

Prediction of total soluble solids and pH in banana using near infrared spectroscopy

ABSTRACT

The potential application of near infrared (NIR) spectroscopy in the range of wavelength from 1000 to 2500 nm to non-destructively determine total soluble solids (Brix) and pH values of bananas were evaluated. Thirty banana samples were measured at five different maturity stages. Each banana sample was scanned at three different locations (top, middle and bottom). The Brix and pH values were associated with the absorbance spectral data for the model development which were split into prediction and calibration sets. The partial least squares (PLS) model was built based on both data sets of banana samples. The prediction model for the Brix values obtained a coefficient of determination of 0.81 and root means square error of predictions of 3.91 Brix. The prediction model for pH values had an R² of 0.69 and RMSEP of 0.36 pH. These findings proposed that near infrared spectroscopy has great potential to predict sugar content in bananas.

Keyword: Non-destructive; Near infrared spectroscopy; pH; Total soluble solids; Banana