Effects of herbivory and rainfall on intraspecific variation in herbaceous species

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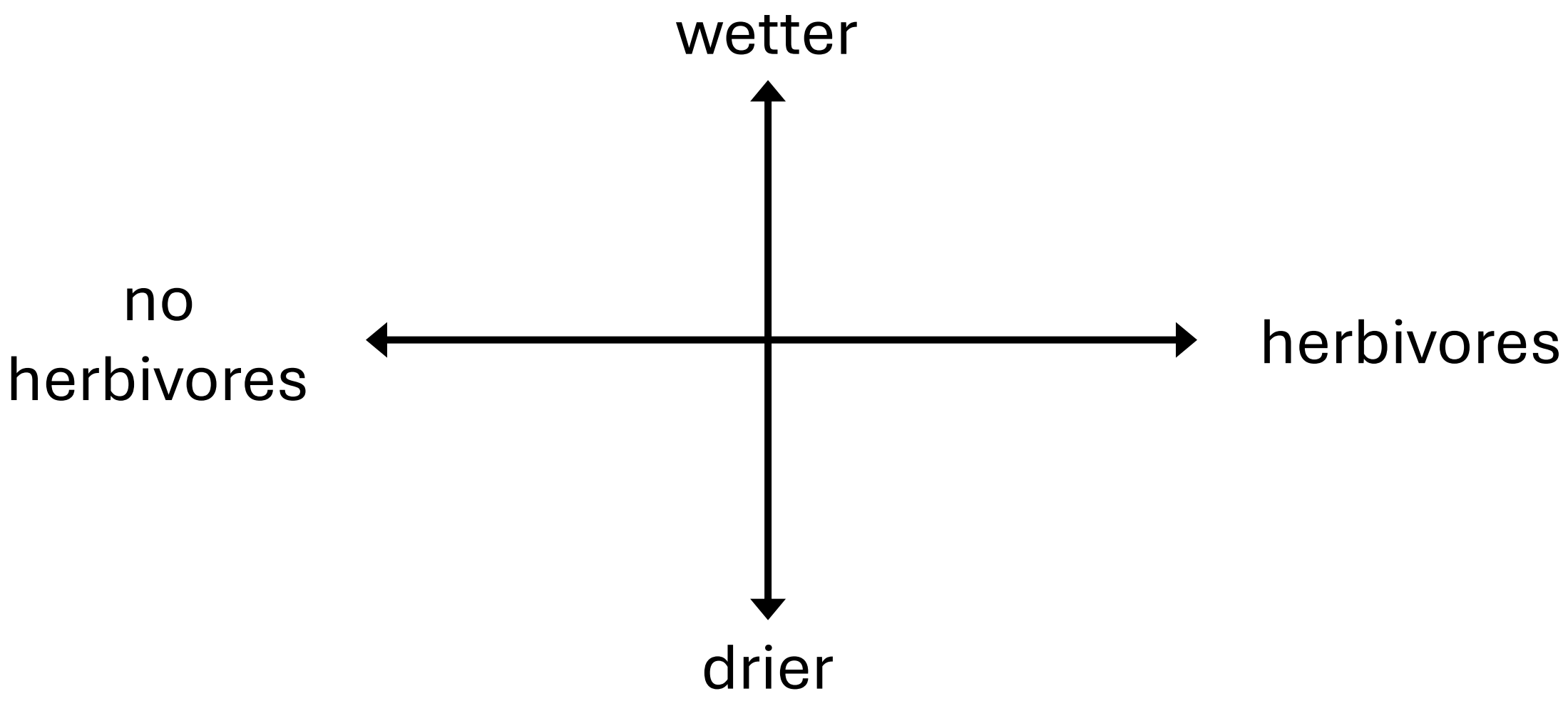
Plant functional traits shift across environmental gradients.



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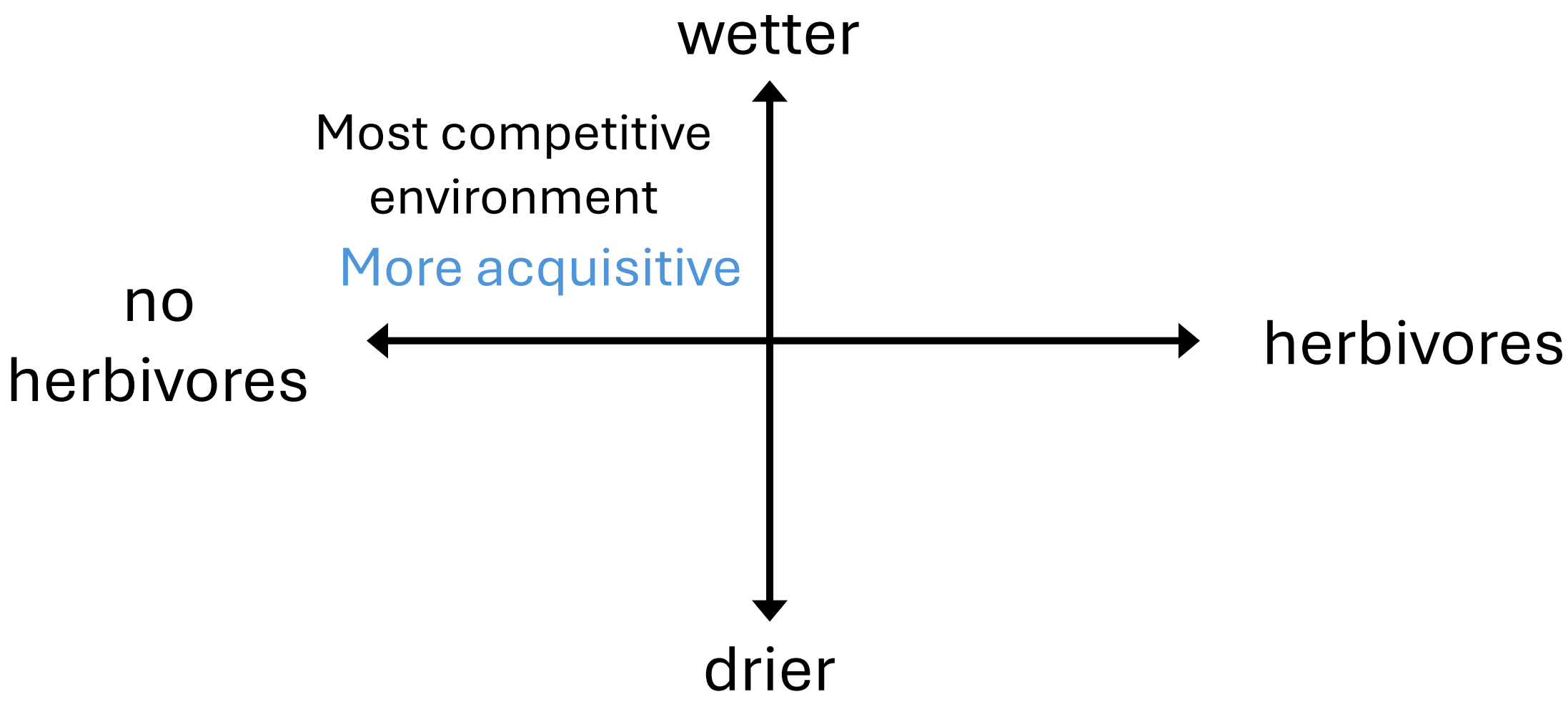
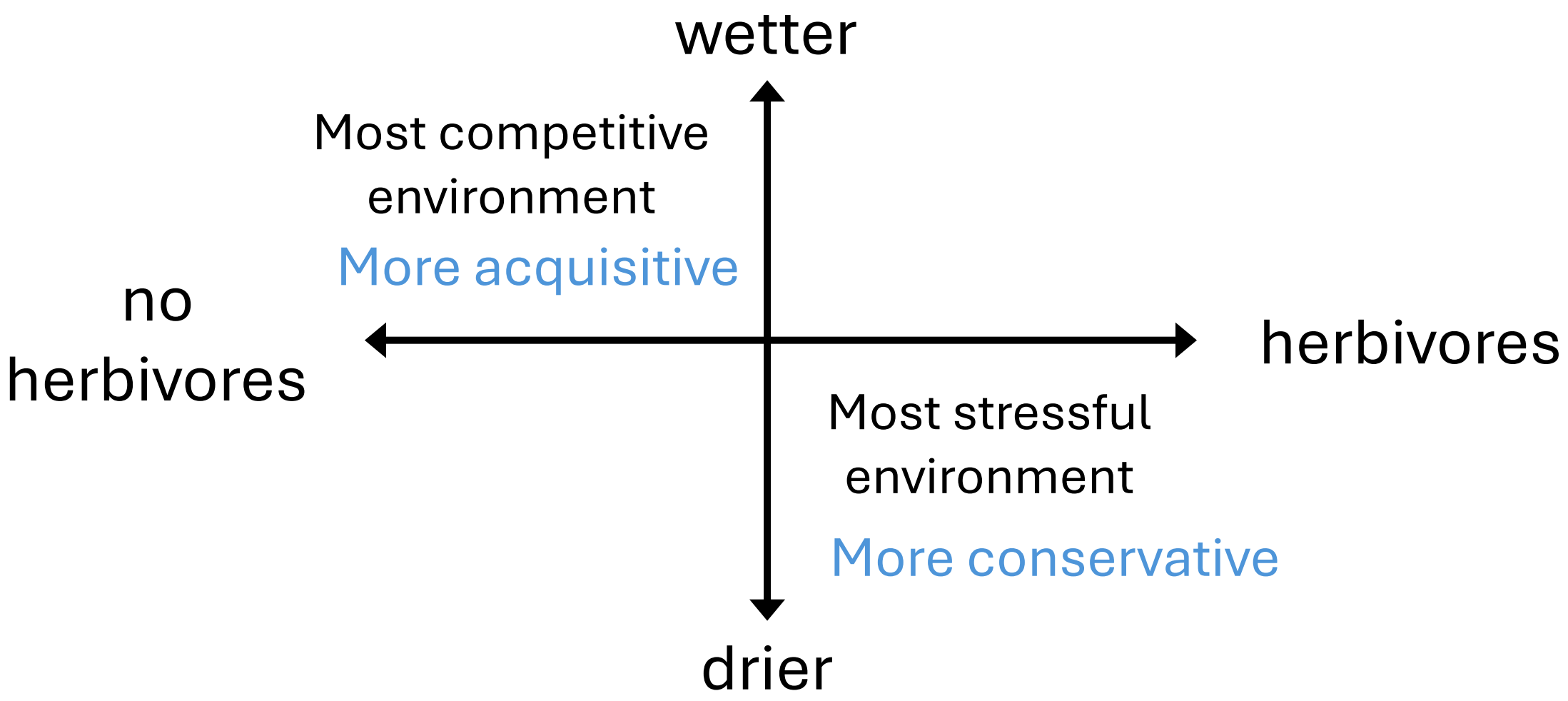
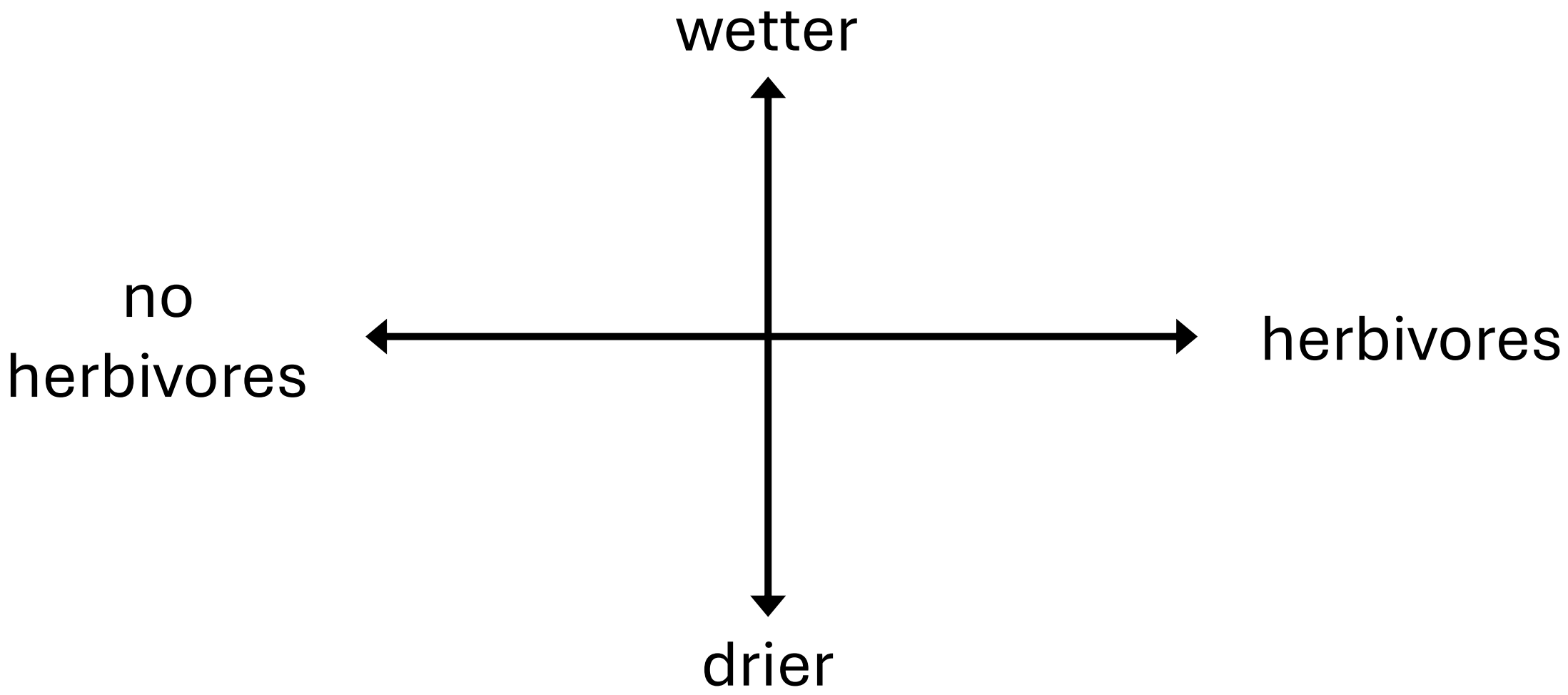


