

Appendix 1/2

Statistical output in tabular form and r session information

Appendix 1

These tables summarize model outputs as used in the creation of figures 4 and 5. 'Par' identifies the parameter, either the regression coefficient on indicator variable, or the specific pairwise contrast studied. 'lo95' and 'hi95' are the lower and upper bounds of the 95% credible intervals, while 'lo50' and 'hi50' are the lower and upper bounds of the 50% credible intervals., while 'med' represents the median (or 50th percentile), our measure of central tendency in all cases. At the end of this document, we provide the complete session information from the Intel Xeon server used to analyze these data.

- **Regression (indicator) coefficients**

Total below

par	lo95	lo50	med	hi50	hi95
Shade	-15.87	-8.16	-3.87	0.34	8.48
Severed	-21.96	-13.35	-9.25	-5.26	2.71
ShadeXSevered	-20.41	-8.59	-2.78	2.89	14.88

Root

par	lo95	lo50	med	hi50	hi95
Shade	-7.52	-4.27	-2.62	-0.96	2.35
Severed	-9.6	-6.37	-4.68	-3.04	0.35
ShadeXSevered	-4.88	-0.23	2.07	4.39	8.8

Rhizome

par	lo95	lo50	med	hi50	hi95
Shade	-10.56	-4.26	-0.95	2.24	8.67
Severed	-14.29	-7.46	-4.19	-1	5.59
ShadeXSevered	-19.15	-10.13	-5.36	-0.94	8.15

Shoots

par	lo95	lo50	med	hi50	hi95
Shade	-42.03	-26.1	-18.15	-10.73	4.59
Severed	-35.4	-19.69	-12.03	-4.49	11.67
ShadeXSevered	-34.14	-13.07	-2.38	9.32	31.93

Tillers added

par	lo95	lo50	med	hi50	hi95
Shade	-1.11	-0.83	-0.68	-0.55	-0.27
Severed	-0.68	-0.4	-0.26	-0.12	0.17
ShadeXSevered	-1.24	-0.79	-0.58	-0.37	0.06

Tillers

par	lo95	lo50	med	hi50	hi95
Shade	-0.72	-0.52	-0.42	-0.32	-0.13
Severed	-0.38	-0.18	-0.08	0.02	0.22
ShadeXSevered	-0.78	-0.49	-0.35	-0.2	0.1

- *Pairwise contrasts*

Total below

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-9.25	-21.96	2.71	-13.35	-5.26
SI-AI	-3.87	-15.87	8.48	-8.16	0.34
SI-AS	5.4	-6.54	17.61	1.3	9.55
SS-AI	-16.08	-28.68	-3.66	-20.1	-12
SS-AS	-6.74	-18.91	5.92	-10.88	-2.75
SS-SI	-12.13	-24.91	0.17	-16.23	-8.05

Rhizome

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-4.19	-14.29	5.59	-7.46	-1
SI-AI	-0.95	-10.56	8.67	-4.26	2.24
SI-AS	3.31	-6.8	13.2	0.07	6.51
SS-AI	-10.64	-20.12	-1.22	-13.84	-7.43
SS-AS	-6.37	-15.95	3.45	-9.72	-3.07
SS-SI	-9.66	-19.44	-0.34	-12.9	-6.56

Root

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-4.68	-9.6	0.35	-6.37	-3.04
SI-AI	-2.62	-7.52	2.35	-4.27	-0.96
SI-AS	2.14	-3.28	7.46	0.4	3.82
SS-AI	-5.25	-10.3	-0.14	-6.86	-3.67
SS-AS	-0.52	-5.4	4.19	-2.21	1.21
SS-SI	-2.67	-7.83	2.5	-4.38	-0.92

Shoots

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-12.03	-35.4	11.67	-19.69	-4.49
SI-AI	-18.15	-42.03	4.59	-26.1	-10.73
SI-AS	-6.3	-29.77	16.76	-14.22	1.6
SS-AI	-32.61	-55.52	-9.46	-40.27	-24.73
SS-AS	-20.35	-44.17	2.74	-28.19	-12.69
SS-SI	-13.94	-37.72	9.33	-21.96	-6.4

