Multi-Spectral Images Tetracam agriculture Digital Camera to Estimate Nitrogen and Grain Yield of Rice at difference Growth Stages

ABSTRACT

Several methods are available to monitor the nitrogen content of rice during its various growth stages. However, monitoring still requires a quick, simple, accurate and inexpensive technique that needs to be developed. In this study, Tetracam Agriculture Digital Camera was used to acquire high spatial and temporal resolution images to determine the status of N and predict the grain yield of rice (Oryza sativa L.). Twelve pots of rice were subjected to four different N treatments (0, 125, 175 and 250 kg ha-1). Three replicates were arranged in a randomized complete block design to determine the status of N and predict rice yield. The images were captured at different growth stages (i.e., tillering, panicle initiation, booting and heading stage) of rice in each pot. N and grain yield were significantly correlated with NDVI ($R^2 = 0.78$) and GNDVI ($R^2 = 0.88$), especially at the panicle initiation and booting stages, respectively. The study demonstrated the suitability of using the Tetracam images as a sensor for estimating chlorophyll content and N. Moreover, the findings showed that the images revealed their potential use in forecasting grain yield at different growth stages of rice.