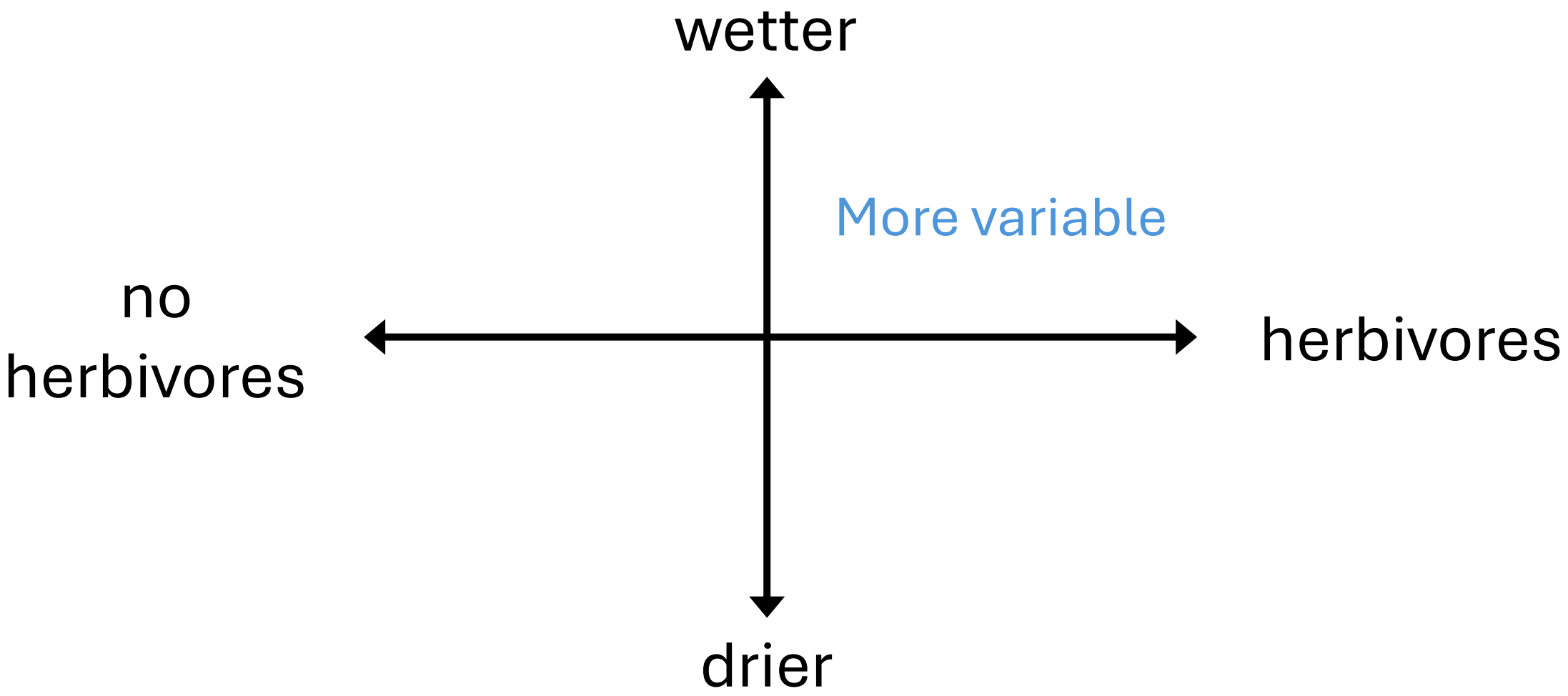
Largest shifts in *average* plant traits across these extremes



