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A low cost two wheel tractor operated tine tiller for paddy cultivation

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Tillage means the preparation of the growth zone in the soil for plant development. It is the first and most important operation in paddy cultivation. Without proper land preparation, higher yield of crop production by applying other input cannot be expected. The paddy farmers in Sri Lanka use expensive, untested, imported ploughs for Land preparation. The commercial ploughs used in many developed countries, which are beyond the financial capabilities of local paddy farmers. A properly designed Tine Tiller can puddled the paddy soil with less power. So far In Sri Lanka tine tillers are not fabricated for two wheel tractor. The share of the Tine Tiller cut and puddles the soil. As a result, the plough-man can till a field in a judicious way in one operation without leaving any unploughed strip of land. Considering the above facts, a low cost three bottom Tine Tiller for two wheels Tractor was designed and constructed after testing first model plough in the field and implementing necessary modifications.

An experiment was conducted in the paddy field to compare the performances of the developed Tine Tiller with conventional Mouldboard plough. Effective field capacity, Effective working width, soil inversion, Field efficiency, Ploughing depth, Travel reduction, Fuel consumption, Average operation speed, and cost for production of Ploughs were considered as criteria for the evaluation of designed plough.

The results show that the Effective field capacity and Effective working width were 0.05ha/hr, and 0.60 m respectively. Above observations for conventional plough were 0.03 ha/hr, and 0.30m respectively. Therefore effective field capacity and effective working width were greater by 60% and 90% respectively. These results are significantly different. Ploughing depth, Travel reduction and operating speed of the designed plough were 24.5cm, 12.4% and 2.6km/hr respectively. Above observation for conventional plough were 15.4 cm, 16.7% and 1.65km/hr respectively. These results are significantly different. Fuel consumption of designed plough and conventional plough was 8.2L/hr and 11.1L/hr respectively. The total cost of production of designed plough and conventional Mouldboard plough was Rs 15500 and Rs 45000 respectively. On the basis of above results, design plough can be recommended as better tillage equipment for paddy cultivation.

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