

Comparative Analysis of Cassava Peeling Concept of an Automated System

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Abstract: An improved cassava peeling machine was developed with the aim of achieving 100% peeling and quality performance efficiencies. The peeling principle is based on impact as tubers spin and come in contact with the cutting tool during linear movement in the direction of auger. This is governed by combining action of auger, tuber monitor and driving force. The mechanism of this principle was mathematically modelled. Performance evaluation was carried out using an improved variety, TMS 30572 harvested in IITA to predict peeling performance of the machine in different locations. Functional parameters at different feed rate and machine speed were determined. These include; throughput capacity (T_C), peeling efficiency (P_E), mechanical damage (M_D), peel retention (P_R) and quality performance efficiency (Q_{PE}). The results showed that T_C ranged from 238.10 to 1351.35 kg/h, P_E ranged from 67.53 to 100.00%, M_D ranged from 0.51 to 1.23, P_R ranged from 32.47 to 0% and Q_{PE} ranged from 67.19 to 98.77%. The result of one way analysis of variance showed that crop parameters and machine parameters had no significant difference ($p = 0.05$) at different locations using the same machine.

Keywords: Cassava tuber, peeling prediction, mechanical peeling performance