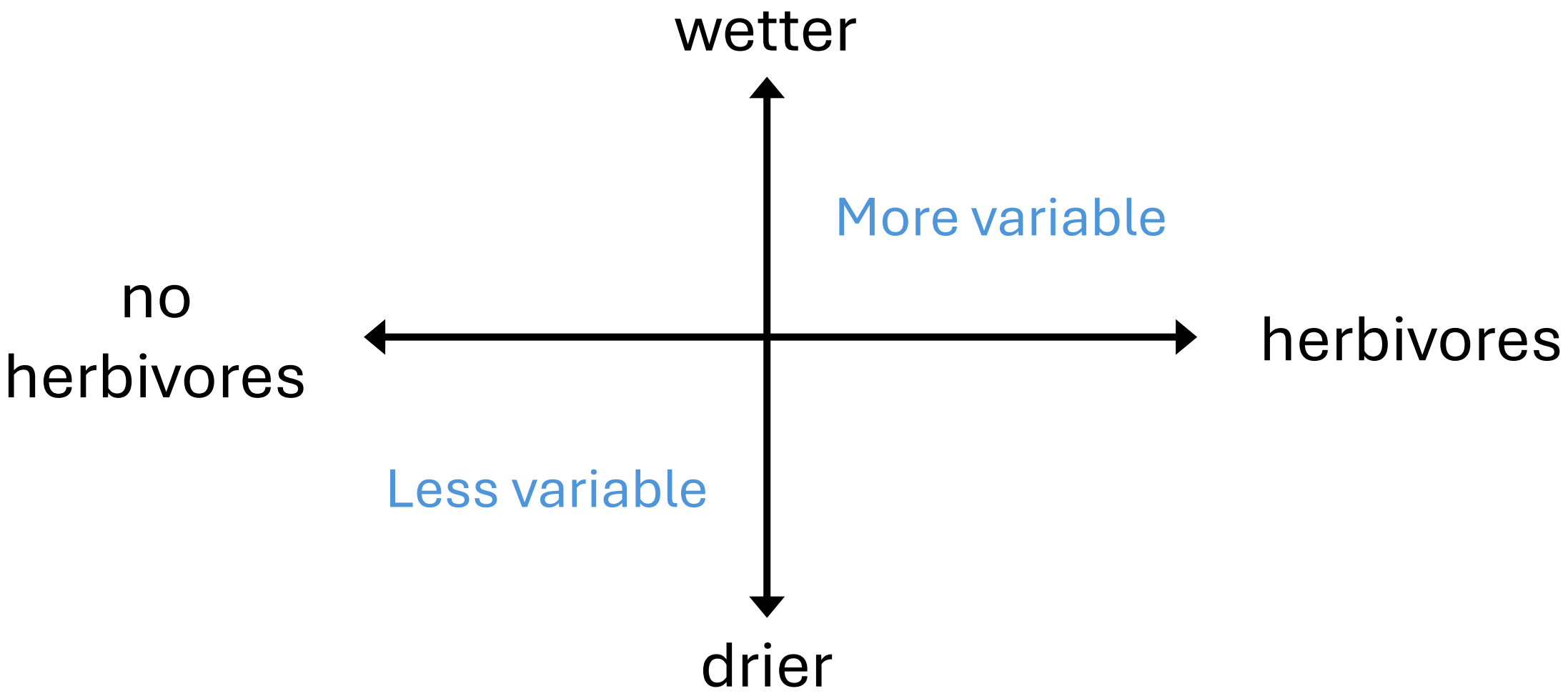
How does trait *variability* shift along these gradients?

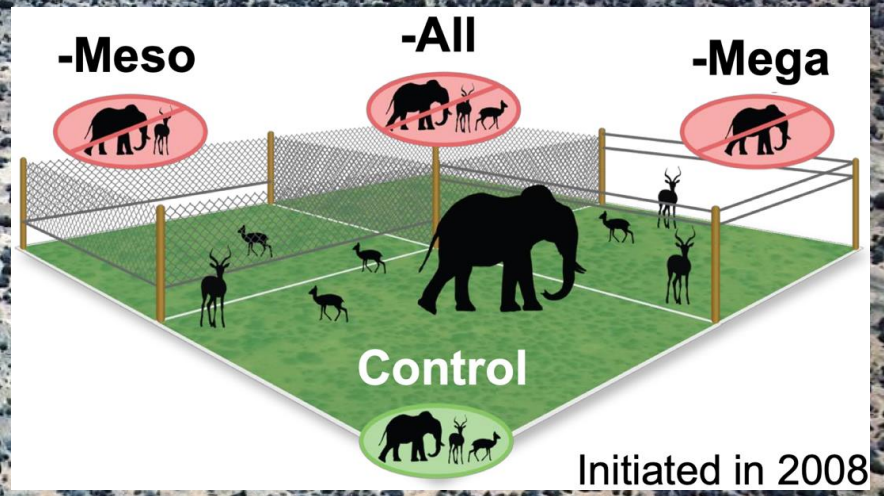


How does trait *variability* shift along these gradients?

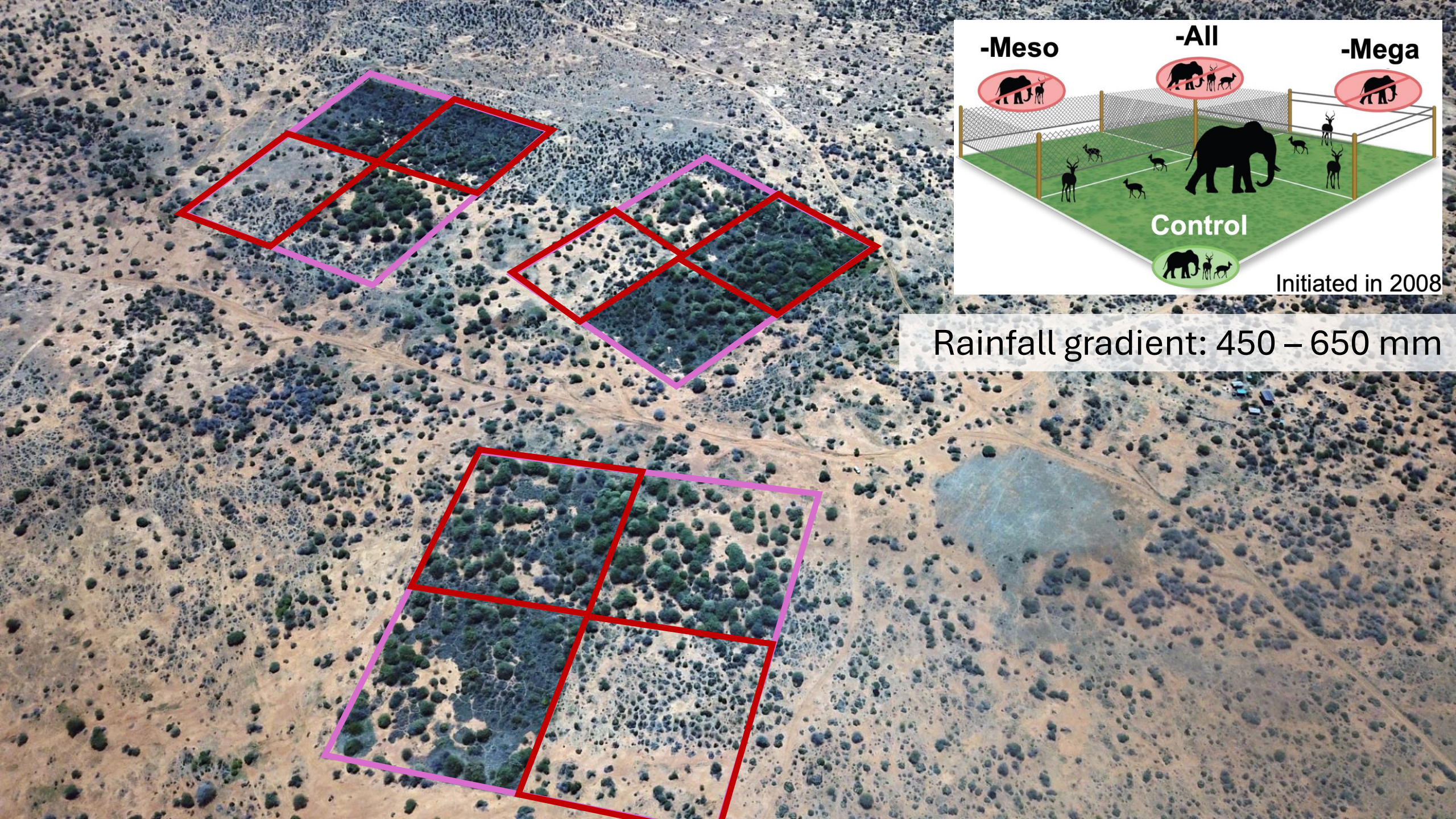


Largest shifts in trait *variation* across these extremes.





Rainfall gradient: 450 – 650 mm



Rainfall gradient: 450 – 650 mm

Sampling

- 8 abundant species
  - 4 grass, 4 forbs
- Across the rainfall gradient
- Across herbivore exclosures
- 960 plants

Traits

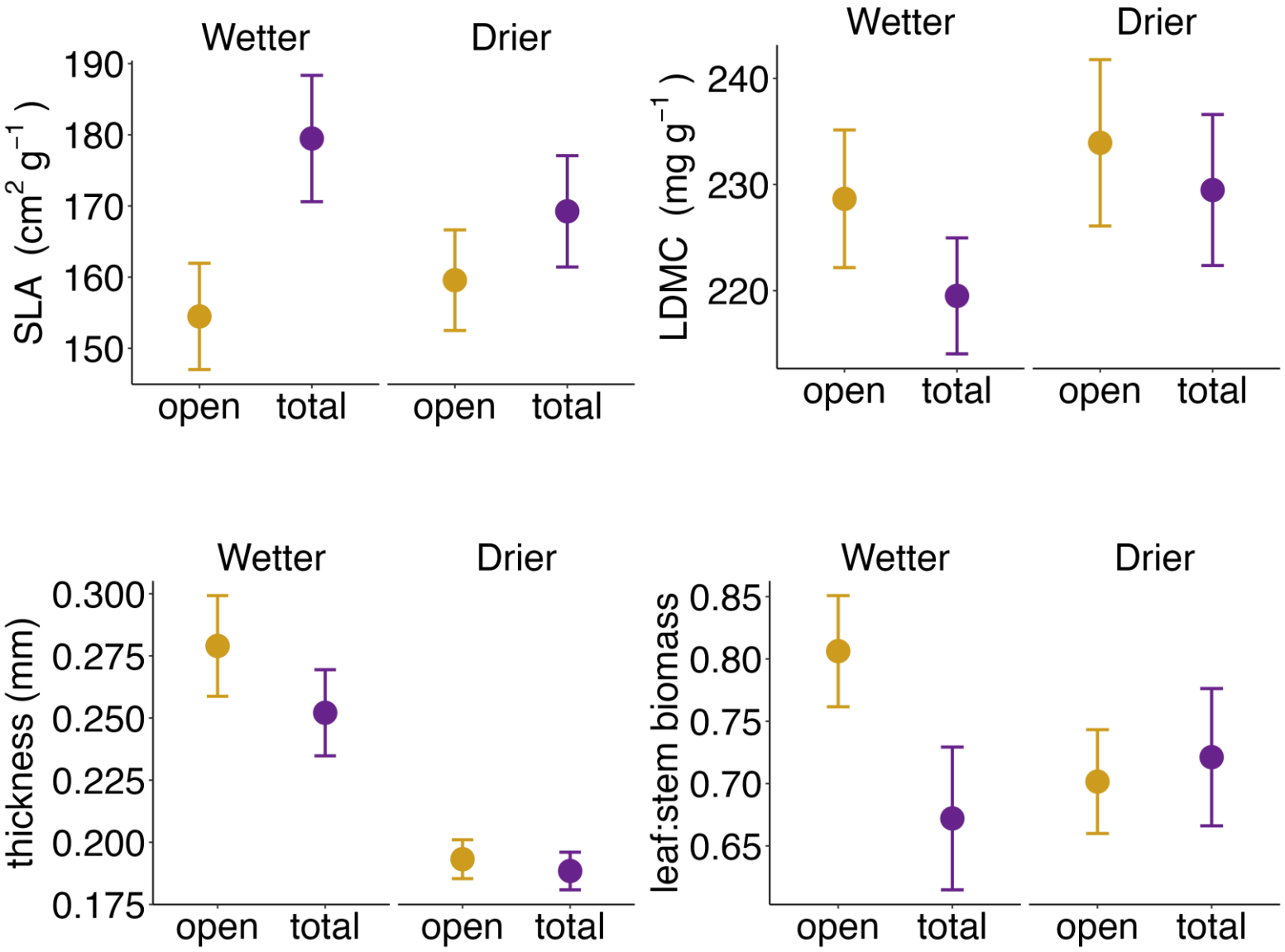
- Leaf and stem biomass
- Leaf dry matter content
- Leaf thickness
- Specific leaf area






