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Automatic Irrigation Using Soil Moisture Sensor

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ABSTRACT: This research aims at working on "Automatic Irrigation System Using Moisture Sensor" is the name of the project we are working on. Because India is a country that prioritises agriculture but the rate at which water supplies are being used up poses a grave threat, thus it is necessary to find a clever and effective method of irrigation. In this project, moisture sensors were to use identify the soil's humidity (an agricultural field) and deliver water to the areas as needed. The project uses an 8051 microcontroller to control both the water supply and the irrigation system for the field. Each field has sensors, but they don't start working until there is water on the field. When the field becomes dry, the sensor detects the need for water and sends a signal to the microcontroller. This research described how an automated irrigation system based on wireless communication and microcontrollers was developed at an experimental scale in a rural location. The goal of model implementations was to show how automatic irrigation may be used to use less water. Conclusion of abstract is each sensor is activated when soil is not fulfil with their optimum moisture content.

KEYWORDS: Automatic irrigation, moisture sensor, Optimum moisture content

I. INTRODUCTION

As we know India is agriculture base country an automated irrigation system is recommended in this research to reduce water input and human involvement while meeting the needs of the plant. Rajpal et.al.(2011) First, a summary of the issue's specifics is provided. There are descriptions of the project's goal and domain. There is a review of several general design strategies. The findings and recommendations of an experiment to establish the necessary water requirements are discussed. The objective, requirements and restrictions, as well as the simulation and test results for each component of the suggested design are then thoroughly explained. To gauge the project's commercial potential, a quick cost analysis is conducted. Finally, criticism of the design and recommendations for future enhancements are offered. An automatic irrigation system operates a system without the need for human intervention. With the use of electronic appliances and detectors like computers, timers, sensors, and other mechanical equipment, every irrigation system, including drip, sprinkler, and surface irrigation, becomes automated. Healthy plants have a high-water transpiration rate, which raises the air humidity in the greenhouse. Mohamed et.al. (2019) A high relative humidity (over 80–85%) should be avoided because it can lower plant transpiration and raise disease incidence. Condensation on plant surfaces and the structure of the greenhouse can be avoided by using sufficient venting or repeating heating and venting. The humidity of the greenhouse air rises during the hotter summer months due to the use of cooling devices. When it's hot and humid outdoors, it could be challenging to regulate the humidity within the greenhouse. For greenhouses located in arid, desert environments, evaporative cooling systems are quite advantageous since they may evaporate large amounts of water into the incoming air, creating significant temperature drops. In this project, we take various types of soil, including black cotton soil, red soil, etc., and determine their maximum water content. Next, the most crucial part of the project, a soil sensor, is inserted into these soils, and it detects whether the soil is dry or wet. In certain circumstances, such as when the soil is dry, water is applied to the soil up to the maximum moisture content allowed in order to minimise the amount of water must be applied to the soil. Also, to conserve water. M. Karthikeyan (2017).

II. LITERATURE REVIEW

1. 2017's "micro-controller based automatic irrigation system with moisture sensor" by abhinav rajpal, sumit jain, et al. This paper shows the design of a prototype microcontroller-based automatic irrigation system that will enable irrigation in zones where watering is necessary.
2. (2018) "sensor based automated irrigation system with iot: a technical review" by karan kansara, vishal zaveri, et al. Farmers are currently suffering due to a lack of rain and a water shortage. The main goal of this paper is to give farmers an automatic irrigation system that will save them time, money, and power.
3. "Automatic irrigation system using soil moisture sensor" by kiran gowd m. R., sarah mahin, et al. This paper demonstrates the successful development, testing, and automatic operation of the moisture sensor.
4. The 2019 paper "evaluation of soil moisture sensors under intelligent irrigation system for economical crops in arid regions" by mohamed said abdall el marazky, fawzi said mohammad, et al. In this paper, the performance of a soil moisture sensor was evaluated in two different irrigation systems during the growing season. This assessment will be done with regard to accuracy/precision
5. "Automatic of soil moisture sensor based basin irrigation system" by monalisha pramanik, manoj khanna, et al. In order to establish and test an internet of things-based system through a wireless connection between the automatic check gate and soil moisture sensor, a study was conducted in a closed end level basin layout in loamy soil.
6. The study, "using plant water status to define threshold values for irrigation management of vegetable crops using soil moisture sensors," was published in 2017 by r.b. thompson, m. Gallardo, et al. The investigation described in this research has revealed uncertainties surrounding the usage of suggested fixed awc threshold values for irrigation control due to the impact on measured aws values.
7. M. Karthikeyan, r. Vagulabranan, et al. (2017) the goal of "automatic irrigation system on sensing soil moisture content" is to automate irrigation by turning the pumping motor on and off in response to soil moisture. Utilising the proper irrigation methods is important in the farming industry.
8. Sakshi singh (2018) "automatic irrigation system" this undertaking is to enable the rancher and nursery staff to retain control over the level of soil dampness. This primary application are for farmers and gardeners who do not have enough time to water their crops.

III. PROBLEM STATEMENT

1. Plant/crop irrigation is typically an extremely time-consuming task to complete. It takes a lot of manpower and human resources.
2. Labour is in high demand in agriculture.
3. Conditions of drought experimental results.

