

Table 4.S1: Sample sizes and experiment schedule for the greenhouse experiment evaluating responses to herbivory over two seasons. We exposed conducted herbivory exposures throughout the life cycle of half of plants to simulate herbivory in the field. We monitored plants for damage by herbivores, reproduction, fecundity, specific leaf area, day of flowering and height at flowering.

| Maternal generation | | | | | | |
|---------------------|---------------------|--------------------------------------|--------------------------------------|---------------------|--------------------------------------|--------------------------------------|
| Treatment | Maternal: Herbivory | | | Maternal: Naïve | | |
| | Individuals planted | Individuals reproduced in season one | Individuals reproduced in season two | Individuals planted | Individuals reproduced in season one | Individuals reproduced in season two |
| Herbivory | 210 | 8 | 105 | 144 | 19 | 28 |
| Naïve | 183 | 10 | 111 | 140 | 52 | 72 |

| Offspring generation | | | | | | |
|-----------------------|---------------------|--------------------------------------|--------------------------------------|---------------------|--------------------------------------|--------------------------------------|
| Offspring Environment | Maternal: Herbivory | | | Maternal: Naïve | | |
| | Individuals planted | Individuals reproduced in season one | Individuals reproduced in season two | Individuals planted | Individuals reproduced in season one | Individuals reproduced in season two |
| Herbivory | 136 | 15 | 35 | 144 | 19 | 28 |
| Naïve | 125 | 56 | 62 | 140 | 52 | 72 |

| Accession | Family | Latitude | Longitude | Elevation (m) | Maternal environment | Herbivore | | Naïve | |
|-----------|--------|------------|------------|---------------|-----------------------|-----------|-------|-----------|-------|
| | | | | | Offspring environment | Herbivore | Naïve | Herbivore | Naïve |
| 209_5A | 209 | 38.8702642 | -106.95197 | 2721 | | 8 | 9 | 10 | 10 |
| 256_1H | 256 | 38.8664167 | -106.91277 | 2735 | | 7 | 6 | 9 | 8 |
| 269_17A | 269 | 38.9197667 | -107.0348 | 2800 | | 5 | 5 | 6 | 5 |
| 68_1 | 68 | 38.9609 | -106.99268 | 2904 | | 6 | 5 | 6 | 5 |
| 91_2 | 91 | 38.9535167 | -106.99242 | 2910 | | 10 | 10 | 11 | 10 |
| 63_8 | 63 | 38.9880833 | -107.00797 | 2960 | | 11 | 10 | 4 | 3 |
| 60_4 | 60 | 38.9879833 | -107.01202 | 2977 | | 8 | 8 | 6 | 7 |
| 154_1 | 154 | 38.9942333 | -107.01468 | 2992 | | 10 | 10 | 9 | 8 |
| 98_7 | 98 | 38.9668333 | -106.98967 | 3011 | | 9 | 7 | 7 | 5 |
| 162_2B | 162 | 39.0003667 | -107.0231 | 3055 | | 5 | 5 | 9 | 7 |
| 194_3 | 194 | 38.9906 | -107.01967 | 3108 | | 7 | 8 | 9 | 9 |
| 250_16A | 250 | 39.0391 | -107.06363 | 3133 | | 11 | 10 | 6 | 7 |
| 170_2 | 170 | 39.0054833 | -107.03448 | 3168 | | 7 | 8 | 8 | 7 |
| 180_5 | 180 | 39.0038333 | -107.00722 | 3249 | | 6 | 6 | 10 | 10 |
| 174_2 | 174 | 39.0141833 | -107.04542 | 3252 | | 7 | 7 | 6 | 6 |
| 185_2A | 185 | 39.0113833 | -107.03395 | 3411 | | 5 | 5 | 4 | 5 |
| 302_9A | 302 | 39.0266667 | -107.08694 | 3511 | | 12 | 10 | 6 | 5 |
| 198_1 | 198 | 39.0129167 | -106.94635 | 3623 | | 4 | 5 | 3 | 3 |
| 304_19A | 304 | 39.0211111 | -107.09333 | 3673 | | 4 | 5 | 6 | 5 |