Forbs

- Exclusion plots were more acquisitive.



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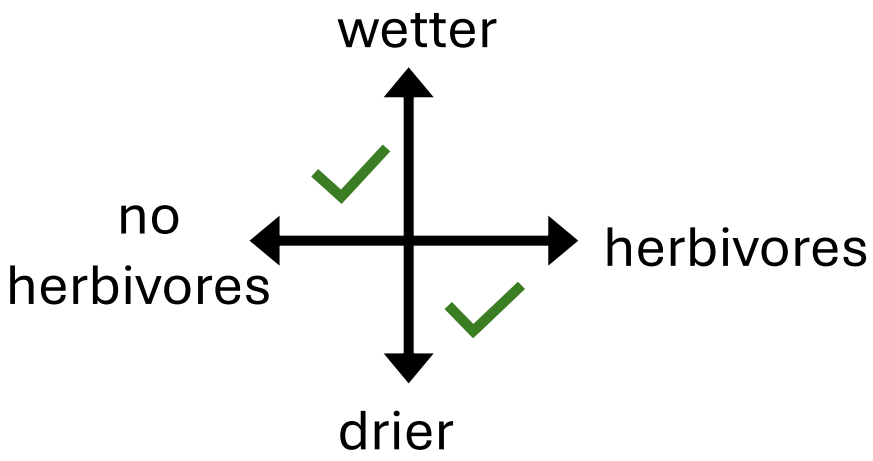
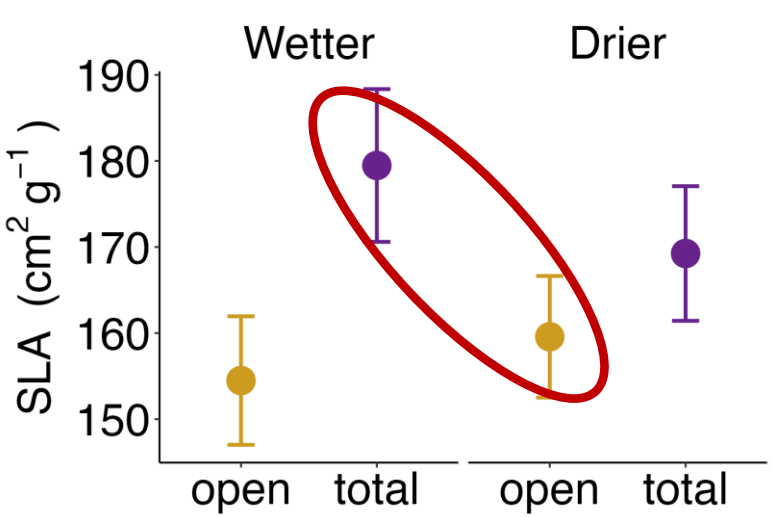
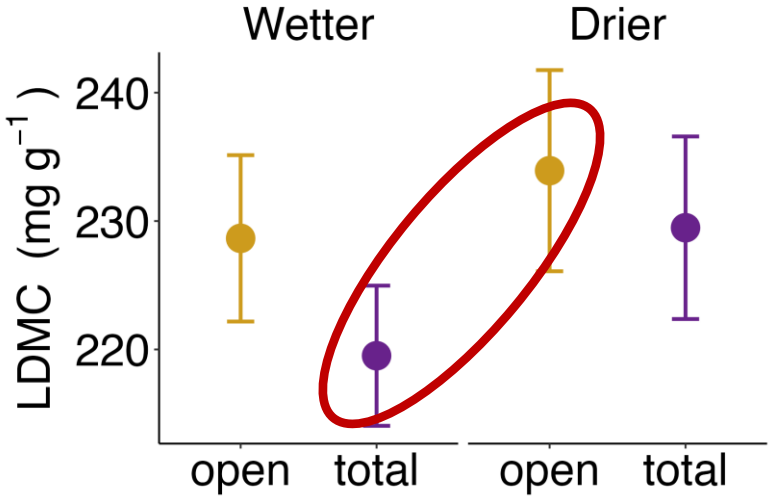
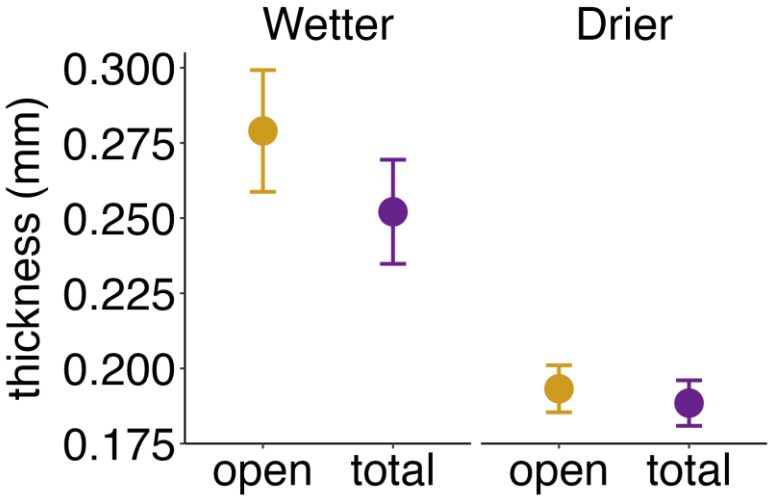
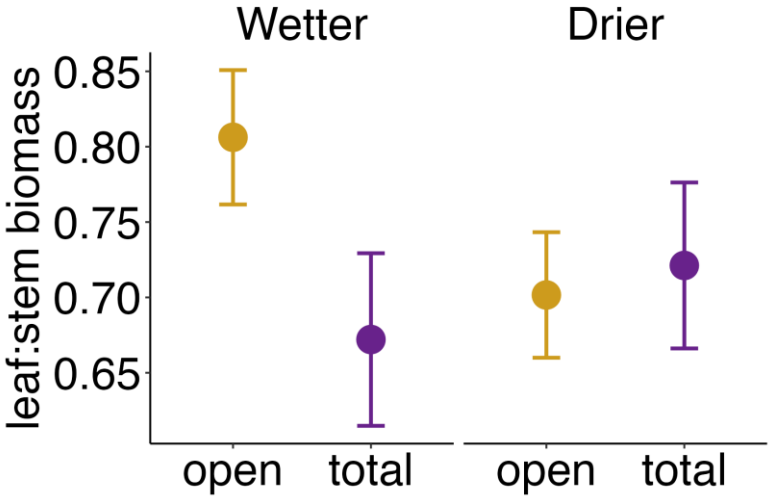




