



# DESIGN AND FABRICATION OF ROLLER SEED SOWING MACHINE

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**Abstract-** The essential objective of sowing operation is to place the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil & provide proper compaction over the seed. The row spacing, seed rate, seed spacing and depth of seed placement differ according to crops and for different agro-climatic conditions to achieve optimum yields. The comparison between the normal sowing method and the new proposed machine may perform a variety of simultaneous operations and has several benefits. As day by day the labour availability becomes a great concern for the farmers and labour cost is more, this machine minimizes the efforts and total cost of sowing the seeds and fertilizer placement.

**Keywords:** *Seed Sowing Equipment's, Sowing Methods, Seed Metering Device, Seed Spacing, Machineries.*

## I. INTRODUCTION

Agriculture is the backbone of India. And for sustainable growth of India development of agriculture plays a vital role. Thus, we made a sowing machine that is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the matter encountered in manual planting. For this machine, we will plant differing types and different sizes of seeds also we will vary the space between two seeds while planting. This also increased planting efficiency and accuracy. We made it from raw materials thus it had been so cheap and really usable for little scale farmers. We simplified its design for the effective handling of the machine by farmers or by any unskilled worker. Also, its adjusting and maintenance method also simplified. The farmer has got to spend his longer in planting. But the time available is minimum for him. Thus, it requires more manpower to finish the task within a stipulated time which is costlier. Also, more wastage happens during manual planting. Hence there is a need of developing such a machine that can help the farmer to scale back his efforts while planting. This process of using machines is called as mechanization.

Seed sowing machine is a device that helps in sowing of seeds within the desired position hence assisting the farmers in saving time and money. The essential objective of sowing operation is to place the seed and seed in rows at desired depth and seed to seed spacing, cover the seeds with soil, and supply proper compaction over the seed. The paper discusses different aspects of seed sowing machines which will be helpful for the agriculture industry to maneuver towards mechanization. The agricultural industry has always been the backbone of India's sustained growth because of the increasing population of the country and hence the demand for produce grows. Hence, there's a greater need for Multiple cropping on the farms and this, in turn, requires efficient and high capacity machines. The paper discusses different types of seed sowing machines which will prove be helpful for the agriculture industry to maneuver towards mechanization.

## II. LITERATURE REVIEW

P. Shelke concludes that bullock drawn planters are becoming necessity for sowing as the skilled workers for sowing are almost diminishing. Planting distance and plant population are crucial factors in maximizing the yields of crops.

Singh (1971) revealed that by using a seed drill for wheat crop there was an increase in yield by 13.025 percent when compared with the conventional method, it also revealed that by using a seed drill for wheat crop, a saving of 69.96 per cent in man-hours and 55.17 percent in huloock hours were achieved when compared, with the conventional method.

Umed Ali Soomro at al. In Pakistan has evaluated three sowing methods and seed rate in a four replicated RCB method and concluded that drilling method of sowing at seed rate 125 kg/ha is optimal for yield and quality of wheat grains, because the said sowing method and seed rate distribute seed uniformly and desired depth which provide appropriate depth for seed germination and crop establishment.

**III. OBJECTIVE****1. Sowing seeds with proper distance and depth**

Because of this machine, we can plant seeds with proper distance between them, and hence the amount required for the sowing of seed per hectare is fix. This also helps to extend the germination of a seed, because seed to seed space is proper so the plant gets space to get older.

**2. Reduce Time**

The foremost important objective for this invention is to scale back the time of sowing seeds fertilization within the conventional method the sowing through hands (manually) which takes an excessive amount of time to finish the sowing in the whole farm. Reduce in time ends in increasing efficiency.

**3. Reduce Work Done**

Due to this invention, the entire work done by the farmer for sowing is decreased, because the farmer has not to carry the heavy bag of seeds and fertilizer and throughout the sowing process and therefore the work of sowing through hands also gone reduce.

To attain proper sowing of seed in the seeding mechanism.

To make machine economic and light-weighted.

To adjust proper depth in variable soil in any weather condition.

**IV. Working Method:**

It is a machine that contains one or more numbers of seeds sowing wheel which contains a number of a tooth on the periphery of the wheel. The tools on the periphery of the wheel are arranged consistent with the space required by the farmer between two consecutive seeds in a single row.

The space between two wheels of seed sowing is arranged according to the consecutive distance required between two rows of cultivating the land. The diameter of the tool which is mounted on the periphery of the roller is consistent with the utmost diameter of the seed for which the machine is to be designed.

The male-female arrangement is providing on either side of roller for easy maintenance of roller after working of the machine. The flow of the seed from hopper to the roller is to be controlled by using spigot mechanisms, the height of the machine is consistent with human ergonomics''.

When the machine is push & external force is applied on the handle the wheel is started to rotate tool mounted on the wheel. Which penetrates the soil which sows the seed. The seed passes into the tool from the roller is due to gravity. The essential construction of seed sowing machine operation is to place the seed into desired rows and depth, seed to seed spacing cover the seeds compaction over the seed. We are constructing the two wheelbase seeding wheels which id having several teeth according to seeding length around the circumference of the wheel. Over it, the Hooper arrangement is put to load the seed in it. according to design, we propose to place nearly 15-30 kg of seeds.

In some conditions, there could also be a chance of soil of getting stick inside to get rid of this soil from the tool we design male & female arrangement on the wheel & tooth also. By consideration of overall weight & capacity of the machine, we are using the maximum amount as less material as such we can operate easily using the machine.

