Do early phenological events constrain later phenology?

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Goal

We aim to test the extent to which previous phenological stages constrain later ones, as this is poorly understood. We plan to submit this paper as a "brief communication" at American Journal of Botany or a "rapid report" at New Phytologist.

Hypotheses

Hypothesis 1: Previous phenological events constrain later events; e.g., late-fruiting species et fruit late in the season because they leaf-out late (Figure 1).

Hypothesis 2: Inter-phenophase time constrains phenology; e.g., late-fruiting species set fruit late in the season because they require longer development time (Figure 1).

Main Messages

Main messages for Sally's thesis paper

1. Earlier phenological stages constrain later phenology (Figures 2, 3). The strongest correlations occurred between adjacent stages (e.g. leafout and budburst, fruiting and flowering). Senescence was the only phenological stage not well-correlated with an earlier phanological stage.
2. Inter-phenophase time constrains reproductive phenology (flowering and fruiting time, Figure 4). Furthmore, reprudctive phenology appears to be constrained by both earlier inter-phenophase times (e.g. time between flowering and budburst, time between fruiting and flowering) and later interphase times (e.g. time between senescence and flowering). However, growth phenology was not strongly constrained.

Figures

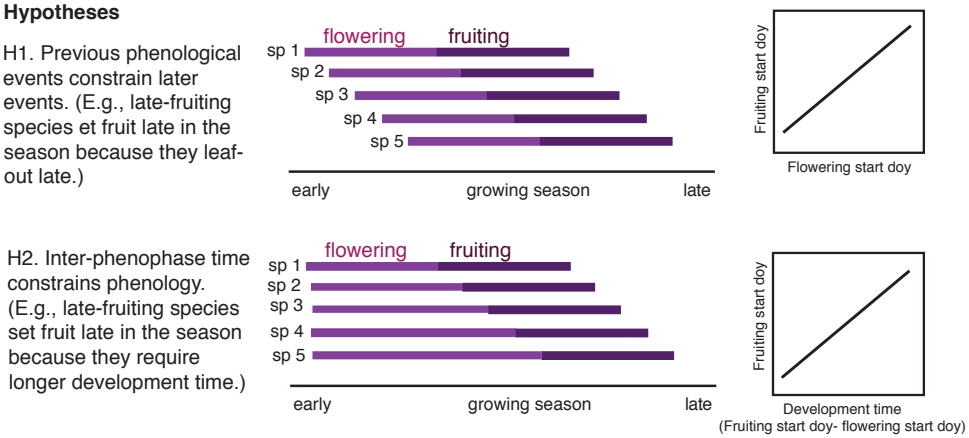

Figure 1: Hypotheses.

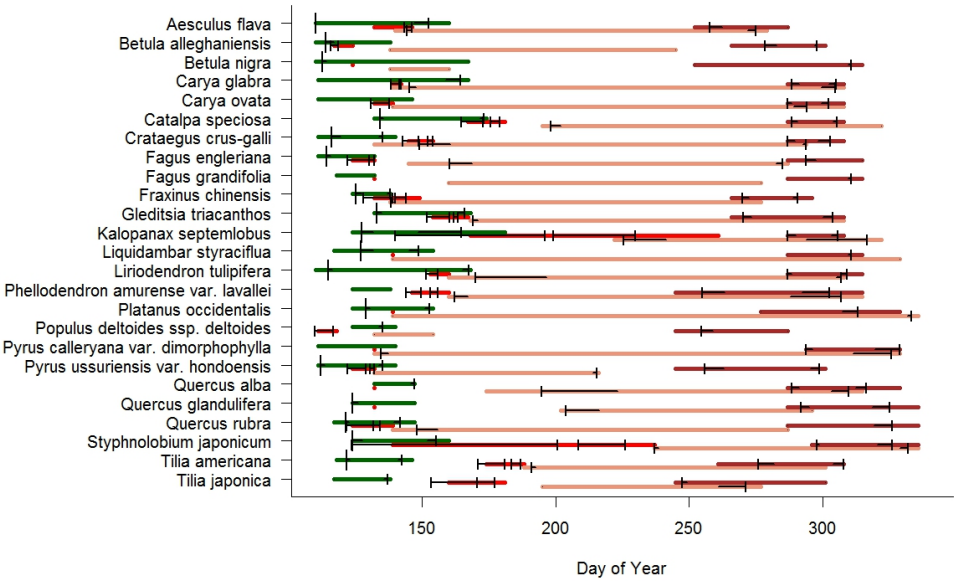

Figure 2: Focal species and their phenology.

