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## Performance of rice varieties under rainfed condition in wet and dry tropics of Queensland, Australia

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**Statement of the Problem:** Rice is adapted to diverse environments such as in tropical lowlands in flooded conditions and in upland rainfed conditions in aerobic soils with little or no puddled water. Rainfed rice systems are becoming more relevant in the context of the seasonal unpredictability of rainfall and declining access to irrigation water for the rice industry in Australia.

**Methodology & Theoretical Orientation:** Field experiments were conducted during the 2015 wet season at Alton Downs, central Queensland (dry tropics) and South Johnstone, north Queensland (wet tropics), to compare varietal performance in the drier and wetter tropics of Australia. The yield performance of varieties was evaluated and related to yield determining physiological, phenological and agronomic traits. At Alton Downs the rainfall was very low during the flowering and grain filling stages, which exposed the late flowering crop to terminal drought. In contrast, in the wet tropics of South Johnstone, the rainfall amount and distribution exceeded well above the crop evapotranspiration demand during the experiment.

**Findings:** The results suggest that the earlier varieties such as AAT 4 and AAT 6 were higher yielders under Alton Downs conditions, but the late flowering and least yielding varieties under Alton Downs conditions, such as AAT 15 and AAT 18, were among the highest yielders in South Johnstone, with their yields greater by 6–20 fold that of Alton Downs. The greater yield of these later varieties at South Johnstone was due to the higher effective tiller number per plant, heavier 1000 grain weight, and greater harvest index, and higher panicle fertility and higher number of grains per panicle. Additionally, the enhanced leaf photosynthetic rate and WUE were coupled with increased flag leaf area, which had a significant contribution to yield under favourable soil moisture conditions in the wet tropical environment of South Johnstone.

### Biography

Sachesh Silwal is doing masters in agriculture at CQUniversity Australia. He is investigating the effect of supplementary irrigation and rainfed system in dry and wet tropics of Queensland, Australia. He has long research experience of participatory plant breeding and on-farm agrobiodiversity management.

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