

**DESIGN, DEVELOPMENT AND EVALUATION OF COCONUT WEEDER
CUM FERTILIZER APPLICATOR**

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Coconut (*Cocos nucifera* L.) is considered as a major agricultural perennial crop which contributed 0.6% to national GDP of Sri Lanka in 2018. Fertilizer application is an important management practice in coconut cultivation. Though, the highest land extent belongs to the small-scale coconut plantations, its productivity is less than the large-scale estates due to labour scarcity and higher cost for fertilizer application practices. Therefore, this research was aimed to introduce a coconut weeder cum fertilizer applicator for small-scale coconut plantations. This study was carried out at Faculty of Agriculture, Rajarata University of Sri Lanka from January to July in 2020. Newly designed implement was comprised with fertilizer hoppers, distributing plates, rotary wheels, and fertilizer metering mechanism. The production cost was 14,500.00 LKR. A 1.2 hp, gasoline, air cooled engine was used as the power source. The implement was designed to distribute fertilizer evenly, while weeds are destroyed by rotary action of the rotary wheels. The newly designed implement was tested against the manual method in a field with 1.37 gcm^{-3} of bulk density and 14.23% of soil moisture content. The optimum operating speed of the implement was 0.63 kmh^{-1} . The actual field capacity of the implement was 0.26 hah^{-1} at a 60% of field efficiency. The prototype could save 50% of time and 86% of operating cost compared to manual method. Time and operating cost of manual method were 7.67 hha^{-1} and 20,540.00 LKR ha^{-1} , respectively. The weeding efficiency by mechanical method was 59.3% which was doubled as manual method. Breakeven point was 0.036 hayr^{-1} . Due to the higher comparative performance and relatively smaller breakeven point, this coconut weeder cum fertilizer applicator could be recommended for fertilizer application for small-scale coconut farmers. However, the implement could be further developed by fixing a handle to carry the fertilizer distributing unit.

Keywords: Labour scarcity, Small-scale coconut cultivation, Weeder cum fertilizer applicator