

# NON-DESTRUCTIVE PREDICTION OF INTERNAL BROWNING IN MANGO

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**M**angoes belong to one of the most economically important tropical fruits worldwide, with 1.3 million tons of mangoes exported from countries like Brazil, Mexico, India and Peru. Although the export of mangoes increases, the supply chain has to deal with substantial post-harvest losses. This is due to large variation in quality and maturity of mangoes. Upon arrival at European wholesalers, mangoes are classified based on their ripeness stage and quality. A substantial number of fruits have internal defects or are misclassified. This leads to food loss and decreases the profits in the mango supply chain. To optimise decision making in the mango supply chain and decrease post-harvest losses, it is important to develop non-destructive methods for reliable classification of mangoes based on the level of internal defects. A non-destructive method to determine quality of fruits and vegetables is NIRs (Near infrared spectroscopy) technology. We assessed internal browning in mangoes and investigated whether or not prediction of the level of internal browning based on NIR spectra would be feasible. A support vector machine (SVM) model was built based on NIR spectra and images of 2234 mango halves were gathered. Using colour analysis software, the images were analysed to determine the level of internal browning. The level of internal browning was defined by the natural logarithm of the HB (healthy-brown) ratio: The ratio of colour pixels associated to healthy mango pulp, versus colour pixels associated to brown mango pulp. Our results showed that NIR spectroscopy enables non-destructive prediction of the level of internal browning from different mango cultivars, harvested at different orchards and at different harvest moments. Based on a SVM model, mangoes were classified into healthy vs. brown, with an accuracy of 85%. Robust and reliable classification using non-destructive methods could improve quality decisions throughout the mango supply chain, thereby reducing post-harvest losses.

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