Tillers added

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-0.26	-0.68	0.17	-0.4	-0.12
SI-AI	-0.68	-1.11	-0.27	-0.83	-0.55
SI-AS	-0.42	-0.84	0	-0.56	-0.28
SS-AI	-1.52	-2	-1.06	-1.68	-1.37
SS-AS	-1.26	-1.74	-0.79	-1.42	-1.11
SS-SI	-0.84	-1.33	-0.36	-1	-0.68

Tillers

par_diff	med	lo95	hi95	lo50	hi50
AS-AI	-0.08	-0.38	0.22	-0.18	0.02
SI-AI	-0.42	-0.72	-0.13	-0.52	-0.32
SI-AS	-0.34	-0.64	-0.04	-0.44	-0.24
SS-AI	-0.85	-1.17	-0.54	-0.96	-0.74
SS-AS	-0.77	-1.08	-0.44	-0.87	-0.67
SS-SI	-0.43	-0.75	-0.1	-0.53	-0.32

Appendix 2

```
R version 3.5.3 (2019-03-11)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: windows >= 8 x64 (build 9200)

Matrix products: default

locale:
[1] LC_COLLATE=English_United States.1252 LC_CTYPE=English_United States.1252
[3] LC_MONETARY=English_United States.1252 LC_NUMERIC=C
[5] LC_TIME=English_United States.1252

attached base packages:
[1] stats graphics grDevices utils datasets methods base

other attached packages:
[1] cowplot_0.9.4 dplyr_0.8.4 ggplot2_3.1.0 rstanarm_2.18.2 Rcpp_1.0.1

loaded via a namespace (and not attached):
[1] splines_3.5.3 gtools_3.8.1 StanHeaders_2.18.1 threejs_0.3.1
[5] shiny_1.2.0 assertthat_0.2.1 stats4_3.5.3 yaml_2.2.0
[9] pillar_1.3.1 lattice_0.20-38 glue_1.3.1 digest_0.6.18
[13] promises_1.0.1 minqa_1.2.4 colorspace_1.4-1 htmltools_0.3.6
[17] httpuv_1.5.0 Matrix_1.2-15 plyr_1.8.4 dygraphs_1.1.1.6
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```
[21] pkgconfig_2.0.2      rstan_2.18.2      purrr_0.3.2      xtable_1.8-3
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[33] shinyjs_1.0         lazyeval_0.2.2   cli_1.1.0        survival_2.43-3
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[73] R6_2.4.0            gridExtra_2.3    rstantools_1.5.1 zoo_1.8-4
[77] utf8_1.1.4          shinystan_2.5.0  shinythemes_1.1.2 stringi_1.4.3
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```

Appendix 3

Details of simulation of theoretical model

Our patch model simulates growth in both a parent and daughter patch as a function of LAI, under an assumed translocation of assimilate scenario fixed at 5% of net photosynthate. Our model uses a multiplicative constant to transform net photosynthate into leaf area (parameter “G” below), and accounts for leaf area turnover with a first order senescence term (‘S’). We initialize our LAI at 0.1 in the daughter patch, and 9.25 in the donor (parent) patch, a value close to the equilibrium given our model of leaf area production and turnover under high light. In effect, our model is a two-pool coupled ODE, analyzed in R (v.3.5.3) using Euler’s method, with delta t (stepsize) set to 0.1. No issues with numerical stability were observed.

Table A3. Note that the only values to differ in our simulation experiment is the choice of the ‘V_max’ parameter, representing either high light or low light in the daughter patch.

Model parameter	Value
V_max	50 (high light); 10 (low light)
S	0.05
h	0.75
G	0.01
k	2.31 (5% of max assimilation from high-light donor)

As stressed in our manuscript, the purpose of this model is to gain qualitative insight into how photosynthate translocation is likely to benefit a clonal genet where daughter patches are either in high or low light, and all other conditions held constant.

Image 1: Chamber base design isolating parent ramets (inside chamber) and daughter ramets (outside)



Image 2: Chamber installation with environmental controls (temperature, relative humidity)



Image 3: Foam rubber barrier isolating daughter ramets from experimental chamber

