Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

The lateral root architecture of the aus-panel

Helena Bochmann[1,3], Amelia Henry [2], Uwe Rascher[3,1], Josefine Kant[1], Johannes Postma[1]

[1] *Forschungszentrum Jülich, IBG-2, Germany*
[2] *International Rice Research Institute, Stress Physiology and Research, Philippines*
[3] *University of Bonn, Inst. Crop Sci. and Res. Conserv. (INRES), Germany*

Abstract

Drought reduces the grain yield of rice with different intensities in various developmental stages, indicating a need to find well-performing root phenotypes for specific drought scenarios. The aus-panel is known for being stress-tolerant and has a different genetic background from the indica and japonica panel. This makes it a new genetic source for breeding programs under climate change aspects.

To understand and screen the lateral root formation and the variation within the aus-lines, field experiments were conducted during the dry season of 2022 at the International Rice Research Institute (IRRI). In two locations, 206 lines mainly from the aus-panel were sown. Besides measurements like yield and tiller number, crown root samples from the topsoil area were scanned and analyzed. Surface area and length of the main root and lateral root types, number of S-type lateral roots, and the average distance between two S-type lateral roots were measured from this dataset, to serve as an overview of the phenotypic variation within the aus-panel. We found that the lateral root surface area did not increase with the nodal root diameter, but the correlation between these traits was weak ($R^2 < 0.5$). In conclusion, root phenotype variation within the aus-panel can be determined by measuring multiple root traits with a focus on lateral roots and testing their correlation and variation. These root phenotypes will be tested in future experimental and modeling work, to test for beneficial root trait combinations and investigate the role of lateral roots under drought stress and rewatering conditions to contribute to stable food crop security.

Keywords: Aus-panel, drought, lateral roots, rice

Contact Address: Helena Bochmann, Forschungszentrum Jülich, IBG-2, Jülich, Germany, e-mail: h.bochmann@fz-juelich.de