

DESIGN OF CROP CUTTER MACHINE

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ABSTRACT

Agriculture especially in India need to concentrate in some aspects such as how to increase the productivity and profit, how to reduce the cost and how to solve the problem comes from workers. Currently in India former used conventional method for the crop cutting i.e. The conventional method for crop cutting is as manually cutting using labor but this method is lengthy and time consuming. It well know that crop like jawar, tuar, bajra maize required more force as compare to easily cutting crop like wheat rice etc. This paper presents the concept for design and analysis of crop cutter. The crop cutting is important stage in agriculture field Crop cutting machine is mechanical device. It can be use for cutting the dry cut stalks of grain break or covering of trunk of tree. This mechanism is used for harvesting the moderate crop. single machine can be perform the work of seven to eight labour which is ultimately help to increase the economy of formers. The only drawback of machine is that it is battery dependent machine.

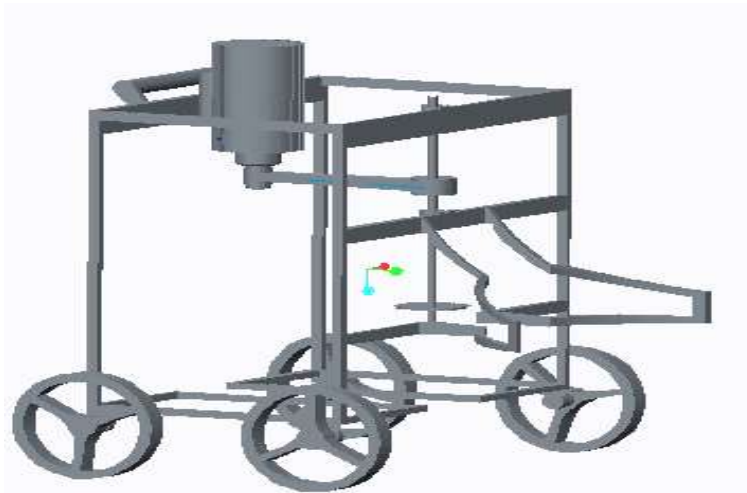
Keyword : - Agriculture field area , Crops analysis, Creo software, Cutter, Drive mechanism, Crop cutting machine.

1. INTRODUCTION

India comes second in the farm product across the globe. So, crop cutting is the benefited factor in the farming. Mostly in India farmers preferred the traditional method of crop cutting by using sickle. Which is more time consuming and exhausting for worker in the farm. Thus continuous cutting crop by this So there is a need for innovation of crop cutting machine which is benefited for farmers rather than traditional method and suitable economically. After visiting various farmers & their fields it has been found that the farmers put forth some common complaints regarding the harvesters. These complaints can be considered as constraints while designing the model.

Crop cutting machine is a mechanical device which is used to cutting the dry cut stalks of grain break steam or covering of trunk tree. Thus by adjusting its tension it can easily change cutting force from one crop to another. This can be applicable for cutting of the crop such as Jawar, tuar, & bajar,,etc