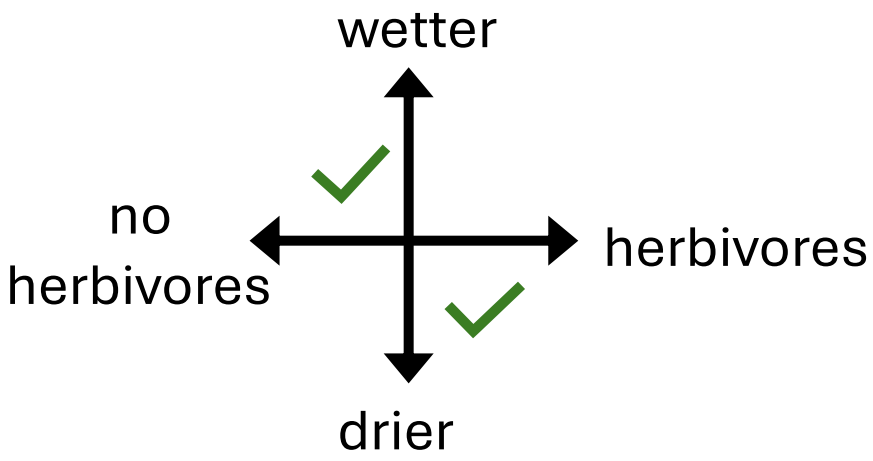


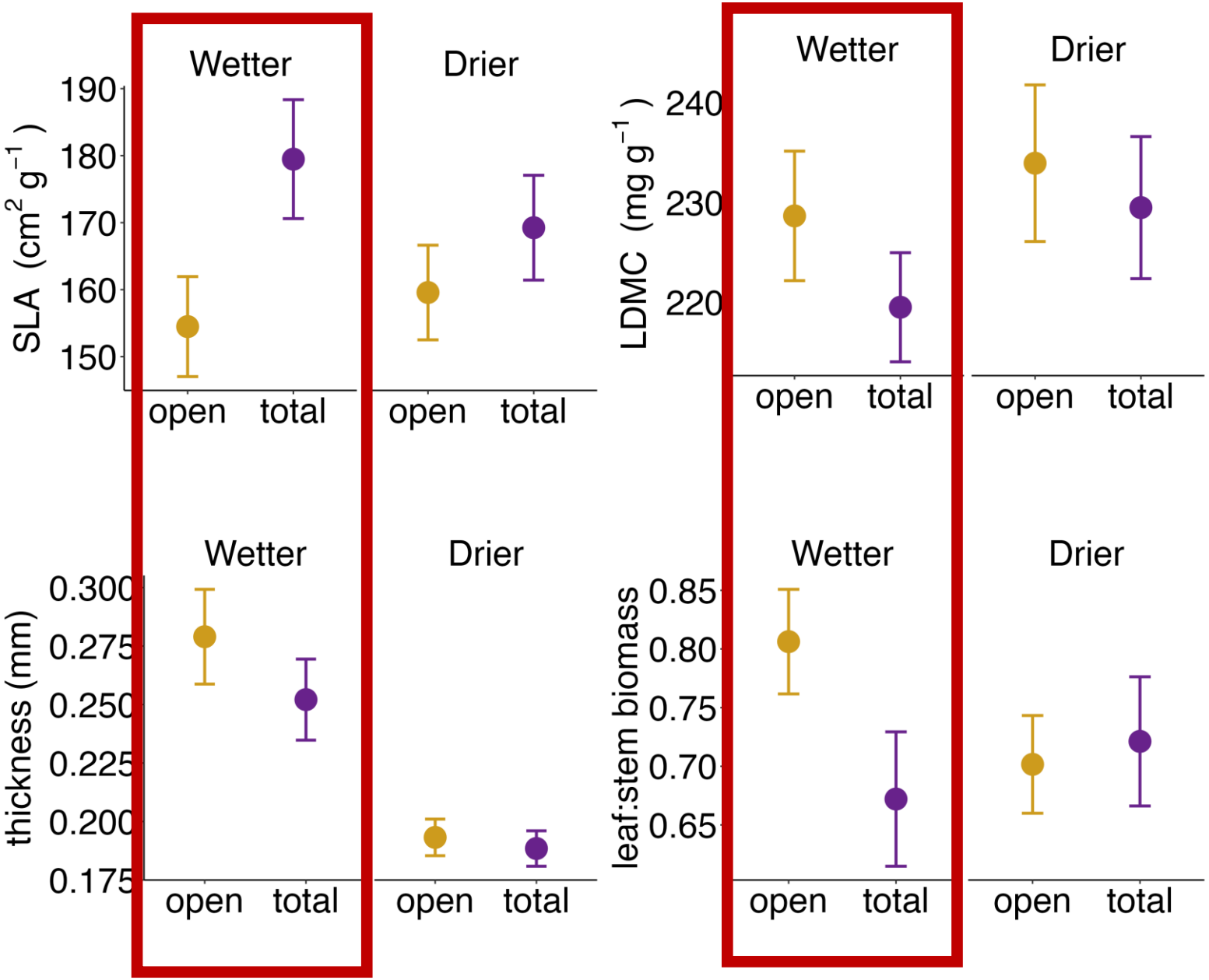




Forbs

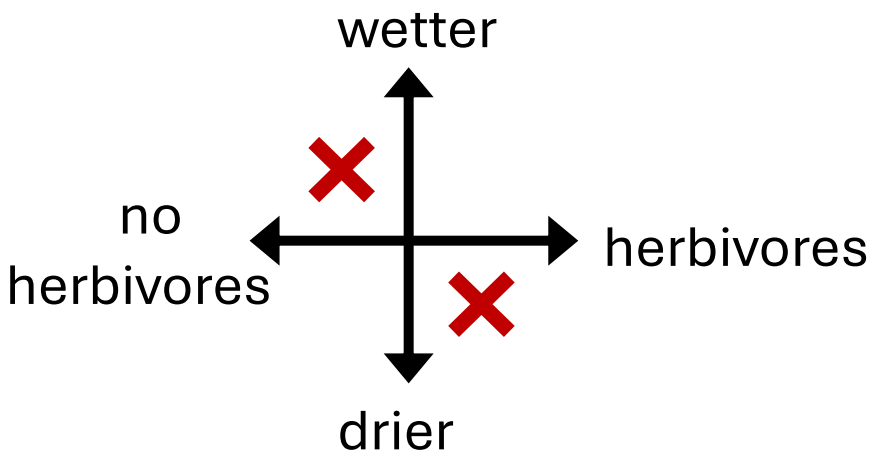
- Exclusion plots were more acquisitive.
- Magnitude depended on rainfall.

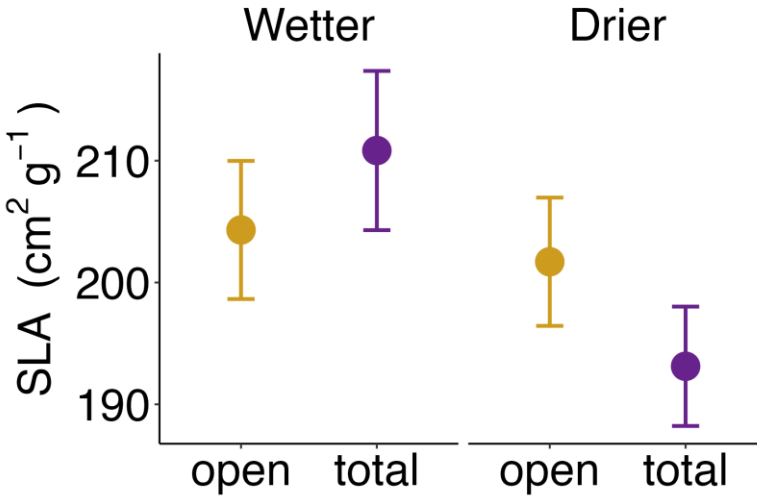


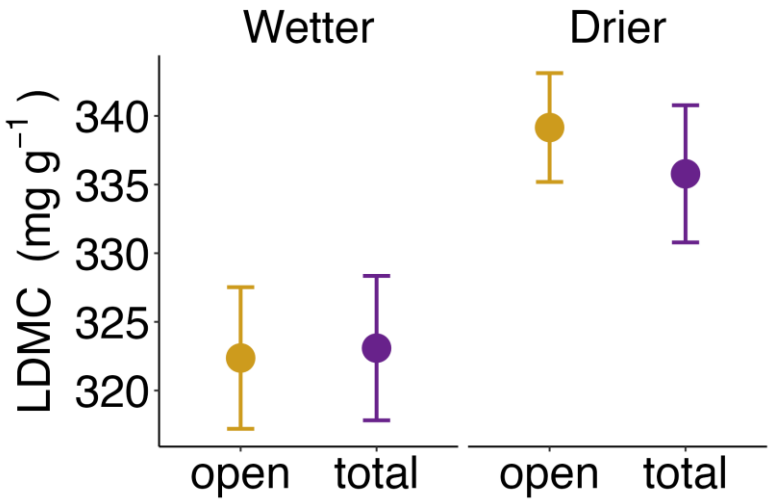


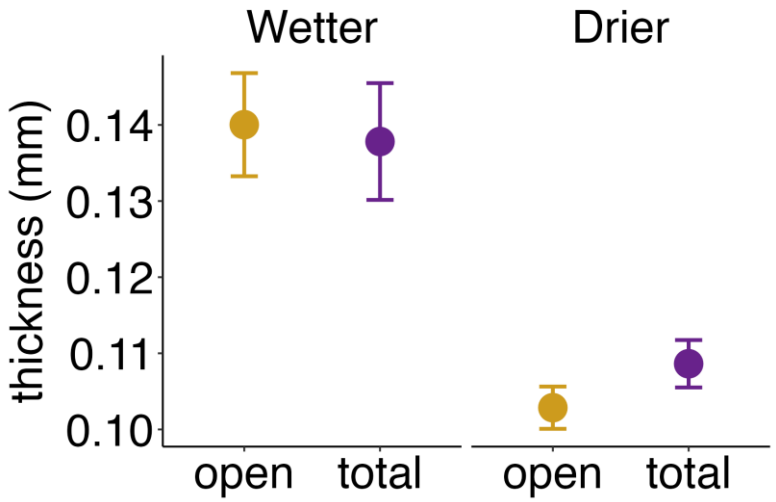
Grasses

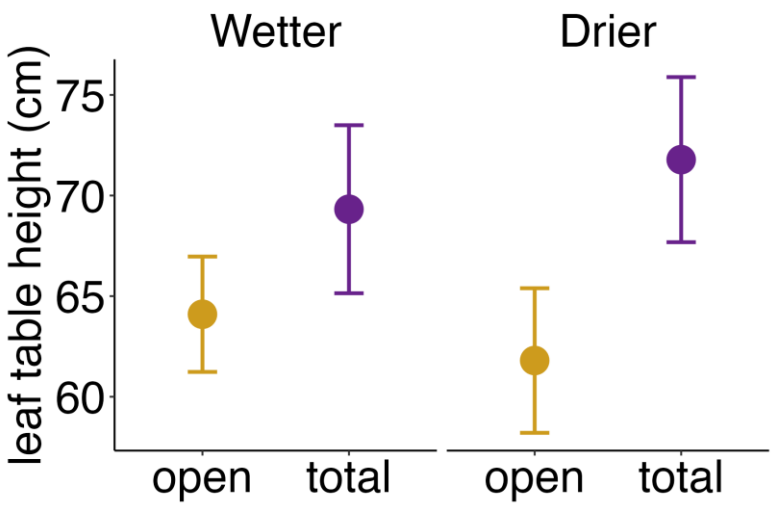
- No differences among herbivory treatments.