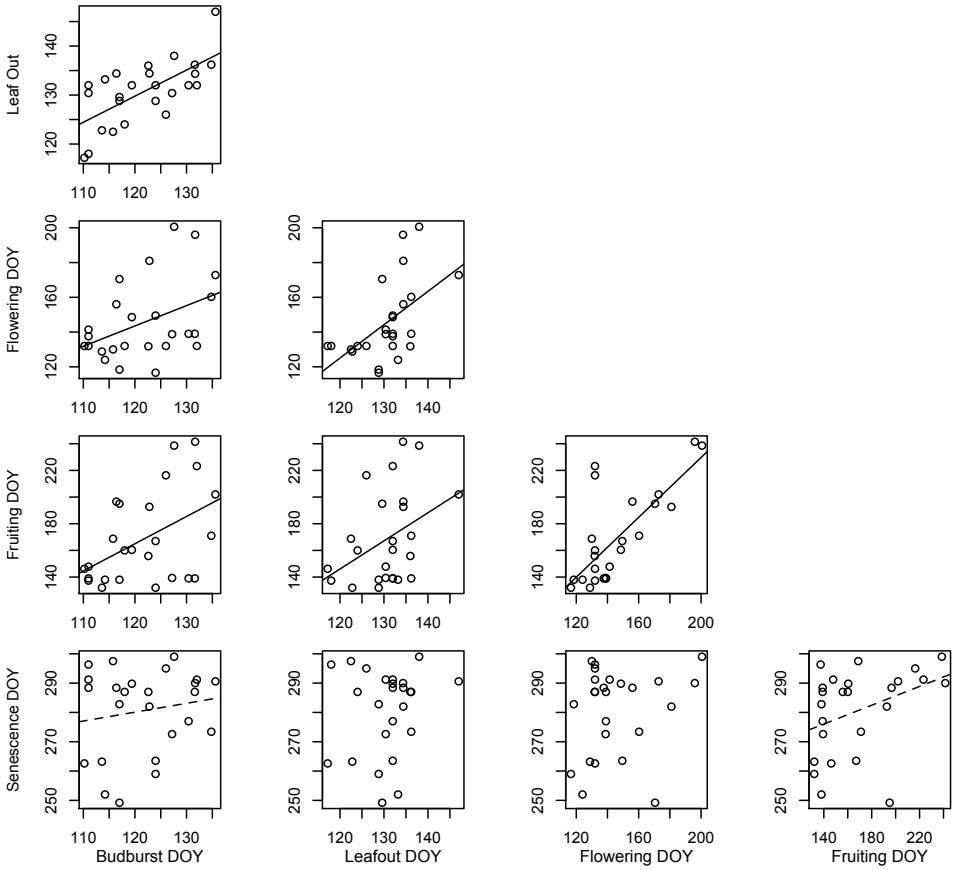

Figure 3: Earlier phenological stages constrain later stages.

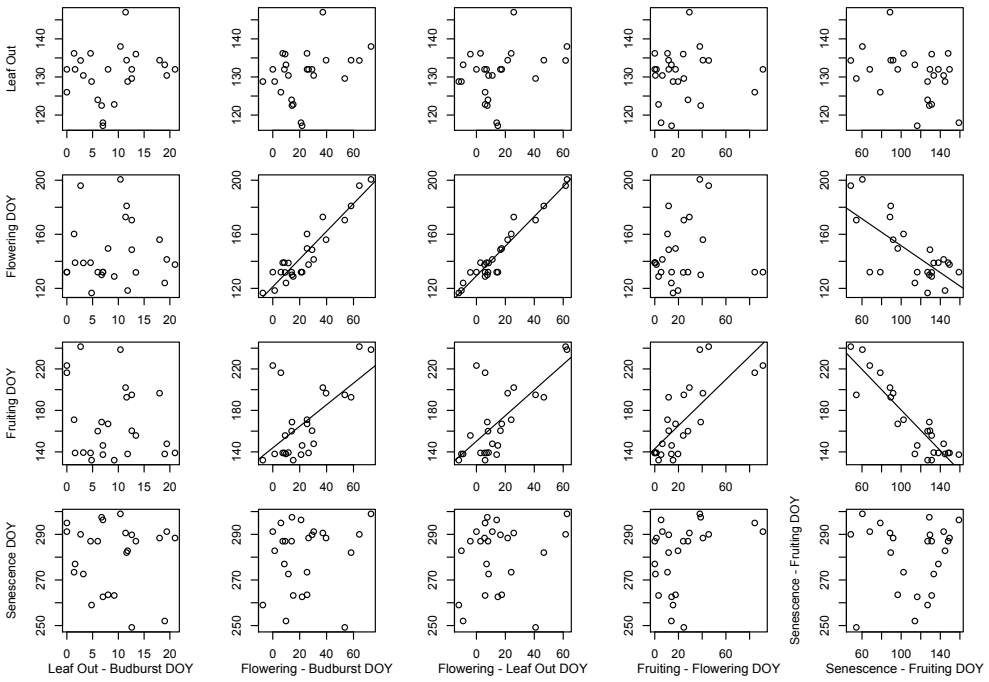

Figure 4: Reproductive phenology is constrained by inter-phenophase time.