عنوان مقاله:

Use of Spectral Reflectance Values for Determining Nitrogen, Phosphorus, and Potassium Contents of Rangeland Plants

نویسندگان:

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خلاصه مقاله:

This study was carried out to determine nitrogen, phosphorus, and potassium contents of rangeland plants using spectral reflectance value. The measurements were made in ۱ m۲ area of different parts of a rangeland. A portable spectroradiometer capable of measuring the wavelength range of ۳۲۵-۱,۰۷۵ nm of the electromagnetic spectrum was used to collect spectral data. Spectral measurements were made in a rangeland while nitrogen, phosphorus, and potassium content of the plants were determined in a laboratory. Stepwise linear regression was used to select wavelengths to investigate relationships between laboratory analysis results and spectral data. According to the result, significant relationships existed between predicted and measured nutrients, with R۲ values of ۰.۸۵, ۰.۴۳, and ۰.۸۴ for nitrogen, phosphorus and potassium, respectively. While ۱۱ wavelengths (R۶۰۹,R۶۴۷,R۶۵۱,R۶۵۴,R۶۶۹,R۶۷۵, R۶۷۶,R۶۸۰, R۷۲۱,R۷۲۷,R۷۶۰) were used in the equation for estimating nitrogen level, ۲ wavelengths (R۶۷۵, R۶۸۰) and fifteen wavelength (R۴۱۰, R۴۱۱, R۴۱۷, R۴۲۲, R۴۶۰, R۴۶۳, R۴۶۸, R۶۴۶, R۶۵۱, R۶۵۸, R۶۶۹, R۶۷۰, R۶۷۴, R۶۷۶, R۶۸۲) were determined for phosphorus and potassium levels, respectively. The results indicated that the changes in nitrogen, phosphorus, and potassium content affected reflectance values of the visible region of spectrum (especially in the red regions) and, therefore, spectral reflectance data could be used to estimate the nitrogen, phosphorus and potassium contents in rangeland plants.

کلمات کلیدی:

Plant nutrient elements, Rangeland, Remote Sensing, Spectral reflectance

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