Are resistance and post-drought performance of temperate grassland species related to specific leaf area and drought length?

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Abstract

Intensification of grasslands has favoured fast-growing, resource-acquisitive species with high specific leaf area (SLA) at the cost of slow-growing, resource-conservative species with low SLA. At the same time, droughts are becoming more frequent and more severe in Europe. According to the leaf economic trade-off, resource-conservative traits are expected to be favourable during droughts, whereas resource-acquisitive traits can favour regrowth post-drought. If SLA is determining plant responses to drought, it is thus likely, that the combination of land-use intensification and climate change will have marked impacts on the stability of temperate grassland ecosystems.

To investigate the role of SLA for the stability of grassland ecosystems in response to drought, we established a common garden experiment. We included 48 species, that are most abundant in four temperate grassland types, covering a gradient from very low to high land-use intensity. We let all plants establish under ambient conditions for one season before exposing them to simulated droughts of four different lengths and one control treatment. In the year of the experimental drought and in the spring to early summer post-drought, we repeatedly recorded the frequency and measured the biomass of each species in each plot.

With my poster, I will present the results of this study, namely how plant drought resistance and post-drought performance is related to SLA and drought length.