Title Extended hot water dip as an alternative quarantine treatment for mango fruits

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Abstract

Quarantine treatment provides an assurance to authorities of importing countries that fruits are free of insect pests. During the past years, quarantine treatment is not a requirement for mangoes exported to China. However, with the reported interception of fruit flies from mangoes exported to China in recent years, quarantine treatment was imposed. Vapor heat treatment is the currently approved quarantine treatment of mangoes exported to Japan, Korea and Australia but this is very costly. There is a need therefore to develop alternative treatment that will ensure insect mortality without impairing fruit quality. Laboratory and pilot scale trials were conducted to develop the extended hot water dip (EHWD) protocol for 'Carabao' mango fruits. These consisted of determining the appropriate water temperature and evaluation of several variables that would affect fruit and insect responses to EHWD. These included fruit size, maturity, effect of delaying the application of EHWD and cooling method after EHWD. Insect mortality test consisted of impregnating 30 fruits with 100 third instar larvae of fruit fly prior to EHWD. Based from insect mortality tests and fruit quality evaluations, the EHWD protocol that can be adopted as a quarantine treatment of mangoes for export to China consisted of the following: dipping mature fruits in water heated to 47-48 deg C until the core pulp temperature reaches the disinfestation temperature of 46 deg C which is maintained for 15 min, followed by 10 min air cooling then 30 min hydrocooling in tap water. Mangoes need to be thoroughly dried before packing in cartons.