.38	6.06	FFT	BLUP	-1.55
G2	F1332_ima-7		9	318	4	284	4	18	8	6.35	5.70	10	4.41	8.55	FFT	BLUP	0.45
G2	F1333_ima-8		9	354	3	288	3	12	6	8.26	3.26	6	4.15	5.73	FFT	BLUP	-1.79
G2	F1334_ima-9		7	312											Fakopp	Mean	0.90
G2	F1335_ima-10		8	337	4	280	4	17	8	4.91	5.55	9	3.96	7.81	FFT	BLUP	-0.34
G2	F1336_ima-11		9	323	4	264	4	17	8	8.49	4.87	9	4.52	9.86	FFT	BLUP	1.09
G2	F1337_ima-12		9	324	4	265	4	15	8	5.80	5.55	7	3.44	9.06	FFT	BLUP	0.27
G2	F1338_ima-13		2	326											Fakopp	Mean	0.51
G2	F1339_ima-14		2	336											Fakopp	Mean	0.23
G2	F1340_sef-1		9	303	3	257	3	12	6	6.01	6.21	6	2.81	10.89	FFT	BLUP	1.41
G2	F1341_sef-2		9	321											Fakopp	Mean	0.65
G2	F1342_sef-3		7	340	3	302	3	18	6	9.53	4.73	12	5.53	6.62	FFT	BLUP	-0.37
G2	F1343_sef-4		9	328	3	294	3	17	6	7.23	5.12	11	4.60	8.49	FFT	BLUP	0.44
G2	F1344_sef-5		9	341	4	283	4	14	8	6.61	4.47	6	2.91	8.17	FFT	BLUP	-0.65
G2	F1345_sef-6		4	326	1	269	1	6	2	7.79	5.29	4	4.74	8.66	FFT	BLUP	0.67
G2	F1346_sef-7		5	308	3	257	3	14	6	6.36	7.58	8	4.75	10.83	FFT	BLUP	2.52
G2	F1347_sef-8		3	337	1	309	1	4	2	5.04	7.17	2	4.27	9.04	FFT	BLUP	0.96
G2	F1348_sef-9		9	297	5	266	5	22	10	5.61	6.54	12	4.26	9.34	FFT	BLUP	1.08
G2	F1349_sef-10		9	359	4	280	4	18	8	7.41	3.41	10	3.67	7.93	FFT	BLUP	-0.84
G2	F1350_sef-11		9	316	4	281	4	24	8	7.24	5.44	16	5.51	7.95	FFT	BLUP	0.44
G2	F1351_sef-12		9	332	4	288	4	19	8	5.78	4.44	11	4.58	7.84	FFT	BLUP	-0.48
G2	F1352_sef-13		8	344											Fakopp	Mean	0.01
G2	F1353_sef-14		9	345											Fakopp	Mean	-0.02
G2	F1354_sef-15		9	329	4	290	4	18	8	6.83	6.17	10	3.76	7.96	FFT	BLUP	0.27

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	Equipment		Fakopp		TreeSonic		FFT Analyser										
	Clone		N of Tree	time (μ s)	N of Tree	time (μ s)	Total		Juvenile point			Mature point					
							N of Tree	N of Lumber	N of Lumber	Wide of ring (mm)	Young (kN/mm ²)	N of Lumber	Wide of ring (mm)	Young (kN/mm ²)			
G2	F1355_sef-16		8	352	3	298	3	10	6	6.47	4.52	4	3.66	6.75	FFT	BLUP	-1.09
G2	F1357_sef-18		4	343											Fakopp	Mean	0.04
G2	F1358_sef-19		9	340	1	296	1	3	2	5.59	4.75	1	4.40	5.61	FFT	BLUP	-1.20
G2	F1359_sef-20		5	356											Fakopp	Mean	-0.32
G2	F1361_sef-22		2	324											Fakopp	Mean	0.56
G1	subtotal				299	289	202	649	397	5.16	5.81	252	4.46	7.45			-0.15
	FFT	27			202	292	202	649	397	5.16	5.81	252	4.13	6.90			
	Fakopp only																
	TreeSonic only	17			97	285											
G2	subtotal		806	350	204	284	191	754	382	6.48	5.74	372	4.41	7.86			-0.16
	FFT	46	390	338	191	283	191	754	382	6.48	5.74	372	4.41	7.86			
	Fakopp only	53	416	360													
	TreeSonic only	2			13	298											
	Total	145	806		503		393	1,403	779	5.99	5.77	624	4.43	7.72			-0.16

The statistics column shows the method used to calculate the Clonal value. BLUP denotes Best Linear Unbiased Prediction. The Mean Stress-wave times of the clones measured using Fakopp or TreeSonic instruments in standing trees were converted into Clonal value using a linear model relating the stress wave times to the Clonal values obtained using BLUP and data from the lumber survey (see details in Supplementary Materials S2)