ADVANCED SEED PLANTATION MACHINE

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Abstract: As we all know the main requirement in the agriculture or any firm is man power. So the main objective of our project is to reduce the need of man power. The agriculture sector is the one where not only number of labor is required but also they must have the required skill set for farming. Need of labor can be accomplished by automating the process of seed sowing. The "Seed plantation" is one of the most important and day-to-day job of the farmers. Conventional method suffers from various problems. The main aim of our project is to reduce the human effort, time requirement and to increased accuracy of the seed plantation system.

Index Terms-*Agricultural operations, agricultural machinery, agricultural equipment, seed sowing techniques, seed sowing mechanism, farming system, robotics technolog*y.

I. INTRODUCTION

In 21st century whole world is affected by global warming. Due to continuous environmental changes the rain short fall happens all over the world specially countries in monsoon areas like India effected by low rain and flood challenges in every year. The greenhouse is the innovative way to overcome from the environmental challenges. Greenhouse is used for the growing vegetables, flowers. A productive greenhouse gives productivity most of year because of its ability to maintain temperature. But the drawback of greenhouse sometime it is not cost effective. For operating greenhouse the large manpower required. To avoiding this issue of the excess men power we design and manufactured the multipurpose seed plantation machine. The manual seed plantation method is used in the greenhouse which is not cost effective method. Advanced seed plantation machine is the integration of the mechanical, electrical and electronic system. This machine reduces labor cost and time for seed plantation at initial condition. This machine also saves the wastage of seed. The machine also drops every seed accurately as per given distance to micro controller and proximity sensors. This machine is multipurpose because it can also use in small farm for seed plantation with some low cost changes. In recent scenario number of changes are occurring in agriculture methodology like seed sowing, pesticides and irrigation. For developing our economical condition it must necessary to increase our agricultural productivity and quality also. Out of them Seed plantation is one of the most important and day-to-day job of the farmers. The conventional method for seeding is manual one but it requires more time and more efforts.

Manually seed plantation method suffers from various problems. The tendency of manual work is going on reducing. The man power shortage is one of the biggest problems faced continuously to all farmers. Due to labour shortage the plantation cost should be increased. So it is not economically beneficial for all farmers. The seed plantation contents proximity sensor, timer, relay, DC motor, seed feeder, rotating wheel etc. The motor agricultural vehicle is provided with a rotating wheel which measures the distance covered by the vehicle. The distance is will be sensed by a proximity sensor. The specific pulses are generated. Proximity sensor is connected to timer for adjusting rotation of rotary drum. This timer is then connected to relay board. Then all connections are connected to DC motor supply. Seed feeder is provided in this system for dropping seed one by one in the farm. Before the seed is dropped proper digging line is also formed with the help of a projection provided. It is a self driven barrier with geared DC motors. The DC voltage is provided to motors. Out of three wheels the two are provided with motor drive and one is driven automatically one more dc motor is provided to rotate the rotary drum.

II. LITERATURE REVIEW

[1] **Mayur Bawaskar:** In the present situation most of the countries don't have sufficient skilled manpower specifically in agricultural sector and it influences the development of creating nations. So it's an opportunity to robotize the division to defeat this issue. Agriculture is the foundation and spine of the Indian economy. About half of the total population of our country has picked agribusinesses as their chief occupation. The states like Maharashtra, Punjab, and Kerala, Assam are highly involved in agriculture.

[2] **Abdulrahman:** This paper represents the modern techniques included the use of tractors for ploughing the field, production of pesticides, invention of tube wells etc. Since water is the main necessity in this scenario, techniques were discovered which would help in watering the field easily, consume less water and reduce human efforts. These revelations enhanced the way of life of farmers. Aggro-Technology is the way toward applying the innovation advancement happening in day by day life and applying that to the agribusiness area which enhances the productivity of the yield created and furthermore to build up a superior Mechanical machine to enable the farming to handle which lessens the sum and time of work spent on one harvest. Subsequently

in this work of task we chose to outline a superior mechanical machine which is accessible to the farmers at a less expensive rate and furthermore which can sow and seed the harvest at same time.

