



Bluetooth Based Solar Seed Sowing Machine

¹ Sai Krishna, ²Gowtham Yadav, ³ Hemanth Kumar, ⁴Punith N, ⁵Ashwini M V

^{1,2,3,4} UG Students, ¹Assistant Professor.

School of Mechanical Engineering, REVA University, Bengaluru, India.

Abstract: Today's era is marching towards the rapid growth of all sectors including the agricultural sector. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall crop production. The aim of this project is to design and develop a solar operated seed sowing machine. The seed sowing machine is a key component of agricultural field. The various technique used in India for seed sowing and fertilizer placement are manual, ox and tractor operator. So, we are developing this equipment which will satisfy all this need and to solve. This machine performs four farming operation (digging, sowing,) which is used small scale farming. By using above attachments, one may perform various farming operations in less time and economically by adding latest technology using Bluetooth by arduino controller.

Index Terms: seed sowing machine, solar operated, agriculture

I. INTRODUCTION

The real power required for machine equipment depends on the resistance to the movement. Even now, in our country 98% of the contemporary machines use the power by burning of fossil fuels to run IC engines or external combustion engines. This evident has led to widespread air, water and noise pollution and most importantly has led to a realistic energy crisis in the near future. The approach of this project is to develop in favor of agricultural machine to minimize the working cost

In this project described here is quite useful in the agricultural field. The project aims on the design, development and the fabrication of the robot which can dig the soil, put the seeds, at constant distance and by maintaining constant depth without waste of seeds, these whole system of the robot works with the battery and the solar power and can be operated using Arduino cell phone by simply connecting Bluetooth device to control the vehicle from one place or without any human force or fatigue Applying on the seed sowing machine. More than 40% of the population in the world chooses agriculture as the primary occupation, in recent years the development of the autonomous vehicles in the agriculture has experienced increased interest. The agricultural industry has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for Multiple cropping on the farms and this, in turn, requires efficient and high-capacity machines. Mechanization of the Agricultural industry in India is still in a stage of infancy due to the lack of knowledge and the unavailability of advanced tools and machinery. In traditional methods seed sowing is done by broadcasting manually, opening furrows by a plough and dropping seeds by hand. The agricultural has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for produce grows as well. Hence, there is a greater need for multiple cropping in the farms and this, in turn, requires efficient and time-saving machines.

II. LITERATURE REVIEW

[1] Mahesh R. Pundkar This study states that the seed sowing machine is a key component of agriculture field. high precision pneumatic planters have been developed for many varieties of crops, for a wide range of seed sizes, resulting to uniform seeds distribution along the travel path, in seed spacing. This method allows you to plant more seeds in less space by concentrating watering, weeding, and fertilizing in a smaller area.

[2] **P.P. Shelke** This study 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 was achieved when compared, with the conventional method. When the plough moves over the field, the tube attached to it leaves the seeds and kept in the funnel at proper depth as well as spacing. The plough keeps making furrows in the soil in which the seeds are dropped by the seed drill. Drawbacks of this system are no proper germination of seeds. Wastage of seeds. No control over the depth of seed placement.

[3] **A. U. Malik** This conducted the field experiment to evaluate the effect of different seed rates on different sowing dates to suggest the appropriate seed rate of wheat for different sowing dates and suggested the farmers that wheat should be preerably sown on 15 November with seed rate for better production. This research paper presents seed sowing machine. In this they present objective of seed sowing machine design, factors affecting seed emergence, some mechanisms. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed.

III. OBJECTIVES

Work reliably under different working conditions.

- | Decrease the cost of the machine.
- | Decrease labor cost by advancing the method.
- | The machine can be operated in the small farming land (1 acre).
- | Making such a machine which can be able to perform both the operation plowing and seeding.
- | Making use of solar power to cut the fuel cost
- | This machine is capable of doing 3 to 4 peoples work, hence reduce the labour cost.

