

Three-year Postdoctoral Researcher Fellow on BONARES project (Uni Hohenheim, Nutritional Crop Physiology, 340h, Prof U. Ludewig):

Implications of soil management practices and application of biocontrol strains on soil disease suppressiveness for improved soil health and sustainable plant production

Application deadline: until filled

Postdoctoral fellow starting date: 1st February 2022

We are looking for a postdoctoral researcher to work on the DiControl project (Implications of soil management practices and application of biocontrol strains on soil disease suppressiveness for improved soil health and sustainable plant production" 2022-2025) funded within the BONARES program ("Soil as a sustainable resource for the bioeconomy") by the BMBF (Federal Ministry of Education and Research, Germany). The postdoctoral fellow will work at the Institute of Crop Science in the Department "Nutritional Crop Physiology" at the University of Hohenheim, 70599 Stuttgart, Germany (<https://crop-physiology.uni-hohenheim.de/>).

The postdoctoral fellow will cooperate with an interdisciplinary group of researchers and students of the DiControl project from three different laboratories/Institutes located in different parts of Germany.

Scientific context:

The goal of DiControl is to find out how the composition of microbial communities is affected by different long-term farming practices, how different crops shape the microbial community, and to analyze which processes in the rhizosphere are involved in this interrelation. In the future, it should be possible to manage microbial communities in agricultural soils to improve the supply of nutrients to crops and thereby reducing the amount of fertilizer applied. Furthermore, useful bacteria, archaea and fungi act as natural plant protection and help to reduce the use of pesticides. In order to support the natural suppressive powers of soil microorganisms, the DiControl project will also evaluate the impact of selected beneficial microorganisms applied as inoculants on both plant performance and plant health. The sustainable soil management by beneficial microbes is integrated into the development of new farming strategies, with the goal of reducing external inputs while maintaining or even increasing yields (<http://dicontrol.igzev.de/>).

Postdoctoral research fellow:

The postdoctoral fellow will work on the characterization of root exudates and rhizosphere soil solutions as well as stress metabolite and hormonal profiling and root phenotyping of field-grown maize plants. The impact of different management practices with respect to fertilization, tillage and pesticide use intensity as well as the use of cover crops and microbial inoculants will be investigated in relation with the expression of stress related genes and the composition and function of rhizosphere microbial communities using network analysis and targeted metabolomic, transcriptomic, amplicon sequencing and metagenomics approaches in close cooperation with the associated working groups.

Key responsibilities

- Installation of root windows in the field and non-destructive micro-sampling of root exudates/rhizosphere soil solutions
- (U)HPLC/MS characterization of exudate profiles, screening of stress metabolites and hormonal profiles in the plant tissue
- Analysis of root morphological traits and arbuscular mycorrhizal infection rate
- Perform data analyses using advanced statistical, multivariate and network approaches
- Perform DNA-Stable isotope probing experiment with plant and metagenomics.
- Train and mentor PhD and Master students working on the same project

- Writing of regular project reports
- Dissemination activities and coordination of data exchange with partner projects
- Publish in international scientific journals

Expected profile

- PhD degree in plant physiology, agricultural biology, environmental sciences or related fields preferably obtained within the last four years
- Analytical experiences in HPLC of natural compounds, enzymatic analysis, metabolite assays
- Knowledge of multivariate analyses, statistics and/or network analysis used in microbial ecology or plant physiology.
- Fluency in English, Good writing and oral skills in English and preferentially also German
- Proficient oral and written communication skills to present and explain technical information. Strong analytical, organizational, and interpersonal skills to collaborate effectively in a multidisciplinary team environment.

This knowledge would be a plus:

- Ecology of soil and plant-associated microbial communities
- Eukaryote stress physiology and molecular biology
- Experience with plant cultivation

Personal qualities, such as teamwork skills, rigor, intellectual curiosity, motivation to learn new things, solve problems and pursue research in an interdisciplinary framework will be particularly appreciated.

Contract and what we offer

- 36 months full-time
- Starting date: February 2022
- Location: University of Hohenheim, Institute of Crop Sciences, Nutritional Crop Physiology (340h) Fruwirthstr. 20; 70599 Stuttgart, Germany-
- The Campus is located 20-25 minutes from Stuttgart city center by public transports.
- Contract: Full TVL E13 salary (depending on experience). Fully covered health insurance and contribution to social security system.

Applications will be collected until position is filled.

How to apply:

To apply for the position, the applicant should send a cover and motivation letter (1-2 pages) and detailed CV including education, previous employments, list of publications and contact details to u.ludewig@uni-hohenheim.de