[3] **Sahana:** This paper presents a system which operates for advanced agriculture process which includes cultivation based on the area defined for different dimensions of land space on robotic platform. The farm is cultivated by the robotic system , depending on the dicotyledon crops(Ground nut, Peas, Beans etc) considering particular rows & specific columns. The multifunctions are operated in an single robotic platform such as Ploughing, Seed sowing, Liquid fertilizing and Water sprinkling. The infrared sensors detects the obstacles in the path.The movement of the machine is predefined and the solar panels are used to charge the battery, the power supply is used as a backup. Embedded C language is used in programming the micro controller.The micro controller is used to control and update the work processed by the agriculture robot which is performed by the system.

[4] **Trupti A:** This survey paper talk about Agriculture is the foundation of Indian economy. About half of the total population of our nation has picked agriculture as their main occupation. The states like Maharashtra, Punjab, and Kerala, Assam are very associated with farming. Everything began because of the effect of, "Green Revolution" by methods for which agriculturists came to think about the different strategies engaged with cultivating and the focal points in it. As hundreds of years passed, certain cutting edge systems were imagined in agriculture because of the advance in science. These cutting edge procedures incorporated the utilization of tractors for ploughing the field, generation of pesticides, creation of tube-wells and so on. Since water is the main necessity in this situation, systems were found which would help in watering the field effortlessly, devour less water and decrease human endeavors. These disclosures enhanced the way of life of ranchers. Aggro-Technology is the way toward applying the technology advancement happening in day by day life.

[5] **Swati D.Sambare**: In India, close around 70% individuals are reliant upon agriculture. So the rural framework in India should to be progressed to decrease the efforts of agriculturists. Different number of activities are performed in the agribusiness field like seed sowing, weeding, cutting, pesticide spraying and so forth. Extremely essential and critical activity is seed sowing. Be that as it may, the present strategies for seed sowing are problematic. The types of equipment's utilized for seed sowing are exceptionally troublesome and awkward to deal with. So there is a need to create equipment which will reduce the efforts of farmers. This framework presents a control mechanism which plans to drop seeds at specific position with indicated separate between two seeds and lines while sowing. The drawbacks of the current sowing machine will be expelled effectively in this automatic machine.

[6] **Kiran AS and Baban Parisa Dathwade:**The physically worked seed sowing procedure faces the issues of seeds to rats, winged creatures and snails. Thus, it is obligatory to mechanize the sowing of seed. This segment and a dynamic development wind up fundamental for raising the request on agricultural item and its quality. To give an answer for these issues, a micro controller guided rover for digging, seed sowing and cover seed properly. The robot is drive by high torque DC equipped engine fitted with the accessible turning shaft. It is pesticide application which advances Indian farming field.

III. COMPONENTS OF ADVANCED SEED PLANTATION MACHINE

1. **Frame: t**here are three frames are made with M.S. angle 25x1 mm weight of 10kg bar height of each frame from its bottom frame 610 mm incrementally each square frame has 610mm x 610 mm dimensions. on which other components like hopper, disk, shaft etc are mounted

2. **Hopper**: The Hopper is made by M.S sheet which contains Seed. There are three hopper mounted upper and middle. Total six hoppers are used in this frame which has 5kg weight.

Fig.1 Seed hooper

3. **Shaft:** The shaft is arrange between upper and middle frame which is shown in 3d diagram. The length of shaft is 615mm with gear head motor

4. **Rotary drum. :** It is made up of fiber plastic material which is circular in shape. there are three rotary drum fitted on shaft at each has 160mm distance between them. Diameter of each rotating drum is 70.5 mm. A small slot is cut on the rotary drum .It picks the seed from upper frame hopper side of hopper and drop it to another side hopper at certain distance with help of programmable gear motor.

