Chanida Bupata 2007: Development of Rose Apple Sizing Machine. Master of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Associate Professor Bundit Jarimopas, D.Sc. 139 pages.

This research was to determine the factors affecting design of rose apple sizing machine and relatively develop a mechanical sizer. Methodology comprised determination of inclination angle of sizing belt and thickness of foam cushions, design, construction, testing, engineering and economic evaluation of the prototype. The prototype featured 390 mm wide by 1,510 mm long by 765 mm high rectangular steel, 10 cm wide by 1,270 cm long sizing belt, 600 mm×1,100 mm receiving tray, 60 watt 220 v 50 hz electric motor drive with 18:1 gear reducer. The prototype was tested with one operate and under the control of four factor, i.e. rose apple cultivar (Toonklao, Tubtimjan and Thongsamsri), fruit size (small, medium, large), belt velocity (7, 15, 22 and 29 m/min) and inclination angle (75, 80, 85 degrees). The prototype performance was evaluated in term of mean contamination ratio $\overline{C_R}$, sizing efficiency E_w and capacity Q by mean of ANOVA and Duncan Multiple Range Test. Results showed that the proper foam cushion was 20 mm and the receiving tray was properly set at 15 cm away from the sizing belt to protect fruit bruising. The inclination angle and belt velocity significantly affected $\overline{C_R}$, E_w and Q at the significance level of 5%. The proper inclination angle for Toonklao, Tubtimjan and Thongsamsri was 75, 80 and 85 degrees. The proper belt velocity was 22 m/min for every cultivar. For Toonklao Q, $\overline{C_R}$ and E_w were 471.8 kg/hr, 15.2% and 84.8% respectively. For Tubtimjan Q, $\overline{C_R}$ and E_w were 609.1 kg/hr, 14.5% and 85.5% respectively. For Thongsamsri Q, $\overline{C_R}$ and E_w were 662.0 kg/hr, 13.0% and 88.3% respectively. Break even point and pay back period were 57.5 ton/yr and 5 months respectively when the prototype worked 1,600 hr/yr with hiring rate of 0.1 baht/kg.

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