

Remote Irrigation and Vaccination System

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ABSTRACT

Irrigation by help of freshwater resources in agricultural areas has a crucial importance. Because of highly increasing demand for freshwater, optimal usage of water resources has been provided with greater extent by automation technology. Also Early disease detection is a major challenge in horticulture. In Remote irrigation and vaccination System (RIVS), the moisture of soil and watering system precisely controlled as well as vaccination module is used for controlling wood borer problem with the help of pesticide. Due to the lack of manpower in agriculture and also variable atmospheric conditions sometimes may vary from place to place in large farm, which makes very difficult to maintain the uniformity at all the places in the farm manually. Therefore there is an intense need to develop such Micro processor based embedded system, which could maintain the physical parameters uniform and also could keep the records for analytical studies.

Keywords

Agriculture, Remote irrigation and vaccination System (RIVS), vaccination, moisture, soil, wood boarer,Pesticide,Microprocessor, auto-control System

1. INTRODUCTION

This project aims in providing user-friendly, reliable and automated water pumping system and vaccination system. Now-a-days technology is running with time, it completely occupied the life style of human beings. Even though there is such an importance for technology in our routine life there are even people whose life styles are very far to this well known term technology. So it is our responsibility to design few reliable systems which can be even efficiently used by them.

The major problem faced in today's Indian agriculture is there are no labors available for working and nurturing the farm because of the industrialization and it's a sector which India earns GDP. Through such atomization there will be growth in the production.

Another major problem is the wood borer problem which Indian farmers are facing. This is such a kind of disease which is not detected in any way and for avoiding this problem traditionally framer follows an varied kinds of approach such as cross cropping, and also the use of injecting pesticide inside the stem of plants which requires manpower to work this out

So to implement such a system a microprocessor controlled web-based system remotely would be more

suitable. As there is a boom in IT and internet which is available everywhere. Here the automation process is done through the microprocessor based technology which is through PC.

Such an atomized approach can help the farmer's a lot and this system can be a boon to agriculture sector.

2. EASE OF USE

Drip Irrigation

Drip Irrigation this is known as most efficient method of irrigation. Water drops right near the root zone of a plant in a dripping motion. If the system is installed properly you can steadily reduce the loss of water through evaporation and run off the software will provide automatic water supply to plant. As well as it will helps to save the water and also Man power.

Soil Moisture Control

Soil moisture is an important component in the atmospheric water cycle, both on a small agricultural scale and in large-scale modeling of land/atmosphere interaction. Vegetation and crops always depend more on the moisture available at root level than on precipitation occurrence. Water budgeting for irrigation planning, as well as the actual scheduling of irrigation action, requires local soil moisture information.

Vaccination

Plant Vaccination System is mainly design for avoidance of the disease like Wood Borers. In this system we are periodically injecting pesticides to the stem of the plants. The software will help the user to automatically provide pesticides.

3. DESIGN OF MICROPROCESSOR BASED SYSTEM

The key elements that should be considered while designing the model: -

1. Microprocessor (above 900Ghz)
2. Flow Control Valve (230 V A.C supply)
3. Vaccination unit
4. Moisture control unit
5. Interface Card
6. LPT port

The circuitry unit is now explained in detail: -

The automated control system consists of moisture sensors, PC, Relay, solenoid control valves, etc. The unit is expressed in Figure. 1

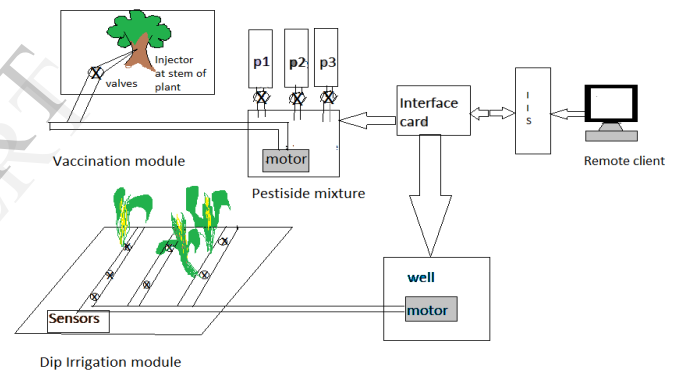


Fig 1. Design of RIVS

The important parameters to be measured for automation of drip irrigation system, soil moisture and vaccination. The entire field is first divided in to small sections such that each section should contain one moisture sensor and a vaccination unit. Moisture sensor is designed to detect moisture contents of soil. These sensors are buried in the ground at required depth. Once the soil has reached desired moisture level the sensors send a signal to the system to turn off the relays, which control the valves.

