PERFORMANCE EVALUATION OF FOUR-WHEEL TRACTOR-MOUNTED DISC RATOONER IN SUGARCANE CROP MANAGEMENT

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Soil earthing-up is an important crop management operation in sugarcane. Farmers are often reluctant to do this operation due to high labour and time consumption. By introducing an efficient, low-cost mechanical solution, it can be easily popularized among farmers. Therefore, this study aimed to evaluate the performance of an Australian made four-wheel tractor-mounted disc ratooner for earthing-up operations in sugarcane crop management. The study was carried out at research farm of the Sugarcane Research Institute, *Udawalawa*, Sri Lanka during January to June, 2020. The experiment was conducted according to the Randomized Complete Block Design in manual and mechanical treatment combinations and 30 replicates were used. The Plot size was 20 m x 2.74 m. In this study, soil bulk density, plant density (numbers of tillers), amount of soil displacement, weed count and field capacity of the mechanical method were measured and compared with manual earthing-up method. SAS software was used for performing this analysis at 0.05 alpha level. Results revealed that, bulk density, number of tillers and weeds were not varied significantly with the earthing-up method. However, significantly different results were observed before and after the application of each treatment ($p<0.05$). Besides, mechanical method showed 49% significantly higher soil displacement than manual method. Field capacities of manual and mechanical methods were 610 m^2h^{-1} and 2053 m^2h^{-1}, respectively. In addition, the average fuel consumption rate of the tractor was 8.12 Lh^{-1}. Also, usage of disc ratooner has saved 54% of the cost incurred for earthing-up operation in sugarcane crop management. Hence, it could be recommended for soil earthing-up in sugarcane crop management in Sri Lanka.

Keywords: Bulk density, Disc ratooner, Earthing up, Field capacity, Sugarcane crop