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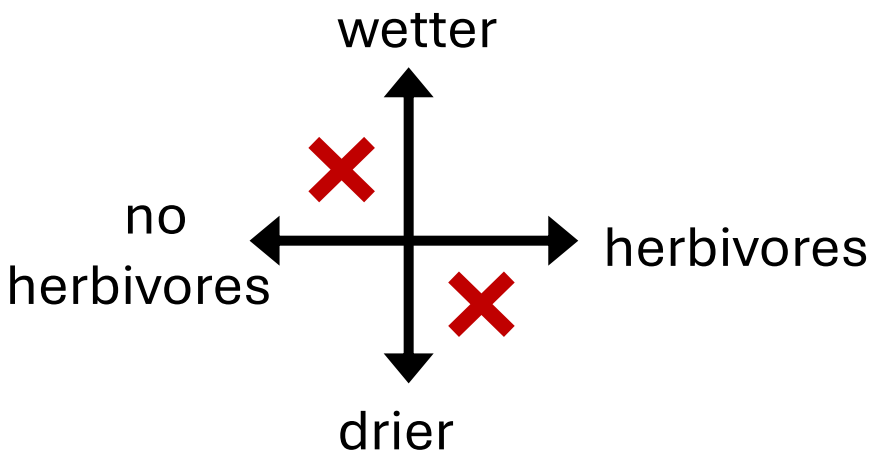
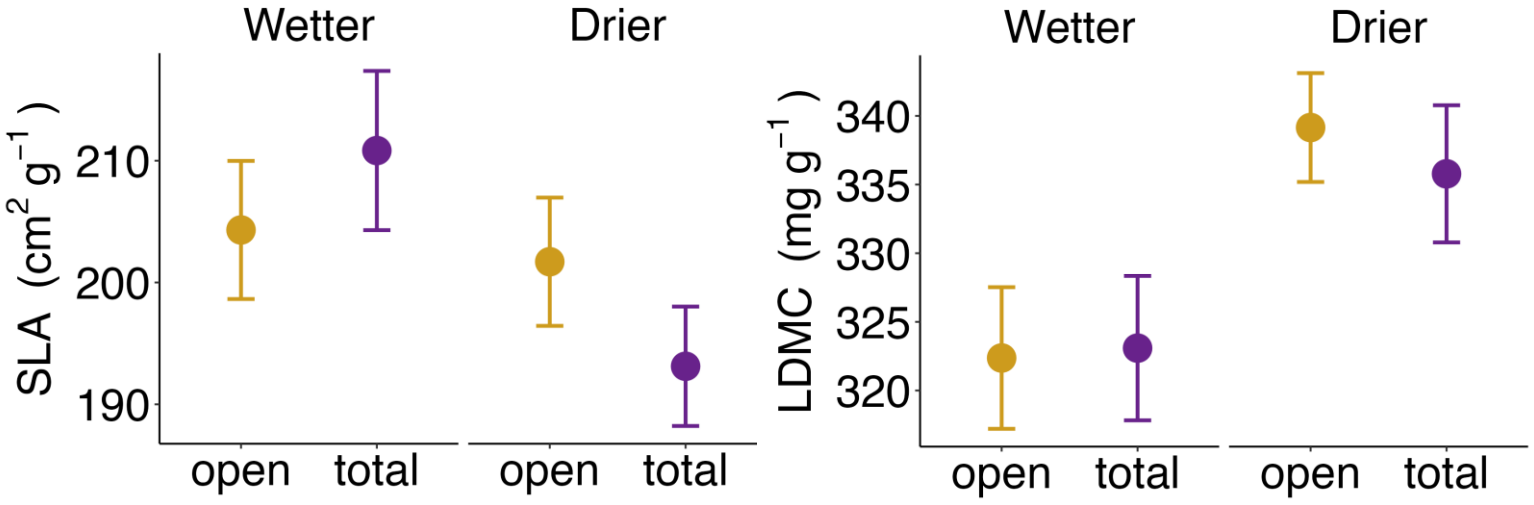
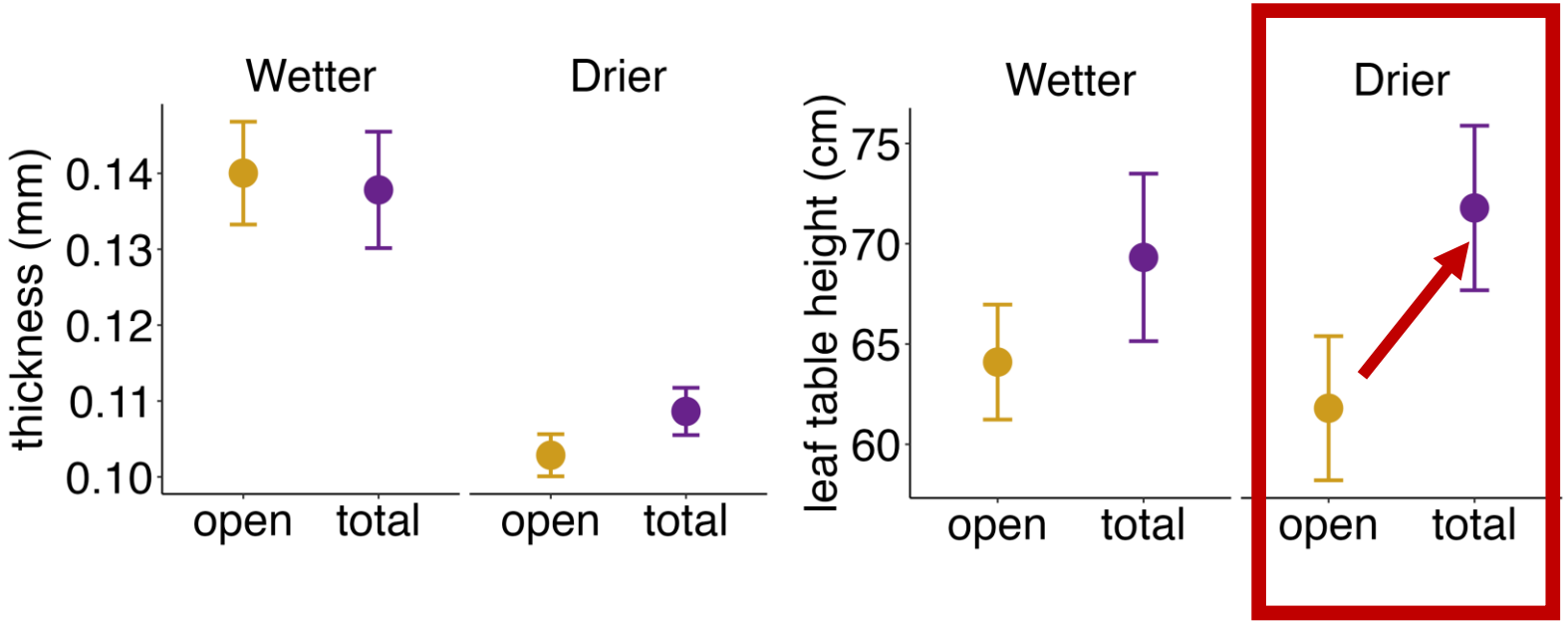
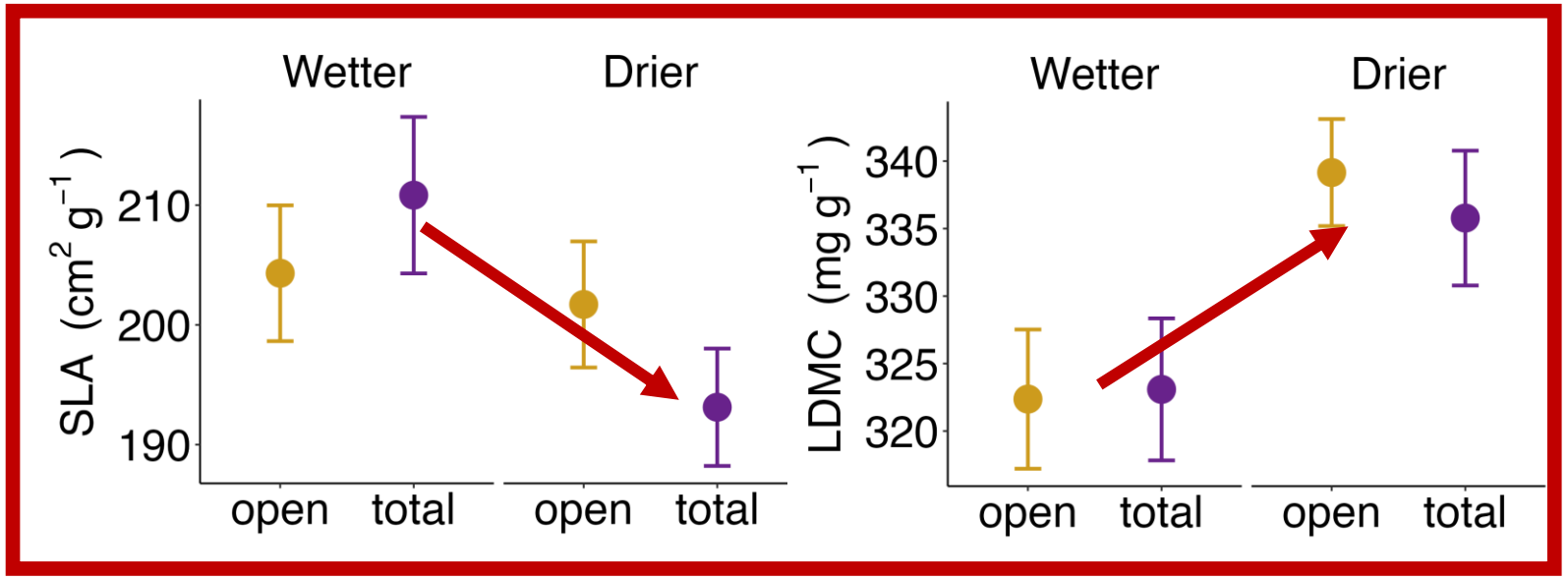


