

1 **S1 Appendix**

2 Table A. Cycle of controlled temperature and relative humidity used in the screening laboratory
3 experiment with individual cones.

Time (min)	Temperature (°C)	Relative humidity (%)
5	36	25
60	36	25
5	36 – 40	25 – 20
120	40	20
5	40 – 44	20 – 15
120	44	15
5	48 – 52	10 – 8
300	48	10
5	48 – 52	10 – 8
240	52	8
5	52 – 56	6 – 4
300	56	6
5	56 – 60	6 – 4
240	60	4

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19 Table B. Cycle of controlled temperature and relative humidity used in the manipulating water
20 availability ex situ experiment with pairs of cones from the same whorl.

Time (min)	Temperature (°C)	Relative humidity (%)
15	0 – 24	40
120	24	40
5	24 – 28	40 – 35
120	28	35
5	28 – 32	35 – 30
240	32	30
5	32 – 36	30 – 25
240	36	25
5	36 – 40	25 – 20
360	40	20
5	40 – 44	20 – 15
360	44	15
5	44 – 48	15 – 10
360	48	10
5	48 – 52	10 – 8
360	52	8
5	52 – 56	8 – 6
240	56	6
5	56 – 60	6 – 4
240	60	4

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33 Table C. Results of linear and generalized linear mixed models for the different experiments.
 34 Models were fitted excluding the relevant terms. Akaike's Information Criterion (AIC), and model
 35 degrees of freedom (DF) are given for each model. Chi-square statistic (Chisq), degrees of
 36 freedom (df) and *P*-value are given for likelihood ratio tests between the model with and without
 37 the correspondence variable. Variance and standard deviation for the random effects of the
 38 chosen models are given.

Model	AIC	DF	Chisq	df	<i>P</i> -value	Var.	Std. Dev.
Eq. 2							
Age + Dens + H	3021.2	6					
Age	<i>3019.2</i>	4	7.85	1	0.005**		
Dens	3028.2	4	1.00	1	0.317 n.s.		
H	3025.9	4	1.07	1	0.301 n.s.		
Random effects: Test cycle						1.042e+07	3.228e+03
Residual						1.684e+08	1.298e+04
Eq. 3							
Treat + Accum.T	<i>60.5</i>	4					
Treat * Accum.T	62.5	5	0.03	1	0.860 n.s.		
Treat	63.2	3	17.74	1	<0.0001***		
Accum.T	76.2	3	4.71	1	0.023*		
Random effects: Pair:Cone						0.291	0.540
Eq. 4							
Null	243.9	4					
Treat	<i>212.8</i>	5	33.13	1	<0.0001***		
Random effects: Pair						1.287	1.135
Test cycle						1.355	1.164
Residual						1.382	1.176
Eq. 5							
Treat + Group + Site	<i>245.6</i>	5					
Treat * Group * Site	248.3	9	1.98	1	0.159		
Treat * Group	249.9	5	0.22	1	0.637		
Treat * Site	252.0	5	0.00	1	0.994		
Group * Site	292.8	5	3.24	1	0.072		
Treat	252.2	3	49.09	1	<0.0001***		
Group	295.9	3	6.37	1	0.012*		
Site	297.7	3	4.34	1	0.037*		
Random effects: Tree						0.479	0.692

39 Accum.T = Accumulated temperature; Treat = Treatment; Group = Group of provenances.

40 AIC and DF of the chosen model for each experiment are in italics.

41 Significant *P*-values for the fixed effects are in bold case.

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49 Table D. Summary of the selection process of generalized linear models and results of the
 50 chosen GLM for the field manipulative experiment carried out at OLM site. Akaike's
 51 Information Criterion (AIC) and degrees of freedom (DF) are given for each model. Degrees
 52 of freedom of each parameter (df), deviance (Dev.), residual degrees of freedom (Res.df),
 53 residual deviance (Res. Dev.) and *P*-value of the ANOVA table are given for each explanatory
 54 variable of the chosen model.

Model	AIC	DF	df	Dev.	Res. df	Res. Dev.	<i>P</i> -value
Eq. 6							
Treat * Prov + Db + Ser	168.4	28					
Treat * Prov + Db	167.9	27					
Treat * Prov + Ser	167.3	27					
Treat * Prov	167.9	26	12	23.12	146	115.89	0.023*
<i>Treat + Prov</i>	<i>167.0</i>	<i>14</i>					
Treat	173.6	2	1	32.11	170	169.64	<0.0001***
Prov	203.2	13	12	30.62	158	139.01	0.002**
Null	203.7	1			171	201.75	

55 Treat = Treatment; Prov = Provenances.

56 The chosen model is in italics.

57 Significant *P*-values are in bold case.