SR. NO.	NAME OF SEED	DISTANCE BETWEEN TWO CROPS (CM)	SEED DIA (MM)	CROPPING DEPTH (CM)
1.	Wheat	10-12	3	2
2.	Bajra	8-10	2	3-4
3.	Jowar	8.89	3-4	3-4
4.	Corn	15-25	13.5	2.5
5.	Gram Chana	7.62	5-10	3-4
6.	Soybean	10.6	11	3.5
7.	Cotton	7.62	9	4
8.	Peanut	10-15	D=13, l=21	8

TABLE 1: IT SHOWS DIFFERENT TYPES OF SEEDS AND CROPPING DEPTH

V. DESIGN MODEL

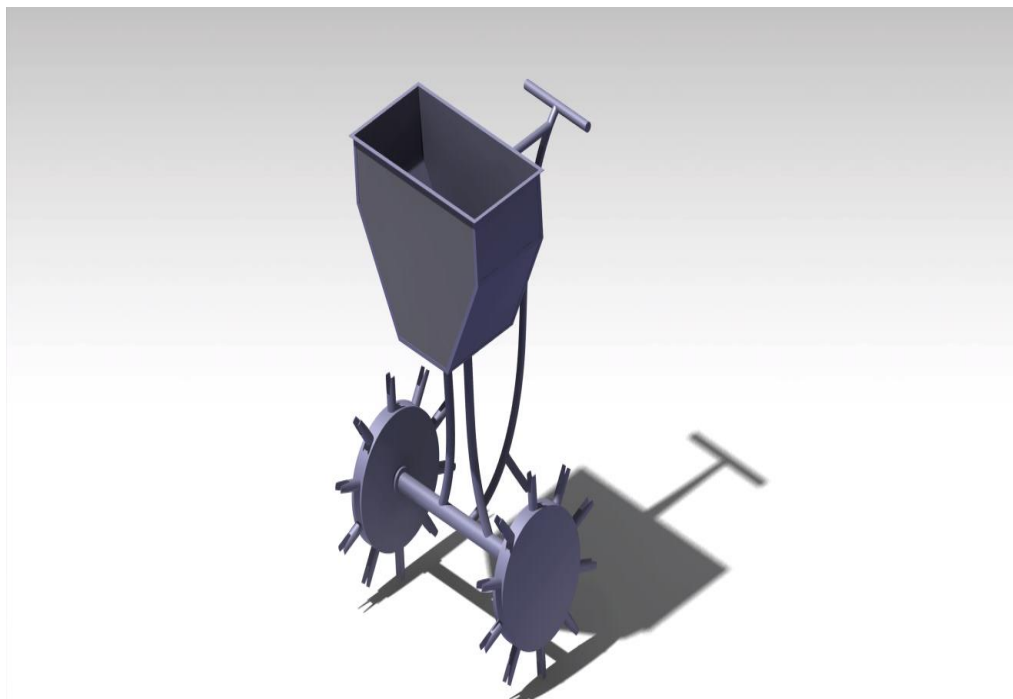


Fig 1: CAD model

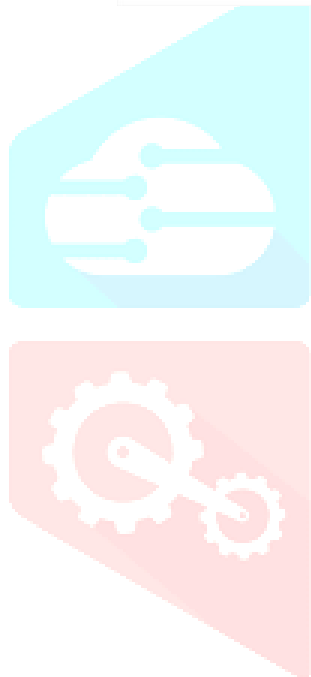


Fig 2 : Model of Roller Seed sowing machine

**VI. Advantages**

1. Improved efficiency in planting.
2. Increased yielding and reliability in crop. Increased cropping frequency.
3. Increased speed of seed planting.
4. Seed planting accuracy.
5. Durable and cheap as low-cost materials are used.
6. Less maintenance cost.
7. Since seed are poured at any required depth, the plant germination is improved.
8. Dependency on labour also decreased. Also, it saves time of sowing.
9. Uniform placement of seeds in row with required distance.
10. Proper compaction over the seeds is provided.
11. Many seeds may be sown by this machine.
12. Due to small size machine is portable. And can also be utilized in small area.
13. Cost efficient.
14. Improve agricultural soil carbon sequestration.
15. Save energy, money and time of a farmer.

**VII. Disadvantages:**

1. Difficult to operate in a moist condition.
2. It will use manpower to drive the machine.

**VIII. Applications**

1. It uses in agriculture for seeds sowing with fixed distance and with more accuracy.
2. Also, it will be used for gardening purposes.

**IX. Conclusions**

Roller based seed sowing mechanism has a remarkable influence in agriculture. By using this innovative project of seed sowing equipment, we are able to save more time required for the sowing process and also it reduces a lot of labourer cost. it is very helpful for small scale formers because it weighs less. After comparing the various method of seed sowing and limitations of the prevailing machine, it is concluded that this seed sowing machine can

- Maintain row spacing and controls seed rate.
- Control the seed depth and proper utilization of seeds can be finished with less loss.
- Perform the various simultaneous operations and hence saves labour requirement so as labour cost, labour time and also save a lot of energy Hence it is easily affordable by farmers. So, we feel that this project serves something good to the present world and that we would really like to present it before this prosperous world.

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