

**Supplementary Table S1.** ANOVA model and Expected Mean Squares used in the study  
[Variances, degrees of freedoms and expected components of related variances (EMS) at each level]

| Source of Variation<br>(and Variance) *                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Degrees of freedom (df)*                     | Expected Mean Squares (EMS)*                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sites, $S_i$ , ( $\sigma^2_s$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $s-1 = 1$                                    | $\sigma^2_e + n_{x10} \times \sigma^2_{SF(P)} + n_{x11} \times p \times f \times \sigma^2_s$                                                                               |
| Population, $P_j$ , ( $\sigma^2_p$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | $p-1 = 5$                                    | $\sigma^2_e + n_{x6} \times \sigma^2_{SF(P)} + n_{x7} \times S \times \sigma^2_{F(P)} + n_{x8} \times f \times \sigma^2_{SP} + n_{x9} \times S \times f \times \sigma^2_p$ |
| Interaction, $S \times P_{ij}$ ,<br>( $\sigma^2_{SP}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | $(s-1) \times (p-1) = 5$                     | $\sigma^2_e + n_{x4} \times \sigma^2_{SF(P)} + n_{x5} \times f \times \sigma^2_{SP}$                                                                                       |
| Family within Pops.,<br>$F(P)_{k(ij)}$ , ( $\sigma^2_{F(P)}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | $p \times (f-1) = 54$                        | $\sigma^2_e + n_{x2} \times \sigma^2_{SF(P)} + n_{x3} \times S \times \sigma^2_{F(P)}$                                                                                     |
| Interaction,<br>$S \times F(P)_{ik(j)}$ , ( $\sigma^2_{SF(P)}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $p \times (s-1) \times (f-1) = 54$           | $\sigma^2_e + n_{x1} \times \sigma^2_{SF(P)}$                                                                                                                              |
| Within, $e_{l(ijk)}$ , ( $\sigma^2_e$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | $s \times p \times f \times (n_x - 1) = 732$ | $\sigma^2_e$                                                                                                                                                               |
| Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $(s \times p \times f \times n_x) - 1 = 851$ |                                                                                                                                                                            |
| <p><b>* Expansions of the abbreviations in Table S1 [suppl.]:</b><br/> s: Number of experimental sites (<math>s = 2</math>), <math>i \rightarrow 1</math> to 2;<br/> p: Number of populations (<math>p = 6</math>), <math>j \rightarrow 1</math>-6;<br/> f: Number of families within each population (<math>f = 10</math>), <math>k \rightarrow 1</math> to 10;<br/> <math>n_x</math>: Number of trees measured within each family (<math>l \rightarrow 3</math> to 10) (harmonic mean = 7.1),<br/> <math>\sigma^2_s</math>: Variance due to experimental sites;<br/> <math>\sigma^2_p</math>: Variance due to populations;<br/> <math>\sigma^2_{SP}</math>: Variance due to Site <math>\times</math> Population interaction;<br/> <math>\sigma^2_{F(P)}</math>: Variance due to families within populations;<br/> <math>\sigma^2_{SF(P)}</math>: Variance due to Site <math>\times</math> Family (within population) interaction;<br/> <math>\sigma^2_e</math>: Error (random, within) variance;<br/> <math>n_{x1}, n_{x2}, n_{x3}, \dots, n_{x11}</math>: Coefficients derived for related variance components [if the number of trees for each family were equal, then these values are expected to be the same, i.e. = Observations with missing values were not included in the analyses. Due to dead and/or missing trees the mean value (harmonic mean) is <math>n_x = 7.1</math>]</p> |                                              |                                                                                                                                                                            |

**Supplementary Table S2.** Predicted genetic correlation ( $r_{\text{GJM-P}}$ ) and selection efficiency per year ( $\text{SE}_{\text{GPY}}$ ) values for different selection ages (J, Juvenile) and rotation (M, Mature) ages

(This table is extracted and summarized from a much larger original table).

| Selecti<br>on age,<br>J <sup>a</sup> | Mature (rotation, harvest) age, M |                                     |                    |                                     |                    |                                     |                    |                                     |                    |                                     |
|--------------------------------------|-----------------------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|
|                                      | 30 years                          |                                     | 40 years           |                                     | 60 years           |                                     | 80 years           |                                     | 100 years          |                                     |
|                                      | $r_{\text{GJM-P}}$                | $\text{SE}_{\text{GPY}}^{\text{b}}$ | $r_{\text{GJM-P}}$ | $\text{SE}_{\text{GPY}}^{\text{b}}$ | $r_{\text{GJM-P}}$ | $\text{SE}_{\text{GPY}}^{\text{b}}$ | $r_{\text{GJM-P}}$ | $\text{SE}_{\text{GPY}}^{\text{b}}$ | $r_{\text{GJM-P}}$ | $\text{SE}_{\text{GPY}}^{\text{b}}$ |
| <b>2</b>                             | 0.382                             | 2.215                               | 0.313              | 2.363                               | 0.215              | 2.383                               | 0.146              | 2.131                               | 0.093              | 1.673                               |
| <b>3</b>                             | 0.480                             | <b><u>2.317</u></b>                 | 0.411              | 2.583+                              | 0.313              | 2.885+                              | 0.244              | 2.960                               | 0.190              | 2.864                               |
| <b>4</b>                             | 0.549                             | 2.272+                              | 0.480              | <b><u>2.587</u></b>                 | 0.382              | <b><u>3.020</u></b>                 | 0.313              | 3.258+                              | 0.259              | 3.349                               |
| <b>5</b>                             | 0.603                             | 2.182                               | 0.534              | 2.517+                              | 0.436              | 3.014                               | 0.367              | <b><u>3.340</u></b>                 | 0.313              | 3.538+                              |
| <b>6</b>                             | 0.647                             | 2.081                               | 0.577              | 2.422                               | 0.480              | 2.948+                              | 0.411              | 3.324                               | 0.357              | <b><u>3.585</u></b>                 |
| <b>7</b>                             | 0.684                             | 1.981                               | 0.614              | 2.319                               | 0.517              | 2.859                               | 0.448              | 3.262                               | 0.394              | 3.562                               |
| <b>8</b>                             | 0.716                             | 1.885                               | 0.647              | 2.219                               | 0.549              | 2.760                               | 0.480              | 3.178+                              | 0.426              | 3.502                               |
| <b>9</b>                             | 0.744                             | 1.796                               | 0.675              | 2.123                               | 0.577              | 2.661                               | 0.508              | 3.085                               | 0.454              | 3.424+                              |
| <b>10</b>                            | 0.770                             | 1.715                               | 0.700              | 2.033                               | 0.603              | 2.564                               | 0.534              | 2.990                               | 0.480              | 3.337                               |

<sup>a</sup>J: age from seedlings (in years).

<sup>b</sup> Underlined bold value within each column is the optimum  $\text{SE}_{\text{GPY}}$  value. Values with plus (+) sign (and the values between two + signs) in each column are within the range of 95% of the relevant optimum  $\text{SE}_{\text{GPY}}$  value in the same column.