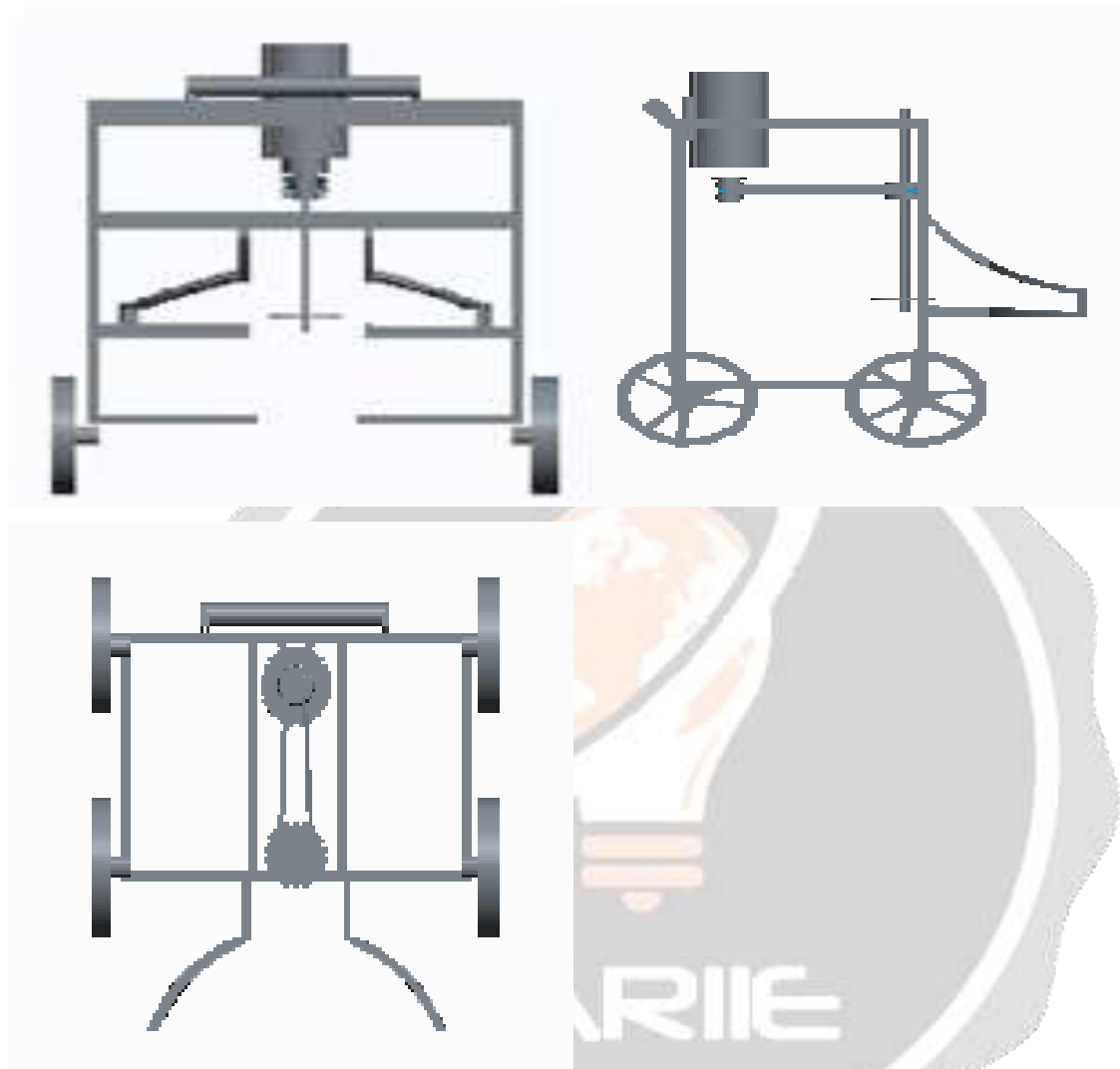
1.1 DIAGREM



1.2 CONSTRUCTION & WORKING

- With the help of creo software we developed crop cutting machine
- It consists of four wheels, motor and cutter, pulley ,shaft, belt and Plummer block
- The pulley and cutter are mounted on a single shaft which is driven by motor.
- We are using the DC motor which works on principal converting electrical energy into mechanical work.
- The motor transmit the power to shaft which with coupled with the belt and pulley drive.
- This belt will transmit the power to shaft on which cutter is mounted, thus the cutter rotate clockwise direction.
- As the cutter will rotate it will cut the crop continuously, this will cause wearing and tearing of cutter.
- The whole cutter assembly mounted on wheel operated chassis.
- This four wheel help to move the machine from one place to another.
- We will use metal wheel and metal frame chassis, simply it will increase the life of machine.
- One cutter will reduce 7 to 8 labour works which ultimately increase the efficiency.
- Thus, it will increase the efficiency as well as economic growth of farmer in one time investment of the machine cost.

