"Fabrication of automatic solar operated sowing and spraying robot"

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ABSTRACT

Agriculture field is the backbone of Indian economy. over 50 to 55 % world population is depend on agriculture. Today, India ranks second in agriculture output worldwide. Most of GDP came from agriculture field. And it required more human effort. Hence there is required more technology in the field of agriculture.

- *The paper aims on the design, development and the fabrication of the robot which can dig the soil, put the seeds, leveller to close the mud and sprayer to spray water. The vehicle is controlled by Relay switch through remote technology and wheels are controlled by motor. This development has led many researchers to start developing more automatic and better vehicles. We can expect the robot can performing agricultural operations such as ploughing, seed sowing, mud closing and water spraying with the help of remote.*

INTRODUCTION

Agriculture contributes only about 14 to 15 % to the overall GDP. But the productivity of agriculture is decreasing now days. This is due to lack of mechanization. Moreover, there is a need for a combination of electrical and agricultural scientists working together for the development. It faces lots of problem like problem Irrigation problem, Sustainability, fragmented land holding, old technologies and negligence of Natural resources. Modern farms and agricultural operations work far differently than those a few decades ago, primarily because of advancements in technology, including sensors, devices, machines, and information technology. Today's agriculture automation are improve lot off in agriculture field. Automation is with the help of sensors, remote. These advanced devices and perfect agriculture and robotic systems allow to get in more profitable, efficient, safer, and more environmentally friendly . conventional forming requires manpower for sowing plugging and more. The object of the project is the automation of three essential agricultural techniques Weeding, Seeding and Water spraying with the help of a single machine. Its benefits include:

- Multiple operation can be done with the help of single machine.
- Reduce operation time, labour cost.
- To reduce human effort in the agricultural field with the use of small robot
  Main function -
  The main project objective is to fabricate a robot vehicle which can dig the soil, put the seeds, and close the mud and to spray water, these whole systems of the robot works with the battery and the solar power and relay,remote.

OBJECTIVE

Our aim is to fabricate a Prototype Multi-Purpose Agricultural Robot which can perform the following functions:

- This project objective is to fabricate a robot vehicle which can dig the soil, put the seeds, and close the mud and to spray water, these whole systems of the robot works with the battery and the solar power.
- To reduce human effort in the agricultural field with the use of small robot.

SCOPE

Multifunctional agricultural vehicle mainly focuses on the basic problems faced

- We can increase gears and the hoppers to get more productivity.
- We can use remote sensing device , which can operate automatically.

Literature

- Dr. C.N. Sakhale [2016] Multipurpose farm machine- Basic concept Design Concept to design a project for small scale farmers. And in one machine multi functions can be performed with cheap cost as compared to other agriculture machine. For this concept not essential to skilled person. Mechanism of the machine should be very simple. so, that for gardening and small-scale farming, design this concept.
- Nitin P V, Shivaprakash S [2016] Multipurpose agricultural robot -The paper aims on the design, development and the fabrication of the robot which can dig the soil, put the seeds, leveller to close the mud and sprayer to spray water, these whole systems of the robot works with the battery and the solar power.
- Vishnu Prakash K, Sathish Kumar V, Venkatesh P, Chandran A [2016] Design and fabrication of multipurpose agricultural robot in this paper designing, implementing, and testing an autonomous multipurpose vehicle with safe, efficient, and economic operation. The vehicle has been designed in a such way that It must move in a soft soil and in an environment with many obstacles and tight spaces It must have enough capacity for optimal work performance. It must perform different tasks within the greenhouse.
- A Nageswara Rao, Dr S Pichi Reddy, N Raju [2018] design and development of seed sowing and spraying use-the paper aim to design, development of robot.

METHODOLOGY

The basic aim of this project is to develop a multipurpose machine, which is used for digging the soil, seed sowing, and leveller to close the mud and water sprayer to spray water with single machine. This whole system of the robot works with the battery and the solar power.

- The base frame is made for the robot with 2 wheels connected and driven by wiper motor.
- One end of the frame, cultivator is fitted. And controlled by movement of wheels and design is made to dig the soil.
- On the end leveller is fitted to close the seeds to the soil, and water pumping sprayer to spray the water or any chemicals which require for crop.
- Gear is mounted in such way that it can pass the seed into hopper. It is controlled by relay switch.
- Hooper is mounted across the gear so seed can place in it.
- Solar is placed on top of the robot and is connected to the battery for charging the battery.
- Thus, the radiation which directed from sun is directly place on solar panel. And the max. energy id absorb by it .
- Here we use the 12v battery to operate the system.

Fig. robot for agriculture sowing and spraying

Wiper motor

Fig. wiper motor

ADVANTAGES

- Avoid the former being exposed to toxic pesticide vapours produced during spraying.
- Reduce the workload on the farmer and as it is easier to operate.
- The former need not spry in the hot sun, he can operate the device while standing in a cooler place.
- By the development of these robots' lot of manual labour will also be decreased and the farmer life will save from chemicals.
- The agricultural robotics the logical proliferation of the automation technology into the bio-systems such as the agricultural forestry, the green house, the horticulture and fisheries, it is replacing the common techniques to perform the same tasks with high efficiency.

Conclusion

- We have been successful in developing a robot whose construction is enough to withstand the challenges of the field.
- Sowing Technique (dispersing seed over the land) is done using round and hollow shape material.
- We have implement a prototype model of drilling and seed sowing machine system within the limited available source and economy.
- The system can be subjected to further development using advanced techniques.

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