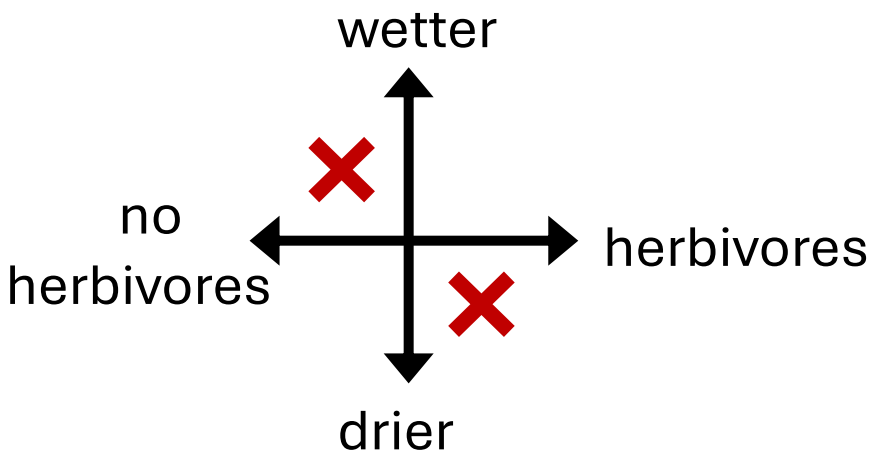


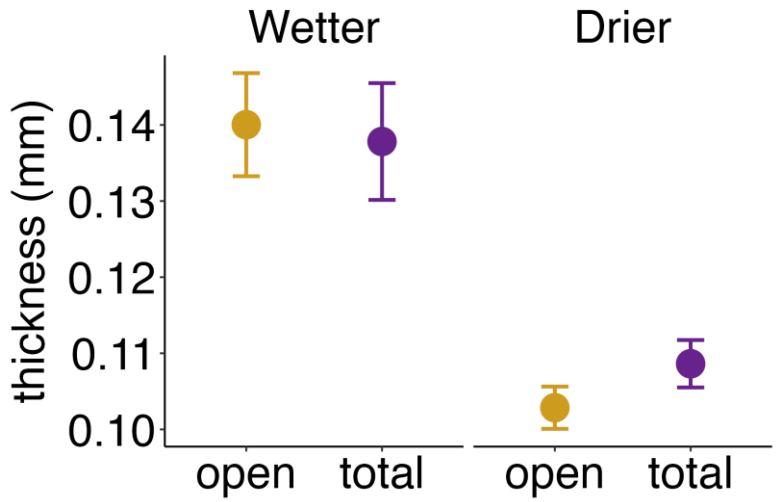


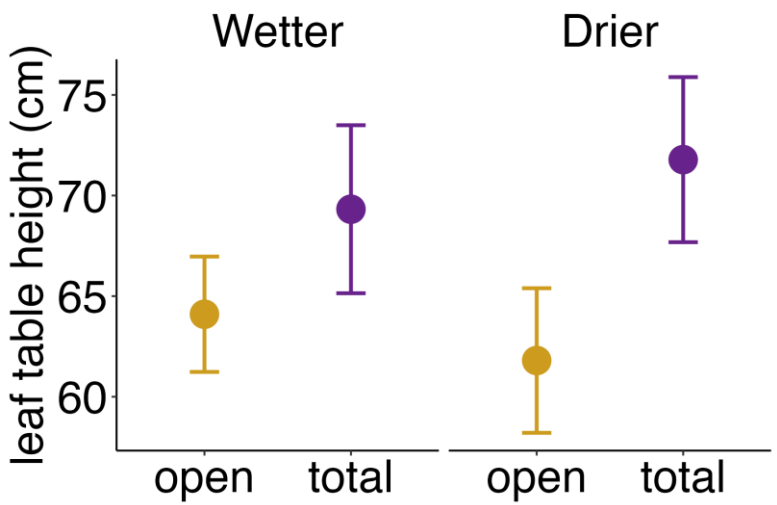
Grasses

- No differences among herbivory treatments.
- Grasses in drier site were more conservative.



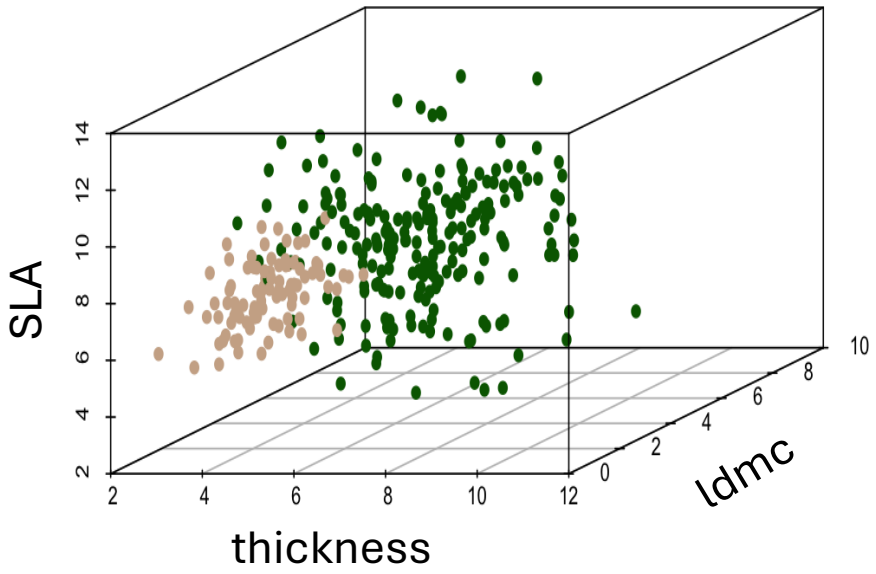


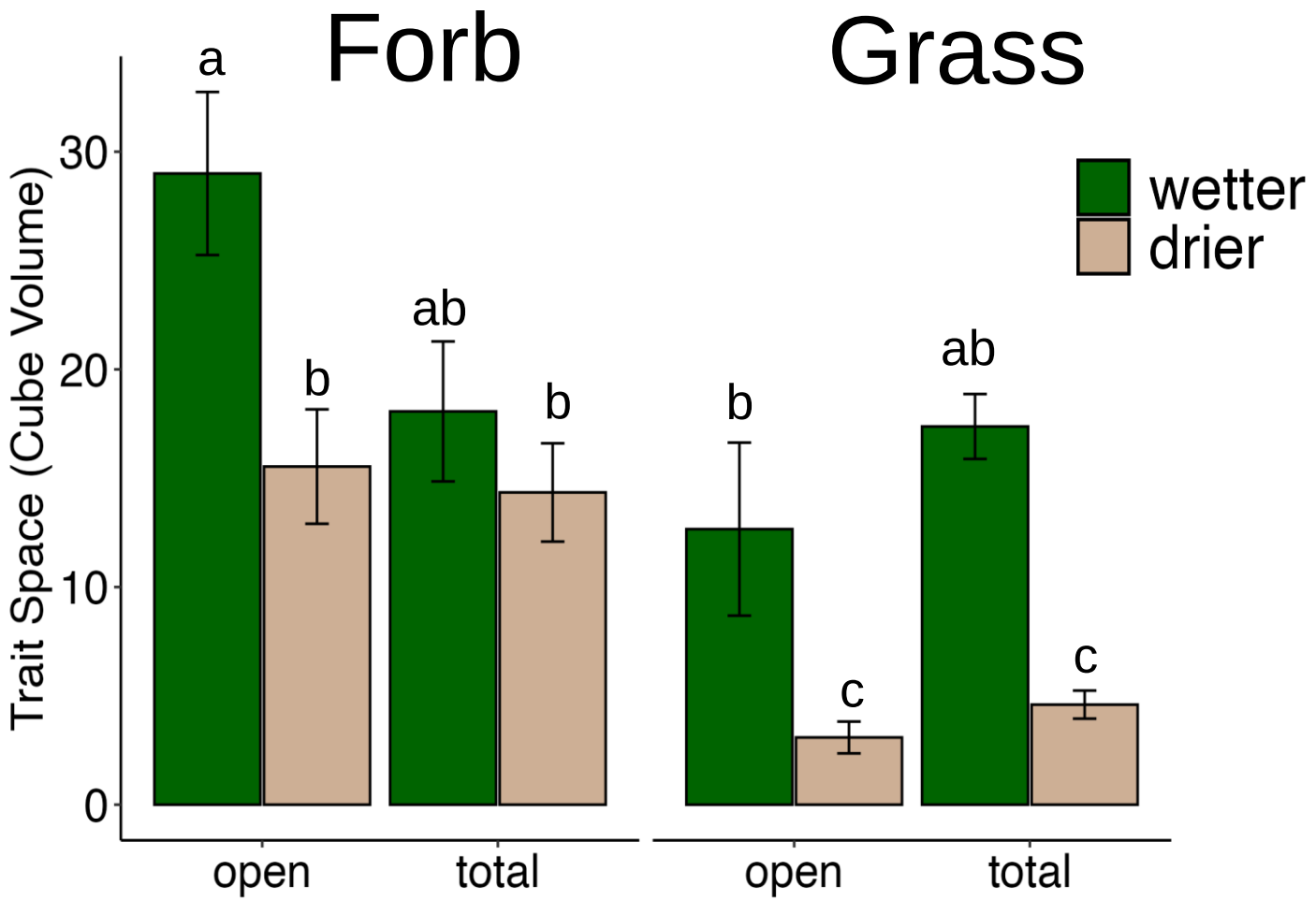




Shifts in trait variation

- Highest variability in the wetter site
- Little difference among herbivory treatments