| | | Event | Maternal generation | Offspring generation |
|---------------------|---|----------------------------------|-------------------------------|-------------------------------|
| | | Duration of initial plant growth | 11/20/19 – 1/26/20 9 weeks | 2/1/21 – 3/31/21 8 weeks |
| | | Duration of first vernalization | 2/14/20 – 3/27/20 6 weeks | 4/28/21 – 7/9/21 10 weeks |
| | | Duration of second vernalization | 6/3/20 – 8/12/20 10 weeks | 1/18/22 – 3/29/22 10 weeks |
| | | Season | | |
| Herbivore exposures | 1 | 1 | 1/27/20 6 hours | 4/1/2021 6 hours |
| | 1 | 1 | 3/30/20 24 hours | 4/22/2021 6 hours |
| | 2 | 2 | 4/28/20 48 hours | 7/12/2021 72 hours |
| | 2 | 2 | 5/12/20 48 hours | 8/1/2021 48 hours |
| | 2 | 2 | NA | 11/11/2021 48 hours |
| | 3 | 3 | NA | 4/5/2022 48 hours |
| | 3 | 3 | NA | 4/27/2022 48 hours |

Table 4.S2: Analysis of variation of leaf area removed in response to offspring environment and maternal environment: We collected data on herbivory for every plant for three seasons. Significant odds ratios are in bold typeface. We analyzed herbivory as a function of source elevation, offspring and maternal environment and season using a generalized linear model with a beta distribution with a log link (function *gamlss*, R package *gamlss* ver. 5.4-20, Rigby & Stasinopoulos). Significant effects are in bold typeface.

| | χ^2 | Std Error | t-value | Pr(> t) |
|--|----------|-----------|---------|----------|
| Source elevation | -0.21 | 0.08 | -2.84 | 0.00463 |
| treatmentNaïve | -2.05 | 0.11 | -18.81 | <0.0001 |
| mat_treatNaïve | -0.02 | 0.09 | -0.28 | 0.78 |
| Season2 | 1.40 | 0.07 | 20.01 | <0.0001 |
| Season3 | -0.12 | 0.08 | -1.48 | 0.14 |
| S_elev:treatmentNaïve | 0.17 | 0.12 | 1.38 | 0.17 |
| S_elev:mat_treatNaïve | 0.27 | 0.10 | 2.61 | 0.0091 |
| treatmentNaïve:mat_treatNaïve | 0.04 | 0.15 | 0.29 | 0.77 |
| S_elev:Season2 | 0.32 | 0.08 | 3.91 | <0.0001 |
| S_elev:Season3 | 0.19 | 0.09 | 2.01 | 0.0441 |
| treatmentNaïve:Season2 | -1.39 | 0.12 | -11.27 | <0.0001 |
| treatmentNaïve:Season3 | 0.32 | 0.15 | 2.12 | 0.0342 |
| mat_treatNaïve:Season2 | 0.13 | 0.10 | 1.31 | 0.19 |
| mat_treatNaïve:Season3 | 0.06 | 0.12 | 0.48 | 0.63 |
| S_elev:treatmentNaïve:mat_treatNaïve | -0.25 | 0.16 | -1.53 | 0.13 |
| S_elev:treatmentNaïve:Season2 | -0.25 | 0.14 | -1.87 | 0.06 |
| S_elev:treatmentNaïve:Season3 | -0.18 | 0.17 | -1.11 | 0.27 |
| S_elev:mat_treatNaïve:Season2 | -0.22 | 0.11 | -1.99 | 0.0466 |
| S_elev:mat_treatNaïve:Season3 | -0.12 | 0.13 | -0.95 | 0.34 |
| treatmentNaïve:mat_treatNaïve:Season2 | -0.16 | 0.17 | -0.92 | 0.35 |
| treatmentNaïve:mat_treatNaïve:Season3 | -0.07 | 0.21 | -0.32 | 0.74 |
| S_elev:treatmentNaïve:mat_treatNaïve:Season2 | 0.20 | 0.18 | 1.07 | 0.28 |
| S_elev:treatmentNaïve:mat_treatNaïve:Season3 | 0.14 | 0.23 | 0.62 | 0.53 |

