

**VALIDATION OF 'APSIM' MODEL FOR SHORT AND MEDIUM AGE RICE VARIETIES IN DIFFERENT AGRO-CLIMATIC ZONES OF SRI LANKA**

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Agricultural system simulation models are very useful tools to assess the performance of agricultural systems under different scenarios (*e.g.* soil, climate and agronomic management) once carefully parameterized and validated. Resource requirement such as time, money and labour for modelling approaches are lower than that of on-farm trials. In addition, crop simulations allow exploration of options that would be not possible using experimental-only approaches. Agricultural Production Systems Simulator (APSIM) is a farming system model that simulates the effects of environmental variables and management decisions (*e.g.* irrigation management) on production (crops, pasture, trees, and livestock), profits and system balance (*e.g.* soil condition). Rice (*Oryza sativa* L.) is the staple food for Sri Lankans and is cultivated as a wetland crop in all three agro-climatic zones *i.e.* Dry Zone (DZ), Intermediate Zone (IZ) and Wet Zone (WZ), in Sri Lanka. The present study was conducted to validate the APSIM rice model for a short age (Bg 300, 3.0 month age class) and a medium age (Bg 359, 3.5 month age class) varieties grown in all three agro-climatic zones, prior to scenario analysis for rice crop using the simulation model. The model parameterization and testing were done using secondary data collected from literature. The yield data were obtained from the Field Crops Research and Development Institute at Maha-Illuppallama, and fertilizer application and management practices were incorporated to the model according to the recommendations of the Department of Agriculture. Model validation was done using crop yields recorded for Maha-Illuppallama (DZ), Batalagoda (IZ) and Bombuwela (WZ). The simulated yields and phenology were used to compare the observed and predicted values using appropriate weather and soil data from those locations. The analysis revealed that the APSIM could simulate the observed rice yields for Bg 300 and Bg 359 with coefficient of determination ( $R^2$ ) of 0.99 and 0.90, respectively and co-efficiency of variation of 12.75 and 7.12, respectively, for all the three tested sites. Thus, the parameterised and validated APSIM rice module for Sri Lankan rice varieties can be used for future simulations and scenario analyses with high precision.

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