Use of spectral reflectance to discriminate between potassium deficiency and orange spotting symptoms in oil palm (Elaeis guineensis).

Abstract

Potassium (K) deficiency and Orange Spotting (OS) disease exhibit similar symptom via visual assessment. This work investigates the separability of K deficiency and OS disease symptoms using spectral reflectance. This assessment was conducted at a commercial oil palm plantation located in Sungai Buloh, Selangor. Leaves from K-deficient trees, OS-infected trees and nonsymptomatic trees (control) were sampled for spectral reflectance acquisition. Leaf spectral reflectance was acquired under constant halogen lighting. All leaf samples exhibited a green peak at 555 nm wavelength, with an average reflectance value of 0.15. Reflectance between OSinfected and K-deficient leaves showed significant separability at the 400-538 nm and 667-688 nm wavelength regions. Reflectance of K-deficient leaves was significantly different than that of OS-infected leaves across all severity classes.

Keyword: Oil palm; Potassium deficiency; Orange spotting disease; Spectral reflectance.