

Predicting Rice Yield by Remote Sensed Images Taken at Booting Stage

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Abstract:

This study integrated multiple regression models, derived from reflectance spectrum measurements and using band ratios (NIR/RED and NIR/GRN) as independent variables, with air-borne and space-borne multispectral images taken at booting stage to predict rice yield before harvest. Air-borne images were obtained using VCDi, developed by ITRC, flown about 2 km above ground. Space-borne images were those taken by SPOT 5. A 4.8-ha paddy rice field was used as testing ground for the accuracy of prediction. Within the site, different rice yield scenarios were produced by using combinations of rice varieties, Japonica and Indica type, nitrogen rate and drought treatments. Rice yields harvested in 10m X 10m mesh were used as ground truth data for comparison. Results indicated that averaged prediction less than 10% could be obtained if using airborne multispectral images. However, predicted yields were underestimated by about 50% when using space-borne multispectral images while applying dark object subtraction method for atmospheric correction. Improved prediction accuracy, using satellite images, was thus expected if better atmospheric correction method were applied. Currently, several atmospheric correction schemes are under testing. Results will be reported during the symposium.

Key words: Rice(*Oryza sativa* L.), Yield estimation, Reflectance spectrum, Multispectral images.