Evaluation of ground-level and space-borne sensor as tools in monitoring nitrogen nutrition status in immature and mature oil palm

ABSTRACT

Monitoring nitrogen (N) in oil palm is crucial for the production sustainability. The objective of this study is to examine the capability of visible (Vis), near infrared (NIR) and a combination of Vis and NIR (Vis + NIR) spectral indices acquired from different sensors for predicting foliar N content of different palm age groups. The N treatments varied from 0 to 2 kg per palm, subjected according to immature, young mature and prime mature classes. The Vis + NIR indices from the ground level-sensor that is green + red + NIR (G + R + NIR) was the best index for predicting N for immature palms (R2 = 0.91), while Vis indices blue + red (B + R) and Green Red Index from the space-borne sensor were significantly useful for N assessment of young and prime mature palms (R2 = 0.70 and 0.50), respectively. The application of vegetation indices for monitoring N status of oil palm is beneficial to examine extensive plantation areas.

Keyword: Ground-level; Nitrogen; Oil palm; Space-borne