



Fabrication of Mini Agro Bike for Multi Purpose Agriculture Use

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Abstract:

Presently, small land holding farmers use work bulls mostly for land preparation. Their use can be increased and made more economical by using them for other farm operations such as ploughing, harrowing, fertilizer application, sowing and weeding. Improved hand tools will also facilitate farm work. Oxen can be used to pull a cart throughout the year which keeps them in training. Ploughs, ridgers, seeders and weeders are all seasonal implements. Manual method of seed planting, results in low seed placement, low crop yield and serious back ache for the farmer which limits the size of field that can be planted. The cost price of imported planters has gone beyond the purchasing power of most of our farmers. Farmers can do much to increase crop production especially grains if drudgery can be reduced or totally removed from their planting operations. The conversion of bike into a mini tractor, the idea of using bike instead of tractor is to save lot o ploughing cost, labor cost and time saving. Now converting is done in rear part of bike. The rear axle is removed to fix line plough with the help of two supporting wheels. The line plough is attached to rear portion of bike, the wheeling system i.e. chain is arranged for newly adopted wheels. The lifting up and down of line is done by lever system which helps to lift up and down the line plough. There is scarcity of tractor in villages due to high cost of tractors. So in order to overcome this problem this bike line plough helps to do same work as tractor in less cost and labor cost also decreases. The main advantage is that fuel used for the bike is very less. Labor cost is reduced. It is suitable for farm. Maintenance cost is very low.

Keywords: Mini Tractor, Ploughing Cost, Time Saving, Less Fuel Consumption

I. INTRODUCTION

Mini tractor was made in view of small and individual farming need .it was made to overcome the disadvantage of bullock carts in the field. Mini tractor reduces the working hours as well as the working labor in the field. The tractors which are having less than 20 HP of power are considered as mini tractor. According to 2011 census about 80 to 85 % of Indian farmers do not have tractors and depends on either the professional tractor lenders or the traditional bulls and related instruments. But as the operations are more costly hence are not affordable by marginal farmer. Hence to solve this problem of unavailability of tractors and unaffordability Of heavy duty tractor the marginal farmers needs a tractor which is affordable as well as which can perform agricultural operation efficiently. The “Fabrication Of Mini-Agro Bike For Multipurpose Agricultural Use “Which is a bike converted into a multipurpose equipment provides a power of near about 12 HP which will result in a less fuel consuming more utility and less maintenance. Agriculture being one of the major occupations in India, it is very essential to discover and implement new idea in this field, though lot of work has been done in this area. It is unfortunate that, these ideas are not been implemented properly in actual field. This is due to high cost and is complicated for rural people. Multipurpose agriculture equipment is basic and major equipment involved in agriculture for maximum yielding.

II. WORKING PRINCIPLE

We use SUZUKI MAX 100 bike, the basic concept our project is into tricycle bike. The main changes are in rear part of bike. We have cut the rear chassis and attach the new rectangular frame having dimension 63 cm *51 cm. The frame is attached

with a shaft with the use of pedestal bearing having diameter of 1”. The shaft is of bright bar. With diameter 1 and 32 long. The rear wheel is fixed with rickshaw bush. Using the self fabricated chassis, drive and power of an SUZUKI MAX 100 motorcycle in front the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. The rear wheel of the motorcycle has been removed and an innovative assembly unit has been attached. It can also be designed and attached to locally available rickshaw or assembled vehicle having minimum 5.74 HP engine. This meets various needs such as ploughing, weeding and sowing seeds and spraying. It can improve productivity and reduce operating costs for farmers, who currently use bullock-driven plough and cannot afford the tractors or power tillers. This is the mechanism used in all the agricultural fields to maintain the fertility of land, due to forward movement of the equipment the plougher is attached to the front of the equipment with predesigned number of teeth and teeth depth.



Figure.1. Actual project model

III. DESIGN OF MINI AGROBIKE

1. For Ideal Condition on Road

Max speed = 35 km/hr

Average= 43 km/lit

Fuel consumed =800ml/hr

2. On Load Conditions in Farm

Max speed=5to 10 km/hr

Average= 2 acre/lit

Time required for sowing= 45min/acre

3. Profit Comparison

PARA	MINI AGRO BIKE	A PAIR OF BULLOCK	TRACTOR
Labor	2 labor*250 wage each=500rs/day	6labor = 950	1driver+1labor =300+250=550
Work done	11.25 acre/day	4 acre/day	25 acre/day
Fuel	500/day	Null only feeding charge	27 liters=27*70=1890
Income	11.27acre*400rs =4500rs/day	1200rs/day	25acre*400rs =10000rs/day
Profit	4500-500(fuel)-500(labor)=3500/day	1200-950(labor)-250(feeding)=00/day	10000-1900(fuel)-550(labor)=7600rs/day

IV. CONCLUSION

Practically our multipurpose agricultural bike can be used for tilling, fertilizing, sowing, and also used for weed removal purposes. All the parts are connected in such a way that in every stage of agriculture the equipment can be rearranged or easily assembled with fasteners to required length and specifications of field operation. Our team has successfully combined many ideas from various fields of mechanical engineering and agricultural knowledge to improve the yield and by reducing the labor effort and expenses. The whole idea of multipurpose equipment is a new concept, patentable and can be successfully implement in real life situations.

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