

Physiological Responses of Lowland Rice Cultivars to the Saturated Soil Culture System



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Introduction

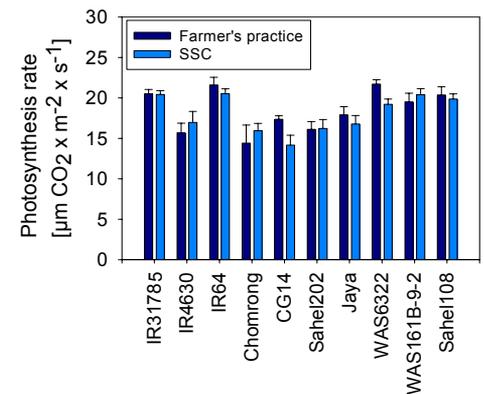
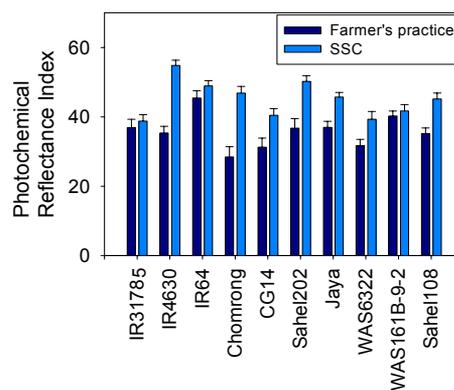
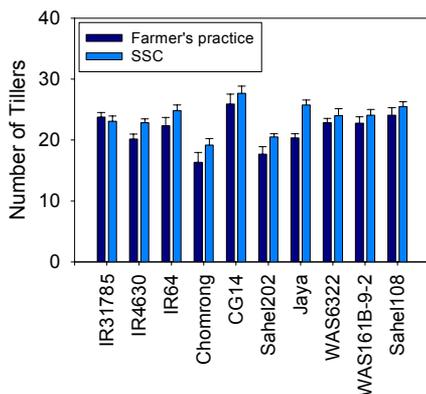
Increasing water scarcity and climate variability the demand for water saving crop production is growing. Irrigated rice is one of the largest consumers of fresh water resources. Saturated soil culture (SSC) is one option to reduce the irrigation water input and can reduce production costs. The aim of our study is the physiological characterization of genotypic traits enhancing water saving practices for irrigated rice. Experiments continue in bi-monthly staggered planting dates on two different sites in Senegal to assess the seasonal variation in physiological and phenological responses.



Conclusion and Outlook

- In the wet season, the SSC system may not inflict yield penalties.
- PRI time kinetics will be analyzed in detail to verify its indicative role for water stress and yield reduction.
- Genotypic changes in physiological patterns between wet and dry season are expected.
- Water use efficiency at different developing stages and yield will be continuously monitored at 2 sites for 2 years in bi-monthly sowing dates.

Results and Discussion



- The SSC system saved about 25% of water (data not shown).

- Tiller number was not affected by the SSC system.

- Photochemical Reflectance Index (PRI) increased with the SSC system.

- ⓘ Indicator of water stress?

- CO_2 assimilation rate and transpiration were not affected by the SSC system.

Materials and Methods

For this study in the Senegal river valley, 10 varieties were selected representing the genetic variation in terms of duration, stress tolerance and water use patterns. For SSC, fields were kept under saturated conditions. Water inflow (irrigation, precipitation) and water loss (transpiration, evaporation, percolation) were determined, variety specific canopy properties, crop growth, photosynthesis, stomatal conductance, the photochemical reflectance index, and leaf area were measured and compared to results obtained in fields irrigated in the traditional way. We present preliminary data collected during the pre-harvest stage.



Acknowledgements

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