

**Title** Cooling field tests of lychees (*Litchi chinensis* Sonn) using air cooler and hydrocooler prototypes

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### **Abstract**

Scientific literature indicates that cooling is an important postharvest operation to preserve the quality of lychees. In order to evaluate the effect of two cooling methods on lychees, an air cooler and a hydrocooler prototype were designed and constructed. Both were compact in design to facilitate handling and transportation to the field but with enough capacity to cool adequate sample sizes for experimental work. The air cooler included a double wall chamber isolated with polystyrene foam and was equipped with mechanical refrigeration, and systems to force cold air through fruit boxes and to keep a high RH. In addition to a double wall polystyrene foam isolated container and a mechanical refrigeration system equipped with a submerged evaporator coil, the hydrocooler included a water recirculation system to keep a uniform water temperature. Cooling tests were conducted in two producing areas of Mexico, using lychees cv. Brewster in two stages of maturity and two average fruit sizes. In both cases cooling curves were obtained and 7/8 cooling times determined. Results indicated that cooling times were comparable with those obtained with commercial equipment's, the temperatures inside the chambers were uniform during the entire cooling process and RHs above 90% were obtained in the air cooler operating at 1°C. This research was supported by UAM and the National Council of Growers and Exporters of Lychee.