Boonvit Sirisawat 2006: Development of Pummelo Sizing Machines. Master of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Associate Professor Bundit Jarimopas, D.Sc. 189 pages.
ISBN 974-16-2815-3

The objective of this thesis developed the Pummelo Sizing Machines. Methodology was composed of design, building, testing, and engineering and economic evaluations. The prototype consisted of a) 40 mm. by 40 mm. box steel frame, 650 mm. wide, 1,350 mm. long and 737 mm. high. b) the diverging belt structure 100 mm. wide and 2,400 mm. long. c) the receiving tray and sizing board made of 3 mm. thick steel 650 mm. wide 1,000 mm. long. d) a 60 watt electric motor as energy source power was transmitted through gear reduction and controlled inverter. The experiment was conditioned as follows: 1) diverging belt speed (4, 8, 12 and 14.5 m/min), diverging belt the slope degree (70, 75 and 80 degree), sample feeding characteristic (turn over and turn up pummelo pole) 2) three evaluated parameters i.e. sizing error $\bar{C}_R$, sizing efficiency E_W and capacity Q. Testing was designed to be Split – Plot Design. Results showed that diverging belt speed and diverging belt the slope degree significantly effected mean contamination ratio $\bar{C}_R$, sizing efficiency E_W and machine capacity Q at 5% significant level. The diverging belt speed was 14. 5 m/min with diverging belt the slope 75 degree, resulting in the best performance result i.e. honey white type was $\bar{C}_R$ = 12.61 %, E_W = 87.35 %, Q = 4171.89 kg/hr and thongdee white type was $\bar{C}_R$ = 9.68 %, E_W = 90.28 %, Q = 3376.98 kg/hr. Engineering economic analysis revealed that hiring the sizing machine at the rate of 0.05 baht/kg. For 540 hr/year gave the break even point = 74,223.9 kg/year and interest rate of return = 4 month. In case of using combined with feeding machine gave the break even point = 118,429.1 kg/year and interest rate of return = 6 month.

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