Abstract

Thermal treatments have been extensively used as a non-chemical alternative in postharvest practice. In order to control the treatment properly and to obtain the desired quality, it is necessary to be able to predict the internal temperature of a fruit, as well as the factors that affect the heat transfer. Based on the heat transfer theory, the variation of temperature within the fruit depends on its size, its thermal properties and the convective heat transfer coefficient of the cooling or heating medium. To simulate the temperature history during thermal treatment of a mango, the basic heat transfer equation was developed under the following assumptions; the fruit was in cylindrical shape, its thermal properties were constant, and the heat transfer occurred only in radial direction. By using the thermal properties of the mango cv. Chokanan at 28.0°C, the predicted temperatures were relatively closed to the experimental values. The root mean square errors were 1.25°C and 1.99°C when the fruits were stored at 13.0±0.5°C and were immersed in the hot water at 48.0±0.5°C, respectively.