Table 4.S2b: Odds ratios for the effect of source elevation on foliar damage by insects under each simulated season. Odds ratios <1 indicate that herbivory declined with source elevation and odds ratios >1 indicate that herbivory increased with source elevation (as predicted). Regression relationships are shown in Fig. 2A.

| Maternal Environment | Offspring Environment | Season | Odds ratio | 95% CI, lower | 95% CI, upper |
|----------------------|-----------------------|--------|------------|---------------|---------------|
| Herbivory | Herbivory | 1 | 0.81 | 0.70 | 0.94 |
| Herbivory | Naïve | 1 | 1.04 | 0.93 | 1.50 |
| Naïve | Herbivory | 1 | 1.15 | 1.07 | 1.59 |
| Naïve | Naïve | 1 | 1.06 | 0.96 | 1.50 |
| Herbivory | Herbivory | 2 | 1.21 | 1.17 | 1.62 |
| Herbivory | Naïve | 2 | 1.11 | 1.05 | 1.51 |
| Naïve | Herbivory | 2 | 1.27 | 1.23 | 1.69 |
| Naïve | Naïve | 2 | 1.10 | 1.05 | 1.49 |
| Herbivory | Herbivory | 3 | 1.07 | 1.01 | 1.45 |
| Herbivory | Naïve | 3 | 1.05 | 0.93 | 1.51 |
| Naïve | Herbivory | 3 | 1.23 | 1.15 | 1.68 |
| Naïve | Naïve | 3 | 1.08 | 0.97 | 1.54 |

Table 4.S3: Analysis of variation of specific leaf area in response to source elevation and offspring and maternal environment: We analyzed specific leaf area as a function of source elevation, maternal environment and offspring environment using a generalized linear model with a log normal distribution with a log link (function *glmmTMB*, R package *glmmTMB* ver. 1.1.4, Brooks et al., 2017). We determined significance of fixed effects using Type III Sums of Squares (function *Anova*, R package *car* ver. 3.0-12, Fox & Weisburg, 2019). Significant effects are in bold typeface.

| | χ^2 | DF | p-value |
|--|----------|----|---------|
| Source elevation | 1.09 | 1 | 0.30 |
| Maternal environment | 1.19 | 1 | 0.27 |
| Offspring environment | 16.38 | 1 | <0.0001 |
| Season | 267.20 | 1 | <0.0001 |
| Source elevation \times Maternal environment | 1.66 | 1 | 0.20 |
| Source elevation \times Offspring environment | 0.39 | 1 | 0.53 |
| Maternal environment \times Offspring environment | 0.64 | 1 | 0.42 |
| Source elevation \times Maternal environment \times Offspring environment | 0.29 | 1 | 0.59 |
| Random Effects | | | |
| Plant Identifier | 0.08 | 1 | 0.77 |
| Accession | 225.48 | 1 | <0.0001 |
| Block | 78.086 | 1 | <0.0001 |

Table 4.S4: Analysis of variation of day of first flowering in response to offspring environment and maternal environment: We analyzed day of first flowering as a function of source elevation, maternal environment, offspring environment and season using a generalized linear model with a log normal distribution with a log link (function *glmmTMB*, R package *glmmTMB* ver. 1.1.4, Brooks et al., 2017). We determined significance of fixed effects using Type III Sums of Squares (function *Anova*, R package *car* ver. 3.0-12, Fox & Weisburg, 2019). Significant effects are in bold typeface.

