Seed Sowing Machine for Zero till Farming

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Abstract*: *Sewing machine ought to be reasonable to all homesteads, a wide level of harvests and it ought to be dependable, this is essential need of sowing machine. The sowing machine which is worked physically which reduces the undertakings of farmers by building up the limit of planting in like manner decreases the issue experienced in manual sowing. As Technology in agribusiness is exchanging quickly, we built up a seed sowing machine which will be significant for little scale ranchers and is anything but difficult to utilize. By utilizing this seed sowing machine, we can plant various sorts and various sizes of seeds. It is the response for the present imperativeness crisis for Indian farmers. Furthermore we developed a compact application to work the seed sowing machine using mobile phone by including a Bluetooth interface and before sowing the seeds we can evaluate the temperature and humidity of a particular place with the objective that reliant on the temperature and humidity the farmer can start sowing the seeds.

Keywords: sowing machine, harvests, Agriculture, temperature and humidity

I. INTRODUCTION

India is an agricultural country. Agriculture has been the main occupation for most of the Indian rural people. It's contribution towards Indian economy is more. during the first two decades it's contribution towards the gross domestic product ranged between 48 and 60%. It supports almost 18 % of the world population from 2.3% of world geographical area graphical area. The net sown area is 142 Mh.

Agriculture has been backward because of the usage of old implements Like wooden ploughs, spades etc or traditional techniques like manual ploughing, two crop patterns. Due to improper irrigation facility, farmers produce only one crop in a year. Our country is lagging In the usage of smart working or technology. With this it clearly shows that there is great need of introducing automation techniques in agricultural farming. By introducing technology, we can make this Horticulture field more prestigious.

The Automation implementation in the Process of sowing seeds requires machines that are cost effective and be affordable by farmers. The present invention is about a device for sowing granular materials,mainly fertilizers particularly for the solid fertilizer and the seed.

The Main theme of sowing operation is to put the seed and fertilizer in rows at desired depth with spacing and covering the seeds with soil by providing proper compaction over the seeds. sowing machine is operated manually and reduces the efforts of farmers by increasing the efficiency of planting and also reduces the problem of manual planting. With this machine we can plant different size and types of seeds, can vary row to row spacing, depth of the seed placement which varies from crop to crop based on agricultural and climatic conditions in order to achieve optimum yields. Besides, it reduces the cost in operation time, labor and saves energy which are the advantages. Due to this day by day increasing heavy population, the productivity of the agricultural is not being sufficient, in order to meet the needs multiple cropping in farms is required which requires time saving and efficient machines.

There are different types of seed sowing. They are:

1.1 BROADCASTING

Broadcasting refers to process of spreading the fertilizers uniformly all over the field. This method is suitable for cropswith dense stand. It is divided into two types: Basal Application and Top Dressing. In Basal application sowing of seeds is done and in Top dressing Fertilizers are given to the crop. By this method, we can have probability of having large number of plants.

1.2 DRIBBLING

Dribbling is done manually. Farmers make small holes in the ground in order to sow the seeds in that holes and these are covered with the soil in order to protect from the birds. It is also called as "Precision Seeding". This is time taking process.

1.3 DRILLING

In this method, a device is used which is used to sow the seeds. The aim of the drilling is to place the seed in the soil with minimum soil disruption. This process saves the germination moisture and also gives good protection against evaporation. This method comparatively reduces the time to sow the seeds. The seed sowing machines involves some of the process like solar powered systems, seed metering systems, Usage of sensors bluetooth modules A seed sowing machine is used to sow the seeds. The Bluetooth module is connected to the **Arduino** so that when we switch on the machine the user/farmer needs to pair up the mobile device .Once the device got paired the user can perform the operations like seed on ,seed off etc…The sensor is used to calculate the temperature and humidity of a particular place. The sensor data is received from DHT11sensor. It uses technology to detect the temperature and humidity level of climate.

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1.4 OBJECTIVE OF WORK.

The main objective of this project is to sow the seeds in row at a desired depth in any climate to produce property development across the sphere

1.5 SCOPE OF THIS WORK.

Seed sowing machine is a machine that helps with in sowing of seeds with in desired position therefore aiding farmers in time saving and cost. It can perform the operations additional with efficiency and additionally will end in low price.

•Work dependably beneath completely different operating conditions.

• Reduces the price of the machine.

• Reduce the labour price.

• This machine will be operated with in the tiny farming land i.e. (1 acre).

• Such a machine is created so that it is able to perform each operation.

II. LITERATURE SURVEY

According to the survey conducted by the Kyada, A. R, Patel, D. B.[2014] concentrated on the fundamental necessities for little scale trimming machines are, they ought to be reasonable for little ranches, straightforward in structure and innovation and flexible for use in various homestead activities. A physically worked format push grower was planned and created for improving planting productivity and lessen drudgery engaged with planting technique manually[6][7][8].

