

Title Non-destructive discrimination of paddy seeds of different storage age based on Vis/NIR spectroscopy

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Abstract

The potential of visible/near infrared reflectance (Vis/NIR) spectroscopy for non-destructive discrimination of paddy seeds of different storage age was examined based on Vis/NIR spectroscopy coupled with chemometrics. Data from 210 samples of paddy seed were collected from 325 to 1075 nm using a field spectroradiometer. The spectral data were processed and analyzed by chemometrics, which integrated the methods of wavelet transform (WT), principal component analysis (PCA) and artificial neural networks (ANN) modelling. The noise of spectral data was filtered and diagnostic information was extracted by the WT method. Then, diagnostic information from WT was visualized in principal components space, in which the structures with the storage period were discovered. Finally, the first eight principal components, which accounted for 99.94% of the raw spectral variables, were used as the input for the ANN model. A promising model was achieved with a high discrimination accuracy rate of 97.5%. Thus, an effective and non-destructive way to discriminate paddy seeds of different storage periods was put forward.