



Spectral profile approach for wheat yield modelling using MODIS data in India

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Abstract: Development of reliable crop yield models with minimal ground data is a major thrust area for agricultural planning which encompasses managing agricultural inventory for ensuring food security. Remote sensing technology provides a systematic and reliable data source required for study of vegetation development. Exploiting temporal behavior in an agricultural environment is very informative as it provides a link for quantitative assessment of plant state and growing conditions to final grain yield. The present study aims at using multi-date MODIS data for wheat yield modelling over North-west India during 2005-06 rabi season. Spectral crop growth curves such as quadratic, cubic and power-exponential were fitted. The data set was grouped into two strata namely, high yield (yield > 3 t/ha) and low yield (yield < 3 t/ha) strata. A correlation analysis of the model estimated peak NDVI (called Gmax) and wheat yield was carried out. In-sample cross validation using leave-one-out method was performed. It was concluded that a significant correlation exists between wheat yield and the peak NDVI value and the prediction performance is satisfactory for high yield stratum but not for low yield stratum.

Keywords: NDVI, least squares fitting, spectral maxima, regression, wheat yield.