

Detecting and monitoring plant nutrient stress using remote sensing approaches: a review

ABSTRACT

Determination of plant stress factors is often challenging as it can be a compound result of water deficit, nutrient deficiency and disease infection. Symptoms arising from these stress factors may also be similar. Hence, visual observation alone could result in flawed diagnosis which would eventually disrupt remedial action for the affected plant/crop. Spectral reflectance measurements can help identify and select wavelengths sensitive to different types plant stress. Previous studies have found that plant stress will change spectral reflectance pattern in the visible range (380-720 nm or F380-F720) and the infrared range (720-1500 nm or F720-F1500). Typically, the magnitude of change will vary at different wavelengths. Such information facilitates early detection of plant stress, particularly nutrient deficiency. This approach can potentially lower operating cost in fertilization and minimize acute loss of productivity. This review examines a range of spectral techniques that deploy remote sensing for detecting plant nutrient stress and monitoring plant nutritional status.

Keyword: Plant; Plant stress