

Nuttapong Ruttanadat 2010: Design and Development of Automatic Young Coconut Fruit Trimming Machine. Doctor of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Associate Professor Anupun Terdwongworakul, Ph.D. 163 pages.

The purpose of the research was to design construct, test and evaluate an automatic prototype young coconut trimming machine. The design concept was that young coconut fruit trimming was obtained by moving an inclined sharp knife in translation motion in vertical plane to trim the fruit which was held tightly and rotating in horizontal plane. The prototype was consisted of main frame, body trimming station, shoulder trimming station, input-output-base cutting station, rotary base, fruit holder, fruit pressing set, slip ring of electrical connection, power and programmed electronic control. In operation, three fruit holders rotated about themselves and traveled in a circle passing the body-trimming station, the shoulder-trimming station, the input-output-base cutting station. The untrimmed fruit was continuously fed on the fruit holder which carried the fruit to be trimmed at every station in sequence. Several improvements for the optimum settings to achieve high capacity and high quality of the trimmed coconut were performed. The travel of body knife and the shoulder knife was 2.5 and 5.5 cm respectively. The DC motor supply voltage was 24 V, resulting in 300 rpm speed driving the trimming knives. The shoulder knife height of the medium young coconuts was 18 cm. Based on these design parameters, the improved prototype was fabricated and tested. The prototype could produce the trimmed young coconut of 86 fruit/hr with the average fibrous area of 0.35%, damaged fruit of 2.5%, and remained untrimmed green area of 14.5%.

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Thesis Advisor's signature