Seed planting is additionally workable for various size of seed at variable profundity and alignment of space between two seeds. Additionally, it expanded seed planting, compost arrangement correctness and is made of tough & modest material reasonable for little scale laborer ranchers. The working, changing & keeping up standards basic for successful taking care of by untalented administrators (ranchers). A. K. Mahalle is exhibited audit gives the brief data about different sorts of advancements done in seed sowing machine accessible for ranch. This machine is a key segment of farming field. The execution of seed sowing gadget affects the expense and yield of farming items. Directly there are numerous ways to deal with distinguish the execution of seed-sowing gadget.

A.A.Wankhede [2015] concentrated on the seed bolstering rate, the time required to finish the task, the absolute expense is additionally increasingly because of work alongside the contracting of hardware. The ordinary seed-sowing machine is less effective and furthermore tedious. The cutting-edge time has kept a walk towards the fast development of horticulture area. To satisfy the sustenance needs in future, the ranchers need to execute the new procedures for cultivating which won't influence the dirt surface yet will expand the yield creation to an immense dimension.

III. EXISTING SYSTEM

Traditional sowing strategies embrace broadcasting, gap furrows by a rustic plough and dropping seeds hand, famous as 'Kera', & dropping seeds in the furrow through a mental funnel connected to a rustic plough i.e.(Pora). For sowing in little areas i.e., creating holes by a stick or tool and dropping seeds by hand, is practiced. Multi row ancient seedling device with manual mastering of seeds are quite common. Sowing strategies have following limitations: 1) In manual seeding, it is unfeasible to realize uniformity in distribution of seeds. A farmer might sow at desired seed rate however inter- row and intra – row distribution of seeds is probably going to be uneven leading to bunching and gaps in field.

2) Poor management over depth of seed placement.3) It's necessary to sow at high seed rates and convey the plant population to desired level by dilution. 4) Labour demand is high as a result persons are needed for dropping seeds.

IV. PROPOSED SYSTEM

This machine is simple to use hence, unskilled farmer is able to handle it. We simplified the design to make it cheaper and affordable for every rural farmer. Bluetooth module (HC05) is used to provide the communication between mobile and the agribot. The agribot is operated using a mobile phone by pairing up with the Bluetooth module. Seeds are stored in the tank which is connected at the top of the robot at rear wheels. The sensors are used to sense the temperature and humidity, so that at the particular temperature the farmer need to check whether the seed should be sown or not.Front sensor i.e.(ultrasonic sensor) serves the function of guiding the robot. As any obstacle comes in front of robot it comes to the rest position.
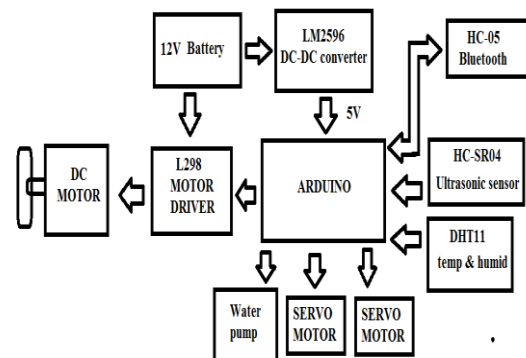
1.6 ARCHITECTURE

Fig 4.3 Architecture of system

The block diagram of this seed sowing machine comprises three main components namely a microcontroller, a motor-driver, a Bluetooth module and a sensor. When the sensor senses the temperature and humidity, the microcontroller then turns on motor driver and Bluetooth module connected to the arduino. Sowing and ploughing operation is performed using servo motors. The DHT11 sensor is connected to microcontroller to get the status of temperature and humidity. The DC-DC converter is used to reduce the power consumption.

1.7 CIRCUIT DIAGRAM.

The circuit diagram of our Seed sowing machine comprises three main components namely an Atmega328 microcontroller,

DC-DC converter and Bluetooth module.

The above circuit diagram represented as a graphical representation of an electrical circuit. A schematic diagram shows the components and interconnections of the circuit using standardized symbolic representations.

It explains about the input and output pins about each component and what are the pins that were used and where they are connected. For example, We had used all the digital pins of arduino and only 2 analog pins. Pins 12 and 13 were connected as echo and trigger pin of ultrasonic sensor. Pins 4,5,6,7 are connected to the motor driver. Pin no 11 is connected to the DHT11 sensor. Pins 9 and 10 are connected to the servo motors. Pin 7 is connected to motor pins. Pin 8 is connected to water Control.
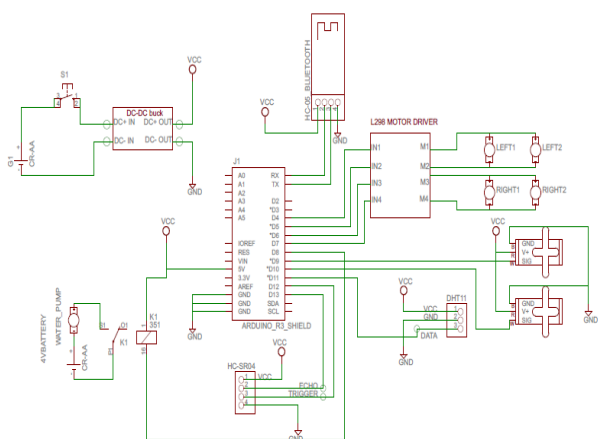

Fig 4.4 circuit diagram of system

Thus, this system depends on the output of the temperature and humidity sensors are shown in the graphs.

