[P4] Crop Genetics and Physiology

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 4 (Poster) (Crop Genetics and Physiology)

12:15 PM - 1:00 PM

[P4-37]Development and Genetic Analysis of Compensatory Growth of Lateral Roots in Rice

*Nominated for Presentation Awards

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Soil compaction is a major problem limiting crop production. Compacted soils limit root system development, causing significant reduction in water and nutrient uptake from the soil, and resulting in yield loss. Mechanical impedance on primary roots caused by soil compaction triggers compensatory lateral root (LR) growth in various plant species. Maintenance of sufficient total root length contributes to continued shoot growth under compacted soils. Therefore, improving compensatory LR growth is a strategy for developing crop plants that tolerate soil compaction. To reveal the mechanisms of compensatory LR growth in rice, a method for root tip excision was established to induce the compensatory LR growth. To identify the genes regulating the compensatory LR growth, a novel rice mutant (T3-7-1) was isolated for its altered root phenotype and response pattern to root tip excision. The mutant produced fewer LRs under water culture and produced thicker LRs in response to root tip excision. Through characterization of the mutant and RNA-seq analysis in LR primordia captured with laser microdissection, molecular mechanisms underlying compensatory LR growth is being investigated. Furthermore, phenotypic traits related to the degree of compensatory LR growth is being examined in rice genotypes using a semi-hydroponic system.