1.3 ISOMETRIC VIEW



2. FIELD WORKING & LAYOUT

- **Machine Placement:**

There is a recess between two ridges in sugarcane farm. First of all, Place the machine in such a way the right hand side wheels will in a recess and left hand side wheels in the adjacent recess

- **Cutter adjustment:**

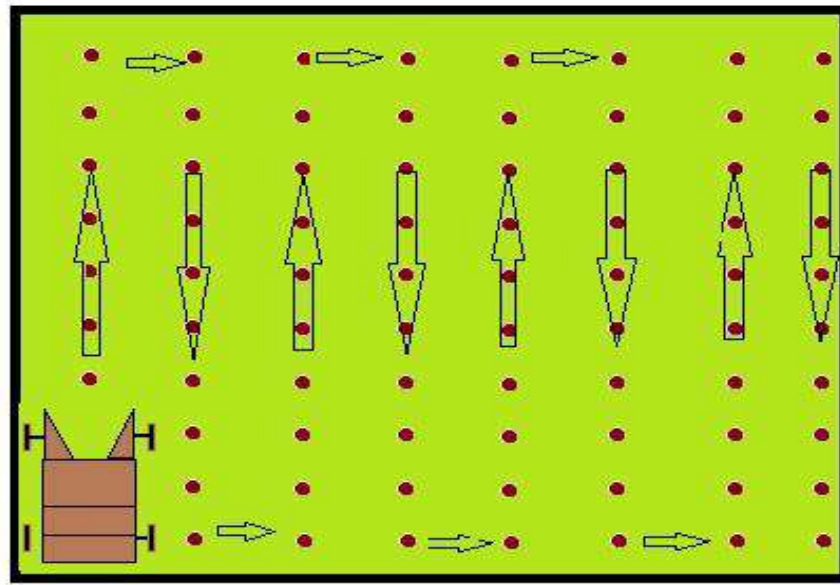
The farms are uneven and the height of ridges varies from field to field. To counter this problem, we have provided an adjustable arrangement for cutter. After placing the wheels of machine in the recess, check the height of cutter, and adjust the cutter as per requirement.

- **Electric supply:**

The motor wire is connected to the battery. Then power is supply to the motor and motor shaft start rotating and cutter begins to rotate.

- **Advancement in the field :**

Now, the machine will push by human labor as our machine is semi-mechanized. The average advancing speed will be maximum.



Field layout

2.1 Future scope:

1. By replacing the motor we can use wheel operated cutter rotation by using the sprocket, chain.
2. This machine can also be used for cutting other crops such as cotton stalks and maize.
3. As the field is uneven, the cutter height varies from node to node. So, a slider mechanism can be used to vary the height of cutter from time to time.

3. Advantages:

1. Reduce the human effort:-crop harvester mostly designs for reduce the human efforts in which only one operator can be operate or handle the machine. While the machine will begin there is not required more than one or two worker.

2. Reduce the cost: - in the agriculture for cropping the soya bin, Javari and Tovar. It can cut cheapest prices because it saves the worker cost.

3. Reduce the time: - when worker is cutting the crop they have more time for cutting but when the use of the crop cutter harvester they increase the capacity of the working and cutting and it can possible the maximum crop cutting within minimum time.

4. Easy to handle: - crop cutter machine is easy for handling we can easily start the machine.

5. Unskilled worker can operate: - no skill person required for operating the machine.

6. Safety to use: - during the working if any problem occurs in the machine we can easily find it.

4. CONCLUSIONS

It is found that generally 2 workers are required to cultivate 1 Acer farm having 400 Rs. / worker. If we use crop cutting machine it consume 3.7 units approximate to cultivate 1 Acer farm if we compare cost wise then our project will save Rs.750/- per day.

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