Design and Development of Intercrop Grass Removing Machine

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Abstract— The Aim Of Paper Is Design And Development Of Self-Powered And Self-Propelled Agricultural Device Which Can Use To Remove Grass From Crops Having Intercrop Distance So Less That Tractor And Such Machines Not Useful Overthere Because Of Bigger Size. Reduce Size and Cost Of Machie By Exploring The Idea Of Narrowing Down The Utility And Making Soil Specific Machine

Keywords: Intercrop, Grass Removing Machine

I. Introduction

Special purpose machine (SPM) is used in many industries including automotive industry. SPM helps to achieve production target with high quality. We explored the idea of narrowing down the utility and making a soil specific machine so as to reduce size and cost of machine. In discussion with Climber Engineering, Pune in present SPM, there is problem in development in power tiller and higher cost and weight which affects the production. This work is undertaken to do stress analysis and optimization of weight and cost for SPM using FEA for solving problem.

II. Problem Definition

As per the discussion with Climber Engineering it is found that they are facing many problems regarding design and development of special purpose power tiller, which are listed below:

1) Develop The Size Of The Tiller For Operation In Farms With Minimum Inter Row Distance Of 1.2m Which Also Leads To Reduction Of Cost.
2) 2.Make Easy Maintenance By Standard Replaceable Spares

III. Objective of the Study

1) To reduce the size and cost of the machine.
2) To make it easy to operate and simple in construction.

IV. Literature Review

ATANU MAITY [1]- This paper deals with the scope for these power tillers to as seedbed preparation and inter culture operation in wide spaced row crops like cotton and sugarcane. Lightweight power tillers have been introduced recently in the country. Most models of the light weight power tiller being manufactured in India have been provided with a front or rear mounted powered rotary unit for forward movement as well as for tillage operation.

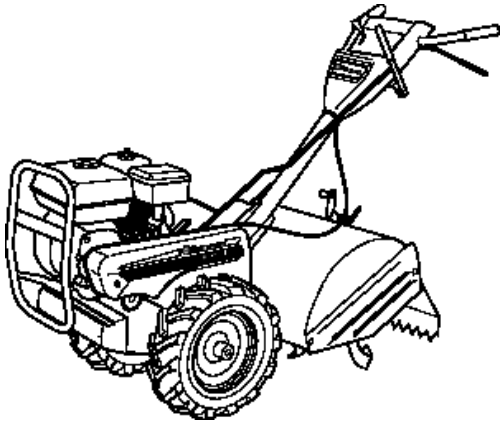

Fig. 1: Schematic sketch of the system

The power tiller is a multipurpose hand tractor designed primarily for rotary tilling and other operations on small farms. While in operations, an operator walks behind to maneuver it. It is also known as a garden tractor, hand tractor, walking tractor or a two wheel tractor. Non-availability of matching equipment for different farm operations limits the versatility of the power tillers. Implements initially offered with the power tillers included rotavator attachment, trailer and in some cases a plough and ridger. The initial introduction of power tillers was without a complete range of matching equipment . The schematic sketch of the system has given in fig.1.

M. VEERANGOUDA [2] - The paper presents a survey of available power tiller. The power tiller drawn multipurpose tool carrier is promising equipment. The different operations like tilling, harrowing and other agricultural operations can be carried out efficiently with a single unit and hence this equipment is suitable for year round use. It also helps in reducing drudgery on the field and also carries out the operations timely. By using the multipurpose tool carrier as an attachment with the power tiller, the small and medium farmers can avoid the year round maintenance of bullocks and also the high investment in tractors.

Safia Abdel Moniem Elzainal Nahas[3]- The Results Indicated No Significant Differences Between The Effect Of Tillage Treatments On The Soil Bulk Density In The Sandy Clay Soil Location, While They Have Significantly ($P<0.01$) Affected The Soil Porosity, The Soil Aggregation Stability And Soil Resistance To Penetration. The Ridger Recorded The Highest Mean Bulk Density (1.33 Gm/Cm^3), And The Lowest Mean Porosity (48.23%) And Resistance To Penetration (4.2 Kg/Cm^2). The Disc Harrow Gave The Highest Mean Aggregation Stability (35.63%) While The Lowest Value (30.64%) Measured By The No-Tillage Treatment. In Contrast To The Disc Harrow And The Ridger, The Chisel Plough Gave The Over– All Higher Mean Penetration Resistance (9.0Kg/Cm^2).At The Clay Soil Location, The Tillage Treatments Did Not Record Any Significant Differences On Their Effects On Bulk Density. Generally Bulk Density Increased With Depth While

Porosity Was Decreased. All The Tillage Implements Significantly (P<0.01) Decreased The Aggregation Stability Of Soil, The Disc Harrow Recorded The Lowest Mean Aggregation Stability Of (25.73%) Compared To (56.34%) For No-Tillage Treatment. The Implements Performance Parameters Showed Higher Slippage, Fuel Consumption Rates, And Field Efficiencies Especially For Chisel And Ridger Implements At Sandy Clay Soil Location. The Disc Harrow Gave The Highest Field Efficiency Of (79.9%) At The Clay Soil Location. The Chisel Plough Demonstrated The Highest Wheel Slippage (19.2%) And Fuel Consumption Rate (15.7L/Ha). The Lowest Slippage (10.4%) And Fuel Consumption Rates (5.97 L/Ha -1.06 L/Hr) Were Recorded By The Disc Harrow.

V. PROPOSED FLOW OF WORK & METHODOLOGY

1) Study of Present power tiller available in market.
2) Take practical input from industry.
3) Problem Identification
4) Failure Analysis of existing power tiller & mountings on power tiller.
5) Conceptual redesign of power tiller by using input & Modeling.
6) Analyze model and select best from available.
7) Material Optimization.
8) Shape Optimization.
9) Analysis for different materials.
10) Results

VI. CONCLUSION

From the above theoretical study we can conclude that design and development of light weight, low cost power tiller with less maintenance is critical part of power tiller. We are tried to reduce the excessive weight in power tiller and also attaining for optimization of machine cost.

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