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MULTI-PURPOSE AGRICULTURE MACHINE: A REVIEW

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ABSTRACT

As we all know that 3/4th population of india live in rural areas. About 70% of population are employed because of agriculture sector. As we are the largest producer of pulses and second largest producer of rices in the world. But the condition of farmer in our country is not so good. They are still struggling for their livelihood. They still prefer conventional method of farming like use of bullockart ,handmade tool and labour work. Because machinery which were invented for the agriculture sector are too costlier for small scale farmer . they can't affcord it .So from this condition the concept of multipurpose agriculture machine arises. The machine which can perform different agricultural process like sowing , tilling and spraying in a single input. It can reduces the labour work and the overall cost of farming.this machine will be helpful for small scale farmer which is the ultimate goal of this project.

KEYWORDS*: Agriculture machine, Battery power source, multipurpose, sowing ,tilling, spraying.*

I. INTRODUCTION

In India agriculture is the major part of Indian economy about 50% of total economy is obtained from rural areas by agriculture. As we all know that the 70 % population lived in rural areas and their living is based on the agricultural. But the poverty rate in rural areas is high so many farmers not able to purchase costly equipment or machine or trolley etc for the cultivation of the field. Mostly rural farmers used traditional methods for the farming these method are time consuming and also take to much effort of the farming which cause pain in their back ,hand etc.

The increasing rate of population day by day cause the need of food for everyone so for that the output of the agricultural should be increased . But when the traditional methods were used the output from the agricultural is remain less and take too much effort of the farmers.

So with the help of scie

This machine is economic and easily operated by the farmers.

nce and engineering we introduce a machine which is capable of performing 3 to 4 operation. Without extra effort putting by the farmers.

This machine conduct seed sowing operation, tilling, spraying water or pesticides, move with the help of wheel which is powered by the motor. Which reduced the most of the farmer work and with respect to the cost they are economic for farmers as compare to the other machines which is costly and not affordable by the farmers.

II. LITERATURE REVIEW

(1) In this paper they proposed a machine which can perform 4 agriculture process like sowing, weeding, ploghing and spraying . For this purpose motor and battery is used. The cost of this machine will be approx 24000 rs which is less than other machinery which is used in agriculture sector . It can be afford by small scale farmers . it consits mainly four components chasis frame rotavator, sprayer ,bttery and motor.the parts of this machine can be adjsutable according to situation and condition
This machine can carry the load of approx 65 kg and can wear the stress of 185mpa[1].
(2) This paper proposed a machine which can perform different process like spraying of pesticides , plugging or cutting process. The most important factor of this machine is it doesnot require a fuel to run. It is manually operated machine. It doesnot require any skilled labour also it converts rotatory of wheels into reciproctaing motion for spraying pesticides. As it doesnot use any external energy resources the cost of this ,machine will be very less . it uses the carbon steel as a frame material[2].
(3) This research paper proposed a machine which uses 24cc engine for the digging process and uses 12v battery for spraying the pesticides and other two
processes like cultivation and sowing it perform manually. This machine consists hopper, fertilizer tank ,cultivating too; sprayer and 24cc engine. It is less costly than other machine ,less man power is required and it take less time in perfoming these activity[3].
(4) This paper proposed a machine which uses AC motor chain drive and hydraulic system non return valve tube . this machine will run with the help of tractor. This machine is divided in to 3 section of 400mm first section consists gearbox which uses worm gear to provide required speed ratio and second section consts hopper which is used to sowing the seeds inside the soil and third section is used for ploughing and consists chopper and pump[4]
(5) In this research paper they majorly focus on the cost of the vehicle so they don't use any external source. This machine can perform sowing and fertilizing process inter cultivation . they proposed diiferent concept for their multi purpose agriculture machine. This machine looks like a bicycle and it can carry the load of 8 to 10 kg and it can do the work of 4 labour as a single unit[5] .
(6) In this research they proposed a machine which uses solar energy to run the vehicle. Solar energy is used to recharge the battery which perform spryaing process. It also consist motor and pump seed feeder, crop cutter and pesticide sprayer. They use renewable source of energy so that this machine will not produce any pollution and also use of solar energy make this energy cost very less.but the only problem with this that it is dependent on weather[6].
(7) The aim of this machine is to add automation in the agricuture sector so they proposed amachine which is fully automatic and use different sensor for their working..and it can be remotely operated. After this machine there's no labour work required for these process like sowing ploughing amd spraying[7].
(8) In this paper , they uses BLDC motor, lithium ion battery and conrtoller to control the speed of the motor. It consists metallic frame , hopper , tiller water tank and sensors to run the vehicle. It is semi-automatic machine . it required less man power and having less cost than other mchine[8].
(9) This machine consists ESP8266 controller to control the motor speed. It perform three processes cutting, pumping and seeding. Connect the cutter pump , seeding meachanism on the robot Connect the surviellance robot to the arduino controller.It
uses separately excited dc motor and is generally used as crop cutter[9]
(10) one more thing that is add up through this paper is that machine should be work like robot and it takes energy from the solar panels. So that this machine will not required further any type of labour work. And help the farmer in reducing the cost of farming[10].

