**TGP**

**WGP**

**Weird parental effect**

**Table 3. trait ~ ot + pt + ot:pt + (1|pop)**

**GROWTH - root biomass**

OT: Drought reduces root biomass.

PT: No effect.

OT x PT: No effect.

* Drought stress in the offspring generation directly reduced root biomass. There is no transgenerational effect.

**GROWTH - shoot biomass**

OT: Drought reduces shoot biomass.

PT: No effect.

OT: No effect.

* Drought in the offspring generation directly reduces shoot biomass. There is no transgenerational effect.

**GROWTH - total biomass**

OT: Drought reduces total biomass.

PT: Parental drought may weakly enhance offspring total biomass (marginal effect).

OT x PT: No effect.

* Drought stress strongly reduces overall plant biomass, but parental exposure to drought may weakly improve offspring biomass.

**GROWTH - max height**

OT: No effect.

PT: No effect.

OT x PT: No effect.

* Drought does not affect plant height.

**RESOURCE ALLOCATION - R:S ratio**

OT: Drought increases R:S ratio.

PT: No effect.

OT x PT: No effect.

* Drought in offspring generation shifts resource allocation towards roots. There is no transgenerational effect.

**RESOURCE ALLOCATION - RGR**

OT: Drought reduces growth rate.

PT: No effect.

OT x PT: No effect.

* Drought in the offspring generation reduces growth rates. There is no transgenerational effect.

**RESOURCE ALLOCATION - SLA**

OT: No effect.

PT: No effect.

OT x PT: No effect.

* Drought does not affect SLA.

**RESOURCE ALLOCATION - LDMC**

OT: Drought increases LDMC.

PT: No effect.

OT x PT: No effect.

* Drought in the offspring generation increases LDMC, indicating thicker or denser leaves. There is no transgenerational effect.

**SURVIVAL - mortality**

OT: No effect.

PT: No effect.

OT x PT: No effect.

* Drought does not affect mortality.

**REPRODUCTION - Days to flower**

OT: No effect.

PT: No effect.

OT x PT: No effect.

* Drought does not affect the timing of flowering.

**REPRODUCTION - Flowering status**

OT: Drought in the offspring generation reduces the likelihood of flowering.

PT: Drought in the parental generation increases the likelihood of offspring flowering.

OT x PT: No effect.

* Drought in the offspring generation reduces flowering, but parental exposure to drought increases the likelihood of flowering in offspring, suggesting a transgenerational effect to increase reproductive success when parents experience drought.

**REPRODUCTION - Number of structures per plant**

OT: Drought in the offspring generation reduces the number of flowering structures

PT: No effect.

OT x PT: No effect.

* Drought in the offspring generation directly reduces flower production. There is no transgenerational effect.

**TGP - REPRODUCTION - Seed number**

OT: Drought in the offspring generation reduces seed number.

PT: No effect.

OT x PT: Negative effect – parental drought exacerbates the negative effect of offspring drought on seed number.

* Drought directly reduces seed number, and parental exposure to drought exacerbates this effect, indicating negative transgenerational plasticity.

**TGP - REPRODUCTION - Seed mass**

OT: Drought in the offspring generation reduces seed mass.

PT: No effect.

OT x PT: Negative effect – parental drought exacerbates the negative effect of offspring drought on seed mass.

* Drought directly reduces seed mass, and parental exposure to drought further exacerbates this effect, indicating negative transgenerational plasticity.

Overall, drought in the offspring generation consistently reduces biomass (root, shoot, total), growth rates (RGR), and reproductive output (flowering, seed mass, seed number). It increases root to shoot ratio and LDMC, reflecting adaptive responses to water stress.

Parental exposure to drought weakly enhances total biomass in offspring. It also increases the likelihood of flowering, suggesting transgenerational effect for reproductive success.

There is little evidence for transgenerational plasticity across all populations, but when present (seed mass, seed number), they indicate negative transgenerational effects, where parental drought exacerbates the negative impacts of offspring drought. Next, we will ask if an environmental characteristic of the seed source location modulates this response.

**TGP**

**WGP**

**Weird parental effect**

**Table 4. trait ~ ot \* pt \* spring-vpd-CV + (1|pop)**

**GROWTH - root biomass**

OT: Drought in offspring generation reduces root biomass.

PT: Parental drought may weakly enhance root biomass (marginal effect).

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV: Negative interaction; transgenerational plasticity response for root biomass depends on VPD variability.

**GROWTH - shoot biomass**

OT: Drought in offspring generation reduces shoot biomass.

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV: Drought effect on shoot biomass depends on VPD variability.

PT x sVPD-CV:

OT x PT x sVPD-CV:

**GROWTH - total biomass**

OT: Drought in offspring generation reduces total biomass.

PT: Parental drought may slightly increase total biomass (marginal effect)

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV: Marginally significant; transgenerational plasticity response depends on VPD variability.

**GROWTH - max height**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV: Significant positive effect; parental drought effect on maximum height depends on VPD variability.

OT x PT x sVPD-CV:

**RESOURCE ALLOCATION - R:S ratio**

OT: Drought increases root to shoot ratio

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV: Marginally significant negative effect. Transgenerational plasticity for RS ratio may depend on VPD variability.

**RESOURCE ALLOCATION – RGR**

OT: Drought reduces growth rate

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV: Negative effect. Transgenerational plasticity for growth rate depends on VPD variability.

**RESOURCE ALLOCATION – SLA**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV:

**RESOURCE ALLOCATION – LDMC**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV:

**SURVIVAL – mortality**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV: Marginally significant positive effects. Parental drought effect on mortality may depend on VPD variability.

OT x PT x sVPD-CV:

**REPRODUCTION - Days to flower**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV:

**REPRODUCTION - Flowering status**

OT: Drought in offspring generation reduces flowering.

PT: Parental drought increases flowering.

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV: Parental drought effect on flowering depends on VPD variability.

OT x PT x sVPD-CV: Marginally significant negative effect. Transgenerational plasticity for flowering may depend on VPD variability.

**REPRODUCTION - Number of structures per plant**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV:

**REPRODUCTION - Seed mass**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV:

**REPRODUCTION - Seed number**

OT:

PT:

sVPD-CV:

OT x PT:

OT x sVPD-CV:

PT x sVPD-CV:

OT x PT x sVPD-CV: