

Title Physiological behavior and quality during growth of Copoazú fruit

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Citation Abstracts Book, 6th International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

Keyword Copoazú fruit; physiological; quality

Abstract

Copoazú fruit [*Theobroma grandiflorum* wild ex Spreng (Schum)] is an ellipsoid amazonic drupe from the *Sterculiaceae* family closely related to endemic cacao. The copoazú sour pulp identifies this fruit that can be used in multiple applications. Fruit harvest is not simple because fruit external appearance did not change much during development. This work was carried out in order to establish some growth pattern and indexes to assist fruit harvesting. The period between fruit set and full ripening of copoazú fruit grown in the Colombian Amazonia was 160 ± 5 days, A complex growth pattern with three stages of sigmoid growth was monitored. The longitudinal and equatorial traits of the fruit fitted a logistic model that were identified at tissue level as follows: S1, involving cellular division and expansion during the first 60 days of growth; S2, maximum fruit growth, during which cellular expansion took place (79 days more), and a final S3 state of 25 days more to reach physiological maturity. After this time, the fruit can be harvested when the abscission layer increased. The respiratory pattern of copoazú fruit during development was climacteric, with a maximum respiration rates after detaching the fruit of around $160 \text{ mg kg}^{-1} \text{ h}^{-1}$ of CO_2 concomitant with a peak of ethylene production at 20°C and 75% R.H. A total soluble solids value of 14 °Brix, matched with an increase in sugars and ascorbic acid content, and a decrease in titratable acidity. Citric acid was the main organic acid in the edible pulp and ascorbic acid was present in a moderate concentration (20 mg per 100 g fresh pulp). The days after fruit set combined with the development of an abscission layer can be recommended as harvest indices for copoazu fruit.