Temporal stability of the NDVI-LAI relationship in a Napa Valley vineyard

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Abstract

Remotely sensed normalized difference vegetation index (NDVI) values, derived from high-resolution satellite images, were compared with ground measurements of vineyard leaf area index (LAI) periodically during the 2001 growing season. The two variables were strongly related at six ground calibration sites on each of four occasions (r^2 = 0.91 to 0.98). Linear regression equations relating the two variables did not significantly differ by observation date, and a single equation accounted for 92 percent of the variance in the combined dataset. Temporal stability of the relationship opens the possibility of transforming NDVI maps to LAI in the absence of repeated ground calibration fieldwork. In order to take advantage of this circumstance, however, steps should be taken to assure temporal consistency in spectral data values comprising the NDVI.