Title Assuring Quality of Fresh Produce: Nondestructive Techniques for Quality Evaluation of Agricultural Products

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Abstract

Quality evaluation of agricultural products has been a subject of interest to researchers for many years. However, there is no clear definition of quality for agricultural products. Different researchers define quality differently. Nevertheless, certain basic factors are commonly used to characterize quality: maturity, appearance, texture, flavor, nutritional value, and freedom from defects and foreign materials etc. Since many quality factors of agricultural products are related to physical properties of the products, it is often possible to develop nondestructive methods for evaluating quality based on physical properties. In the past 30 years researchers have developed such methods for a number of agricultural products. This paper presents an overview of various quality evaluation techniques that are based on one of the following properties: density, firmness, acoustic, ultrasound, optical reflectance and transmission, electrical properties, aromatic volatile emission, and nuclear magnetic resonance (NMR). The sophistication of nondestructive methods has evolved rapidly with modern technologies. The use of various modern image acquisition techniques, such as solid state TV camera, line-acan camera, X-ray scanning, ultrasonic scanning, and NMR imaging, in conjunction with high-speed image-processing techniques has provided new opportunities for researchers to develop many new and improved techniques for nondestructive quality evaluation of agricultural products.