

Modification of Existing Evaporative Cooling Device for Improvement of its Performance m)

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Much of post harvest loss of fruits and vegetables is due to lack of proper storage facilities. Therefore, provision of proper storage facilities to preserve fruits and vegetables helps to decrease the losses and increase income. A low-cost zero-energy evaporative cooling device has been constructed at the Institute of Post Harvest Technology, Anuradhapura to store fruits and vegetables at fresh form. A study was undertaken to modify the existing evaporative device for its improvement and evaluate the performance.

A two inch pvc pipe with two inch holes on top side was fixed around bottom part of the structure and connected to a 0.75 hp air blower. Three wooden frame lids with poly-styrene boards were made to cover the device. Temperature and Relative Humidity readings of inside and outside were measured in equal two hours interval at days and four hours interval at night time continuously for four days. After modifications, air blower was operated for ten hours at day time, and Temperature and RH readings were measured same way. Cooling device was loaded with brinjal. As control same amount of brinjal was stored under ambient conditions. Temperature, RH as above and weight losses due to shriveling, ripening, microbial spoilage and physiological weight loss separately were measured in two days intervals.

Modified evaporative cooling device showed; 6 - 9.50 C temperature difference in inside compared to the ambient condition which was significantly ($p > 0.05$) higher value to normal condition. With artificial air flow the wind velocity around the device was 3 m/s. Normal wind velocity was 0.27 m/s. Inside relative humidity was 90%-95% during operation period. Shelf life of brinjal was extended up to 21 days and freshness was not changed. In ambient condition shelf

life was 7 days, freshness also very low. Significantly lower losses due to physiological weight loss, microbial spoilage, ripening and shriveling were recorded in the modified device with compared to the ambient condition. The operational cost to store one kg of brinjal per day was with modifications was Rs 0.10. This modification indicated a significant effect on performance of the evaporative cooling device.