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# Solar Powered Seeds Sprayer Machine Control by Mobile

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**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 powered remote controlled seed sowing machine with sprayer. The seed sowing machine is a key component of agricultural field. This power is then transmitted to the DC motor to drive the wheels. And to further reduction of labor dependency, IR sensors are used to maneuver robot in the field. Here 4 post sensors are used to define the territory and robot senses the track length and pitch for movement from line to line. This paper represents a machine which can carry out various farming activities simultaneously. Air and Noise Pollution are caused by the combustion of fossil fuels in IC Engines and External Combustion Engines. To negate these problems, this machine uses Solar Energy as an eco-friendly energy resource. Solar Panel is used to convert solar energy into electrical energy and a DC Motor converts this electrical energy into mechanical energy to rotate a cutter for digging operation. Seed Hopper and Water Tank are used for seed sowing and irrigation operations respectively. This machine maintains seed to seed spacing and row to row spacing. It also decreases the cost of sowing the seeds and requirement of labour.

## I.INTRODUCTION

The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agricultural and climatic conditions to achieve optimum yields and an efficient sowing machine should attempt to fulfill these requirements. This paper is about the different types of methods of seed sowing and fertilizer placement in the soil and developing a multifunctional seed sowing machine which can perform simultaneous operations. The basic objective is to optimize the energy produced from photovoltaic cells, by making the overall systems more efficient and cost effective. they have a fixed position at a certain angle towards the sky. Therefore, the time and intensity of direct sunlight falling upon the solar panel is greatly reduced, resulting in low power output from the photovoltaic (PV) cells. Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. The government of India appointed a commission to assess the feasibility of increasing the crop productivity under prevailing Indian ecological conditions. In order to develop the standard of living of small farmers we should make the machines with low cost. Then only small farmers can implement the recent modern machines for farming purposes. Components are used:

1. Arduino Board
2. Motor
3. Wheels
4. Sensors
5. Seed Dispensing mechanism
6. Solar Panel
7. Bluetooth Module
8. Power Supply
9. Mobile



## **II.LITERATURE REVIEW**

Our country faces the total loss of 33% of its economy from Weeds. The Losses are due to some of the following reasons, total loss of 26% from Crop Diseases, total loss of 20% from Insects and Worms, total loss of 6% from Rats. Has been Surveyed. Shrinking farm lands, acute labor shortage, decreasing income per acre of cultivation, and economic frustration are some of the key factors hurting a farmer's confidence in continuing farming. Weeding control is done by: mechanical weeding, thermal weeding: flaming, biological control, chemical control, and by farming pattern. It has always been a problem to successfully and completely remove weeds and other innocuous plants. Invariably, weeds always grow where they are not wanted. As a solution to these problems, mechanical weeder was designed and constructed. The mechanical weeder was made of two implements attachment i.e. the primary cutting edge which is in front to loose soil above and the secondary cutting edge which is behind to do cutting and lifting of weeds. The overall machine field efficiency was 98.67%. The Single Wheel Weeder being manufactured is the equipment, which is used for very special purpose when the weeding is required at narrow places or between rows. The blade is thin but very sturdy and tough besides, it is very safe to use and offers zero threat of hurting to the user, Other than the wheel, there is nothing mechanical in this single wheel weeder but, it works wonderfully under the condition where it is put into. This hassle free equipment requires no special maintenance. It is necessary to design the weeder which minimize the human effort and provide efficient work output.

### **Objective**

- 1.The main objective of this project is to fabricate a complete functional seed sprayer machine which is fully powered by solar energy.
- 2.The solar seed sprayer machine should be able to spray different types of vegetable seeds..

