

Supplemental materials for Phenological sequences: How early-season events define those that follow

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Supplemental Tables

Analysis of Variance Table

Model 1: fLOstartm fLDstartm Model 2: fLOstartm 1 + offset(1 * fLDstartm) Res.Df RSS Df Sum of Sq F Pr(>F) 1 23 567.61 2 24 909.03 -1 -341.42 13.835 0.001126 ** — Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 Linear hypothesis test

Hypothesis: fLDstartm = 1

Model 1: restricted model Model 2: fLOstartm fLDstartm

Res.Df RSS Df Sum of Sq F Pr(>F) 1 24 909.03 2 23 567.61 1 341.42 13.835 0.001126 ** — Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 Analysis of Variance Table

Model 1: fFRstartm fLDstartm Model 2: fFRstartm 1 + offset(1 * fLDstartm) Res.Df RSS Df Sum of Sq F Pr(>F) 1 23 22381 2 24 24087 -1 -1705.4 1.7526 0.1986 Analysis of Variance Table

Model 1: fFRstartm fFLstartm Model 2: fFRstartm 1 + offset(1 * FLstartm) Res.Df RSS Df Sum of Sq F Pr(>F) 1 23 13260 2 24 30117 -1 -16857 29.238 1.709e-05 *** — Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Table S1: Summary of linear models for relationships between later phenophases and earlier phenophases, as shown in Figure 3 in the main text. Linear models were fit with the species-level mean day-of-year of the later phenological stages as the response variable, and mean day-of-year of earlier phenostage as the explanatory variable.

previous phenostage model	intercept	slope	r ²	p
leafout vs. budburst	65.84	0.53	0.44	<0.001
flowering vs. budburst	3.18	1.17	0.17	0.039
fruiting vs. budburst	-80.31	2.04	0.23	0.016
senescence vs. budburst	243.88	0.30	0.03	0.427
flowering vs. leafout	-105.28	1.92	0.30	0.005
fruiting vs. leafout	-107.19	2.11	0.16	0.051
senescence vs. leafout	237.39	0.33	0.02	0.484
fruiting vs. flowering	5.21	1.12	0.54	<0.001
senescence vs. flowering	261.65	0.13	0.04	0.332
senescence vs. fruiting	277.81	0.02	0.00	0.851

Table S2: Summary of linear models for relationships between later phenophases and inter-phenophase duration, as shown in Figure 4 in the main text. Linear models were fit with the species-level mean day-of-year of the later phenological stages as the response variable, and the number of days in each previous inter-phenophase duration as the explanatory variable.

inter-phenophase model	intercept	slope	r ²	p
leafout vs. leafout-budburst	128.977	0.196	0.035	0.374
flowering vs. leafout-budburst	144.522	0.123	0.001	0.874
fruiting vs. leafout-budburst	276.477	-1.564	0.047	0.3
senescence vs. leafout-budburst	281.980	-0.151	0.004	0.763
flowering vs. flowering-leafout	129.280	1.097	0.926	<0.001
fruiting vs. flowering-leafout	245.864	1.117	0.250	0.011
senescence vs. flowering-leafout	278.627	0.134	0.034	0.381
fruiting vs. fruiting-flowering	143.556	1.018	0.740	<0.001
senescence vs. fruiting-flowering	258.294	0.191	0.242	0.013
senescence vs. senescence-fruiting	282.109	-0.082	0.047	0.296

Supplemental Figures

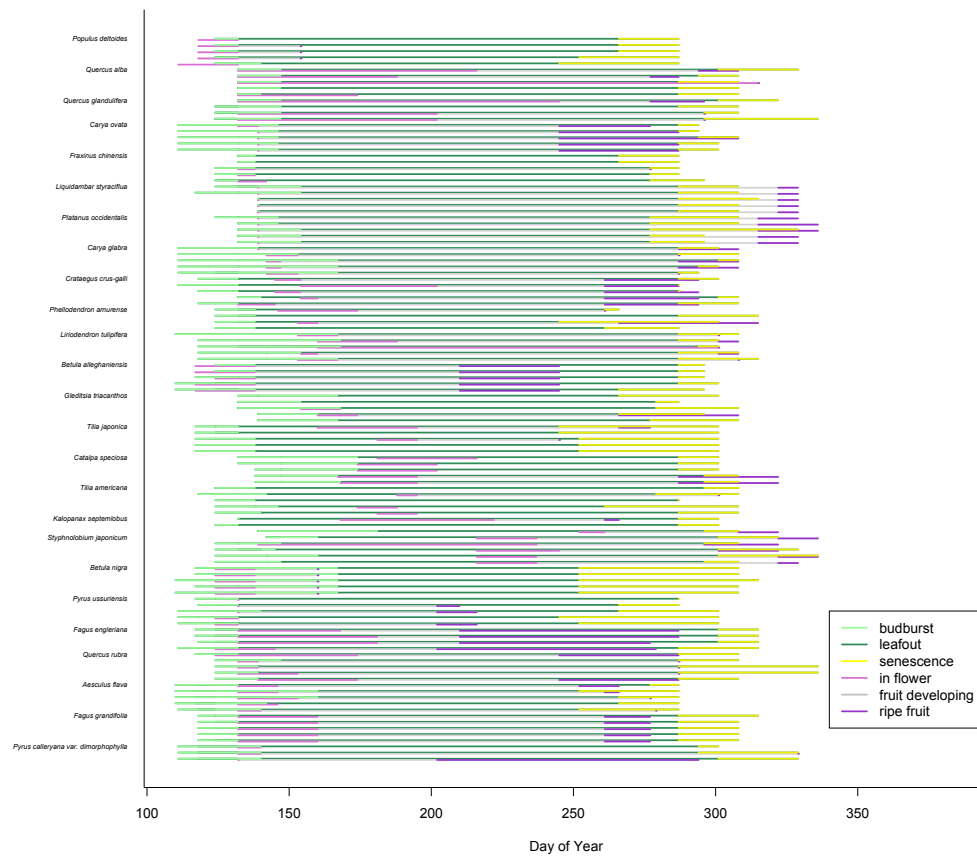


Figure S1: **Individual tree phenology during the 2015 growing season, ordered by species-level mean first-flower dates.** Growth phenology is shown for budburst (from its mean start day-of-year to the mean start day-of-year for leafout, across all individuals within a species), leafout (from the mean day-of-year when fully-expanded leaves were first observed through the start of senescence), and senescence (from the mean day-of-year when leaves first began changing color through the mean day-of-year when more than 95 percent of leaves on the tree had changed color). Reproductive phenology is shown for flowering (from the mean day-of-year when flowers first appeared to the mean day-of-year when fruits first appeared, across all individuals within a species) and fruiting (from the mean day-of-year when fruits first appeared to the mean day-of-year when more than 95 percent of fruits were first observed as ripe).