

DESIGNING, DEVELOPMENT AND EVALUATION OF A SMALL SCALE SEED PADDY CLEANER

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Paddy (*Oryza sativa L.*) is the staple food crop and single most important crop occupying 34% of the total cultivated area in Sri Lanka. Seed paddy production is one of the major economic activities in paddy cultivation, which is fully mechanized only at large scale level. Therefore, considerable amount of seed paddy production is with the giants of the paddy industry who can control the market price. Unavailability of an affordable mechanical solution is a big barrier for the entrance of small and medium scale producers to the seed paddy industry. Thus, market price of seed paddy is difficult to control. Therefore this study was aimed to introduce an efficient and affordable electric motor driven cleaning machine for seed paddy production at small and medium scale level. Main components of the seed paddy cleaner are paddy sieving unit to separate large size impurities, blower unit to separate light impurities and stone separator unit. Although, the same power source was used to operate all the three units, sieving unit was designed to operate independently as lower operational rate of the stone separator makes troubles in continuous operation. According to the variety of paddy, the sieves of the sieving unit can be changed. Fabrication cost of the machine was LKR 45,000. The performance of the machine was evaluated according to the Regional Network for Agricultural Machinery (RNAM) test code and procedures. The suitable speeds for the better operation of sieve, separator and blower were 90 rpm, 200 rpm and 960 rpm, respectively. Light impurities separate percentage and same size impurities separate percentages were 40.12% and 64.4%, respectively. Theoretical and Actual capacities of the machine were 224.4 kg/h and 179.74 kg/h, respectively under 80.09% efficiency. At the evaluation process, it was realized that the efficiency of the blowing unit can be further increased by suitable modifications. According to the overall performance of the machine, it can be concluded that, the machine is suitable for small and medium scale seed paddy production.

Keywords: Actual capacity, Efficiency, Seed paddy, Theoretical capacity