## **III.WORKING**

Solar powered remote controlled seed sowing machine is device which works on solar energy with the help of remote. When farmer going to sow the seed he can do it by our self without any man power.Solar panel is the main component of this device. Solar energy takes and store's all the solar energy and after convert it into Electrical energy and converts it to battery thus farmer/person doesn't need to worry about the charging of battery. And in addition to this we set the program in Nano Arduino.So now the whole device going to work on remote/mobile app with the help of Bluetooth. Sprayer is going to work like a fertilizing machine when it's needed so farmer can spray the fertilizer or water during seed sowing or after seed sowing. This project focus on the broadcasting as it possesses the highest efficiency of seed sowing for those crop that does not require singular space.Crops that are suitable with broadcasting method including wheat, corn, lettuce, carrot, and more. Further research was done on the principle of broadcasting, working system of ordinary broadcast spreader, and every part of broadcast spreader. Broadcast spreader is an equipment that spread the seed over the field using centrifugal force.Seeds are stored in a hopper positioned above a spinning disk.The spinning disk rotates at high rotation speed. When seed drops from the hopper and fall on the spinning disk, the centrifugal force generated by the spinning disk will throw the seed out for a distance.The seed sprayer machine is purely powered by solar energy. Photovoltaic is the conversion of light into electricity using semi conducting materials With an additional solar charge controller, photovoltaic system could be used to generate electricity and stored in rechargeable battery. However, the voltage and current generated by the solar panel are floating depending on the sunlight. Thus, solar charge controller is used to avoid battery damage due to excessive charging or discharging.