IV. METHODOLOGY

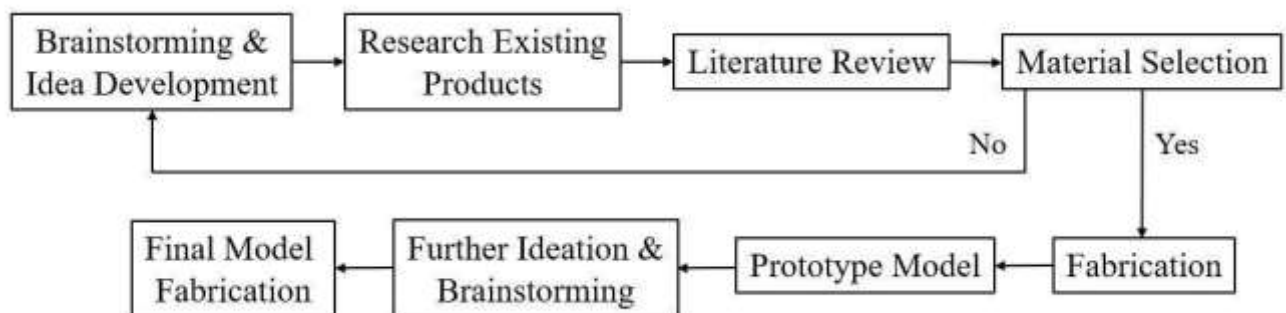


Fig. No. 1 – Methodology

4.1 Calculation

Calculation for Plough

Depth of cut= 5 cm

Speed of the tool= 2.5 km/hr = 41.66 m/hr

No. of tool= 4

Feed rate= Rpm x N x CL

FR= 41.66x4x0.05 Feed rate

R= 8.332 m² /min

Calculation for seed sowing:

Speed of the motor= 30 rpm

Row spacing= 22 cm

Seed sowing time= 2 sec/per

seed No. of openings = 4 Seed dropping per minute = 30x4 = 120 seeds

If the speed of the wheel is 42 m/min,

then for 42 meter 120 seed is dropped

DESIGN OF BALL BEARING

Bearing No. 6202

Outer Diameter of Bearing (D) = 35 mm

Thickness of Bearing (B) = 12 mm

Inner Diameter of the Bearing (d) = 15 mm

r_1 = Corner radii on shaft and housing

$r_1 = 1$ (From design data book)

Maximum Speed = 14,000 rpm (From design data book)

Mean Diameter (dm) = $(D + d) / 2$

= $(35 + 15) / 2$

dm = 25 mm

•Watt-hours = Milliampere - hours \times Volts / 1000

For battery spec is 12v 7.5 amps

For converting amps to milliamps multiply by 1000

Because 1amps =1000milliamps

I.e. $7.5 \times 1000=7500$ milliamps

Watt hour =7500/1000

Total Battery capacity is 75 watt hour

specification of the battery:-

Weight of battery: 2KG

Output power:12v 7.5 amps

Operating voltage:12v 1amp

Current:1 to 1.5 amps

Specification of motor:-

Weight of motor: 1kg

Operating power required: 12v 1.5 amps

Operating voltage: 12v

Operating current: 1.5 amps

Motor speed: 80 rpm

Testing of charging time:

Instrument used to measure sun radiation: Pyranometer

The sun radiations are measured in: watts/mtrs

Required voltage for charging the battery: 12v

Time measurements:

When solar radiation is between 200 to 300 mW/cm² : 3 to 4

When solar radiation is between 300 to 400 mW/cm² : 2 to 3 hrs

When the solar radiation is between 400 to 600 mW/cm² : 1hr.

Running period : 3 to 4 hrs.

