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Documentation of Cavity Closure in Ripening Mango Fruits

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Abstract

Mango production as a cash crop for fresh fruit and processing markets is increasing worldwide. Mango is a climacteric fruit, so the development stage at harvest is paramount in determining the quality of the final product after post-harvest ripening. The current practical methods for determination of the harvest date are limited, especially in developing countries. In these areas it is mainly done by a manual "tapping" method based on acoustical properties. Mango fruit acoustics change over time because a cavity that initially exists between the mesocarp and the kernel gradually fills as the mango seed develops.

A study on the dynamics of the above mentioned cavity was carried out under the framework of the existing research collaboration between Hohenheim and Chiang Mai Universities on sustainable land use and rural development in mountainous regions of northern Thailand (The Uplands Program, SFB 564). The sample materials were mango fruits of the cultivars Choak Anan and Talap Naa, grown under different irrigation regimes in northern Thailand. Fruits harvested at 24-hour intervals were cut longitudinally through the kernel. A millimetre raster was placed over the cross sections and the area of the seed and cavity for each fruit was measured and recorded by use of digital photography. As a result, the closure of the cavity was documented and correlated with other parameters of mango development which are routinely monitored to determine harvest time.

Knowledge about the ripening behaviour with respect to the closure of the cavity will advance the development of a procedure and/or instrument to automatically detect ripeness of mango fruits, which will be based either on sound detection or ultrasonic reflex.

Keywords: Kernel, ripeness sensor

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