The mission of the Leibniz Centre for Agricultural Landscape Research (ZALF) as a nationally and internationally active research institute is to deliver solutions for an ecologically, economically and socially sustainable agriculture – together with society. ZALF is a member of the Leibniz Association and is located in Müncheberg (approx. 35 minutes by regional train from Berlin-Lichtenberg).

MSc thesis announcement

within the framework of the BExudation project

Supervisors: Jule Hoysagk, Joana Bergmann, Maire Holz

Working Group: Root Soil Interactions (RA1) & Sustainable Grassland Systems (RA2); in Müncheberg

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Background:

Root exudation is increasingly recognized as key process linking plant resource acquisition with soil carbon and nutrient cycling. Plants release a substantial amount of photosynthetically derived carbon into the rhizosphere, where root exudates influence microbial activity, nutrient mobilization, and soil organic matter formation. Despite their ecological importance, root exudation is still poorly integrated into existing trait frameworks such as the root economics space (RES), which describes trade-offs in nutrient acquisition strategies by plants.

The project "BExudation" aims at integrating root exudation into the RES to better understand plant-soil interactions and carbon and nutrient dynamics in grassland systems. By combining a greenhouse experiment with trait-based ecology and rhizosphere research, the project will investigate exudation patterns in relation to plant resource-use strategies and ecosystem functioning.

Objectives & Methods:

The Master student will participate in the data sampling of the main experiment in the BExudation project during summer and autumn 2026. This experiment will be conducted in a climate chamber on multiple grassland species (grasses, forbs and legumes) to quantify species-specific fine-root traits, root exudation rates, biomass allocation and mycorrhizal colonization. The Master thesis will focus on a subset of these traits and compare them across the studied species.

During the harvest phase, plant roots will be washed, root exudates will be collected, fine roots will be scanned, plant samples will be dried, above and below ground biomass will be weighed and fine-root subsamples will be grinded or stained for further analysis. Specific methods depend on traits of the student's interest for the Master thesis.

Requirements:

- Background in plant science, environmental science or related fields
- Interest in experimental work and belowground plant ecology
- Basic lab skills
- Motivation, precision, patience and organizational skills

Application:

Please send your application (PDF format) including your CV and a short motivation letter via email (subject line: **MasterThesis-BExudation-2026**) to: **Jule.Hoysagk@zalf.de**

If you apply, we collect and process your personal data in accordance with Articles 5 and 6 of the EU GDPR only for the processing of your application and for purposes that result from possible future employment with the ZALF. Your data will be deleted after six month.