



Universität
Zürich ^{UZH}



Master project

Title: Plant–Microbiome Responses to Drought and Heat Stress: Comparing Traditional and Modern Barley Varieties

Context

Microbes play a fundamental role in plant growth and ecosystem functioning, yet the specific interactions between plant varieties and their environment under climate change remain an area of active exploration (Rog, Lutz, et al., 2026; Trivedi et al., 2020, 2022; Van Der Heijden et al., 2008). Modern commercial crops have been optimized for high yield, often relying on significant inputs of water and fertilizer. In contrast, wild-types and traditional landraces (varieties from before the mid-20th century) often originating from regions with harsh climates may possess unique traits for surviving drought and heat (Barnes et al., 2025; Guo et al., 2024; Kumar et al., 2020; Poets et al., 2015). This project seeks to understand how these traditional varieties compare to modern cultivars when experimentally exposed to those environmental stressors, and how their growth patterns differ in response to changing conditions. This project will contribute to a larger research initiative (<https://aegisearth.bio/en>), and will involve activities such as growth chamber experiments, analysis of biomass and physiological measurements to quantify plant responses to drought and heat (Rog, Malinowski, et al., 2026). It will be possible for you to help designing experiments, propose different approaches for data analysis, and refine the research questions based on your interests and observations during the project.

Dates and application

- Starting date: February 2027 (flexible)
- Duration: 6-12 months
- Contact: Prof. Dr. Marcel van der Heijden (marcel.vanderheijden@uzh.ch)

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<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1461-0248.2007.01139.x>

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