Application of spectroscopic method to predict sugar content of sugarcane internodes

ABSTRACT

The aim of this study was to investigate the potential of near-infrared (NIR) reflectance spectroscopy for predicting sugar content of sugarcane from internode samples. NIR spectral data were measured using a full-range spectroradiometer (FRS) in the wavelength region between 350 and 2,500 nm based on cross sectional scanning method (CSSM) and skin scanning method (SSM). Statistical models were developed using the partial least square (PLS) to interpret the spectral data and develop calibration model for the sugar content (Brix) of sugarcane. Both CSSM and SSM had good prediction accuracies in predicting Brix values, with the corresponding correlation of determination (R2) values of 0.92 and 0.82 and root mean square error of prediction (RMSEP) of 1.03 and 1.50 Brix respectively. These results showed that the FRS can be used to predict the sugar content from internode samples using CSSM or SSM. However, CSSM was found to give better prediction accuracy than SSM. These findings showed that spectroscopic methods have the potential to be applied for rapid determination of sugar content from stalk samples in the fields.

Keyword: Sugarcane quality; Brix; Stalk; Cross sectional scanning method (CSSM); Skin scanning method (SSM)