Impact Factor (SJIF): 4.542

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 4, Issue 4, April-2017

DESIGN OF COTTON SEEDS SOWING MACHINE

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Abstract

In India most of people are depend upon agriculture for their development of life and for survive. But in India farmers are still using traditional methods for agricultural activities which results in too much hard work of farmers. So improvement in agricultural instruments is quite required. Agricultural activities consist of many different processes like seed sowing, watering, spraying etc. But most important and quite required operation is seed sowing. The present methods for seed sowing are difficult to operate and also difficult to handle. So there is need to improve the methods of operating and handling of seed sowing machine. In our project we tried to develop a mechanism in which seed drops in a particular position with predetermined distance between two seeds. In this project we aim to make a sowing machine that puts the seed and fertilizer in rows at desired depth with a certain seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed.

Keywords: cotton, seed, sowing machine, Seed, Sowing, Machine.

I. INTRODUCTION

Today there is no sufficient man power for hard work especially in agricultural sector. So it's a time to automate the sector to overcome this problem. In India modernization of agricultural instruments was started with the use of modern hand tools and bullock drawn instruments. The modernization of agriculture aims to increase in yield and considerable decrease in human work. India has achieved lots of achievements but with the use of traditional methods. One of the many barriers which affect the modernization is land holding. In India, generally farmers have small land areas for agricultural purposes so it is not economical to modernize the instruments for small land areas.

Seed sowing machine is an instrument which helps in sowing of seed with particular position and predetermined distance between two seeds. The Main object of this machine is to sow seed at desired depth and specific seed to seed distance and it also contains the proper compaction of soil. India has a high numbers of farmers who are still using manual method for sowing which results in increase in cost and proves to be laborious. The traditional method contains the opening of furrows by plugging and dropping seed in furrows manually.

The comparison between the manually sowing and sowing by seeding machine.

Sr. no.	Parameter	Manual	Seeding machine
1.	Manpower	More	No
2.	Time required	Mere	Less
3.	Seeding technique	Manually	Automatically
4.	Required energy	High	Less
5.	Labour cost	High	Less

Table 1. Comparison of seed sowing

India has a high numbers of farmers who are still using manual method for sowing which results in increase in cost and proves to be laborious. The traditional method contains the opening of furrows by ploughing and dropping seed in furrows manually.

II. **RELATED WORK**

In India the main income or we can say that the widely spread thing is Farming. More than 70 % people of Indian family are dependent on the farming or related business of the farming. That's why we thought that if we can solve any of that problems it will be very helpful for the people. After the analysis we find the main problem in the farming is seed sowing we are need to best and extra care in seed sowing. We made this project just because of the problems which are facing by a farmer in recent time or real time. Now a days there are many problems in the Agriculture.

Cotton is known as white gold in India and one of the most important commercial. That's why we are going to create the project on this particular cotton seed sowing machine.

III. **TEXT INPAINTING**

In the farming process, often used seeding operations always take more time and more Labor and the seed feeding rate, the time required to complete the operation, the total cost is also more due the all this process. So we are going to make the machine or can say equipment we are using in sowing of seed which consider less time, less labour work and the main which we are going to suffer is the cost of that machine or the equipment.

Steps how this project is going to work: -

1. Put the seeds in the hopper as per the capacity of the hopper.
2. While the walking in the flow of the direction the ground rotate and with that the chain sprocket mechanisms transmit the power to seed rotor.
3. At the same time the furrow opener open the furrow soil.
4. After this all process the seed is drop down by the tube which is connected to seed rotor.

IV. EXPERIMENTAL RESULTS

2.1 COMPONENT OF COTTON SEEDS SOWING MACHINE

2.1.1 GROUND WHEEL:

The ground wheel provided at the centre of the frame from the functional component of power transmission unit. The ground wheel is mounted on shaft and rotates along with the shafts. The lugs are placed at the peripheral end which helps to produce better grip on the soil. The rotation of ground wheel results in the rotation of seed rotors in the seed box through chain and sprocket arrangement.

