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# AGRIBOT-RF based farmer friendly Agricultural Robot with automatics eeddispen sing system

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## Abstract:

Our country's economy would be unable to function without agriculture. In an effort to save money and time, farmers are exploring for new ways to use technology. The RF tractor is a great way for farmers to experiment with new farming technologies. Agricultural research companies around the country are embracing this as a way to experiment with new technologies in farming. These tractors are controlled by an RF remote. The tractor can be moved forward and backward with dc motors, and it can also make sharp turns to the left and right. AT89S52 is used as the controller in this project. During farming, ploughing, watering, and seeding are the most common activities. All of these tasks necessitate a substantial amount of labor. So, utilizing an RF tractor, all of these tasks can be accomplished quickly and efficiently. The RF modules in use are the transmitter, receiver, RF encoder, and RF decoder. Using a controller, we connect the switches to the radio transmitter. The encoder reads the condition of the switches and passes the data to the RF transmitter, which transmits the data. the collected information. The robot will be able to execute a variety of tasks related to farming using this data.

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## Chapter1

### 1.INTRODUCTION

Agriculture is the primary source of income for rural Indians, and it is a task shared equally by men and women. The Indian economy has always relied heavily on agriculture, and it will continue to do so for a long time to come. 17 percent of the world's population is supported by 2.3 percent of the world's land area and just 4.2 percent of the world's water resources. Since 1950-51, the current cropping intensity of 137% has barely

increased by 26%. A total of 142 Mha of new seed has been planted. Seed and fertilizer are sown in rows at the correct depth and spacing, soil is applied to cover the seeds, and dirt is compacted over the seeds as the primary goal of the sowing process.

The recommended row to row spacing, seedrate,seedtoseedspacinganddepthofseedp lacement vary fromcropto

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crop and for different agricultural and climatic conditions to achieve optimum yields and an efficient sowing machine should attempt to fulfill these requirements. In addition, saving in cost of operation, time, labor and energy are other advantages to be derived from use of

1.1 enhanced equipment for this type of work. Traditional seed-sowing methods have a number of drawbacks. In this work, various seed sowing and fertilizer placement methods are discussed, as well as the development of a multifunctional seed sowing machine that can carry out multiple tasks at once.

## 1.2 AGRICULTURE:

### 1.1 Introduction

Crop production and improvement through the efficient use of soil fertility, water, labor, and other aspects associated to crop production is what we mean when we say "agriculture." It is the world's most important business. As many as 70% of Indians are farmers or engaged in agricultural-related activities.

### 1.2 Steps Involved In Agriculture

#### a. Seed selection

b. A appropriate crop must be chosen from a wide range of available kinds before it can be planted. Land preparation

It involves tilling, ploughing and furrows and ridges formation

c. Fertilizer application: organic fertilizer is applied during ploughing, chemical fertilizer is applied before sowing and during vegetative stage.

#### d. Seed preparation

Seeds are treated with fungicides like carbendazim before sowing.

#### e. Sowing

Seeding or sowing is an art of placing seeds in the soil to have good germination in the field

#### f. Irrigation

Watering the crops for its growth and development.

- Surface irrigation.
- Drip irrigation.
- Sprinkler irrigation.
- Rain dependent irrigation.

g. Germination – seed develops into a two leaf stage, tiny plant.

h. Thinning – The surplus seeds is removed from each pit so that just one plant can grow there. In order to ensure that a single plant has enough water, fertilizer, and space, all other seedlings are discarded.

i. Filling – if there is no germination in some pits; when some seeds fail to germinate, then seedling is plucked from where it is excess and planted at the empty space.

j. Weeding: In order to make sure that all of the available resources are exclusively used for the crop, this procedure involves clearing the field of all undesirable vegetation.

k. Weeding by hand (once in 3 weeks).

l. All weeds must be plowed out of the land before planting.

m.- Weeding blades are used to eradicate little weeds that have emerged after germination.

n.- At the end of the vegetative stage, weedicides are sprayed. Pesticide "pendimethalin" is diluted in water to make a solution that may be sprayed across an acre of land with a single application. Weeds will not grow for one month if they are sprayed during weeding.

o. Vegetative stage – maximum growth of plant takes place in this stage.

p. Flowering stage: plant starts producing flowers in this stage.

q. Pesticides spraying – When the crops are infested with pests use pesticides.

