DESIGN DEVELOPMENT OF A SMALL CAPACITY FRUIT PULP EXTRACTOR

A.R. ARIYARATNE, H.M.M.A. BANDARA[1] AND S. SHANMUGASUNTHARAM

Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya, Peradeniya
[1]Farm Mechanization Research Centre, Maha-Illuppallama

The fruits such as woodapple, (*Beli)* and tamarind, found mainly in the dry zone of Sri Lanka, bring seasonal harvests. Due to unavailability of processing technology at rural level and the seasonal over supply, high losses can be observed. The common option available to the grower is to sell the product through the middlemen resulting in low income. As a result, the crops have been under utilized and have been given less attention in assessing the potentials. Pulp preparation from these fruits is one of the options available for value addition. In present practices, water is added to facilitate the extraction by changing the consistency. As a result, the diluted pulp requires concentration or chemical preservation. Suitable pulp extraction technology will help in better utilization of the crops and development of small-scale agro based processing industries.

The objective of this study was to develop a prototype design of a pulp extractor that could be operated at the natural concentration of ripen fruits of selected crops. The basic concept was to separate pulp from seeds and fibre by centrifugation as a continuous process. Therefore, it requires feeding of raw material and removal of by-products continuously.

The design consists of a pulp extractor, collection mechanisms for pulp and by-products and drive mechanism. The pulp extractor is a rotating holder unit that can support conical shape structure made of wire mesh with a flat bottom. The wire mesh structure was reinforced by 8 mm rod arrangement with the same conical shape. The holder unit was designed to support selected sizes of conical shape extractors. This unit is mounted on bearings and is connected to the drive mechanism. An independent hopper and a chute were positioned above the holder unit so that material could be fed to the flat bottom of the conical shape extractor. Stainless steel materials were used for fabrication of the holder, extractor and the material feeding components. Rotating parts were designed and fabricated to maintain the mechanical balance.

The tests carried out with woodapple (*Beli)*, and tamarind fruits showed that pulp could be extracted and the equipment can be operated in a continuous manner. However, mixing of water to about 5-10% by weight prior to extraction improved the process. The prototype design was successful in pulp separation. The design requires further improving of components for convenient assembly, disassembly and cleaning.

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