1 Supplementary Material

Table 1: Data sources

	traitname	unitname	no.obs	no.spp	database	datasetid	reference
1	Height	m	26.00	8	bien	10_bien	
2	Height	m	2.00	2	bien	12_bien	
3	Seed mass	mg	3.00	3	bien	12_bien	
4	LNC	mg/g	287.00	12	try	130_try	Craine et al. (2009)
5	Height	m	27.00	19	bien	14_bien	
6	LNC	mg/g	44.00	2	try	154_try	Wilson et al. (2000)
7	SLA	mm2 mg-1	44.00	2	try	154_try	Wilson et al. (2000)
8	Height	m	2.00	1	try	156_try	Bond-Lamberty et al. (2002)
9	Seed mass	mg	4.00	2	bien	17_bien	
10	Height	m	18.00	16	bien	18_bien	
11	LNC	mg/g	7.00	4	try	180_try	Wenxuan et al. (2012)
12	LNC	mg/g	7.00	3	try	181_try	Yahan et al. (2011)
13	Height	m	275.00	3	try	186_try	unpub.
14	SLA	mm2 mg-1	204.00	3	try	186_try	unpub.
15	Seed mass	mg	250.00	37	bien	19_bien	
16	Seed mass	mg	12.00	12	bien	2_bien	
17	Height	m	90.00	19	bien	20_bien	
18	Height	m	28.00	19	try	20_try	Wright et al. (2004)
19	LNC	mg/g	65.00	32	try	20_try	Wright et al. (2004)
20	SLA	mm2 mg-1	93.00	33	try	20_try	Wright et al. (2004)
21	Height	m	10.00	10	bien	21_bien	
22	Height	m	21.00	14	bien	22_bien	
23	Height	m	2.00	2	try	236_try	Prentice et al. (2011)
24	LNC	mg/g	3.00	2	try	236_try	Prentice et al. (2011)
25	SLA	mm2 mg-1	2.00	2	try	236_try	Prentice et al. (2011)
26	Height	m	47036.00	19	bien	24_bien	
27	LNC	mg/g	120.00	20	try	240_try	Vergutz et al. 2012
28	Height	m	5.00	5	bien	25_bien	
29	SLA	mm2 mg-1	102.00	18	try	25_try	Kleyer et al. (2008)
30	Height	m	21.00	21	try	251_try	Schweingruber & Landolt (2005)
31	Height	m	8.00	5	bien	26_bien	
32	Height	m	35.00	2	try	275_try	unpub.
33	SLA	mm2 mg-1	83.00	2	try	275_try	unpub.
34	Height	m	5.00	5	try	28_try	Moles et al. (2004)
35	LNC	mg/g	24.00	8	try	286_try	Atkin et al. (2015)
36	SLA	mm2 mg-1	40.00	11	try	286_try	Atkin et al. (2015)
37	Height	m	18.00	1	bien	3_bien	
38	LNC	mg/g	72.00	22	try	342_try	Maire et al. (2015)
39	SLA	mm2 mg-1	86.00	23	try	342_try	Maire et al. (2015)
40	LNC	mg/g	2.00	1	try	37_try	Cornelissen et al. (2003)
41	SLA	mm2 mg-1	615.00	14	try	37_try	Cornelissen et al. (2003)
42	LNC	mg/g	3216.00	37	try	412_try	unpub.
43	SLA	mm2 mg-1	6307.00	37	try	412_try	unpub.
44	LNC	mg/g	6.00	2	try	443_try	Wang et al. 2017
45	SLA	mm2 mg-1	6.00	2	try	443_try	Wang et al. 2017
46	Height	m	120.00	1	bien	5_bien	
47	SLA	mm2 mg-1	20.00	2	try	50_try	Shipley et al. (2002)
48	Height	m	1.00	1	try	54_try	Cavender-Bares et al. (2006)
49	SLA	mm2 mg-1	42.00	2	try	54_try	Cavender-Bares et al. (2006)
50	SLA	mm2 mg-1	1.00	1	try	65_try	unpub.
51	Height	m	20.00	1	bien	7_bien	
52	Height	m	11.00	10	try	86_try	Diaz et al. (2004)
53	SLA	mm2 mg-1	11.00	10	try	86_try	Diaz et al. (2004)
54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