### 1.2 Objective

- To achieve proper distance in two seed in planting and sowing mechanism for proper nutrition and growth of plants.
- To make this machine which operate manually for small farmer
- To provide this machine in lowest cost and light in weight.
- To adjust proper depth in variable soil in any weather condition

### 1.3 Methodology

To make an agriculture project we follow these steps

- The first step is to go to the farmers and find the problems faced by them.

- The second step is to choose a problem. The third step is to visit to agriculture industry.
- The fourth step is to Analyze the problem & their solution.
- The fifth step is the selection of Design of gear for proper seed distance.
- The sixth step is to find which mechanism is suitable in lowest cost.
- The seventh step is to find all components were require in proper dimension.
- The eight steps are to start fabrication.
- The ninth step is to make proper balance sheet of work done.
- The last step is the testing of machine.

## **CHAPTER:2**

### **2.LITERATURE SURVEY**

For Mahesh R. Pundkar [1, the seed sowing equipment is a critical component in farming]. For a wide variety of crops and seed sizes, high precision pneumatic planters have been designed, resulting in uniform seed spacing along the travel path.

Different seeding techniques and machinery, as well as varying amounts of oilseed rape application, were tested on seeding emergence plant establishment and final grain production by M.A. Asoodar [2], another agricultural researcher.

Bullock-drawn planters, according to P.P. Shelke [3], have become indispensable for sowing due to a shortage of competent sowers. Crop yields can be increased by increasing the space between plants and increasing the number of plants in a field. When compared to the conventional method, Singh (1971)[4] found that using a seed drill for wheat crop increased yields by 13.025 percent and saved labor time by 69.96 percent and hulioc time by 55.17 percent, with the latter figure being more accurate. Because the sowing method and seed rate were examined using a four replicated RCBD method, Umed Ali Soomro et al. found that drilling method of sowing at 125 kg/ha yielded the best quality wheat grains for Pakistan.

Seed should be sown evenly and at the desired depth to ensure that seed germination and crop establishment can take place.

Asoodar [2] another agricultural researcher determined the effects of various seeding

techniques and machinery as well as various rates of oilseed rape application on seeding emergence plant establishment and final grain production.

## **CHAPTER3**

### **3.1 seeding and spraying machine**

#### **,Introduction:**

To meet the growing demand for food in India, the modernization of agricultural sectors is essential. Soil fertility is declining as a result of the use of chemical fertilizers. Hence farmers are attracted towards organic farming. Spraying devices that use mechanization distribute fertilizers and insecticides evenly across the farm and limit waste, preventing losses and waste of input applied to the farm. As a result, production costs will be reduced. As a result, production costs will be reduced. Mechanization increases output while requiring less input. Traditional methods for applying pesticides and fertilizers are still being used by farmers. In the past, workers using backpack sprayers and manually applying fertilizer sprayed the crops. They are cultivated using traditional methods, such as seed sowing, fertilizer application, and pesticide application. Development in this area is needed, most notably in the spraying of fertilizers and pesticides, because the old method is laborious and time-consuming. This initiative aims to address these issues.

the development of dual mode solar powered insecticide and fertilizer spraying machine.

#### **3.2 BRIEF INTRODUCTION ABOUT THE PROJECT**

Herbicides, pesticides, fungicides, and fertilizers are sprayed on crops using a sprayer, which is a mechanical device. With the use of a sprayer, insecticides or other liquids can be used to their fullest potential with minimal effort. For the most part, chemical applications involve the use of dusters and sprayers. Chemicals can be applied using dusters, which are ideal for portable machinery and need minimal equipment. However, due to the limited dust retention, these devices are less effective than sprayers. In the agricultural or horticultural sector, sprayers have revolutionized the industry, allowing farmers

to maximize their yield. Pest and weed control, fertilization, and leaf polishing are just a few of their many applications. Sprayers have a number of advantages, including being simple to use, maintain, and manage, as well as facilitating the consistent distribution of chemicals. high-quality nozzle tip allows for fine stream control, fogging spray, light or heavy mist to be discharged depending on the application. Sprayers come in a variety of styles. Hand-operated spray pumps are the most common form of spray pump used on Indian farms, however fuel-operated spray pumps are also common. Hand operated spray pumps have the major problem of not being able to be used continuously for more than 5-6 hours due to operator fatigue after such a long period of time. Additionally, the fuel-operated spray pump requires fuel, which is costly and difficult to get in remote areas. areas is a challenge. As a pollutant, carbon dioxide emitted from the process harms the environment. In such a case, we should consider shifting our focus to alternative sources of power. When all is said and done, solar energy could be a viable option.

