

ABSTRACT

HERNANDEZ, MARY MESAIAH P. Design, Construction and Evaluation of a Micro-Scale Motor-Operated Coffee Depulping Machine. Undergraduate Thesis. Bachelor of Science in Agricultural Engineering. Cavite State University. Cavite Philippines. April 2015. Adviser: Dr. Marilyn M. Escobar.

The study aimed to design, construct and evaluate a micro-scale motor-operated coffee depulping machine. Specifically, it aimed to: develop and construct a motor-operated coffee depulping machine based on design specifications; perform testing and evaluation of the machine in terms of depulping capacity, depulping efficiency and wholeness of beans; and conduct a cost and return analysis of the machine.

A preliminary study was conducted to determine the optimum blade clearances that would yield quality parchment coffees. The blade clearances that were tested were 5.28 mm, 7.04 mm, 8.80 mm and 11.0 mm representing the 30 percent, 40 percent, 50 percent and 60 percent of the geometric diameter of soaked coffee cherries, respectively. Five hundred grams of coffee cherries were loaded into the hopper of the depulping machine in order to evaluate the preliminary performance of the machine at the selected blade clearance which was replicated three times. Evaluating the results of the experiment in terms of depulping efficiency and wholeness of parchment coffees gave the two highest depulping efficiency of 98.00 percent and 97.90 percent at 7 mm and 9 mm blade clearance, respectively. These two blade clearances were further tested in the laboratory using 5 kg of soaked samples for each blade clearance and was replicated three times.

The results of the study showed that the depulping capacity and depulping efficiency of the machine were not affected by the blade clearance used while the wholeness of parchment coffee was significantly affected by the blade clearance.

The developmental cost of the machine was P41, 700.