

**Evaluation of Local Packaging Materials for
Efficient Handling of an Easily
Bruisable Horticultural Produce
(Tomato).**

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Abstract:

Laboratory experiments were carried out to determine the tensile or compressive properties of cane and frond under various curing conditions. Three package shapes were constructed from both materials namely, U-, ellipsoid and trapezoid while the open U-shaped frond market type served as the control. Tomato fruits were used to evaluate the various package shapes. Cane, frond or composite packages so constructed were subjected to transportation hazard tests (compression or impact) at full or half loading. Contents and packages were evaluated for fruit defects and package deformation after test over 11 days at ambient storage. The effect of materials on physiological status of the fruits was also evaluated in lined or unlined fruit loaded packages.

The results show that cane and frond behaved as-linear orthotropic viscoelastic materials in uniaxial tension. Although the tensile strength of fresh cane was much greater than that of fresh frond, cured frond samples had higher tensile strength than fresh cane samples and were as comparable in strength as cured cane samples. Curing brought about moisture reduction in both materials.

In compression, significant differences were found for package type, compressive load and duration of bulk compression. The open U-shaped frond (control) was more prone to fruit damage due to instability of the package to compressive loading. Permissible produce damage/duration of bulk compression was three days.

On impact-induced fruit loaded packages, significant differences were obtained for cultivar, loading, package material and package shape. Ife 2 was more susceptible to physical damage than Ife Plum. Cane inflicted more injury on fruits end resulted in greater fruit rot than control. Fruit damage of all categories except decay was less in-trapezoidal-shaped package compared with the control. Damage was also higher at half than full loading. In terms of package shape/material composition, the woven cane trapezoidal-shaped was better than the deformable U-shaped composite type. On the effects of lining and varietal differences, stress inducing factors, such as, impact and rot, increased the rate of ethylene production and physiological biodeterioration.

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