Abstract

The prediction accuracy of models based on visible-short wavelength near infrared spectra (VIS–SWNIR; 500–1050 nm) collected from intact fruit using a partial transmittance optical geometry was considered for dry matter (DM) and total soluble solids (TSS) content of mesocarp tissue of banana (*Musa acuminata*, cv. Robusta) and mango (*Mangifera indica*, cv. Keitt) fruit. The DM content was modelled well across all stages of maturity for mango, with a cross validation correlation coefficient of determination (R^2_{cv}) > 0.75 and root mean square error of cross-validation (RMSECV) of <0.70% DM. However, the performance of the banana mesocarp DM model was relatively poor, presumably due to the thickness of the peel. For mango, TSS content was modelled well only in ripened fruit (typical R^2_{cv}> 0.75, RMSECV < 0.60%), and was predicted poorly across ripening stages (R^2_{cv}<0.75). This result is consistent with an inability to discriminate between starch and soluble sugars when using spectra of intact fruit. Better results were achieved for banana pulp TSS, however, this outcome is interpreted as an indirect assessment, with mesocarp TSS content highly correlated (R^2> 0.85) with skin colour (Hunter a and a/b) in the populations assessed. VIS–SWNIR is recommended for assessment of the ripening stage of mango and banana fruit and for assessment of DM in intact mango, but not banana fruit. The technique is also not recommended for assessment of TSS content across ripening stages of banana or mango fruit.