

Spectral Response of River Plant Canopy

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ABSTRACT

Irrigated rice crop is practised in an area of about 21million ha. Which is about 49% of the country's rice producing area and contributing above 70% to the country's rice production? Due to expansion of irrigation, it has become possible to cultivate rice in dry areas and in dry season.

Increase in the yield of rice crop grown in Punjab, Haryana and Western Uttar Pradesh largely because of assured and regulated water supply. The inherently congenial climatic environment for traditional rice culture in the eastern region is relatively less congenial for modern rice culture involving the use of high yielding varieties and high levels of fertilizers and pesticides.

The main objective of this study was to establish the relationship between spectral reflectance of rice canopy and crop growth. Taking account of the goals of the study and of the rice cover density variation, two fields were chosen for radiometric and agronomic measurements during the period August to November 1997.

A hand held Radiometer (model 100 BX) was used to measure spectral reflectance with four bands corresponding to band 4, 5, 6 and 7 of the Multi Spectral Scanner on board Landsat 1-5. Radiometer with 21T steradian diffuser cap was set upward to measure direct (sun) and diffuse (sky) irradiance with a 15° field of view viewed the canopy with a zenith angle of 57.5°.

Relations among spectral reflectance, and crop growth stages of rice plants grown on irrigated light textured soil in a semi-arid region are presented. There was a linear relation between spectral reflectance and rice plant height ($r=0.97$) for band 1 (0.45-0.52 / μm) reflectance values. On the other hand, in bands 2 (0.52-0.60 / μm) and 3 (0.63-0.69 / μm), reflectance values decreased until 70 days after planting (DAP) and then increased during the reproductive phase of the crop. This suggests that band 2 is affected by the greenness of the plant. The near infrared band 4 (0.76-0.90 / μm) showed maximum reflectance at 59 DAP (panicle initiation stage) and a decline in reflectance thereafter through maturity.