| | χ^2 | DF | p-value |
|---|----------|----|---------|
| Source elevation | 0.43 | 1 | 0.51 |
| Maternal environment | 2.93 | 1 | 0.08 |
| Offspring environment | 8.24 | 1 | 0.0041 |
| Season | 151.28 | 1 | <0.0001 |
| Source elevation \times Maternal environment | 0.65 | 1 | 0.42 |
| Source elevation \times Offspring environment | 0.36 | 1 | 0.55 |
| Source elevation \times Season | 0.33 | 1 | 0.57 |
| Maternal environment \times Offspring environment | 3.79 | 1 | 0.05 |
| Maternal environment \times Season | 0.87 | 1 | 0.35 |
| Offspring environment \times Season | 6.87 | 1 | 0.0087 |
| Source elevation \times Maternal environment \times Offspring environment | 0.81 | 1 | 0.37 |
| Source elevation \times Maternal environment \times Season | 0.18 | 1 | 0.67 |
| Source elevation \times Offspring environment \times Season | 0.26 | 1 | 0.61 |
| Maternal environment \times Offspring environment \times Season | 1.31 | 1 | 0.25 |
| Source elevation \times Maternal environment \times Offspring environment \times Season | 0.231 | 1 | 0.63 |
| Random Effects | | | |
| Plant Identifier | 0 | 1 | 1 |
| Accession | 0.12 | 1 | 0.73 |
| Block | 4.71 | 1 | 0.03 |

Table 4.S5: Analysis of plasticity and clines of tallest stem at first flowering in response to offspring environment and maternal environment: We analyzed specific leaf area as a function of source elevation, watering and environment and year using a generalized linear model with a log normal distribution with a log link (function *glmmTMB*, R package *glmmTMB* ver. 1.1.4, Brooks et al., 2017). We determined significance of fixed effects using Type III Sums of Squares (function *Anova*, R package *car* ver. 3.0-12, Fox & Weisburg, 2019). Significant effects are in bold typeface.

| | χ^2 | DF | p-value |
|--|----------|----|---------|
| Source elevation | 3.19 | 1 | 0.07 |
| Maternal environment | 1.24 | 1 | 0.27 |
| Offspring environment | 11.29 | 1 | 0.0007 |
| Season | 140.84 | 1 | <0.0001 |
| Source elevation \times Maternal environment | 0.41 | 1 | 0.52 |
| Source elevation \times Offspring environment | 0.003 | 1 | 0.95 |
| Maternal environment \times Offspring environment | 3.14 | 1 | 0.07 |
| Source elevation \times Maternal environment \times Offspring environment | 2.62 | 1 | 0.11 |
| Random Effects | | | |
| Plant Identifier | 0 | 1 | 1 |
| Accession | 34.04 | 1 | <0.0001 |
| Block | 12.02 | 1 | 0.0005 |

Table 4.S6: Analysis of probability of reproduction in response to offspring environment and maternal environment: We analyzed the probability of reproduction as a function of source elevation, watering and environment and year using a generalized linear model with a log normal distribution with a log link (function *glmmTMB*, R package *glmmTMB* ver. 1.1.4, Brooks et al., 2017). We included initial size as a covariate to account for size differences between the individuals at planting. We determined significance of fixed effects using Type III Sums of Squares (function *Anova*, R package *car* ver. 3.0-12, Fox & Weisburg, 2019). Significant effects are in bold typeface.

| | χ^2 | DF | p-value |
|--|----------|----|---------|
| Source elevation | 0.72 | 1 | 0.39 |
| Maternal environment | 0.77 | 1 | 0.38 |
| Offspring environment | 47.10 | 1 | <0.0001 |
| Season | 23.83 | 1 | <0.0001 |
| Source elevation \times Maternal environment | 1.78 | 1 | 0.18 |
| Source elevation \times Offspring environment | 0.06 | 1 | 0.81 |
| Maternal environment \times Offspring environment | 4.66 | 1 | 0.03 |
| Source elevation \times Maternal environment \times Offspring environment | 0.0002 | 1 | 0.98 |
| Initial size | 17.13 | 1 | <0.0001 |
| Random Effects | | | |
| Plant Identifier | 0 | 1 | 1 |
| Accession | 41.878 | 1 | <0.0001 |
| Block | 1.09 | 1 | 0.29 |

