

Title Nondestructive ultrasonic monitoring of tomato quality during shelf-life storage
Author Amos Mizrach
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Abstract

A nondestructive ultrasonic method was used to monitor the firmness and sugar content of greenhouse tomatoes (cv. 870) during their shelf-life. This method is based on measurement of acoustic wave attenuation in the fruit tissue, by means of ultrasonic probes in contact with the fruit peel. The fruit for measurement were transferred from the greenhouse to a controlled-temperature room, and were subjected to nondestructive ultrasonic tests and also to destructive penetration measurements of firmness. The results were analyzed statistically to determine the changing relationships between the ultrasonic attenuation measurements and the destructive measurements, during the shelf-life. The differences in the acoustic signals transmitted through the tissue of fruit of various degrees of firmness were measured and analyzed as well. The measured attenuation and the firmness were found to decrease significantly during shelf-life. A linear relationship between the attenuation and the firmness was observed until the end of the softening process. This suggests that this ultrasonic method might be used as a nondestructive means of monitoring the firmness of tomatoes during various stages of storage.