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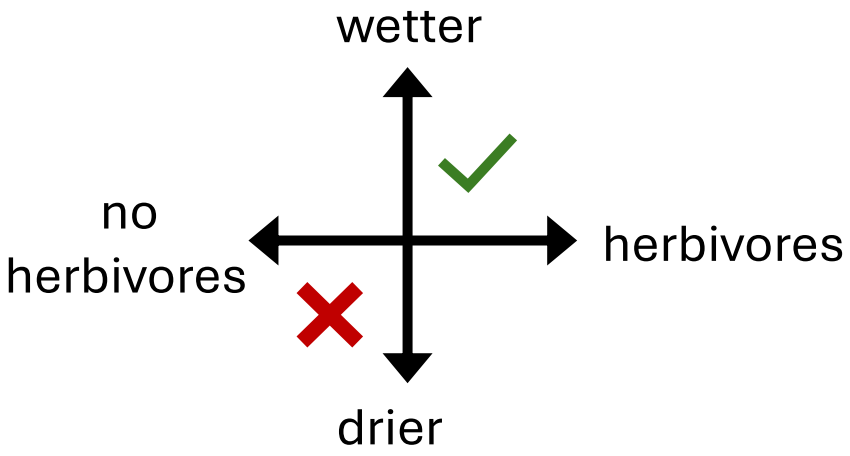

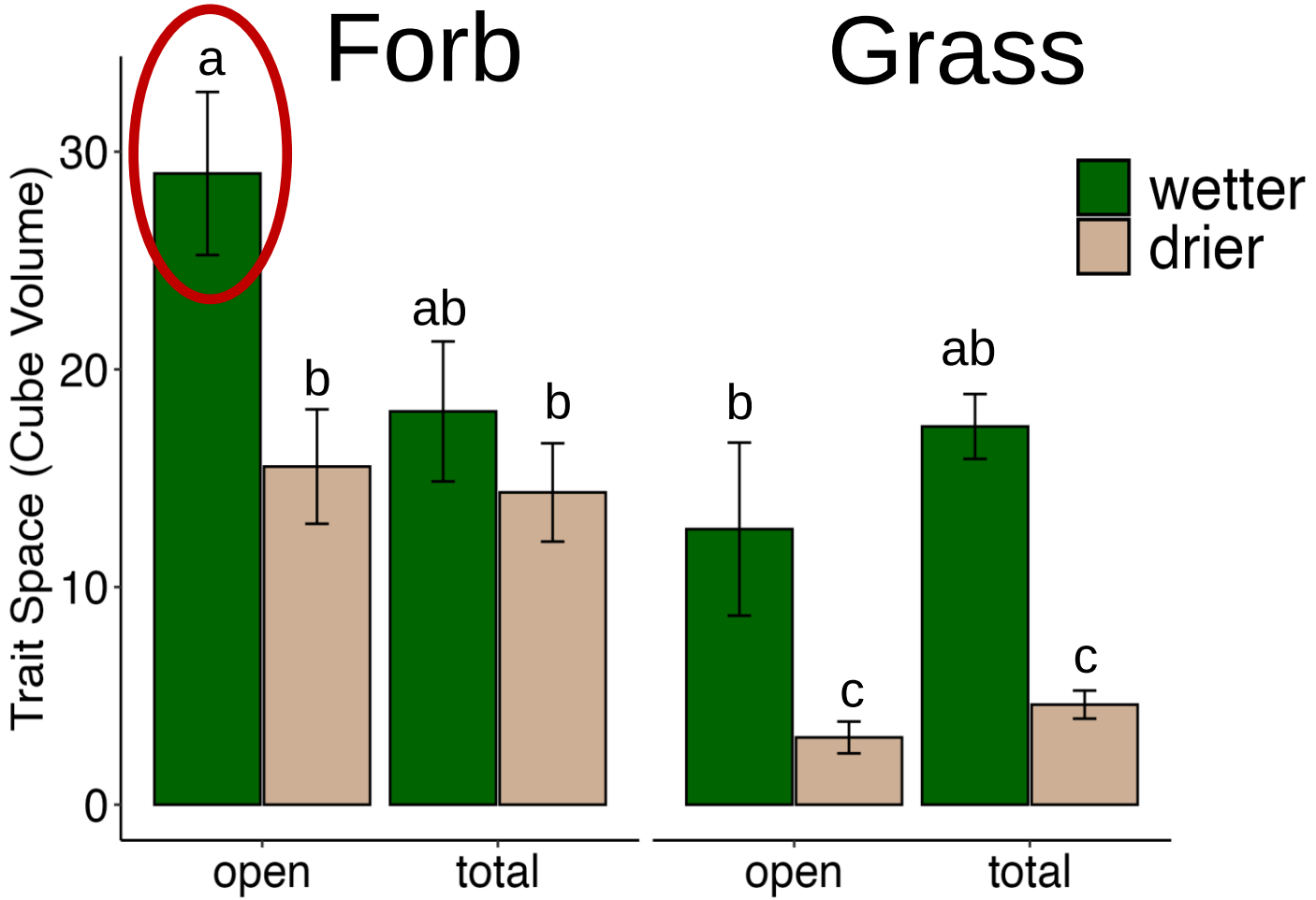

- Forbs responded more to herbivory, grasses more to site.
- Some evidence of constrained trait variation in drier sites.
- No clear evidence for herbivory increasing trait variation.

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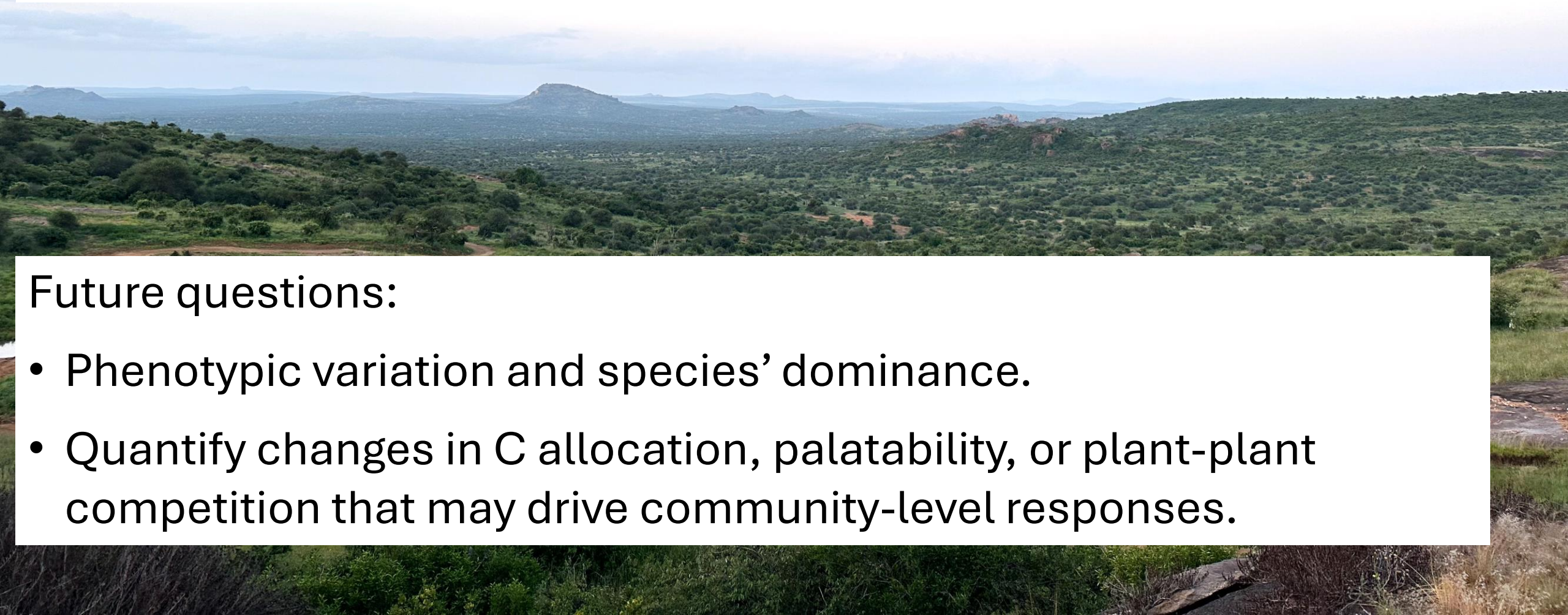

Future questions:

- Phenotypic variation and species' dominance.
- Quantify changes in C allocation, palatability, or plant-plant competition that may drive community-level responses.

Thanks!

- Evan Foster
- Hunter Gonzales
- Shukri Adan
- James Lolget
- Noah Hanisch
- Katie Galletta