Operating cost : NIL

4.2 Design

The design of Bluetooth based solar seed sowing machine is below 2D and 3D Model

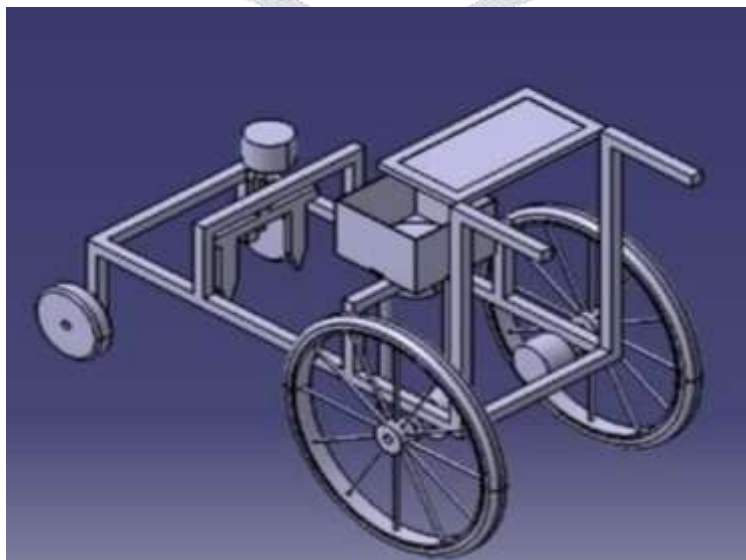


Fig. 2: 3D view of model

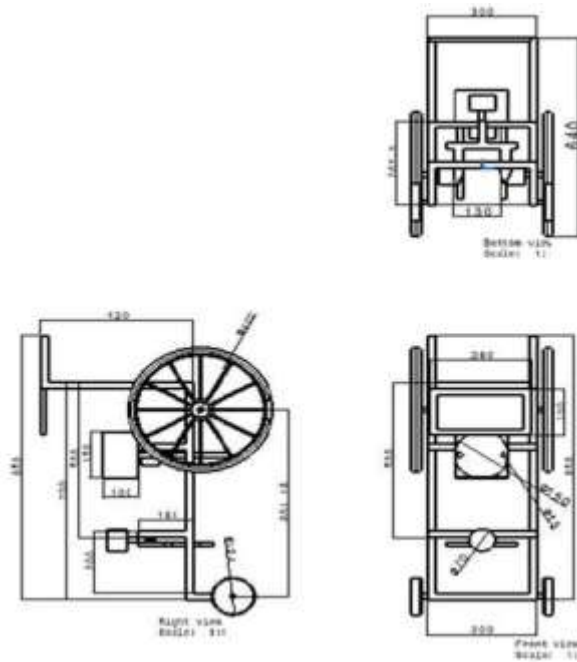


Fig. 3: 2D view of model

V Working principle

The Automated seed sowing technology is a method design in order to reduce the human efforts

| It requires less amount of manmade labor and can be handle efficiently without a skilled operator.

| Seeding manually requires lots of time, therefore this technology develops which eradicated much amount of time with proper efficiency, less time consuming, accuracy in sowing seed at specific distance.

| It works on simple mechanism, a battery operated D.C. motor is used transmits the rotary motion to the shaft with the help of chain drive, and there is another connection of sprocket and chain to the rotary motion.

| When the farmer puts seeds into the hopper.

5.1 Fabricated model



Fig. 4. Fabricated model

VI RESULTS & DISCUSSION

- After considering different advantages and disadvantages of the existing machine .
- It is concluded that the seed sowing machine for farmers can Maintain row spacing, Proper utilization of seeds can be done with less loss, Perform the various simultaneous operations and hence saves labor requirement, labor cost, labor time, total cost of saving and can be affordable for the farmers.
- In conventional machining, for 1acre land a tractor takes about 2hr for ploughing but the time in universal seed sowing machine is reduced by 50%.

VII CONCLUSION

The This system gives an advance method to sowing and plowing crops with minimum man power and labor ,making it an efficient vehicle and eco friendly vehicle using solar system and cell phone controlled. The machine will cultivate the farm by considering particular rows and specific column at fixed distance depending on crop which is controlled manually by the driver for a particular distance.

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