

INTISARI

Metode survei tanah lapangan membutuhkan banyak waktu dan penilaian dari profesional untuk memberikan penilaian yang relevan. UAV Multispektral memiliki peluang untuk mengidentifikasi karakteristik tanah secara cepat dan non destruktif. Penelitian ini bertujuan untuk mengetahui hubungan antara nilai spektral Vis-NIR yang diperoleh menggunakan UAV multispektral terhadap beberapa karakteristik fisika dan kimia tanah. Karakteristik fisika yang diamati adalah tekstur tanah dan kadar lengas tanah. Karakteristik kimia yang diamati adalah bahan organik tanah, kapasitas pertukaran kation dan Fe tersedia. Analisis regresi linear berganda digunakan untuk mencari hubungan antara spektral Vis-NIR terhadap karakteristik tanah. Nilai panjang gelombang tampak dan inframerah dekat berperan sebagai variabel independen, sedangkan data karakteristik tanah sebagai variabel dependen. Penelitian dilakukan pada 9 lokasi berbeda dengan kriteria lahan pertanian pasca panen, minim vegetasi dan genangan air pada jenis tanah yang berbeda. Spektral Vis-NIR memiliki hubungan yang kuat terhadap debu tanah ($R^2 = 0.837$), hubungan moderate mendekati kuat terhadap kadar lengas tanah ($R^2 = 0.745$), lemah terhadap Fe tersedia tanah ($R^2 = 0.377$) dan sangat lemah terhadap bahan organik tanah ($R^2 = 0.167$).

Kata kunci : UAV, Multispektral, Regresi, Karakteristik Tanah

ABSTRACT

Field soil survey methods require considerable time and professional assessment to provide relevant evaluations. Multispectral UAVs have the potential to quickly and non-destructively identify soil characteristics. This study aims to determine the relationship between Vis-NIR spectral values obtained using multispectral UAVs and several soil physical and chemical characteristics. The observed physical characteristics include soil texture and soil moisture content. The observed chemical characteristics are soil organic matter, cation exchange capacity, and available Fe. Multiple linear regression analysis was used to determine the relationship between Vis-NIR spectra and soil characteristics. Visible and near-infrared wavelengths serve as independent variables, while soil characteristic data serve as dependent variables. The study was conducted at 9 different locations with post-harvest agricultural land criteria, minimal vegetation and waterlogging, on different soil types. The Vis-NIR spectra have a strong relationship with soil dust ($R^2 = 0.837$), a moderate to strong relationship with soil moisture content ($R^2 = 0.745$), a weak relationship with available Fe ($R^2 = 0.377$) and a very weak relationship with soil organic matter ($R^2 = 0.167$).

Keywords: UAV, Multispectral, Regression, Soil Characteristics