Title On-tree evaluation of harvesting quality of mango fruit using a hand-held NIR instrument

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Abstract

An on-site system was established for determining the maturity of hard green mangoes that are consumed later when ripened off the tree. A hand-held near infrared (NIR) instrument operating in the short wavelength region was used for spectral acquisition. The effect of sunlight on spectra measured outdoors was described and removed. The NIR measuring system developed was used for predicting dry matter (DM) and starch content in hard green mangoes prior to harvest. On the 2D-scatter plot between predicted DM and starch content, the fully-mature hard green mangoes, with excellent eating quality when ripe, could be completely separated from the immature ones, with unacceptable eating quality when ripe. The feasibility of *in vivo* monitoring of internal composition changes was demonstrated. It was concluded that the NIR system was sufficiently capable of determining maturity stages of hard green mangoes on trees. The system could be used as a tool for a grower to decide a proper harvesting date that will provide high-quality fresh fruit to consumers.