IV. AREA OF APPLICATION:

1) Roof gardens 2) Lawns 3) Agriculture lands 4) Home gardens.

V. METHODOLOGY

1. Study area
2. Determination of optimum soil content
3. Installing sensors
4. Circuit operation
5. Model Preparation
6. Taking trials
7. Concluding values.

VI. EXPERIMENTAL RESULTS:

| Soil sample of 500 mg | Water required in ml |
|-----------------------|----------------------|
| Trial 1 | 100 ml |
| Trial 2 | 120 ml |
| Trial 3 | 100 ml |
| Trial 4 | 100 ml |
| Trial 5 | 100 ml |
| Trial 6 | 100 ml |
| Trial 7 | 120 ml |
| Trial 8 | 100 ml |

Table No.1

As we can see, 100 ml of water is often needed to irrigate 500 g of soil, but occasionally 120 ml may be needed owing to human mistake, temperature changes, or moisture conditions. Therefore, we only use 100 ml.

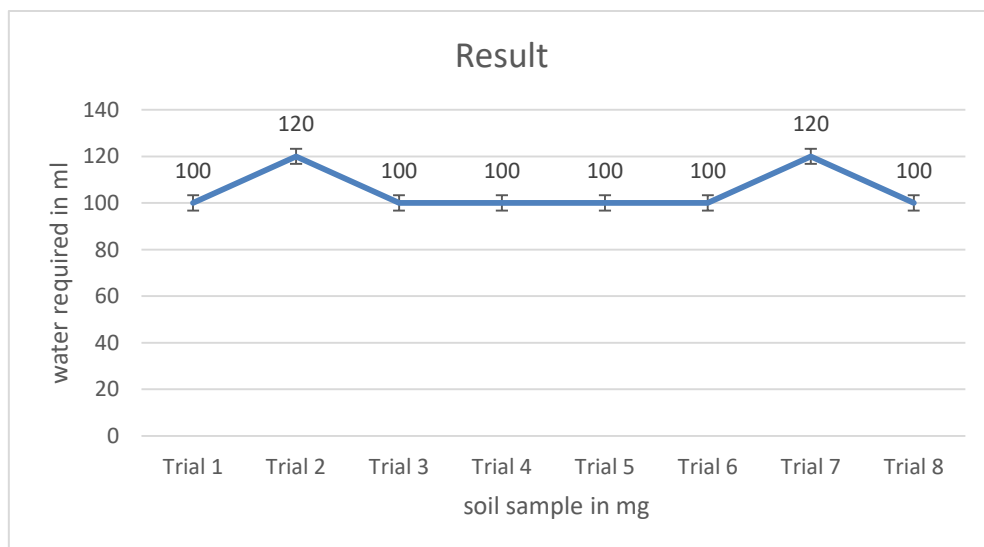


Fig no. 1

VII. CONCLUSION

This model will function through the combination of hardware and software, and it is very cost-effective and requires little maintenance. It is highly helpful to farmers who are unsure of the state of the soil, its characteristics, or the amount of water needed for crops. This aids in enhancing farming methods. According to the preceding chart, 100 ml of water are needed for 500 mg of dry black cotton soil..

REFERENCES

1. "Automatic Irrigation System Using Soil Moisture Sensor," Kiran R., Mahins, Narmada K., Mohammed A., Sridhar S., et al. Department of Mechanical Engineering, Channabasaveshwara Institute of Technology Gubbi, Tumkur, India.
2. "Automated Irrigation System," Department of Electronics and Telecommunication Engineering, Vivekanand Education Society's Institute of Technology, University of Mumbai, Maharashtra, India, by Krishanan S., Lakkanige K., Ananthakrishnan R., Virwani D., Laungani V. Et al. International Journal of Engineering Research and Technology, Volume 9, Number 6, June 2020.



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| DOI:10.15680/IJIRSET.2023.1205420 |

3. Mohamed S, Mohamed F, Mohamed H, et al., "Evaluation of Soil Moisture Sensor under Intelligent Irrigation System for Economical Crops in Arid Regions." King Saud University, College of Food and Agriculture Sciences, Dept. of Agriculture Engineering, Riyadh 11451, Kingdom of Saudi Arabia.Issn15574989
4. The article is titled "Automation of Soil Moisture Sensor Based Basin Irrigation System" and was written by Parmanik M., Khanna M., Singh M., Singh D., Sudhishri S., et al. The Water Technology Centre of the Indian Agriculture Research Institute is situated in New Delhi, India (110012). Division of Environmental Science, Division of Agriculture Physics. (2022) 1000 32.
5. The "Microcontroller Based Automatic Irrigation System With Moisture Sensor" by Rajpal A., Jain S., Khare N., Shukla A., et al. Sector 125 in Noida, 201303; Amity Institute of Telecom Technology & Management.
6. Sakshi Singh's "Research Paper on Automatic Irrigation System" was published in 2018. Teerthankar Mahaveer University's Faculty of Engineering, Department of Electronics and Telecommunication Engineering, Moradabad, Uttar Pradesh, India. August 2018 JETIR, Volume 5.
7. Vagulabranan R, Karthikeyan M, Sasikala V, et al. (2016) "Automatic Irrigation System On Sensing Soil Moisture Content" India's V.R.S. College of Engineering and Technology, Dept. of Information Technology, Vol.03, March 2016.



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