The solenoid valves are controlled by microcontroller though relays. A Vaccination unit is used to mix required amount of pesticides using helical gear motor, and pumped through motor which is operation on 230 V A.C. supply.

The required readings can be transferred from the interface card to the Centralized Computer for further analysis, through the LPT port.

While applying the automation on large fields more than one such microprocessor units can be interfaced to the Centralized Computer. The microprocessor unit has in-built timer in it, which operates parallel to the system.

3.1 SOFTWARE IMPLEMENTATION

User Interface

The user interface will be simple and consistent, using terminology commonly understood by the intended users of the system. The system will have a simple interface, consistent with industry standard interfaces, to eliminate the need for user training of infrequent users.

Hardware Interface

The hardware interface in this system is basically interface card and parallel ports are used for communication between end-user and the hardware devices. The hardware devices such solenoidal valves and moisture sensor are controlled from the end-user system which signals the interface card through parallel port.

Software Interface

The system will use Microsoft.NET 2005 framework which is an open source, ASP.Net is used for designing web-application and VB.net is used for designing the drivers. MS SQL server 2005 as a backend for storing the data and monitoring the data. IIS services are used to access the web-application.

Communication Interface

The system will use the communications resources provided by the IIS services. This system uses HTTP protocol for communication with the web browser and the web server and TCP/IP network protocol with HTTP protocol.

4. ADVANTAGES

1. Are relatively simple to design and install

2. This is very useful to all climatic conditions any it is economic friendly

3. This makes increase in productivity and reduces water consumption

5. This is safest and no manpower is required . Permit other yard and garden work to continue when irrigation is taking place, as only the immediate plant areas are wet

6. Reduce soil erosion and nutrient leaching.

7. Reduce the chance of plant disease by keeping foliage dry.

8. May be concealed to maintain the beauty of the landscape, and to reduce vandalism and liability when installed in public areas.

9. Require smaller water sources, for example, less than half of the water needed for a sprinkler system.

5. DISADVANTAGES

1. This is only applicable for large size farms

2. Equipment is costlier

6. CONCLUSION

The Microprocessor based remote irrigation and vaccination system proves to be a real time feedback control system which monitors and controls all the activities efficiently. The present proposal is a model to modernize the agriculture industries at a mass scale with optimum expenditure. Also to overcome from the problem of wood borer by which a lot of capital is wasted if the crop is being harmed by this diseases .So, we are providing a “protection is better than cure solution” for controlling the wood borer problem which is undetected.

Using this system, one can save manpower, water to improve production and ultimately profit.

Such system can be useful for modernizing the agriculture and would prove to be beneficial to human being. Such kind of system taking care of the wood borer problem would save a lot of capital invested in agriculture. It would also increase the productivity of crop.

7. FUTURE SCOPE

In remote irrigation and vaccination system our main objective is to remotely water and vaccinate the plants to avoid the wood borer problem. Similarly such kind of system can be useful for green house where temperature controlling is major factor.

More advancement can be done in such system by embedding web-cam on farm for keeping more controlling on the farm and also, for detecting the and analysis of growth of the plant. Moreover, early pest detection can also be possible with the help of image processing.

Also such system give a modernize approach to agriculture and also improve the quality of crops.

8. ABBREVIATIONS AND ACRONYMS

1. GDP: Gross Domestic Product value
2. PC : Personal Computer`
3. DBA: Database Administrator
4. HTTP:Hyter Text Transfer Protocol
5. IIS: Internet Information Service
6. TCP/IP: Transfer Control Protocol Internet Protocol
7. RIVS: Remote Irrigation And Vaccination System

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