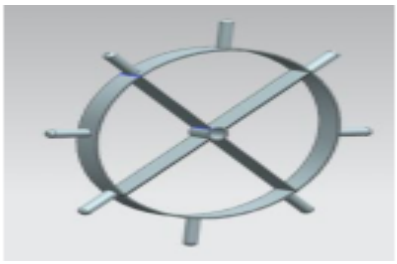

Figure 2.1: Ground wheel

2.1.2 CHAIN AND SPROCKET MACHANISM:

The power to the shaft is transmitted by roller chain and sprocket arrangement. The power to the intermediate shaft is transmitted from ground wheel shaft which transmits power to the seed rotor shaft. Generally there are four sprockets from which two are placed on intermediate shaft and one sprocket on ground wheel shaft and remaining one on seed rotor shaft. The chain Material is steel.

Figure 2.2: chain

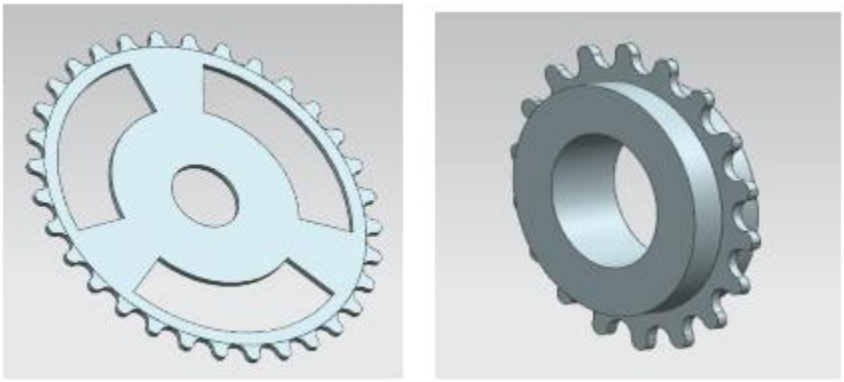

Figure 2.3: small and big sprocket

2.1.3 HOPPER (seed box):

It is made up of 2mm thick aluminium sheet. There are one seed box are provided in each box contain one rotor. The seed box capacity is 1.5 kg of cotton seed. The overall length and width of seed box 360 mm and 270 mm respectively. The box is mounted on secondary frame with the help of support. In secondary portion of the seed box a level of seed is maintained by adjusting the screws provided at upper side. The seed box is shown in figure.

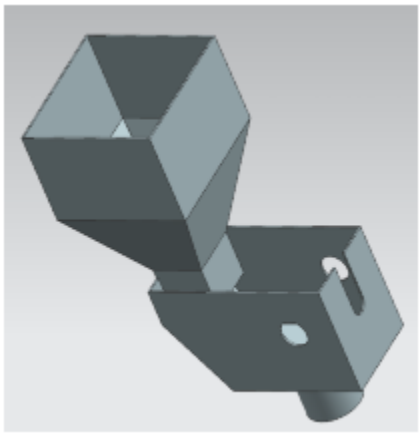

Figure 2.4: seed box

2.1.4 SEED ROTOR:

Seed rotor takes cotton seeds from seed box (hopper) and transfers it to seed tube. Seed rotor is rotated by chain and sprocket mechanism which is connected to ground wheel. In seed rotor an elliptical hole is provided at the centre of seed rotor. Elliptical shape of the hole provides positive engagement of the shaft.

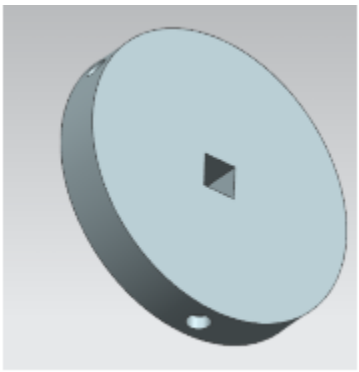

Figure 2.5: seed rotor

2.1.5 FORROW OPENER:

There is one furrow opener for seed which is fitted on the channel frame of the planter with the specific placing. The furrow opener is fitted with sweep. The furrow is made from mild steel strips and one end of it is attached to the furrow by nut bolts. For proper penetration of soil inclination for sweep is provided. The space is provide between the seed furrow opener and sweep for insertion of seed tube.