5. **Farrow:** This is multipurpose device used for digging soil as well as dropping in the seed in soil. It is made of circular hollow cut at an pipes at angular cutting rod attached with bottom side frame at 45 degree angle which mad up with the C. I. material which is used for cultivating the soil be for dropping the seed. The angle of dropping seed made for stopping excess seed at one place.

6. **Wheel**: The three fiber wheel attaché to frame according to soil condition. The each wheel has 90.5 diameters

7. **Electric Motor:**2 DC electric motors are used in seed plantation machine. Each motor has 1\2 HP power with gear head runs at 30 r.p.m., and required 12Voltage to run motor.

8. **Gear drive:**- The helical gear attached with both motor. This gear gaving 60mm pitch circle diameter.
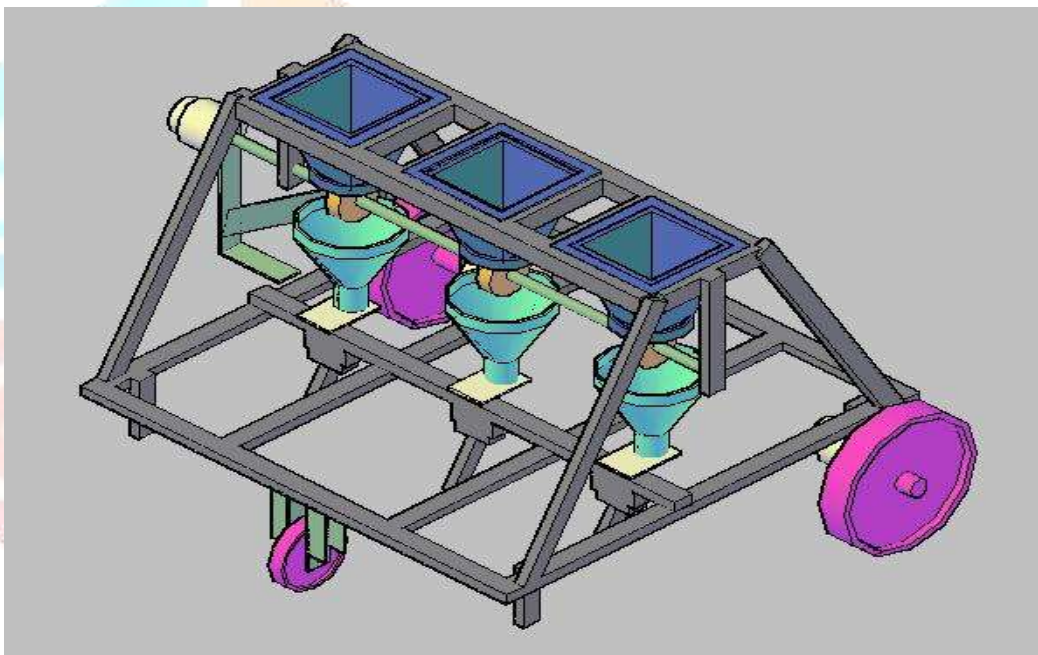
IV. EXPERIMENTAL SETUP
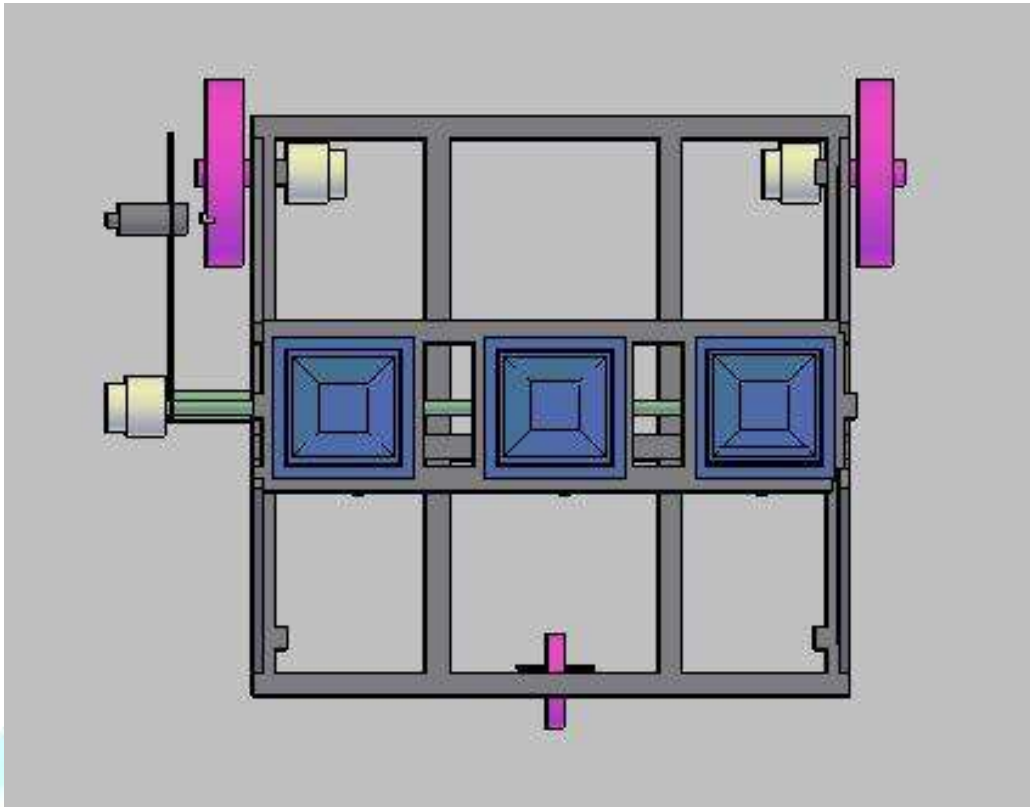

