

Prakit Timkhum 2004: Oil Palm Frond Hydraulic Cutting Machine. Master of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Associate Professor Bundit Jarimopas, D.Sc. 114 pages.
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This research was to develop a prototype of oil palm frond cutting machine driven by hydraulic power. The machine was expected to solve the problem of skill labor shortage in oil palm branch cutting and accident reduction at work. Methodology comprised design, construction, testing and evaluation of the prototype, which was made of 4.2 m long, 38.1 mm diameter aluminum tube weighing 9 kgs. A Malaysian sickle knife was vertically -slidable over the other fixed knife which was made of S45C steel. The prototype was driven by hydraulic pump and 12 V. battery. Results showed the prototype developed by laboratory could make one cut-off oil palm frond completely 98.37% at the average time of 3.01 seconds per frond. Cutting section was characterized by 132.42 mm. wide, 63.42 mm. thick, 4,312.07 mm² sectional area and 73.73% moisture content (wet-basis). Machine capacity was 196 frond/hour. Results showed the prototype developed by factory could make one cut-off oil palm frond completely 98.50% at the average time of 2.82 seconds per frond. Cutting section was characterized by 124.74 mm. wide, 67.12 mm. thick, 4,294.69 mm² sectional area and 79.97% moisture content (wet-basis). Machine capacity was 228 frond/hour. After some training farmers could well operate the machine and accepted in general its capacity with little comment on the machine weight. The comment is a challenge for further development. Economic analysis indicates that based on the prototype cost of 56,185 baht, 30 days of annual use, 8 hours a day, payback period would be 3.41 years.

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