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Sugarcane Pieces: Postharvest Quality-Maintenance Guidelines

Robert E. Paull[1] and Chao Chia Huang[2]
[1]Department of Tropical Plant and Soil Sciences, University of Hawai'i at Mānoa
[2]Taiwan Agricultural Research Institute, Wufeng, Taichung, Taiwan

Scientific Name and Introduction

Sugarcane (*Saccharum officinarum* L. Family Poaceae) is a perennial grass thought to have originated from wild types in Oceania. This C-4 plant thrives in humid temperatures between 20 and 35°C (68 to 95°F).

Sugarcane stem pieces are frequently available for purchase in cane-growing areas. The stem pieces are about 15 to 30 cm (6 to 12 in) long and have about 15% sugar. Some varieties are better suited to chewing; however, preferences seem to vary between regions. In the Caribbean, a preference is shown for varieties that contain fibers that stick together when chewed. The fiber makes it easier to spit out the pulp once the sugar has been consumed. Examples of such high-fiber chewing canes include 'Yellow Gal', CP57-603, CP80-1837, CP80-1907, NG57-258, and 'White Transparent'. In some parts of Asia, preference is shown for the less fibrous, softer varieties, such as 'Badilla' (Schueneman 2002). The cane pieces can be eaten either cold or hot. It is recommended to allow the pieces to warm up for 5 minutes or so after removal from refrigeration. To heat, the cane pieces are removed from the bag and placed in the oven for 10 to 15 minutes.

Sugarcane awaiting processing.

Quality Characteristics and Criteria

During storage, sucrose levels decline and reducing sugars increase, along with an increase in alcohol content. The reducing sugar increase is associated with elevated invertase activity (Mao and Liu 2003). Juice yield can be 70% when freshly harvested then declines after harvest due to dehydration.

Horticultural Maturity Indices

The sugar concentration is highest at the basal end of the stalk, though this can be the most fibrous and difficult to chew. During harvest, the leaves of the sugarcane stalk are trimmed off. The cane is then typically transported to markets and retail stores as an uncut cane.

Grades, Sizes, and Packaging

There are no standards for grading. The quality is considered high when the internode length is long, the diameter is suitable, the sweetness (sugar content) is high, and the pulp is tender and juicy. Only the middle portion of the cane is used, as the basal portion is hard, and the shoot apex is not sweet.

In Taiwan, sugarcane is peeled and cut to the desired length at the retail store or at processing centers

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Sugarcane packaged for sale in Taiwan.

Sugarcane storage reddening disorder.

for supermarkets. The peeled cane is cut into 20- to 25-cm (8- to 10-in) lengths and packed by 600g or 1200g lots in a vacuum bag for the supermarket. It can also be packed in 1200g or 1800g PE bags when sold to retail stores in Taiwan.

Pre-Cooling Conditions

The packed sugarcane pieces sold in supermarkets are precooled at 0 to 4°C (32 to 39°F) overnight. The packed cane is then shipped to supermarket on the second day and displayed on the shelf at 7 to 10°C (44 to 50°F).

Optimum Storage Conditions

Stalks can be stored under cool, moist conditions for about two weeks, though they may dry slightly. For longer storage, dipping the cut piece in hot paraffin helps to retard moisture loss. The cut surface of the cane piece will often turn red and develop an off-flavor if stored for longer than 7 to 10 days.

The cane pieces should be stored for no longer than 5 days at 5°C (41°F). Vacuum-packed pieces can be stored at 0 to 2°C (32 to 35.6°F) for three weeks. In Taiwan, no preservatives are allowed.

Controlled Atmosphere (CA) Considerations

No available data.

Retail Outlet Display Considerations

Store at 0 to 2°C (32 to 35.6°F) and display at 7 to 10°C (44 to 50°F).

Chilling Sensitivity

No available data.

Table 1. Respiration Rates of Sugarcane

Temperature	(mg CO_2 kg^{-1} hr^{-1})*
2°C	8
10°C	16
20°C	41

*** Intact cane 20 days after harvest**

Ethylene Production and Sensitivity

No available data

Respiration Rates

See Table 1. The respiration rate of intact cane is about 12 mg kg^{-1} hr^{-1} and of pieces is about 60 mg kg^{-1} hr^{-1}. Peeling also increases the rate to about 580 mg kg^{-1} hr^{-1}. To calculate heat production, multiply mg CO_2/kg.hr by 220 to get BTU/ton/day or by 61 to get kcal/metric ton/day.

Physiological Disorders

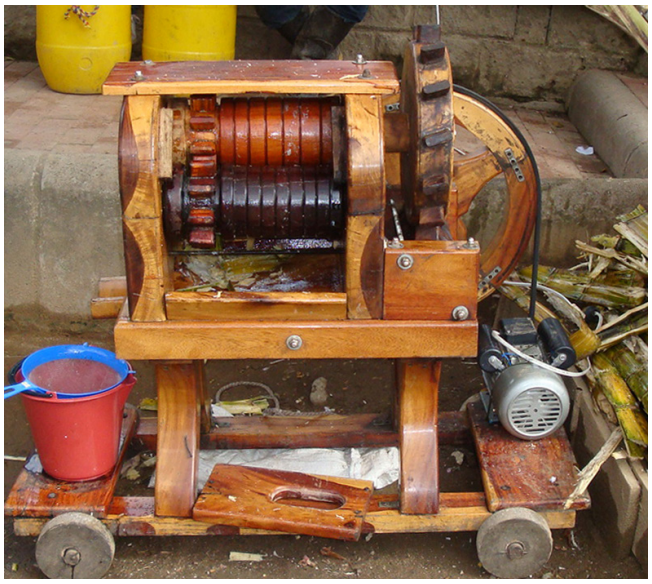
Reddish discoloration of the cut end occurs after storage for 7 to 10 days at 2°C (35.6°F). This discoloration may be due to saprophyte growth.

Postharvest Pathology

No available data.

Quarantine Issues

No available data.



Sugarcane juice press.

Suitability as Fresh-Cut Product

For the supermarket, sugarcane is peeled and cut into 20- to 25-cm (8- to 10-in) pieces and then sealed in a vacuum bag. Normally, 4 or 10 pieces are packed per bag, with weights of 500g or 1200g.

In Asia and Latin America sugarcane is often crushed at the markets to make fresh juice, which should be chilled as soon as possible. The canes are washed before crushing. Fresh juice spoils after 4 days at 5°C (41°F) and one day at 27°C (80°F) due to microbial growth (Yusof et al. 2000). Addition of ascorbic acid to the fresh juice delays quality loss at 10°C (50°F) (Mao et al. 2007).

Special Considerations

None

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