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TITLE: THREE IN ONE AGRICULTURE MACHINE

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Abstract

India is known as agricultural based country directly or indirectly many peoples are dependent on outcome of farming. Agricultural field work have many operation such as digging, reaping, levelling, etc. apart from this sowing, spraying and cultivation are important field works .In today's era peoples are attracting towards industries because of the less outcome from agriculture .Also with the increasing population the farms are divided into small scale farm and farmers are not able to purchase machine of higher cost .Now a days labour shortage is becoming another problem to farmer .This condition encourage us to make efficient and highly mechanized machine which can be used for multipurpose and can be handle by single person .In this paper we are making "Three in one Agricultural machine" which is used for sowing, spraying and cultivation purpose .To reduce the weight of machine plastic gears, hoppers ,spay pump are used .Also this will be economically profitable to rural farmers .By using such a machine the crop productivity will be improved as the machine is manually operated .This machine doesn't require any extra sources like electrical energy, solar energy and chemical energy of fuel this directly reduces machine cost .The machine is seems to be developed for less maintenance .We can easily attach and detach the components like sprayer pump and cultivation tools as per our requirement .There are various nozzle such as 12 hole nozzle,8 hole nozzle ,rocket nozzle ,etc. To spray fertilizer, insecticides, pesticides, nutrients at a desired depth in required quantity.

Index Terms: Manual, Spraying, Sowing, Cultivation, etc.

1. INTRODUCTION

Agriculture is main occupation of many Indian rural people. Agriculture has been major backbone of Indian economy and it has to be maintain further. Cropping intensity of India is about 137% registered and increase only by 26% since 1950. The population of India is increasing day by day, the demand for agricultural output increase as well. So there is greater need for multiple cropping in the farm, which require efficient and high mechanised machines. We have many machines for various operations in the farm such as digging, levelling, etc. But sowing, spraying and cultivation are the important operation. Many of these machine are available but perform single task and also have higher cost. So, the cost for performing different operations gradually increases .The paper discussed different operation like seed sowing, spraying and cultivation which will be helpful for agriculture to increase productivity. The productive outcome from agriculture is not up to the mark. So, rural areas farmers are not satisfied. This will lead them to march towards industries. Therefore the availability of labour decreases. Above stats encourage us to devlope such a machine which will cover many operation on a

single device. As our machine has low weight and does not need any sources like electrical energy, solar energy, and chemical energy as fuel, etc. and work manually by a single person. So it is profitable for poor farmer having low scale farm.

2. LITERATURE REVIEW

- V. K. Tiwari, et. Al [1] In this research paper author have done a case study on farm mechanisation in India and observed the availability and progress of India. We have taken this as a base for our research and further production of our multifunctional agriculture vehicle
- Mahesh R. Pundkar et al [2] mentioned that the seed sowing machine is key component of agricultural field high precision pneumatic plunger have been developed for many varieties of crop, for a wide range of seed sizes, resulting in uniform seed distribution along travelled path in seed spacing.

- V. Pranavamoorthi et al [3] conducted the research to evaluate mechanical sprayer pump. spraying can be done using electrical energy, solar energy and chemical energy of fuels . But the large amount of energy is used at such place where mechanical energy can be utilized instead of direct energy sources. This gives us idea to make such a sprayer pump

push forward the reciprocating motion is generated due to chain sprocket arrangement this motion is given to shaft inside the pump. We use 12 hole nozzle, 8 hole nozzle, rocket nozzle as per our requirement for spray fertilizer according to need. There are two plastic pipe on which nozzles are attach and spraying operation is performed.



Fig-2: Spray pump

3. METHODOLOGY

- Data is collected by literature survey, market study and user study through questions , videos and observation, etc.
- QFD is generated by user requirement and technical requirement.
- Concept would be generated by comparing with previous models.
- Concept evaluated and finalize by weighted ranking
- Working model can be made with detailed feature and feedback will be observed.

3. CONSTRUCTION AND WORKING

In this type of portable device ‘Three in one Agricultural machine’ the basic motto is to perform operation like spraying, sowing and cultivation of soil. As we use maximum plastic material for hopper, sprayer pump , gears etc. The machine has very less weight as compared to other machines. A single man can run this machine and get effective output.

3.2 Sowing Machine

Sowing machine mainly have arrangement. As maximum material is of plastic the machine has less weight .The capacity of hopper is 5 to 7 kg. This machine is place on rear wheel. The main objective is to put the seeds and fertilizer in row at desired depth and cover seed with soil and provide proper compaction over the seeds. As machine push forward the rear wheel and axle rotates the hopper shaft with the help of chain sprocket mechanism. The required amount of seeds and fertilizers from hopper are drawn into the plough with the help of non sticky pipes to avoid the blockages of seed and fertilizers.



Fig-1: Three In One Agriculture Machine

3.1 Spraying Pump

A spray pump is of plastic material of capacity 16 litre mounted on chassis. It is connected with gears of 48 teeth and 19 teeth. Sprocket is attached to shaft and axle of machine. A chain is placed between them. When machine



Fig-3: Sowing Machine

3.3 Cultivation Tool

As blades are mounted below the chassis behind the plough of sowing machine .The cutter assembly is detachable .According to ground condition in farm cutter relative to ground can be adjusted .As machine moves forward

cultivation tool at bottom of device on ground runs and cuts the grasses and unnecessary plants.



Fig-4: Cultivation tool

4. CONCLUSION

Three in one agricultural machine works manually and it performs various operations like seed sowing, cultivating, spraying. The machine can be assembled and disassembled easily and it is single unit system containing multi attachment. As we mentioned labour shortage this machine can overcome the problem and can minimize the labour cost. The parts are detachable and a human can easily handle the machine, that part can be added when operation needs to be done. This type of manually operated machine helps to get maximum production and increases net profit of farmer. The machine is manually operated that is why no external power source needed as compared to other machines which can be beneficial factor considered for poor farmers. In this way we conclude that various operation can be performed without polluting environment and by using non-conventional power source.

5. REFERENCES

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