Abstract:

It is difficult to diagnose physiological disorders, namely, water soaked and browning flesh, in melons. Consumers do not want to buy such melons. The non-destructive evaluation of fruit and vegetable quality is important and a practical problem. To measure NIR absorption spectrum, each melon was hand placed 3 mm apart from the end of a fiber optic probe ('non-contact mode') (Ito et al., 2000; Ito and Fukino-Ito, 2002) so that the blossom end was centered. The original spectra were converted to the second derivative spectra (d2 log 1/R). Following optical measurement, the melon was cut vertically and mainly the water soaked symptom inside irradiated area with NIR beam was visually scored between 0 to 5 (5 is the severest) and taken a photograph. Multiple linear regression (MLR) on spectra (n=8) gave a calibration equation using d2 log 1/R at 942 and 810 nm with a multiple correlation coefficient (MR) of 0.78, and a standard error of the calibration sample set (SEC) of 1.16. We tried to validate the MLR calibration using other lots including not only cultivated but also purchased melons. Nevertheless, the melons whose scores were predicted more than 2.30 by our NIR method always showed the symptom. The calibration was also able to detect browning flesh. The vicinity of 810 nm has just been used for detection of browning inside apples. Water soaked symptom in melons appears to be similar to browning in apples and melons. We conclude that NIR technology offers the potential of non-destructive water soaked and browning flesh detection in melons.