Figure 1 – 3 example theoretical curves: bang bang and 1-2 graded

A, B, D, E, F From Wenk 2015

Make end point on D higher

(Daniel

Figure 2. Inclusion of different energy pools results in very different RA schedule shapes and magnitudes. All 4 panels plot data from the same species, but considering different energy pools: a) All vegetative materials, both new tissue investment and investment to replace shed tissues, are included in the vegetative components, while seed weight is used as a proxy for reproductive investment; b) All vegetative materials are included in the vegetative components and all tissues associated with reproduction (seed + accessory costs) are included in the reproductive investment pool; c) Investment in leaves to increase leaf mass and replacement of shed tissues is included in the vegetative component and all tissues associated with reproduction (seed + accessory costs) are included in the reproductive investment pool; d) Just investment in leaves to increase leaf mass is included in the vegetative component and all tissues associated with reproduction (seed + accessory costs) are included in the reproductive investment pool.

Aim: This is an illustrative/methodological figure to set scene for next figure with key result.



Figure 3. For each species, total reproductive investment is divided into five functionally different reproductive tissue types, investment in the seeds themselves, investment in tissues of individual flowers and fruit that form mature seeds (divided into pollen-attraction and packaging & dispersal components), and investment in tissues of flowers or fruits that fail to mature seeds (again divided into pollen-attraction and packaging & dispersal components).



**Figure 4. Panels RA schedules, calculated as a proportion of surplus energy, for the fourteen study species. The burnt orange color indicates the proportion of surplus energy to reproduction, while the pale green is the proportion of surplus energy invested in leaf area expansion. The black circles indicate data points for the individual plants assessed. Top to bottom species are sorted from shorter to longer-lived. Rows 3 versus 4 are distinguished by species that approach their maximum RA long before the end of the study sequence versus only near the end of the study sequence.

Figure 5. Maximum RA, assessed, for each study species, as the average RA of the age-class with the highest RA, correlated with a number of life history strategy dimensions, including (a) lifespan, (b) age at maturity and (c) maximum height. At the population level (accessed on each species for each age cohort) there is also a strong positive correlation between the proportion of leaves lost over the year and RA. In all plots, RA is calculated as the proportion of surplus energy as defined in the methods.

 \*\*not sure how to make some axes log and not others, other than taking log values ahead of time

Figure 6. Plant investment in reproduction (red), replacement of shed leaves (dark green), and growth of additional leaves (pale green). A sizable proportion of net production is investment in the replacement of shed leaves throughout a species’ lifespan, but in many species insufficient energy is invested to compensate for all shed tissue. For individuals where the weight of shed leaves is greater than the investment in replacement leaves, the straight line indicates the magnitude of the deficit; to fully replenish shed leaves the plant would have to exhibit the investment indicated by the top of the line, but instead invests the amount represented by the dark green dot. Investment in reproduction continues to increase with increasing plant weight. Investment in additional leaves declines quickly after reproductive maturity is reached, dropping to zero in many species.

Changes

* Daniel fix x-axis formatting (scientific notation)

Figure 7. Standing leaf biomass plateaus and even declines with increasing plant age. This trend is stronger in shorter lived species. (Color indicates age, shading from pale blue in the youngest plants, through darker blues to grey and black.)

* try without colours? No longer necessary if age on x axis – *tried and didn’t immediately like it – somehow harder to see progression*



Supp Material Figure 1. Leaf area is a superior predictor of total production than is plant weight, height or diameter.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| species | | maximum RA (based on leaf area) | | lifespan (years) | | age at maturity (years) | | embryo + endosperm weight (mg) | | maximum height (mm) | | LMA | | wood density | |
| BAER | | 0.66 | | 40 | | 7.0 | | 24.06 | | 2790 | | 0.0224 | | 0.59 | |
| BOLE | | 1.52 | | 9 | | 1.4 | | 2.10 | | 770 | | 0.0159 | | 0.86 | |
| COER | | 0.79 | | 12 | | 2.4 | | 0.69 | | 990 | | 0.0206 | | 0.79 | |
| EPMI | | 0.91 | | 40 | | 2.4 | | 0.02 | | 1370 | | 0.0122 | | 0.73 | |
| GRBU | | 1.23 | | 30 | | 5.0 | | 26.70 | | 1365 | | 0.0146 | | 0.73 | |
| GRSP | | 1.37 | | 20 | | 2.4 | | 13.48 | | 1000 | | 0.0169 | | 0.74 | |
| HATE | | 0.62 | | 40 | | 7.0 | | 8.18 | | 3005 | | 0.0516 | | 0.57 | |
| HEPU | | 1.06 | | 20 | | 1.4 | | 0.30 | | 703 | | 0.0205 | | 0.83 | |
| LEES | | 0.98 | | 40 | | 2.4 | | 0.81 | | 985 | | 0.0129 | | 0.79 | |
| PELA | | 0.62 | | 40 | | 9.0 | | 14.39 | | 2140 | | 0.0203 | | 0.67 | |
| PEPU | | 0.30 | | 40 | | 7.0 | | 2.21 | | 2010 | | 0.0297 | | 0.66 | |
| PHPH | | 1.00 | | 30 | | 2.4 | | 1.71 | | 1630 | | 0.0174 | | 0.85 | |
| PILI | | 1.26 | | 7 | | 1.4 | | 0.72 | | 542 | | 0.0086 | | 0.84 | |
| PUTU | | 1.29 | | 30 | | 2.4 | | 1.27 | | 1420 | | 0.0101 | | 0.89 | |

**Table 1.** Species means for maximum RA and a collection of demographic and functional traits. Lifespan is the approximate age at which each species disappears from the community through mortality. 40 years is indicated as the maximum age of climax species, due to the high probability that are killed by fire by this age. Age at maturity is the site age at which the majority of individuals of a species begin reproducing. Embryo-endosperm weight, LMA, and wood density are all measured on a collection of other individuals at nearby locations. Maximum height is the height of the tallest individual in this study. *(Will change RA to use different metric.)*