



The Rheinische Friedrich-Wilhelms-Universität Bonn is an international research university that offers a wide range of degree programs. With 200 years of history, about 38,000 students, over 6,000 employees, and an excellent domestic and international reputation, Bonn University is among Germany's leading universities.

The Soil Science and Soil Ecology division of the Institute of Crop Science and Resource Conservation (INRES) is seeking for a

### **PhD student soil sensing (65%, TV-L 13)**

for 3-4 years starting as soon as possible until max. 31.12.2023 within the core project 5 "new field arrangements" of the Cluster of Excellence PhenoRob – Robotics and Phenotyping for Sustainable Crop Production.

The candidate will work with proximal soil sensing techniques to identify patterns in soil properties at various experimental sites. The project is part of a research program that aims to establish crop mixtures to increase diversity in agricultural landscapes at different scales. Crop mixtures, such as combinations of cereals and legumes, offer multiple advantages over sole crops, including more efficient resource use. However, complex interactions between partners in a crop mixture on the one hand and soil properties and climate conditions on the other hand impeded to know the comprehensive evaluation of crop mixtures and their introduction into agricultural practice. This complexity is enhanced by spatial heterogeneity of soil properties within fields. The project aims to deepen the practical understanding of a range of soil sensor signals in order use spatial soil information on available plant water and nutrient supply for evaluating the agronomic success of crop mixtures.

Tasks:

- Physical field work to derive soil sensing data on multiple sites across Germany
- Elucidate the use of different soil sensing techniques to define areas of soil heterogeneity on site
- Statistical data evaluation and machine learning to evaluate the field data
- Publication of research outcomes in peer reviewed scientific journals

Qualifications:

- Degree in natural sciences (Master or Diploma) with a strong background in soil science and environmental sensing
- Knowledge on nutrient cycling in agricultural systems
- Computational skills and/or the motivation to learn machine learning techniques
- Readiness for practical field work
- Previous laboratory experience to collect ground truthing data
- Independent work method, reliability, engagement, capacity for team work, sense of responsibility and high self-motivation as well as good command of English (written and oral)

The candidate will be member of the Bonn International Graduate School (BIGS-TBGS), which is offering various opportunities for further PhD student training and networking. Applicants are asked to submit an application (letter of motivation, CV, relevant certificates) as one file via email to Dr. Nina Gottselig (ngottsel@uni-bonn.de). The position will remain opened until filled.

The University of Bonn is committed to diversity and equal opportunity. It is certified as a family-friendly university and aims to increase the number of women employed in areas where women are under-represented and to promote their careers. To that end, it urges women with relevant qualifications to apply. Applications will be handled in accordance with the Landesgleichstellungsgesetz (State Equality Act). Applications from suitable candidates with a certified disability or equivalent status are particularly welcome.