Table 4.S7: Analysis of fecundity in response to offspring environment and maternal environment: We analyzed fecundity (Summed length of mature fruits) as a function of source elevation, maternal environment, offspring environment, and season using a generalized linear model with a gamma distribution with a log link (function glmmTMB, R package glmmTMB ver. 1.1.4, Brooks et al., 2017). We included initial size as a covariate to account for size differences between the individuals at the start of the experiment. We determined significance of fixed effects using Type III Sums of Squares (function Anova, R package car ver. 3.0-12, Fox & Weisburg, 2019). After correcting for multiple tests, offspring environment was not significant.

| | χ^2 | DF | p-value |
|--|----------|----|---------|
| Source elevation | 1.31 | 1 | 0.25 |
| Maternal environment | 0.31 | 1 | 0.58 |
| Offspring environment | 4.37 | 1 | 0.0365 |
| Season | 0.17 | 1 | 0.68 |
| Source elevation \times Maternal environment | 1.39 | 1 | 0.24 |
| Source elevation \times Offspring environment | 0.36 | 1 | 0.54 |
| Maternal environment \times Offspring environment | 0.61 | 1 | 0.43 |
| Source elevation \times Maternal environment \times Offspring environment | 2.37 | 1 | 0.12 |
| Initial size | 0.69 | 1 | 0.40 |
| Random Effects | | | |
| Plant Identifier | 0 | 1 | 1 |
| Accession | 25.16 | 1 | <0.0001 |
| Block | 0 | 1 | 1 |

Table 4.S8: Selection analysis using probability of reproduction: We analyzed how leaf damage averaged across all censuses within a season and specific leaf area influences the probability of reproduction using a generalized linear model with a binomial distribution with a log link (function `glmmTMB`, R package *glmmTMB*, Brooks et al. 2017). We included initial size as a covariate to account for size differences between the individuals at planting. We determined significance of fixed effects using Type III Sums of Squares (function `Anova`, R package *car*, Fox & Weisburg, 2019). Significant effects are in bold typeface. We used an adjusted alpha of 0.025 (0.05/2) to assess significance and account for analyses of selection via two fitness components.

| | χ^2 | DF | p-value |
|---|----------|----|---------|
| Initial size | 12.41 | 1 | <0.0001 |
| Offspring environment | 12.20 | 1 | 0.0265 |
| Maternal environment | 4.92 | 1 | 0.27 |
| Season | 1.20 | 1 | 0.39 |
| Leaf area removed | 0.75 | 1 | 0.14 |
| Specific leaf area | 2.14 | 1 | 0.0117 |
| Maternal environment \times Offspring environment | 6.35 | 1 | 0.18 |
| Offspring environment \times Season | 1.84 | 1 | 0.37 |
| Maternal environment \times Season | 0.80 | 1 | 0.82 |
| Offspring environment \times Leaf area removed | 0.05 | 1 | 0.0189 |
| Maternal environment \times Leaf area removed | 5.51 | 1 | 0.37 |
| Offspring environment \times Specific leaf area | 0.81 | 1 | 0.24 |
| Maternal environment \times Specific leaf area | 1.41 | 1 | 0.18 |
| Offspring environment \times Maternal environment \times Season | 1.84 | 1 | 0.97 |
| Offspring environment \times Maternal environment \times Leaf area removed | 0.0014 | 1 | 0.07 |
| Offspring environment \times Maternal environment \times Specific leaf area | 3.33 | 1 | 0.22 |
| Random effects | | | |
| Plant ID | 0 | 1 | 1 |
| Accession | 71.33 | 1 | <0.0001 |
| Block | 6.40 | 1 | 0.0114 |

