
Oral sessions | Crop Genetics and Physiology | O42: Assimilate Partitioning for Crop Productivity and Quality

[O42] Assimilate Partitioning for Crop Productivity and Quality

Chair: Naohiro Aoki (The University of Tokyo, Japan)

Chair: Tatsuro Hirose (Takasaki University of Health and Welfare, Japan)

Chair: Yong-Ling Ruan (The University of Newcastle, Australia)

Thu. Sep 9, 2021 2:30 PM - 4:30 PM Room 4 (Oral) (Crop Genetics and Physiology)

3:40 PM - 3:55 PM

[O42-05] Sink-Source Relationship in Short-duration and Hybrid Rice Varieties in Tropical Asia

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Poor grain filling has been often suggested as a major yield constraint in the popular short-duration rice varieties in tropical Asia. This study put emphasis on the sink-source relationship and the role of nonstructural carbohydrates (NSC) around heading on grain filling. Field experiments were conducted in four consecutive growing seasons at International Rice Research Institute (IRRI), Philippines in 2016 and 2017 to compare Rc10 (IR50404-57-2-2-3), a popular short-duration variety, and Rc132, a popular hybrid variety. The percentage of filled grains in Rc10 was lower than Rc132, although sink capacity (spikelets m⁻² x single grain weight) of Rc10 was smaller than that of Rc132. Rc10 had lower content of stem NSC at heading whereas biomass accumulation during the grain filling stage (ΔW) did not differ between varieties. Moreover, Rc10 translocated less NSC from stems to panicles and had lower total carbohydrate availability (NSC plus concurrent photoassimilates) than Rc132 during the early grain filling period. The results suggest that source limitation is likely a possible reason for poor grain filling of Rc10. Sufficient NSC accumulation around heading and photoassimilates supply to the developing caryopses will be required for further yield improvement in short-duration varieties in the tropics.