Kennis voor Klimaat

Knowledge for Climate

2.3 Optimization of water storage in stream valleys in the elevated cover-sand landscape

Testing the effects of short-term extreme events on plants

Introduction

Climate change scenarios predict an increasing number of extreme climatic events. The selective effects of extreme events from previous research suggest that traits, or trait plasticity, may determine plant performance. Species that have appropriate traits to withstand extremes or are able to adapt their traits during extreme events, may increase their chance of survival and eventually increase their competitive advantage.

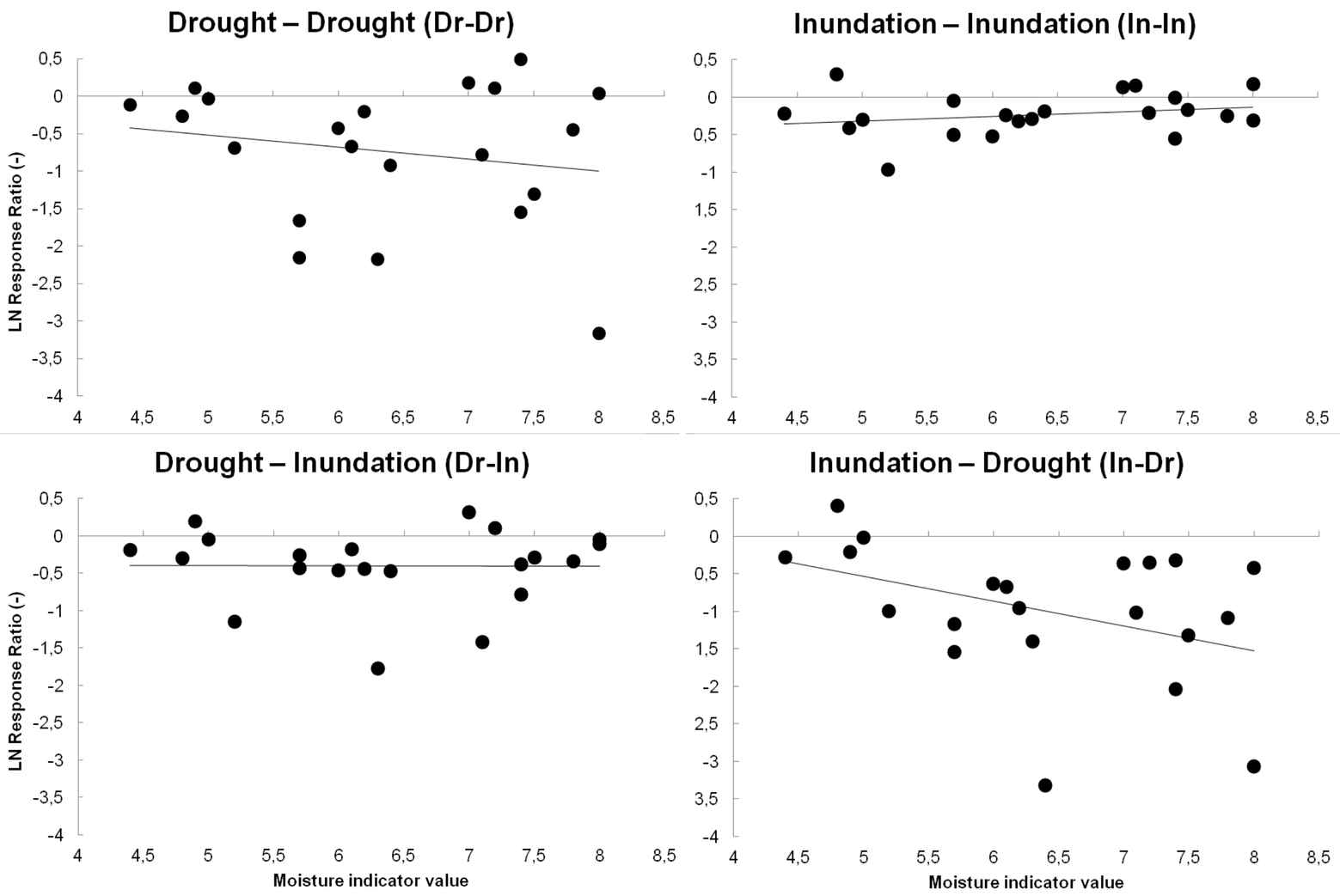
Research question

What are the effects of short-term extreme events and event sequence on plant trait plasticity and plant performance?

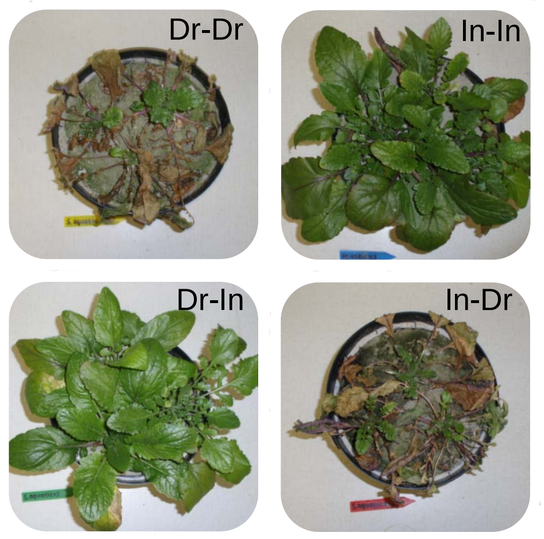
Methods

- 25 drought to wet tolerant plant species
- 10 day single and double drought and inundation, and all combinations thereof
- Performance parameters (e.g. biomass) and plant traits (e.g. root porosity) were measured

Main Results



Plant biomass for all double treatments. The 'Moisture indicator value' indicates the wet (high values) or drought (low values) tolerance of a species. The 'LN Response Ratio' is the natural logarithm of the relative change in biomass for the treatment compared to the control.



Example of what a species (Senecio aquaticus) looked like after 40 days of experiment. The treatments are shown on the pictures.

- No observed changes in trait plasticity, severe impact on plant performance parameters
- Dr-Dr & In-Dr most effect on plant performance, In-In least effect
- Sequence matters! (Dr-In effects ≠ In-Dr effects)
- Selective effects; wet tolerants more affected than drought tolerants

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