Abstract: A seed sewing machine is a device that sows the seed by positioning them in the soil and covering them to a certain depth. The basic requirement of the seed sowing machine is that it should be suitable to all farms and all types of crops. The construction of this machine should be robust. Thus this paper proposes the construction of sowing machine that reduces the efforts of the farmers. This machine is operated manually and has increased efficiency and accuracy. The seed to seed spacing, seed rate and depth of seed placement may vary from crop to crop for different agro. Climatic conditions to achieve optimum yields. This machine renders a great help in achieving these conditions to get the yield. The proposed design is so cheap and usable for small scale farmers. The design is so much simplified that it could be handled by any farmers or untrained workers.

2. EXISTING METHOD

In traditional method of seed planting we have following limitation.

1. In manual seeding, it is not possible to achieve uniformly in distribution of seeds.
2. A farmer may achieve the desire seed rate but inter and intra row distribution of seeds is likely to be uneven.
3. Poor control over depth of seed placement.

Thus we need to make the proper design of the agriculture machine. The process of using machine is called Mechanization. Along with mechanization automatic helps to increase the efficiency. This paper proposes the hardware implementation, selection of components and controller of the four-wheel robot’s system on which seed tank, sowing mechanism is installed to turn it into the automatic operated vehicle.

2.1 FACTORS AFFECTING SEED EMERGENCE

Factors that affect seed germination are,

1. Depth with regard to the placement of seed.
2. Uniform distribution along the rows.
3. Transverse displacement with regarded to the row.
4. Loose soil setting.
5. Uniform coverage of soil over the seed.
6. Mix-age of fertilizer.

The above factors help to get best performance of the seed drill or planter. To improve the performance, we need to optimize the above factors to get the desired efficiency from the system in economical way. The design is simplified and components are selected to suit the need of crops. The working of the seed drill plays a vital role in maintaining the system environment. The system serves the need that the seen should not be damaged while working.
3. PROPOSED METHOD

The design of the planter is very simple. The machine is very cheap and affordable to every rural farmer. It can also be handled by unskilled farmers. Various adjustments in simplification have been made from controlling and maintaining point of view. In this design we have used the motor driver, DC motor, Arduino mega and Ultrasonic sensors. The Drive shaft is used for metering mechanism and it eliminates attachment such as pulleys and belt systems. The DC motor drives the shaft of the motor and it is coupled with battery bank. As the motor starts the robot is moved and also operate tank is connected at the top of the robot. The ultrasonic sensor is fitted to sense the level of seed in it. It also gives an alarm when the tank is empty. Front serves the function of guiding the robot when the robot finding any obstacles it gives the signal and diverts the path of the robot. According to the adjustment made every rotation of the wheel allows the definite seed to fall into the hoper. Hence, the wastage of seed is reduced to zero and sowing process also takes place smoothly when the robot reaches the other end and when its task is completed it creates an alarm so that required facility can be provided.

3.2 SANDCOVER ARRANGEMENT

Seed storage tank

This storage device is the seed storage tank, which is one of the important devices of the system. It is designed according to the wait sustained and received capacity for planting. This is the stationary component to the bottom of this tank a sowing disc is arranged that serves the function of distribution of the seeds. For each complete rotation of the rotating wheel one seed falls from the tank.

This disc evenly opens the way to the seed. Hence, planting is done more smoothly and accurately.

Seed sowing disc and seed bucket

The disc that is attached to the bottom of the tank allows the seed during one rotation of the wheel. The buckets are screwed on the disc. There see very similar to half shape of pelton buckets. The size is varied to the diameter of the seed and re-screwed distance between the seed as they are screwed to the disc.

Developed seed mechanism

Seed metering device meters the quantity of seed and maintains the level of sand in the tank. Metering is necessary to track the amount of seed and to maintain when the seed tank is to be filled again. It gives the length for distance which seed can be sowed. Thus only require seed falls for every rotation of the wheel.

Seed meter mechanism

The functional requirements of the metering devices are,

- Metering should be done at the required and paper rate.
- It should be accurate as per the requirements.
- The seed should not be damaged.

4. SOFTWARE TOOLS

ARDUINO IDE -For programming the arduino mega 2560 r3 Arduino IDE is used.

5. HARDWARE TOOLS

ARDUINO MEGA 2560 r3 –It is the heart of the project which controls the overall system.

LEDs –For indication LEDs are used.
**DC MOTOR** – For rotating wheel 12V, 100 rpm. DC Motor is used.

**MOTOR DRIVER** – Motors should not be connected directly to Arduino due to generation of back emf due to this L298N Motor Driver is used.

6. RESULT AND DISCUSSION

![Figure1: Obstacle avoiding sensor base](image1)

The figure shows the project steps of the proposed system. Here ultrasonic sensor is used. The use of this sensor is to direct the machine in right path. It detects the obstacles and directs the machine. The motor driver is used to control the movements. Arduino is used to control the entire system. This machine could help the middle class farmers as it costs less.

7. CONCLUSION

This seed drill has higher potential for increasing the productivity with the adaptation of seed planting mechanism. The purpose of seed tractor is replaced. Hence, there is need to promote this technology and make it available even to small scale farmers with affordable price. This machine can be made by raw materials that save the cost of the whole project. It also easily manufactured. By using this machine, we can achieve flexibility of distance and controlled depth variation for different seeds and hence it is usable to all seeds.

7. REFERENCES


