Optimization of Storage Parameters of Selected Fruits in Passive Cooling Structures

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Abstract

This study was carried out to determine the optimum storage parameters of selected fruit using three sets of four types of passive evaporative cooling structures made of two different materials clay and aluminium. One set consisted of four separate cooling chambers. Two cooling chambers were made with aluminium containers (cylindrical and square shapes) and the other two were made of clay container (cylindrical and rectangular). These containers were separately inserted ina bigger clay pot inter- spaced with clay soil of 5 cm (to form tin-in-pot, pot-in-pot, tin-in-wall and wall-in wall) with the outside structure wrapped with jute sack. The other two sets followed the same pattern with interspacing of 7 cm and 10 cm, respectively. The set with 7 cm interspace served as the control in which the interspace soil and jute sacks were constantly wetted with water. The other two sets (5 cm and 10 cm interspaced soil) were constantly wetted with salt solution (sodium chloride) to keep the soil in moist condition. Freshly harvested matured oranges and bananas were used for the experiments and temperature, relative humidity and decay were monitored daily. The weight, β carotene, vitamin C, vitamin E, lycopene, bacterial and fungal counts of these produce were determined at intervals of three days for a period of 21 days for oranges and 10 days for bananas. Further analysis by optimisation process revealed optimum storage conditions for stored produce using Essential regression software package. Optimum values of 951.42 g, 22.76/IU, 48.60/mg/100ml, 2.89/mg/ml and 3.27/mg/ml were obtained for weight, β carotene, vitamin C, vitamin E and lycopene contents, respectively for stored oranges at various conditions. Also 238.34g, 12.43/IU,24.23/mg/100ml, 2.52/ mg/ml and 2.88/mg/ml were obtained for weight, β carotene, vitamin C, vitamin E and lycopene contents, respectively for stored bananas at various conditions

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