

## Appendix S7

### Model parameters:

**Table S1.** Posterior means, standard deviations and 95% credible intervals of the parameters included in the model. Letters indicate comparisons between N treatments (variance, optimal and range parameters) or between antecedent effects (monthly and annual), different letters state parameters are significantly different (95% CI do not overlap).

| Parameter   | Mean(SD)        | 95%CI                  |
|---|-----------------|------------------------|
| $\sigma^2_{Ambient}$  | 0.0091(0.00018) | 0.0087,0.0094 <i>a</i> |
| $\sigma^2_{Ndeposition}$                                    | 0.011(0.00022)  | 0.011,0.012 <i>b</i>   |
| <i>temperature optimal</i> <sub>Ambient</sub>               | 16.37(0.12)     | 16.11,16.6 <i>a</i>    |
| <i>temperature optimal</i> <sub>N deposition</sub>          | 15.83(0.28)     | 15.15,16.27 <i>a</i>   |
| <i>temperature range</i> <sub>Ambient</sub>                 | 7.98(1.06)      | 6.21,10.38 <i>a</i>    |
| <i>temperature range</i> <sub>N deposition</sub>            | 15.03(3.58)     | 10.02,23.97 <i>a</i>   |
| <i>soil moisture optimal</i> <sub>Ambient</sub>             | -0.452(0.055)   | -0.58,-0.37 <i>a</i>   |
| <i>soil moisture optimal</i> <sub>N deposition</sub>        | -0.463(0.061)   | -0.61,-0.37 <i>a</i>   |
| <i>soil moisture range</i> <sub>Ambient</sub>               | 0.32(0.1)       | 0.19,0.59 <i>a</i>     |
| <i>soil moisture range</i> <sub>N deposition</sub>          | 0.48(0.17)      | 0.27,0.96 <i>a</i>     |
| <i>previous growth optimal</i> <sub>Ambient</sub>           | 2.28(0.29)      | 1.78,2.91 <i>a</i>     |
| <i>previous growth optimal</i> <sub>N deposition</sub>      | 3.31(0.4)       | 2.63,4.15 <i>a</i>     |
| <i>previous growth range</i> <sub>Ambient</sub>             | 4.01(1.18)      | 2.27,6.75 <i>a</i>     |
| <i>previous growth range</i> <sub>N deposition</sub>        | 8.08(2.15)      | 4.75,12.99 <i>a</i>    |
| <i>temperature annual effects</i> <sub><i>t</i></sub>       | 0.29(0.03)      | 0.21,0.36 <i>a</i>     |
| <i>temperature annual effects</i> <sub><i>t</i>-1</sub>     | 0.63(0.02)      | 0.58,0.68 <i>b</i>     |
| <i>temperature annual effects</i> <sub><i>t</i>-2</sub>     | 0.06(0.03)      | 0.006,0.14 <i>c</i>    |
| <i>temperature month effects</i> <sub>June</sub>            | 0.84(0.04)      | 0.76,0.93 <i>a</i>     |
| <i>temperature month effects</i> <sub>July</sub>            | 0.01(0.01)      | 0.0004,0.06 <i>b</i>   |
| <i>temperature month effects</i> <sub>August</sub>          | 0.13(0.04)      | 0.04,0.22 <i>c</i>     |
| <i>soil moisture annual effects</i> <sub><i>t</i></sub>     | 0.25(0.02)      | 0.20,0.29 <i>a</i>     |
| <i>soil moisture annual effects</i> <sub><i>t</i>-1</sub>   | 0.0043(0.0043)  | 0.00011,0.016 <i>b</i> |
| <i>soil moisture annual effects</i> <sub><i>t</i>-2</sub>   | 0.74(0.02)      | 0.69,0.78 <i>b</i>     |
| <i>soil moisture month effects</i> <sub>June</sub>          | 0.37(0.10)      | 0.12,0.51 <i>a</i>     |
| <i>soil moisture month effects</i> <sub>July</sub>          | 0.0078(0.0079)  | 0.00022,0.028 <i>b</i> |
| <i>soil moisture month effects</i> <sub>August</sub>        | 0.615(0.098)    | 0.475,0.859 <i>c</i>   |
| <i>previous growth annual effects</i> <sub><i>t</i>-1</sub> | 0.01(0.009)     | 0.0002,0.036 <i>a</i>  |
| <i>previous growth annual effects</i> <sub><i>t</i>-2</sub> | 0.109(0.058)    | 0.01,0.23 <i>ac</i>    |
| <i>previous growth annual effects</i> <sub><i>t</i>-3</sub> | 0.56(0.06)      | 0.44,0.69 <i>b</i>     |
| <i>previous growth annual effects</i> <sub><i>t</i>-4</sub> | 0.31(0.06)      | 0.18,0.43 <i>c</i>     |