

Title Non-destructive quality and maturity evaluation for the papaya (*Carica papaya* L.) IPB 1
Author Enrico Syaefullah, Hadi K, Purwadaria, sutrisno and Suroso
Citation Program and Abstracts, 4th International Symposium on Tropical and Subtropical Fruits, November 3-7 2008, Bogor, Indonesia. 215 pages.
Keyword Papaya; image processing; artificial neural network; maturity; near infrared; quality; total soluble solids; hardness

Abstract

The objective of this research was to evaluate quality and maturity of papaya using image processing, artificial neural network and near infrared spectroscopy. The images of papaya were captured using digital camera. The images were processed using an image processing algorithm. Image processing algorithm was developed and applied to 150 samples of papaya from three level maturity based on their harvest time. The color indexes and shape factors were extracted from sample images using the developed image processing algorithm. The features extracted from the image processing were used as input to develop artificial neural network that modeled into 7 inputs with the level of maturity as output. Neural network running program used value of momentum constant value constant 0.6, sigmoid function value 1 and 10000 iteration. The NIR system was developed and applied to 100 samples of papaya at the wavelength range from 900 - 1400 nm, the data was recorded in 5 nm interval. Data was analyzed for calibration and validation with Stepwise Multiple Linier Regression (SMLR). Data from all samples was divided into two, each for calibration and validation. The result showed that the use of 7 image processing features as input on 3 hidden layer provided the highest accurateness of validation of 99% in classifying the papaya based on its maturity. The validation for total soluble solids has standard error of prediction (SE), coefficient of variation (CV) and the ratio of standard deviation over the standard error prediction (SD/SE) were respectively 0.25, 2.51 %, and 3.07. For hardness: 0.35, 30.51 %, and 2.43.