

Title Nondestructive detection of internal insect infestation in jujubes using visible and near-infrared spectroscopy

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Abstract

This paper reports on a study comparing three spectroscopic measurements (interactance, reflectance, and transmittance) in the Vis/NIR range for the detection of internal insect infestation with different damaged levels in jujubes (*Hovenia acerba* Lindl.). Stepwise discriminant analysis was used to derive the discriminant functions based on the effective wavelengths that had maximum discriminatory potential for the different internal conditions. The results show that both interactance in the long-wave NIR (LWNIR) and transmission in the visible and short-wave near-infrared (VSWNIR) wavelength ranges have an obvious advantage over reflectance for every range in completely distinguishing infested from intact jujubes. However, interactance and reflectance in the VSWNIR wavelength range exhibited higher classification accuracies in sorting severely damaged jujubes from slightly infested and intact samples. Furthermore, transmission had clear advantages over both interactance and reflectance for distinguishing slightly infested jujubes from intact jujubes in the VSWNIR range.