

DESIGN, DEVELOPMENT AND EVALUATION OF THE PERFORMANCE OF PALMYRAH PEELER

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Palmyrah (*Borassas flabellifer* L.) is a multipurpose perennial crop with about more than 80 years of economic life span. Palmyrah juice extraction is one of the major economic activities in palmyrah industry, which is partially mechanized, at present. Peeling off the fruit is the first step in juice extraction and is a labour intensive activity. Decreasing labour force for the palmyrah industry over several years and inadequate replenishment of the new technology have been major problems for development in palmyrah juice production. Mechanization of peeling process of fruits can be used to obtain the maximum benefit and to increase the annual palmyrah juice production. There is no efficient method to peel palmyrah fruits except manual peeling. Therefore, the aim of this study was to introduce an efficient and hygienic method to peel off palmyrah fruits. Major components of the palmyrah peeler include a set of peeling blades and hooks, adjustable fruit holder, operating handle and peel collector. The cost of machine fabrication was Rs. 10,445 with labour. Palmyrah peeler was easy to operate with less damages to fruit and hygienically safe. After conducting a series of trials and modifications final prototype machine was designed and fabricated. The machine was tested for performance using ripen palmyrah fruits and results were compared the manual method. The new machine gave satisfactory results. Theoretical capacities of the machine and manual peeling were 72 fruits per hour and 59 fruits per hour respectively. Actual capacity of the machine and that of manual peeling were 65 and 51 fruits per hour respectively. Field efficiencies of this machine and manual method were 90% and 86%, respectively. There was a significant difference ($p < 0.05$) between performance of newly designed palmyrah peeler and the manual method.

Keywords: Palmyrah, Palmyrah peeler, Peeling