HARDWARE SPECIFICATION:
- Arduino uno
- L298 Motor driver
- LM2596 DC to DC converter
- Bluetooth module HC05
- DHT11 sensor
- Ultrasonic sensor
- Water pump
- SG90 servo motors
- Metal geared DC motors
- Hopper

SOFTWARE SPECIFICATION:
- Arduino Software (IDE)
- MIT App Inventor

V.   IMPLEMENTATION

5.2 MODULES DESCRIPTION.
5.2.1 ARDUINO UNO.
Arduino is a microcontroller which are connected to all the sensors and other hardware assembly required to achieve the desire work, where LM2596 DC-DC converter acts as input and the sensors that are used are also inputs for arduino. The sensors that are used as inputs to predict the temperature and humidity of a machine. The Dc motor driver, servo motors, water pump are the outputs for the arduino.

5.2.2   BLUETOOTH MODULE.
It is used as an interface because using this module the machine is operated and its assembled   to the arduino for a particular pin because it acts as a input for the arduino. To operate the machine we used Bluetooth interface module and also built a mobile application which acts as interface between the user and the machine. It becomes easy for operating and pairing the device and to perform the operations. It is operated using a mobile phone.

5.2.3   USER.
In this module, the user plays a major role because the user performs actions according to the requirement and the operation to be performed. User should switch on the device and start searching for the Bluetooth device that was used, After the device is available then pair up the device. After pairing takes place between the devices then the user starts performing the operations which was required.

VI.   RESULTS

Fig. 7.1 Execution phase

DESCRIPTION:
Air moisture sensors measure the temperature and humidity. The wheels which were used in our project are very hard because for sowing and digging the land it requires geared motors so that it can move easily in any type of land. The tank which was used for sprinkling the land with water before digging and sowing.
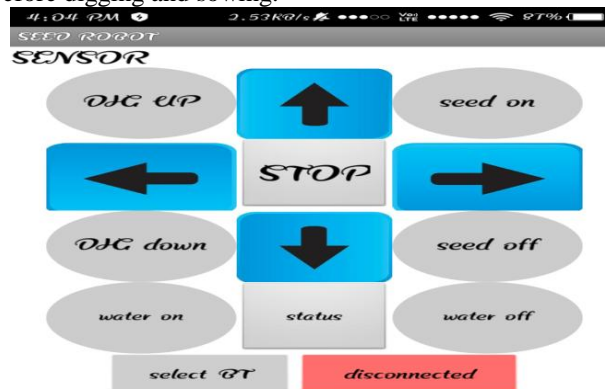

Fig. 7.2 Execution step-1 of system

The design of the mobile application by using different buttons and the actions performed by the buttons.

Fig. 7.3 Results of sensor

DESCRIPTION:

The device has paired with the mobile phone. The green color represents that both the devices are connected and performing the operations. In this we can check the status of temperature and humidity of a particular room or a place. And on the top left corner it displays the temperature and humidity when we click on a status button. Even we can disconnect the phone using disconnect BT button.

DESCRIPTION:

It represents the day to day evaluation of the temperature and humidity, So that before sowing the seeds the farmer can check the climatic conditions. If the climatic conditions are not good then the farmer cannot sow the seeds.

Fig. 7.4 portraying results

8. LIMITATIONS AND FUTURE ENHANCEMENTS.

8.1 LIMITATIONS OF THE SYSTEM:

Comparing the various ancient Seed sowing strategies with planned machine & considering the limitations of it and over that.

• The machine will work with fewer efforts and thus it reduces the price of labour needed for sowing.

• It is additionally a relatively less time overwhelming machine and the previous strategies used for farming and cultivation of crops.

• Increases the potency of sowing there by reducing the wastage of seeds.

• The farmer will sow the seeds based mostly upon the weather conditions like temperature and humidness.

8.2 FUTURE ENHANCEMENTS:

At present we've got developed associate agribot in such a way that the user manually operates the automation per playacting every and each operation like forward, backward etc…Presently user itself perform the operations without the help of labour, but it future enhancement it can be done automated like while digging the seed must be sown automatically at a particular place at a desired depth. In place of Bluetooth module - WLAN module may be more in order that it's directly connected to the server.

VII. CONCLUSION

Seed sowing machine has outstanding influence in agriculture. until currently tractor is the elemental footing for unit sustenance of cultivating. With adjustment of this seed planting machine its motivation are finished. By victimisation this machine we are able to save longer needed for sowing method and additionally it reduces heap of labor value. it's terribly useful for little scale farmers. when comparison the completely different technique of seed sowing and limitations of the present machine, it's over that this seed sowing machine will perform the varied synchronic operations and thus saves labour demand , thus as labour value, labour time and additionally save voluminous energy. it's simply cheap by farmers. The machine may be operated within the tiny farming land. creating such a machine which might be ready to perform each the operation. Works faithfully beneath completely different operating conditions.

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