

**Poster**

**APSIM-ORYZA MODEL TO ANALYSE THE YIELD GAP OF RICE UNDER  
MOISTURE AND NITROGEN STRESS**

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**ABSTRACT**

APSIM-Oryza model is utilized to identify the yield limiting factors and their strength on yield gaps between farmers realized yield and potential yield. This study was conducted to investigate the effect of nitrogen and water on yield gaps among potential, experimental, recommended and farmer practices using APSIM Oryza model. Experiments were conducted at RRDI, Bathalagoda from *maha* 2010/11 and 2011/12 seasons to parameterize the model. Relevant weather data were collected on daily basis from 1996 to 2013. Soil fertility parameters were determined from soil analysis for different soil depths (0-15, 15-30, 30-60 and 60-90 cm). Grain yield of Bg 300 rice variety grown in the above soil under different levels of nitrogen (0, 50, 80, 100, 150 and 200 kg N/ha) were collected from field trials conducted in three *maha* seasons. Farmers realized yield of the same variety was collected from the surveyed data. Calibrated APSIM-Oryza model was used to simulate the potential yield under different conditions. Simulated results were then compared with the experimental results of different levels of nitrogen under irrigated conditions and surveyed results of farmer yield under irrigated and rainfed conditions. Cumulative distribution functions (CDF) were set up for the assessment of treatments. Yield potential of Bg 300 is 7.0 t/ha. Simulated results revealed that the potential yield of Bg 300 under non limiting condition of water and nitrogen were in between 7.0 t/ha and 5.5 t/ha. Experimental yields obtained under irrigated condition were more or less similar to the simulated results. With the rainfall pattern of each year, model illustrated the existence of water stress in different years. Nitrogen stresses were observed in 0 kg N/ha and 50 kg N/ha under both rainfed and irrigated situation. No yield differences were observed from 100 kg N/ha onwards. When nitrogen and water was unlimited yield gap between potential and farmer practiced was 34 % (6.1 t/ha vs. 4.9 t/ha) but yield gap between potential and rainfed farmer practiced was 74 % (6.1 t/ha vs. 3.5 t/ha). Therefore, water management plays a significant role on yield gap and management interventions are needed to reduce the gap.

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