### 3.4 Objectives of the project

- The use of renewable energy sources for pesticide sprayer.
- To make spraying easier on the farmers and less painful for them.
- To raise farmers' understanding of the benefits of renewable sources of electricity.
- To reduce the amount of pollutants in the environment by employing renewable sources of energy.

- To be able to operate effectively in a variety of environments.

In order to reduce the price of the machine

- To cut down on the expense of labor and maintenance.

#### Advantages:

- It is a multipurpose machine.
- Easy to operate and user friendly.
- Very less pollution than other models.
- It is portable
- Unit cost is very cheap.
- Maintenance cost is low

### Chapter 4

#### MICROCONTROLLER VERSUS MICROPROCESSOR OR

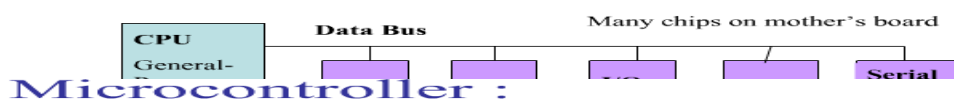
To make RAM, ROM, I/O ports, and timers work with a general-purpose CPU like the Pentium or the 68040, the system designer must do so externally. In spite of this,

As a result of the flexibility provided by external interfaces, these systems are more expensive and more cumbersome because they can be tailored to the task at hand. Microcontrollers are single-chip devices equipped with an on-board CPU (microprocessor), as well as predetermined amounts of RAM, ROM, I/O ports, and a timing circuitry. It's not possible for a chip's designer to add any additional external memory or I/O ports or timers because they're all built into the same device. Microcontrollers are appropriate for many applications due to the fixed quantity of ROM, RAM, and the number of I/O ports on-chip..

### Microprocessors:

#### General-purpose microprocessor

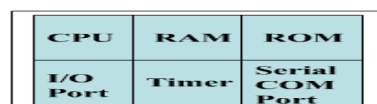
- CPU for Computers
- No RAM, ROM, I/O on CPU chip itself
- Example : Intel's x86, Motorola's 680x0



### Microcontroller :

- A smaller computer
- On-chip RAM, ROM, I/O ports...
- Example : Motorola's 6811, Intel's 8051, Zilog's Z8 and PIC 16X

AT89S52MI  
The AT89S5



← A single chip  
Microcontroller

Programmable in-system Flash memory of 8K bytes for the CMOS 8-bit microcontroller (included). Atmel's high-density nonvolatile memory technology is used to produce the device, which is compatible with the 80C51 instruction set and pinout. Using a typical non-volatile memory programmer, the program memory can be reprogrammed in-system. The Atmel AT89S52 is a powerful microcontroller that provides a highly flexible and cost-effective solution to many PinAssignment:

embedded control applications by combining an 8-bit CPU with in-system programmable Flash on a monolithic chip.