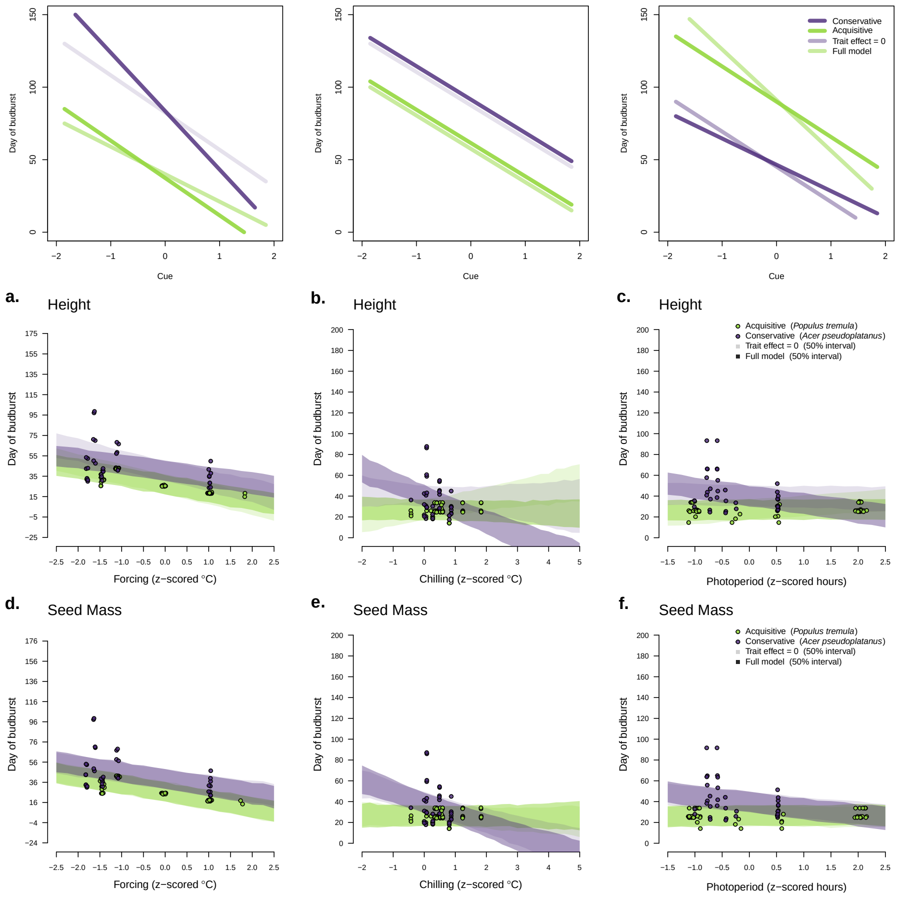

Figure 1: Comparisons of estimated cue responses of a species with an trait value associated with acquisitive growth strategies, shown in green, or conservative growth strategies, shown in purple. Associations between seed mass and forcing, chilling, and photoperiod are depicted on panels a to c and associations between LNC and each cue in panel d to f. The green points represent the budburst data for *Populus tremula*, a relatively small seeded species, while the green points are budburst data of the large seeded species, *Aesculus hippocastanum*. Dark bands represent the 50% credible interval for the posterior cue estimates for the full model. Opaque bands represent the 50% credible interval for the posterior cue estimates with a trait effect of zero. The negative value of the seed mass model's slope for each cue produces a more negative effect on the day of budburst when seed mass is included in the model. This suggests that trees that produce large seeds advance their budburst dates at a higher rate to increasing cues (a-c). The effect of seed mass however, is relatively small compared to that observed from other traits. Estimates of the cue responses in our LNC model were all positive and produced more positive slopes in the full model. This indicates that high SLA values are less responsive in their budburst to increasing forcing, chilling, and photoperiod values (d to f). The greater effect of slopes on taller trees and high SLA species is a artifact of the trait value itself being larger and not a reflection on the magnitidue of the response.

Table 2: Height model estimates

	mean	sd	2.5%	50%	97.5%	Rhat
mu_grand	12.62	1.83	8.95	12.63	16.21	1.00
muPhenoSp	32.13	2.69	26.94	32.12	37.43	1.00
muForceSp	-10.81	2.81	-16.34	-10.77	-5.33	1.00
muChillSp	-4.42	4.05	-12.71	-4.35	3.34	1.00
muPhotoSp	1.44	2.23	-2.98	1.44	5.77	1.00
betaTraitxForce	0.18	0.19	-0.21	0.18	0.56	1.00
betaTraitxChill	-0.51	0.28	-1.04	-0.52	0.06	1.00
betaTraitxPhoto	-0.30	0.16	-0.62	-0.30	0.02	1.00
sigma_sp	5.91	0.76	4.61	5.84	7.58	1.00
sigma_study	7.51	1.20	5.49	7.38	10.24	1.00
sigma_traity	5.39	0.02	5.36	5.39	5.43	1.00
sigmaPhenoSp	15.17	2.07	11.23	15.11	19.42	1.00
sigmaForceSp	4.95	1.18	2.99	4.84	7.56	1.00
sigmaChillSp	8.63	2.19	5.25	8.33	13.72	1.00
sigmaPhotoSp	3.45	0.93	1.87	3.36	5.51	1.00
sigmapheno_y	14.22	0.25	13.74	14.22	14.72	1.00

