Abstract

Fruit eating quality is determined by a number of factors, including soluble sugar level, acidity, flesh firmness, and aroma. For example, a standard of 10 or 11% TSS is commonly set for melon fruit. Near infrared spectroscopy (NIRS) has been used commercially since 1989 for the in-line grading of fruit for sugar and starch content, and such units are now available from a number of manufacturers. The principle of this technology will be briefly considered, to separate this application from that of NIR imaging to detect skin blemishing, and from that of sorting fruit on background skin colour (ie. maturity). Design criteria for such instruments will be reviewed (e.g. detector signal to noise, wavelength range, wavelength resolution, sample presentation geometry, outlier detection), in context of the commercially available units. Performance criteria, and limitations to the technology, will be discussed. In-line units sort for sweetness after harvest. A current challenge is the development of the NIRS technology for use in the field, to allow rapid, non-invasive checking of fruit on the plant. There are several challenges in such an exercise, from design of the unit to be insensitive to interference from sunlight, to design of a rugged, vibration insensitive, lightweight unit with all electronics on-board. Performance data from one unit will be presented, and limitation for use with melons discussed.

The performance of NIRS units in assessment of melon TSS, relative to apple, peaches, nectarines, plums etc, is hampered by the presence of a non-edible 'rind' of exocarp and outer mesocarp. Likely future developments in optical design and chemometric analysis, and the potential application of other technologies that may allow for improvement in analysis of melon eating quality will be presented.