

An Assessment of Impact Damage to Fresh Tomato Fruits

P.A. Idah, E.S.A. Ajisegiri, and M.G. Yisa

Department of Agricultural Engineering, Federal University of Technology Minna, Niger State, Nigeria

A b s t r a c t

An impact damage assessment of fresh tomato fruits was carried out to ascertain the effects of drop height, impact surfaces, maturity and size of fruits on bruise area and impact energy. Five different impact surfaces namely, cardboard (A), wood (B), metal (C), Plastic (D) and Foam (E) were used on the platform of the equipment. Tomato fruits of two maturity stages, fully ripe (80-100% red) and turning (1-50% pink) and two mass groups (30 -70 g as M1 and 1-30 g as M2). The fruits were dropped from different heights onto the different surfaces and the impact energy and bruise diameter were measured. The results show that impact damage measured in terms of bruise diameter is highly influenced by the impact surfaces. The metal surface inflicted the greatest impact damage on the fruits. The impact energy on the fruit is greatly influenced by the drop height and the mass of fruits. Fruits dropped from H1 (140 cm) absorbed the greatest energy indicating that they suffered the most impact damage. The results obtained can be used by designers of packaging materials, processing plants and handlers of fresh tomato fruits in Nigeria to reduce mechanical damage, especially those due to impact and ensure good quality products.

Keywords: impact damage, tomato fruits, handling.