
Oral sessions | Abiotic Stress for Crop Production | O32: Drought Physiology

[O32] Drought Physiology

Chair: Junichi Kashiwagi (Hokkaido University, Japan)

Thu. Sep 9, 2021 2:30 PM - 4:30 PM Room 3 (Oral) (Abiotic Stress for Crop Production)

3:55 PM - 4:10 PM

[O32-06] Transcriptome Analysis of Soybean Responses to Water Deficit Conditions in the Field

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Drought is the most serious abiotic stress affecting crop productivity. Because of the impact on global food security, the development of drought tolerance is a major concern in plant research. Numerous studies mainly conducted under severe water stress conditions in the laboratory have revealed the central role of abscisic acid (ABA) in stress signaling and drought tolerance in plants. On the other hand, studies on the effect of soil water deficit conditions that cause reduction of plant growth in the actual field are limited. In this study, we analyzed the transcriptome profile of soybean grown in the field with different soil water contents to elucidate the underlying molecular basis of how soybean plants respond to water deficit in the actual agricultural fields. We found that the aboveground biomass and yield of soybean correlated with the soil water contents in the experimental field. The genome-wide RNA-seq analysis revealed that a large number of up-regulated genes by the water deficit conditions were enriched in the Gene Ontology terms for response to nutrient starvation. Our findings would contribute in designing new strategies to develop drought tolerant crops and could shed light on future research towards understanding plant response to water stress in relation to nutrient acquisition from the soil.