Title Comparison of different modes of visible and near-infrared spectroscopy for detecting internal insect infestation in jujubes

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Abstract

This study compared the abilities of the interactance, reflectance, and transmission modes of visible and near-infrared (Vis/NIR) spectroscopy in detecting internal insect-infested jujubes. Statistical analysis was performed to identify the effective wavelengths that best discriminated the insect-infested jujubes from intact jujubes and to derive a discriminant function in classifying the jujubes showing internal insect infestation and those that were free of infestation. The highest correct classification rates obtained from the above modes were 100%, 90.0% and 97.0% respectively. The interactance mode in the long-wave NIR (LWNIR) range is preferable to the transmission mode in the visible and short-wave near-infrared (VSWNIR) ranges. Furthermore, the transmission mode in the VSWNIR range displayed an obvious advantage over the reflectance mode in every range. The results indicate that it is possible to use both the interactance and transmission modes to develop a system in detecting the internal qualities of jujubes.