Fig. 2Experimental setup

Fig.3 Experimental setup (top view)

V. ACTUAL PROPOSED SETUP

The advanced seed plantation machine is implemented as shown below. It consists of three storage hoppers in which the seed to be planted are stored. Below the hoppers, the rotary drum is provided. It is having a hole through out. During entire rotation of drum the hole once comes below the outlet of the hopper and a seed is allowed to pass down wards, where it directly goes to ground. Then the soil is spread over the seed so that the seed properly goes below soil.

Before the seed id dropped proper digging line is also formed with the help of a projection provided. It is a self driven barrier with geared DC motors. The DC voltage is provided to motors. Out of three wheels the two are provided with motor drive and one is driven automatically one more dc motor is provided to rotate the rotary drum. Near to the tire wheel a proximity sensor is provided.

Fig.4 Actual proposed setup

Fig.5Actual proposed setup (top view)

During one rotation of tire, the sensor provides one logic pulse. This logic pulse goes to the switching circuit then to micro controller. It is expected that the rotor will rotate once after receipt of one pulse. One seed is dropped and the process continues.

VI. WORKING PRINCIPLE

The seed plantation machine consist hoppers in and rotary drum arrangement. Hoppers are used for the storing seeds and the rotary drum is arranged below the hopper. It is having a hole through out. During entire rotation of drum the hole once comes below the outlet of the hopper and a seed is allowed to pass down wards, where it directly goes to ground. Then the soil is spread over the seed so that the seed properly goes below soil.
Before the seed dropped proper digging line is also formed with the help of a projection provided. We reduces It is a self-driven barrier with geared DC motors. The DC voltage is provided to motors. Out of three wheels the two are provided with motor drive and one is driven automatically one more dc motor is provided to rotate the rotary drum.
Near to the wheel a proximity sensor is provided. During one rotation of tire, the proximity sensor provides one logic pulse. This logic pulse goes to the switching circuit then to micro controller. It is expected that the rotor will rotate once after receipt of one pulse. One seed is dropped and the process continues.