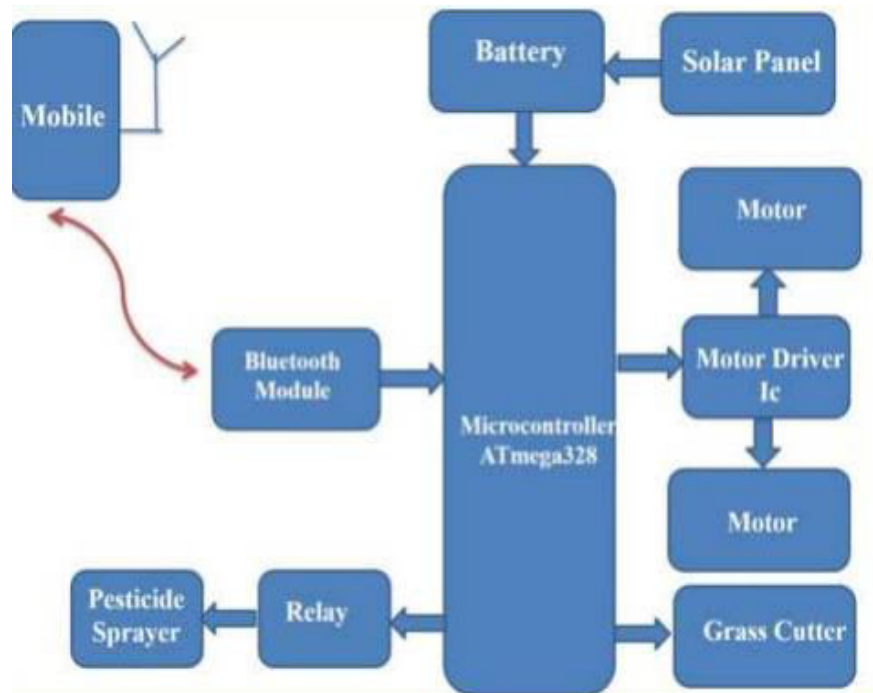


Fig1. Block Diagram

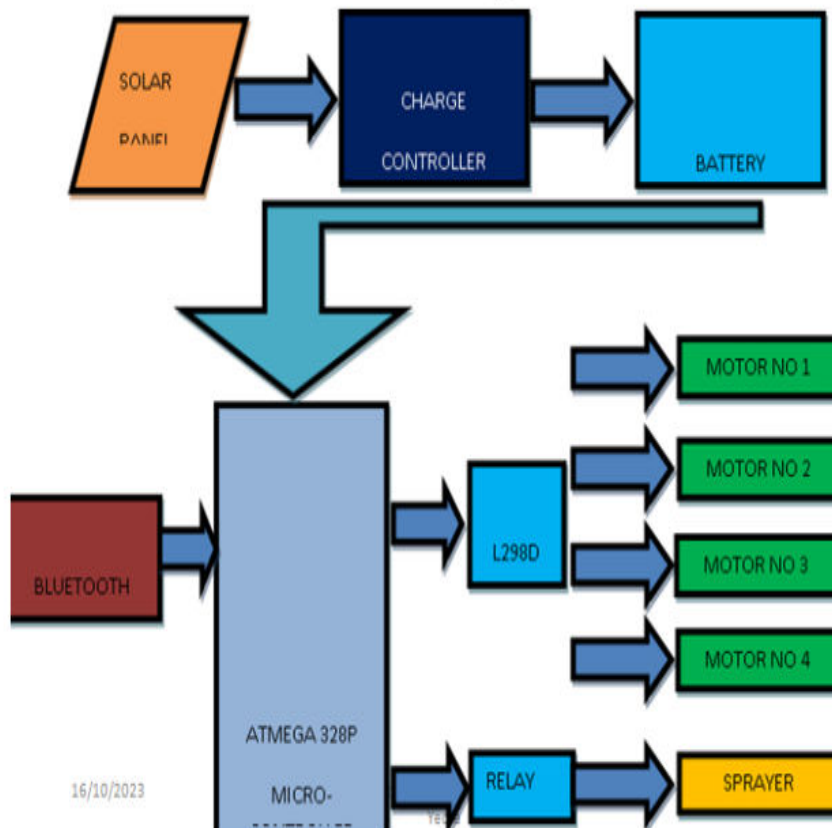


Fig2. Block Diagram

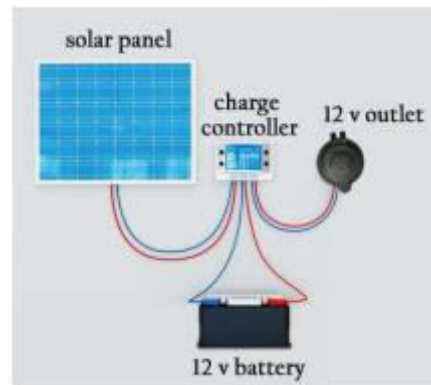


Fig.2 The circuit used for the solar energy charging control system

### Component

- Transformer
- LM7805 OR LM7812
- DC Motor 1000RPM
- Resistors (470, 100k and 1k ohm)
- Capacitor (10uf, 470uf, 220uf)
- ATmega328P Microcontroller
- Bluetooth (HC-05)
- Diode (1N4007)

**Solar Panel** Energy comes in different forms. Light is a form of energy. So is heat. So is electricity. Often, one form of energy can be turned into another. This fact is very important because it explains how we get electricity, which we use in so many ways. Electricity is used to light streets and buildings, to run computers and TVs, and to run many other machines and appliances at home, at school, and at work. One way to get electricity is to burn a fuel like oil or coal. This makes heat. The heat then makes water boil and turn into steam.



**Microcontroller** The ATmega8 provides 8 Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 512 bytes of EEPROM, 1 Kbyte of SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible Timer/Counters with compare modes, internal and external interrupts, a serial programmable USART, a byte oriented two wire serial interface, a 6-channel ADC (eight channels in TQFP and QFN/MLF packages) with 10-bit accuracy, a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and five software selectable power saving modes.



### III.FUTURE SCOPE

- 1) Introduction of drill in place of cutter can be used as soil erosion equipment.
- 2) Machine can be operated automatically with the help of remote control or navigation sensors.
- 3) Multi-hopper can be attached instead of single hopper for sowing of a large farm.
- 4) Seed Spacing sensors can be used for accurate spacing.

### IV.CONCLUSION

This project demonstrates the implementation of robotics and mechatronics in the field of agriculture. This being a test model the robustness of the vehicle is not very high. The performance is satisfactory under laboratory condition. The model gave a fairly good rate of area coverage and the cost of operation as calculated was also reasonably low. In addition the safety and long term health of the farmers is ensured by eliminating human labour completely from this process. It does not compromise the performance of a petrol based pesticide sprayer

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