

Title Application of time-of-flight near-infrared spectroscopy to detect sugar and acid content in Satsuma mandarin.

Authors Tsuchikawa, S., Sakai, E., Inoue, K. and Miyamoto, K.

Citation Journal of the American Society for Horticultural Science Vol: 128 (2003); 391-396

Abstract

Time-of-flight near infrared spectroscopy was applied to detect the sugar and acid contents of satsuma mandarins (*Citrus unshiu*) collected from Japan. The combined effects on the time-resolved profiles of soluble solids, free acids, laser beam wavelength, and detection position of transmitted light were investigated. Attenuance of the peak maxima (A_t) and time delay of the peak maxima (Δt) increased as the sugar content increased. However, these optical parameters decreased with increases in acid content. In the case of a model sample of a polyurethane block immersed in specified solutions, A_t and Δt decreased by adding sucrose or citric acid. These results suggested that time-resolved profile was governed not only by the concentration of soluble solid or free acid but also by other inherent factors of a fruit; for example, an optical characteristic of tissue or difference in refractive index between the tissue substance and the liquid. Results indicated the optimum optical parameters for detection of sugar and acid content were A_t and Δt , respectively.