VII. . DESIGN CALCULATIONS

Torque required driving the motor

Power transmits from motor

$$P = \frac{2\pi NT}{60}$$

$$0.3677 \times 10^3 = \frac{2\pi * 30 * T}{60}$$

$$= 117.04 \times 10^3$$

Torque T $= 117.04 \times 10^3$

Design of ground wheel

Diameter of wheel D $= 0.095$m

Circumference of ground whee

$$= \pi \times D$$

$$= \pi \times 0.095$$

Circumference of ground whee

$$= 0.29\text{m}$$

Number of turns the ground wheel is moving in 100m

$$\text{No of turns} = \frac{Distance}{Circumference\,of\,wheel}$$

$$= \frac{100}{0.29}$$

= 365 turns

Area covered for one revolution of circumference of ground wheel

X width of seed dril

l=0.29×0.5

= 0.145 m^2

Number of turns need per hector

$$= \frac{10000}{0.145}$$

=68965 turns

Number of turns per hector are 68965 turns

VIII. ECONOMICAL ASPECTS AS PER FARMER REQUIREMENT

  We know that success rate of every project is considered not only with its design but also with its cost profitability to end user. In this project we consider that the low scale Indian farmer is end user of this product or project

Hence we need to considered the some aspect like easy handling or user friendly operating ,durability ,low maintenance cost ,easy to repair at local condition and structural rigidity of project etc.so we taken a simple case study of green peas seed by using the conventional method, tractor and automatic seed plantation machine which are mostly used in india.

1. BY MANUAL METHOD

Table 1: By Manual Method

Sr..No.	Parameter	Manual seed plantation
1	Man power	More man power required than tractor and automatic seed sawing machine
2	Time required	More timer required than other system
3	Distance between seed	Distance between two seeds are not fixed
4	Seed planting technique	Manual seed planting
5	Energy required	High human energy required
6	Pollution	No pollution
7	Cost of machine	No machine is used

2. BY USING TRACTOR

Table 2: By Using Tractor

SR.No.	Parameter	Tractor operating seed plantation
1	Man power	More man power required than automatic seed planting machine and less man power required than manual seed plantation process
2	Time required	Very less required than manual system and moderate time requied than any automatic seed plantation machine.
3	Distance between seed	Distance between two seeds are fixed
4	Seed planting technique	Automatically seed planting
5	Energy required	High fuel energy required
6	Pollution	High pollution
7	Cost of machine	Very high operating cost and as well as initial cost than other seed plantation process.

3. BY USING ADVANCEDSEED PLANTATION MACHINE

Table 3: By Advanced Seed Plantation Machine

SR.No.	Parameter	Advanced seed plantation machine.
1	Man power	Man power required only for supervising operation.
2	Time required	Very less required than manual system and moderate time required than any automatic seed plantation machine.
3	Distance between seed	Distance between two seeds are fixed
4	Seed planting technique	Automatically seed planting
5	Energy required	Only electric energy required for charging battery
6	Pollution	No pollution.
7	Cost of machine	Very low operating cost and as well as initial cost than other seed plantation process.

IX. CONCLUSION

The main aim of this system is its Automatic method for plantation of the seeds. The seeds are been sowed in an appropriate sequence which brings about proper germination of seeds. This advanced method for sowing seeds utilizing a robot reduces the work of labors. In this system, the wastage of seeds is also been reduced to a greater extent. This system has been created for the sowing of seeds in a programmed way. Here with the assistance of a robot the seeds are been dispensed in the soil in a proper

arrangement thus reducing the wastage of seed. Therefore after successful testing we touch base at the conclusion that the multipurpose advanced seed plantation is useful in saving labor and also economical.

X. REFERENCES

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