TESTING AND EVALUATION OF A NEW WEEDER CUM FERTILIZER APPLICATOR FOR COCONUT CULTIVATIONS

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Coconut yield is significantly improved by the proper weeding and application of fertilizer. Though several mechanical methods have been introduced for weeding and applying fertilizers, still manual method is the most popular despite it is time intensive, laborious and expensive. Moreover, the available technologies are best applicable for large-scale coconut cultivations rather than small or medium scale settings. Hence, a weeder cum fertilizer applicator for medium and small-scale coconut cultivations was developed. Nevertheless, it has not yet been evaluated. This study evaluated the performance of newly invented machine and compared it with the manual method. A healthy, well-grown, properly maintained coconut cultivation was selected for the field testing and both weeding and fertilizer application methods were replicated ten times. The effective field capacity, field efficiency, and weeding efficiency were 0.17 ha h^{-1}, 61.8% and 66.6%, respectively in mechanical method whereas they were 0.048 ha h^{-1}, 55.3% and 60.3%, respectively in manual method. The effective field capacity and field efficiency of the mechanical method were significantly higher ($p<0.05$) than the manual method, however, the weeding efficiency was not significantly different ($p>0.05$). In addition, the fertilizer spreading uniformity of the mechanical method was reported as 100% while it is operating at the optimum speed of 1.45 km h^{-1}. Furthermore, the break-even point of the machine was recorded as 2.85 ha yr^{-1}. The study concludes that the new weeder cum fertilizer applicator performs at an acceptable level to be recommended for medium and small-scale coconut farmers in Sri Lanka.

Keywords: Coconut cultivation, Fertilizer applicator, Field capacity, Performance evaluation, Weeding efficiency