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SUGAR BEET ROOT YIELD ESTIMATION BY REMOTE SENSING DATA

ABSTRACT

Estimating the potential crop yields greatly benefits strategic planning for developed and developing countries. Remote sensing could successfully be used for yield estimation. The objective of this investigation was to develop a robust technique to forecast sugar beet root yield (RY). This study evaluated capabilities of the Moderate Resolution Imaging Spectroradiometer (MODIS) Vegetation Index 250-m 16 day composite (MOD13Q1) and MODIS surface reflectance 250-m 8 day composite (MOD09Q1) to track and retrieve information over sugar beet fields at Eqlid county, Fars province, Iran. Vegetation indices (VIs) were calculated from remotely sensed data. VI time series were obtained from several single day and temporal cumulative values. Correlation and regression analyses were performed using VI values as the independent variables and field level RY as the dependent variable. Results demonstrated that power regression models best described the relationship between RY and VIs from MOD13Q1. The best yield estimation equations were found based on temporal cumulative VI values on 241 day of year (late August). MOD13Q1 can be successfully used to forecast sugar beet RY with good accuracy. The best time for making RY forecasting was 30 to 50 days before harvest. It can be concluded that VIs derived from remote sensing data can be an effective tool for sugar beet RY estimation before harvesting time.
