

Determination of optimum maturity stages of mangoes using fruit spectral signatures

P. Subedi, K. Walsh, P. Purdy

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Abstract

A purpose designed hand-held spectroscope (“Nirvana”, Integrated Spectronics) was used to assess mango fruit pigmentation (flesh and skin) and flesh dry matter content. Fruit dry matter content and flesh colour was assessed of fruit on the tree, and used as indices of fruit maturity. Dry matter of fruit at harvest was also closely related to total soluble solids of fully ripe fruit, and thus eating quality. The calibration model was robust across growing regions for dry matter ($R > 0.96$ with RMSECV $< 0.6\%$ DM), but regional models were required for flesh colour. The units were used to: (i) non-invasively monitor fruit on tree at weekly intervals from stone hardening stage, allowing a gauge of time to harvest; (ii) describe variation in fruit maturity in relation to canopy architecture, and thus inform selective picking procedures; (iii) assess average fruit maturity across blocks, allowing maturity zoning across the production area; (iv) relate dry matter content of hard green fruit to later ripening behaviour and eating quality (Brix and flavour).