Abstract

In this research, the potential of using a multi-spectral imaging system was investigated for detecting bruises on 'Golden Delicious' apples. For this purpose, a hyperspectral imaging system has been built in the spectral region between 400 and 1000 nm. Based on the principal components analysis for the hyperspectral images, four wavebands were selected for a multi-spectral imaging test. The principal components analysis on the multi-spectral images gave very similar results as on the hyperspectral images. The second and third principal components scores images were found to be suitable for identifying the presence of bruises. An image processing and classification algorithm based on moments thresholding was developed. The classification results indicated that, for the sample population used in this experiment, about 93% of the non-bruised apples were recognised as sound. An accuracy of about 86% was achieved for detecting bruises, although all the bruised regions were found to remain in the images after moments thresholding.