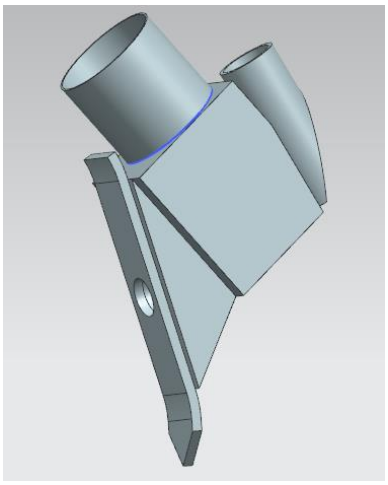

Figure 2.6: Furrow opener

2.1.6. SEED TUBE:-

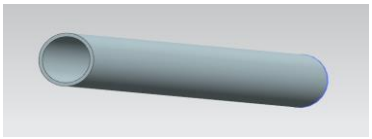

Figure 2.7: seed tube

2.1.7. SHAFT: -

Ordinary transmission shafts are made of carbon steel with a carbon content from 0.15 to .0.40 per cent. Shafts are manufactured by hot rolling and finished to size either by cold drawing or by turning and grinding. Transmission shafts are subjected to axial tensile force, bending moment or torsional moment or their combinations.

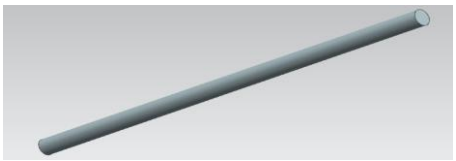

Figure 2.8: shaft

2.3 .3D MODEL OF COTTON SEED SOWING MACHINE

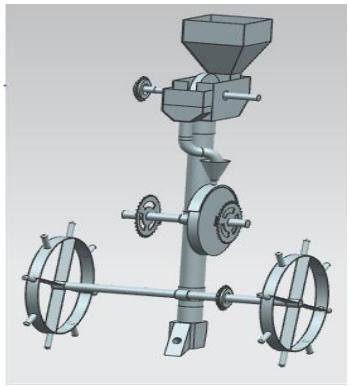

Figure 2.9: 3D model of cotton seed sowing machine

2.4 CALCULATION

We know that,

D = diameter of the ground wheel = 400mm
N = rotation of the ground wheel = 1rpm
D1 = diameter of the small sprocket = 80mm
N1 = rotation of the small sprocket = 1rpm
D2 = diameter of the big sprocket = 135mm
N2 = rotation of the big sprocket =?
Rotation of the ground wheel is equal to rotation of the small sprocket because of arrangement of both are on
same shaft.

$$\frac{N1}{N2} = \frac{D2}{D1} \quad ; \qquad N2 = \frac{80}{135} = .60\text{rpm}$$

Form the above calculation we can get rotation of the big rotor is=0.60rpm.
No of hole on the small seed rotor = 3
No of hole on the big seed rotor = 5
When ground wheel rotate one revolution then **900 mm** distance is cut. So, from the arrangement of the chain sprocket mechanism the seed rotor is rotted .60rpm rotation and number of hole on the big seed rotor is five. So one revolution of ground wheel then three seeds are fall down.

V. **CONCLUSION**

After comparing different methods of seed sowing it is very clear that, seed sowing by mechanical instruments save time, money, and energy of farmers. The seed sowing machine has a great ability to sow seeds at a time with proper spacing between seeds, at a specific depth and with the compaction soil over the seeds. It can be operated by tractor drive so it reduces man power. The main advantage is that it can be used for small areas as well as large areas as it parts are portable andit can be operated manually in small areas and mechanically in large areas.

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