



Technologies for Quality Measurement and Grading of Fruits and Vegetables

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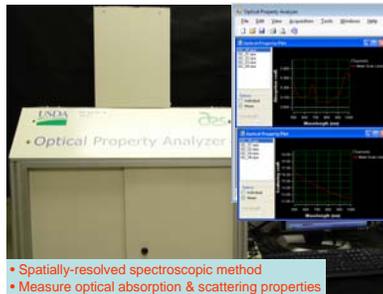
Mission: Develop new and/or improved engineering methods and technologies for nondestructive assessment, grading, and sorting of tree fruits and vegetables to assure postharvest quality and marketability and achieve labor cost savings.

Current Research Activities: Optical characterization of horticultural and food products; spectral scattering and sensors fusion techniques for sorting and grading internal quality of apples; mobile infield apple sorting technology; sensor for maturity/quality detection of apples in orchard and after harvest; hyperspectral imaging technique for online quality inspection of pickling cucumbers and pickles.

Approach: Our research applies a systems approach of integrating property characterization, sensor development and mathematical modeling/analysis, to address critical technological issues in nondestructive quality evaluation of fruits and vegetables before, at and after harvest.

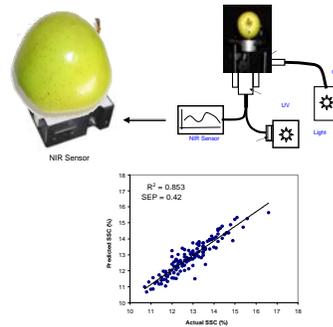
Outcome and Impact: New knowledge and insight about quality characterization of fruits and vegetables through nondestructive means, new sensors enabling growers, packers and researchers to measure and monitor quality/maturity of fruit, cost effective technology for presorting apples in orchard, and new inspection technology for sorting, grading and assigning value to fruits and vegetables based on desired quality traits. The research will enable growers and packers/processors to more efficiently manage harvest and postharvest operations, deliver better quality products to the market and achieve production cost savings.

Optical Property Analyzing Instrument for Plant and Food Materials

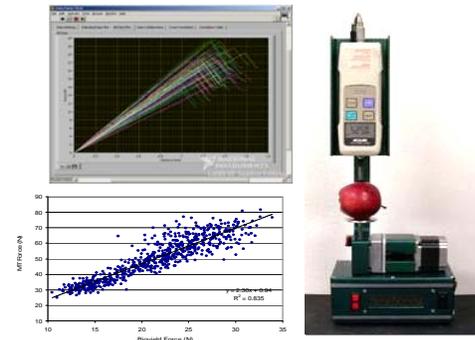


- Spatially-resolved spectroscopic method
- Measure optical absorption & scattering properties

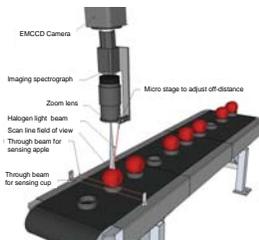
NIR Sensor for Apple Maturity/Quality Assessment



A portable Apple Firmness Tester

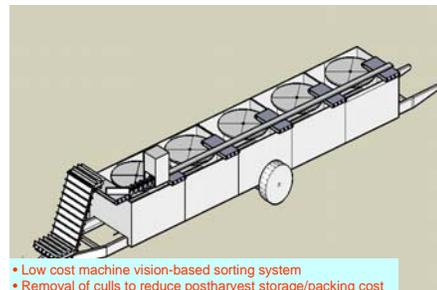


Spectral Scattering Technology for Online Grading of Apple Internal Quality



- Novel light scattering technology
- Prediction of fruit firmness and soluble solids content

Mobile Infield Apple Sorting Technology



- Low cost machine vision-based sorting system
- Removal of culls to reduce postharvest storage/packing cost

Hyperspectral Imaging System for Online Quality Inspection of Pickling Cucumbers/Pickles

- Simultaneous reflectance & transmittance measurement
- Inspection of internal and external quality