Table 4.S9: Selection analysis using fecundity: We analyzed how leaf damage averaged across all censuses within a year, specific leaf area, flowering phenology and tallest bolt at flowering influences fecundity using a generalized linear model with a gamma distribution with a log link (function `glmmTMB`, R package *glmmTMB*). We included initial size as a covariate to account for size differences between the individuals at planting. We determined significance of fixed effects using Type III Sums of Squares (function `Anova`, R package *car*, Fox & Weisburg, 2019). Significant effects are in bold typeface. We used an adjusted alpha of 0.025 (0.05/2) to assess significance and account for analyses of selection via two fitness components.

| | χ^2 | DF | p-value |
|---|----------|----|---------|
| Initial size | 2.08 | 1 | 0.15 |
| Offspring environment | 0.25 | 1 | 0.61 |
| Maternal environment | 2.94 | 1 | 0.09 |
| Season | 1.18 | 1 | 0.27 |
| Specific leaf area | 3.53 | 1 | 0.06 |
| Leaf area removed | 2.13 | 1 | 0.14 |
| Flowering time | 0.22 | 1 | 0.63 |
| Tallest stem at flowering | 5.80 | 1 | 0.0160 |
| Offspring environment \times Maternal environment | 3.94 | 1 | 0.0472 |
| Offspring environment \times Season | 0.44 | 1 | 0.51 |
| Maternal environment \times Season | 2.88 | 1 | 0.09 |
| Offspring environment \times Specific leaf area | 6.13 | 1 | 0.0133 |
| Maternal environment \times Specific leaf area | 0.02 | 1 | 0.89 |
| Offspring environment \times Leaf area removed | 0.30 | 1 | 0.58 |
| Maternal environment \times Leaf area removed | 0 | 1 | 0.99 |
| Offspring environment \times Flowering time | 0.11 | 1 | 0.74 |
| Maternal environment \times Flowering time | 4.28 | 1 | 0.0384 |
| Offspring environment \times Tallest stem at flowering | 0.65 | 1 | 0.42 |
| Maternal environment \times Tallest stem at flowering | 0.12 | 1 | 0.73 |
| Offspring environment \times Maternal environment \times Season | 5.01 | 1 | 0.0251 |
| Offspring environment \times Maternal environment \times Specific leaf area | 0.004 | 1 | 0.95 |

| | | | |
|--|------|---|---------|
| Offspring environment × Maternal environment × Leaf area removed | 0.25 | 1 | 0.62 |
| Offspring environment × Maternal environment × Flowering time | 7.64 | 1 | 0.0057 |
| Offspring environment × Maternal environment × Tallest stem at flowering | 0.47 | 1 | 0.49 |
| Random effects | | | |
| Plant ID | 0 | 0 | <0.0001 |
| Accession | 0 | 0 | 1 |
| Block | 0 | 0 | 1 |

Table 4.S9b: Coefficients for fecundity selection on Specific leaf area and flowering phenology. We extracted coefficients and confidence intervals using the *emmeans* R package ver. 1.8.8 (Lenth et al. 2023). Bold values indicate significant relationships between fecundity and trait values

| Trait | Maternal environment | Offspring environment | coeff | SE | Exp beta | 95% CI, lower | 95% CI, higher |
|---------------------|----------------------|-----------------------|-------|------|----------|---------------|----------------|
| Specific leaf area | | Herbivory | 0.17 | 0.06 | 1.19 | 1.05 | 1.35 |
| Specific leaf area | | Naïve | -0.09 | 0.04 | 0.92 | 0.84 | 0.99 |
| Flowering phenology | Herbivory | Herbivory | 0.08 | 0.18 | 1.09 | 0.77 | 1.54 |
| Flowering phenology | Herbivory | Naïve | 0.01 | 0.14 | 1.01 | 0.77 | 1.32 |
| Flowering phenology | Naïve | Herbivory | -0.39 | 0.14 | 0.68 | 0.52 | 0.90 |
| Flowering phenology | Naïve | Naïve | 0.38 | 0.15 | 1.47 | 1.09 | 1.98 |