Sustainable management of a matured oil palm plantation in UPM campus, Malaysia using airbone remote sensing

ABSTRACT

Accurate and reliable near-real time information is needed for a sustainable oil palm plantation management, especially on plant quality and health. Airborne remote sensing provides the effective recent agricultural crop information for the oil palm plantation industry planning, management and sustainable development. A study on the characteristic of a matured oil palm plantation in UPM campus was conducted using airborne hyperspectral remote sensing technique. Airborne hyperspectral remote sensing can be used as an effective tool in monitoring the characteristic of oil palm plantation in order to predict and manage the oil palm production. The general objective of this study is to assess the capability and usefulness of UPM-APSB's AISA airborne hyperspectral sensor to determine the characteristic of a matured oil palm plantation for its sustainable development while the specific objective is to identify, classify and produce the thematic map of matured oil palm plantation in the study site. The age of the oil palm plantation used in this study is 27 years old. Sobel filtering was used to enhance the image. Spectral Angle Mapper (SAM) analysis was then used to classify the characteristic of the plantation within the study area. A thematic map of 27 years old matured oil palm plantation was produced and the characteristic of the oil palm plantation in the study site was identified as 173 healthy, 7 dead, 9 stressed oil palm trees and open areas in the plantation with a mapping accuracy of 93.33%. This has shown that UPM-APSB's AISA airborne hyperspectral sensor is capable of mapping a matured oil palm plantation with such characteristics for its sustainable management and future development.

Keyword: Oil palm; Precision; Sustainable production; Individual tree; Plantation characteristics