Table 3: SLA model estimates

	mean	sd	2.5%	50%	97.5%	Rhat
mu_grand	16.54	1.57	13.51	16.53	19.54	1.01
muPhenoSp	31.39	2.51	26.51	31.35	36.45	1.00
muForceSp	-10.95	2.67	-16.44	-10.89	-5.87	1.01
muChillSp	-16.49	4.62	-26.03	-16.33	-7.86	1.01
muPhotoSp	0.97	2.56	-4.29	1.02	5.74	1.02
betaTraitxForce	0.15	0.15	-0.13	0.15	0.45	1.01
betaTraitxChill	0.34	0.25	-0.12	0.33	0.84	1.01
betaTraitxPhoto	-0.19	0.14	-0.47	-0.19	0.10	1.02
sigma_sp	7.78	0.97	6.12	7.70	9.89	1.00
sigma_study	3.27	0.96	1.82	3.12	5.49	1.00
sigma_traity	6.17	0.05	6.07	6.16	6.26	1.00
sigmaPhenoSp	13.96	2.10	10.03	13.91	18.20	1.00
sigmaForceSp	4.91	1.13	3.07	4.79	7.43	1.00
sigmaChillSp	10.48	2.29	6.60	10.28	15.35	1.00
sigmaPhotoSp	3.72	0.89	2.24	3.64	5.75	1.00
sigmapheno_y	14.21	0.26	13.71	14.21	14.72	1.00

Table 4: Log10 Seed mass model estimates

	mean	sd	2.5%	50%	97.5%	Rhat
mu_grand	1.84	0.48	0.90	1.84	2.77	1.00
muPhenoSp	31.43	2.70	26.33	31.40	36.84	1.00
muForceSp	-8.04	1.57	-11.19	-8.03	-4.98	1.00
muChillSp	-9.36	2.79	-15.05	-9.28	-4.02	1.00
muPhotoSp	-1.44	1.27	-3.90	-1.47	1.06	1.00
betaTraitxForce	-0.29	0.67	-1.58	-0.29	1.03	1.00
betaTraitxChill	-1.08	1.09	-3.20	-1.09	1.07	1.00
betaTraitxPhoto	-0.59	0.58	-1.74	-0.59	0.54	1.00
sigma_sp	1.62	0.19	1.30	1.60	2.03	1.00
sigma_study	0.97	0.10	0.77	0.97	1.16	1.00
sigma_traity	0.25	0.01	0.23	0.25	0.27	1.00
sigmaPhenoSp	14.93	2.29	10.62	14.89	19.61	1.00
sigmaForceSp	4.92	0.99	3.18	4.85	7.06	1.00
sigmaChillSp	10.65	2.53	6.44	10.37	16.20	1.00
sigmaPhotoSp	3.76	0.91	2.23	3.67	5.80	1.00
sigmapheno_y	14.16	0.25	13.69	14.15	14.64	1.00

Table 5: LNC model estimates

	mean	sd	2.5%	50%	97.5%	Rhat
mu_grand	22.65	1.41	19.90	22.65	25.44	1.00
muPhenoSp	31.21	2.51	26.35	31.15	36.32	1.00
muForceSp	-19.42	5.45	-30.39	-19.50	-8.61	1.01
muChillSp	-26.48	7.09	-40.56	-26.52	-12.15	1.00
muPhotoSp	-10.07	4.89	-19.99	-10.02	-0.60	1.01
betaTraitxForce	0.48	0.23	0.02	0.48	0.95	1.01
betaTraitxChill	0.70	0.30	0.09	0.70	1.30	1.00
betaTraitxPhoto	0.33	0.20	-0.06	0.33	0.73	1.01
sigma_sp	5.12	0.61	4.05	5.07	6.44	1.00
sigma_study	3.54	0.97	2.07	3.40	5.78	1.00
sigma_traity	5.13	0.06	5.02	5.13	5.25	1.00
sigmaPhenoSp	14.07	1.96	10.46	13.96	18.13	1.00
sigmaForceSp	4.51	1.03	2.70	4.42	6.76	1.00
sigmaChillSp	8.92	2.02	5.73	8.63	13.60	1.00
sigmaPhotoSp	3.85	0.88	2.37	3.77	5.80	1.00
sigmapheno_y	14.22	0.26	13.73	14.21	14.73	1.00