

Title Vacuum cooling of longan fruit after harvest
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Abstract

Since longan fruit mature during the hot season and the fruit are very perishable, pre-cooling is strongly recommended to remove field heat and reduce the respiration rate of fruit before storage or transportation. Vacuum cooling is the most rapid cooling method for post-harvest horticultural crops. A kinetic model of vacuum cooling fruit based on Fick diffusion law was established. The model well predicted experimental results and showed that at low pressure the cooling rate was inversely proportional to the square of the fruit radius and related to the temperature of water vapor condenser and air pressure in the vacuum chamber. Vacuum cooling can reduce pulp temperature of 'Chike' longans from 28 to 7°C within 11 min. The experimental data showed a good fit with model. The application of pre-wetting fruit with water prior to vacuum cooling can reduce weight loss and increase the speed of cooling. And the result showed that vacuum cooling was a good cooling method for longan fruit after harvest. However, vacuum cooling is not used commercially because of the high cost of vacuum cooler.