III. DISCRIPTION OF COMPONENTS

Frame or Chassis

Chassis or frame is considered to be one of the basic structures of an machine in automobile which supports the equipment as well as body. It is the frame work which holds the body of the machine and others parts mounted on them.Various parts are bolted on the chassis. Its basically a structure made up of stell or mild steel rod by joining with the help of welding.

Figure 1. Frame

Motor

Motor is a device which converts electrical energy into mechanical energy.motor is mounted on the chassis which used to run the machine. A 12 v DC motor is used for operating the machine with the help of the battery

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• Which is used to give power to the front wheel.
• its used power source a battery and a controller.

Figure 2. Motor

Battery

A battery is used to provide power to the motor through which they run. A 12 v lithium ion battery is used .the battery is rechargeable.
Able to provide power to the 12 motor easily.

Figure 3. Battery

Water tank

Water tank is situated on the chassis near the real axel. The water tank is used to wet the soil for the seed sowing operation. The water tank connected with pipe mechanism which is attached to the rod which having hole to pour the water on the ground.

Figure 4. Water Tank

Seed sower

A seed sower is a roller like box which is mounted on the front axel of the machine. The main work of the seed sower is to sow the seed to the soil . Seed sower box design is made in such a way that several small holes dug on the box which are capable to released the seed on the ground while rolling. Its connects through chain and gear mechanism to the front or rear wheel

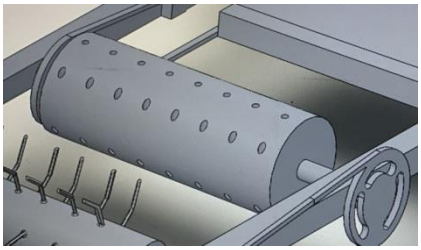

Figure 5. Seed sower

Tiller

Tiller is used to dig the ground for the cultivation of the soil or for the sowing of the seed.
Tiller is placed on the front axel of the machine which is attached with two rod to the front axel of the machine

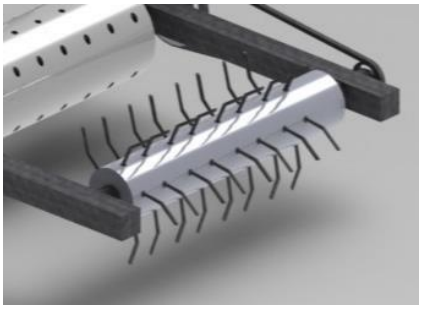

Figure 6. Tiller

Wheel

Wheel is a circular frame of hard material that may be solid, partly solid, or spoked and that is capable of turning on an axle.
The power delivered by motor to the axel which is capable to move the machine With the help of wheel easily without any discomfort.

Figure 7. Wheel

OBJECTIVE

The objective of this multi purpose agriculture machine is

- Reduce the cost of farming
- Increase productivity of farmer
- Increase automation in agriculture sector
- Reduce the labour work

FUTURE SCOPE

- We can add sensor so that it can measure some parameters.
- We also can add more drill and type of wheel according to surface of field
- If machine required there should be provision to add through tractor
- We ac add wireless technology with the help of raspberry pie
- We can add solar panel for spraying system

ADVANTAGES

- It can plough large surface area in less period of time . After this machine there will no animal work is required.
- It makes farming more advance and faster than traditional one.
- The time required for sowing is vey less as compare to traditional one.
- 2 or more process can perform simultaneously.

IV. CONCLUSION

This machine can perform three farming processes like sowing seeds , spraying pesticdes and water and ploughing. This machine is designed in such a way it doesnot not required any skilled labour .multi purpose agriculture machine reduce the workload on farmer of doing different process through labour work . this machine is affordable for small scale farmers who cannot afford costlier machine . This machine reduce the cost of farming and reduce labour work also.

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