Calibration of cultivar parameters of SIMRIW-RS (rice simulation model for remote sensing) for the rice growth monitoring in Thailand

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Rice production is one of the most important agriculture in Thailand. Because the production variability caused large impact on the people living, the assessment of disaster impact before harvest is recommended. The authors have been developing a satellite based observation system for the purpose by employing SIMRIW-RS, a rice growth simulation model for remote sensing. SIMRIW-RS would be applied anywhere, but preparation of cultivar parameters is recommended before the application in order to adjust the relation between rice growth and production.

To obtain cultivar parameters, rice growth and production data obtained in a farmer's field in Nongchok districe in Bangkok was used. 50 sample points were selected from the field of 6.88-ha. The growth was evaluated in terms of LAI measured by LAI-2200 (Li-Cor Ltd), above ground biomass and grain yield was measured by 1-m^2 harvesting at the maturity.

The phenological parameters for the cultivar were substantially derived from the parameters that the authors previously obtained for a Thai rice cultivar, and adjusted for the growth duration provided as the cultivar information. The parameters for LAI growth was estimated on the basis of average LAI change for the 50 sample points with air temperature. The parameters for production against LAI growth was also estimated on the basis of average above ground biomass and grain yield for the 50 sample points.

LAI growth at each sample points can be calibrated by using the estimated cultivar parameters for the phenological development and LAI growth, and the calibration produces field parameters to explain locational variability for rice growth and production. The field parameters suggest the field has a large variability of soil fertility, most of which were caused by that of chemical fertilizer application. The estimated rice grain yield after the calibration showed a relative consistency with the measured yield, suggesting the estimated parameters would be reasonable.

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