

We are currently seeking a team member

### **PhD student (Entgeltgruppe 13 TV-L / 65%; all genders welcome)**

to join the Chair of Root-Soil Interaction at the School of Life Sciences, Technical University of Munich (TUM). Starting date is 01.04.2026.

The position is limited to 4 years.

### **Topic: “Investigating the physiological, biochemical, and molecular responses of maize to concurrent biotic and abiotic stresses”**

#### **Project context**

The PhD position is embedded in the DFG Research Unit

“MultiStress - Concurrent multiple abiotic and biotic stress interactions in maize: impacts and mechanisms” (RU 6101).

The MultiStress Research Unit investigates how maize responds to interacting abiotic stresses (e.g. drought, nitrogen deficiency, heat) and biotic stresses (e.g. foliar disease or herbivory), and how these interactions affect plant performance across environments. The project follows an integrated experimental approach across laboratory, greenhouse, and field scales, combined with advanced phenotyping and data-driven analysis.

This PhD project is part of Subproject 2 (SP2), which aims to provide a mechanistic understanding of maize multistress responses at the physiological, biochemical, and molecular levels. SP2 focuses on plant water relations, hormonal regulation (with emphasis on abscisic acid), oxidative stress responses, and their integration with high-resolution phenotyping under single and combined stress conditions. Coordinated field experiments will be conducted in Germany and Kenya, offering an international research context.

The position will be hosted at TUM, within a highly interdisciplinary and international research environment, and involves close collaboration with partners at the University of Göttingen and Kenyan research institutions.

#### **Main tasks**

- Conducting laboratory, greenhouse, and field experiments on maize under single and combined abiotic and biotic stress conditions
- Measuring physiological traits such as gas exchange, transpiration, leaf water potential, and chlorophyll fluorescence
- Biochemical analyses including phytohormones (ABA), reactive oxygen species (ROS), and antioxidant enzyme activities
- Molecular analyses related to ABA signalling, including protoplast-based functional assays
- Integration of physiological and biochemical data with advanced phenotyping approaches (e.g. thermal imaging)
- Statistical analysis and interpretation of multi-factorial datasets
- Active collaboration with other subprojects within the MultiStress Research Unit
- Publication of research results in international peer-reviewed journals

*Opportunities  
for Talents*

### Required qualifications

- Master's degree (or equivalent) in plant sciences, biology, crop science, environmental sciences, or a related field
- Strong interest in plant stress physiology and crop responses to environmental variability
- Experience with experimental plant research
- Ability to work independently as well as collaboratively in an interdisciplinary and international team
- Very good command of English, both written and spoken

### Preferred experience and skills (not mandatory)

- Experience with plant water relations, plant hydraulics, or hormone signalling
- Biochemical or molecular biology techniques
- Experience with imaging, phenotyping, or data-driven analysis
- Willingness to participate in field experiments, including research stays abroad (Kenya)

### We offer

- A four-year PhD position (65% TV-L E13) within a DFG-funded Research Unit
- An interdisciplinary, collaborative, and internationally visible research environment at TUM
- Close supervision and training in experimental design, data analysis, and scientific writing
- Access to state-of-the-art laboratory, phenotyping, and imaging infrastructure
- Opportunities for international collaboration and participation in conferences and project workshops

### Application procedure

Please submit your application in one PDF file, named: **Multistress\_SP2\_Name of Applicant.pdf**

The application should include the following documents: motivation letter, CV, certificates, and contact details of two references.

Applications should be submitted to [rsi@ls.tum.de](mailto:rsi@ls.tum.de) by 28.02.2026.rsi@ls.tum.de

For further information, please contact:

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### Please note:

With submission of your application, you accept the processing of your applicant data in terms of data-protection law. Further information on the legal basis and data usage is provided in the Information General Data Protection Regulation (GDPR).