

Postharvest Physiology of Tropical Fruits in the Philippines

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Abstract

Banana, mango and pineapple are important tropical fruits in the Philippines. Papaya is rapidly becoming important because of its export potential. Of these fruits only pineapple is non-climacteric. Banana is harvested in a range of maturities depending on the handling requirements and the expected green life, but always prior to the initiation of any changes associated with ripening, in contrast to mango and papaya, in that the latter are harvested at a stage when ripening of the fruit had started and ethylene production had been initiated. The differences in the physiology of these important fruits give rise to different requirements with respect to postharvest technologies. Specifically, these fruits differ in their response to modified or controlled atmosphere (MA or CA) storage technology.

Temperature management results in an extension of marketable life in these fruits. However, prolonged holding at temperatures lower than 12.5°C may lead to chilling injury. The response to chilling conditions can be affected by a number of factors related to the fruit and postharvest environment.

The physiological characteristics of each fruit will be discussed in relation to low temperature holding and MA or CA storage.

Discussion

Sornsrivichai, J. (Thailand): What is the thickness and permeability of the plastic bags you used for MA packaging of mango. Do you use other plastic types that are more effective for MA storage of mango?

Answer: We have tested a number of plastic films of different types and thicknesses and have even provided diffusion holes in some cases. We have never come up with an appropriate MAP system even if combined with low temperature. Mango is apparently very sensitive to the restriction of gas diffusion. Dr. Kitagawa has informed us that ripe mangoes put in plastic sleeves (open) to prevent the shrivelling of the skin showed an increase in the acidity level. The susceptibility of mango to anaerobiosis may be attributed partly to its dermal characteristics (thick cuticle compared with banana). Also the contribution of the large seed to oxygen depletion needs to be documented.

Participant: Do you use fungicides in the hot water treatment to prevent the occurrence of anthracnose?

Answer: We can obtain satisfactory control of diseases with hot water without the addition of fungicides as long as the fruits are treated soon after harvest. We recommend both pre-and postharvest control measures, for example bagging of fruits.

Kawashima, K. (JIRCAS): Have you subjected tropical fruits to gamma irradiation combined with hot water treatment?

Answer: We have recently concluded an IAEA-sponsored study since it was reported that in the case of mango chilling injury was aggravated by gamma irradiation and ripening was inhibited. The fol-

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lowing results were obtained: 1. Irradiation does not inhibit ripening (softening) at doses of 150 km gamma rays. 2. Irradiation leads to uneven peel coloration due to the inhibition of chlorophyll degradation. This condition can be alleviated by hot water treatment since carotenoid pigment biosynthesis is enhanced by high temperature treatment. 3. Mature fruits respond well to irradiation.

Uritani, I. (Japan) : Most of the bananas exported to Japan consist of 'Cavendish' bananas. Could other cultivars be exported from the Philippines to Japan?

Answer : 'Cavendish' bananas are generally exported due to their high quality and satisfactory handling in large farms. In the Philippines we have a large number of banana cultivars. Two percent of the bananas exported to Japan consist of the cultivar 'Senorita'. However the market is not favorable because the appearance is poor and the postharvest life is short. 'Latundan' would be the best cultivar due to the good balance between the content of sugars and acids. However the skin is thin and easily bruised. We are also attempting to export other cultivars, namely 'Lakatan' and 'Saba', a cooking banana.