Specifications

Voltage :3to12volts

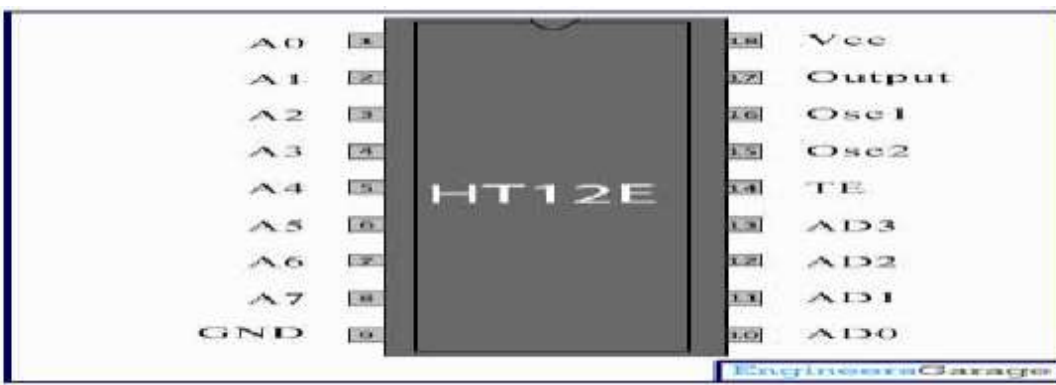
Current :10to15mA

WorkingMode :AM

Speed :4Kbps

Frequency :

315/433MHzExternalAntenna :315MHz



#### Features

- Operatingvoltage:2.4V~12V
- LowpowerandhighnoiseimmunityCM
- OStechnology
- Lowstandbycurrent
- Threewordstransmission
- Built-inoscillatorneedsonly5%resistor
- EasyinterfacewithanRForinfraredtransmissionmedia
- Minimalexternalcomponents

#### Applications

- Burglaralarmsystem
- Smokeandfirealarmsystem
- Garagedoorcontrollers
- Cardoorcontrollers

**EmbeddedSystemsdevelopmentwithasingleuserinterface.**

- Caralarmsystem
- Securitysystem
- Cordlesstelephones
- Otherremotecomtrolsystems

#### CHAPTER5SOFTWARE

##### IMPLEMENTATION(RIDE)RIDE:

RIDE6 software, which supports 8051, XA, and other derivatives, will be referred to by RIDE. RIDE7 is the software for the ARM, ST7, and STM8 families.

Full-featured, Integrated Development Environment (IDE) that allows simple access to all the development tools. RIDE makes it simple to work with a Simulator, ICE, Rom Monitor, or other debugging tools to modify, compile, link, and debug programs.



## Chapter 6

### 6.1 Objective of Our Project

With this project, farmers will be provided with multipurpose equipment that incorporates all of the scientific farming specifications and technology to get the greatest yield and high quality crops while minimizing investment and the number of laborers needed to operate the farm.

Only for farms with more than 5 acres of land can tractor-powered equipment be cost-effective. There are a number of gardening tools that can only be operated by hand. Using cutting-edge scientific methodologies and advanced robotics, we plan on manufacturing spraying equipment for farms with acreages ranging from one to three. The majority of Indian ex-pats possess between one and three acres of land. Indian economic and farming practices, therefore, are the best fit for this technology.

### 6.3 Components of the Equipment Working principle and fabrication details

AT89S52 battery and microcontroller AT89S52 are supported. To make the mixture work, a battery is required. The battery's positive and negative charges are connected to a battery to provide the necessary dc power.

the ability to spray pesticides at night, when the sun isn't rising, makes this device more cost-effective than other methods of pesticide application, such as the use of gasoline or diesel-powered pesticide sprayers. There is no operating or maintenance cost because it is powered by solar energy, which is free and pollution-free. Its working principle is simple, and it is economical for farmers because it can generate power that can be used for both spraying and lighting in the house when there

is no current supply. The main components used to fabricate the model are:

- Microcontroller
- Pump
- DC motor
- Battery
- Tank
- Nozzle
- Bevel gear

## Chapter 7

### Conclusions

Productivity can be considerably increased by using this manual seed planter machine. Countries where the two-wheel tractor is the primary traction unit in farming are not included in this list. The most important objective at this point is to spread awareness of this technology and make it inexpensive for farmers to use.

In comparison to already available systems, the newly built technology is also effective. The cost of developing a new trans-planter with a simple construction and a smaller number of parts has been reduced. The total cost of creating the system is also less. New spraying machine is more flexible than machines available in the market at starting cost.

In this work a robot, named, AGRIBOT, has been designed, built and demonstrated to carry out ploughing, sowing and harvesting in an agriculture field. It is expected that the robot will assist the farmers in improving the efficiency of operations in their farms. The use of mobile camera is the highlight of this paper, which can be very cost effective

tive. This is our first step in making all the process involved in agriculture automatic.

### References

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