

Title An acoustic impact method to detect hollow heart of potato tubers
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Abstract

An acoustic sorting system was developed to detect hollow heart in potato tubers (Spunta variety). The system includes a microphone, digital signal processing hardware and material handling equipment. Upon impact with a steel plate, it was found that solid potato tubers emitted higher magnitude sounds than hollow tubers. Linear discriminate analysis was used to classify potato tubers using three features extracted from the microphone signal. One of the discriminate features was the integrated absolute value of microphone output signal. The other two features were the number of data points in the digitised microphone signal following impact that have slopes and magnitudes below preset threshold levels. The classification accuracy of this system was approximately 98%. Thus, it was concluded that the internal quality of potato tubers can be detected by the acoustic impact method.