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Microcontroller Based Automatic Oyster Mushroom Cultivation

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ABSTRACT: In the cultivation of Oyster Mushrooms need special treatment because oyster mushrooms are susceptible to disease. Mushroom growth will be inhibited if the temperature and humidity are not well controlled because temperature and inertia can affect mold growth. Oyster mushroom growth usually will be optimal at temperatures around 22-28ºC and humidity around 70-90%. This problem is often encountered in the cultivation of oyster mushrooms. Therefore it is very important to control the temperature and humidity of the room of oyster mushroom cultivation. In this paper, we developed an automatic temperature monitoring tool in the cultivation of oyster mushroom-based Arduino Uno microcontroller. We have designed a tool that will control the temperature and humidity automatically by Android Smartphone. If the temperature increased more than 28ºC in the room of mushroom plants, then this tool will turn on the pump automatically to run water in order to lower the room temperature. And if the room temperature of mushroom plants below of 22ºC, then the light will be turned on in order to heat the room. Thus the temperature in the room oyster mushrooms will remain stable so that the growth of oyster mushrooms can grow with good quality.

KEY WORDS: Arduino,Temperature and Humidity senso , Soil Moisture sensor, Gas sensor, Wifi Module.

I.INTRODUCTION

In India large percentage of population is dependent on agriculture. Agriculture techniques improve day by day. Modern agriculture in amalgamation of agriculture and technology. Wireless sensor utilized in agriculture has importance in modern agriculture. Having wireless sensors in a variety of agriculture sectors have huge positive result on crops, facilitates increasing yield and saving price of operation. Mushroom publication rack new and small scaled as can rival other agriculture industry in India. Mushroom farming is low investment. Since most of the mushroom farms in India are small-scaled, their production capability is restricted to inadequate environmental control system and the deficiency of savings to upgrade the systems. The white button mushroom is increasingly popular in India also in the world. These mushrooms have commercial significance in India. They mostly farm in north India as the temperature condition is favorable. They are following parameters for mushroom growth, temperature for mycelia growth is 22°C-25°C for fruit body formation 70°C -80°C and also a significant number of relative humidity. The chief goal of this paper is always minimize the human beings care essential for the mushroom where environmental condition for mushroom farming are certainly not fully supported we design a control and monitoring system determined by required parameter values.

II.LITERATURE REVIEW

IoT FOR SMART FARM (Lingzhi Mushroom Farm at Maejo University Oran Chieochan et al.,(2017)) applied the use of IoT with a sensor to measure and monitors the humidity in the Lingzhi mushroom farm. The research aims to develop a prototype of a smart farm using technology IoT, NET and LINE API to measure and monitor the humidity of the Lingzhi mushroom farm and control the sprinkler and fog pumps automatically. The Thai government would like to promote Thailand 4.0 to use a new technology for Thai agriculture. Therefore, Maejo University Chiangmai, has a concept to develop a prototype of a smart lingzhi mushroom farm by using current information technology to control the environment. The reason for developing the smart Lingzhi mushroom farm is to promote a new modern agriculture to Thai farmers. _Controlling the environment of mushroom temperature needed.‘ Previous research was applied using IoT with RFID to find the best practice of logistic management [1]. The developed IoT system was considered stable. Humidity data was considered reliable and accurate (if compared to the information done manually). The functional status of sprinkler and fog pumps were done correctly. The project leaders of smart Lingzhi mushroom farm from Maejo University, ChiangMai were satisfied.

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| Volume 4, Issue 6, June 2021 |

Relevance to current Research

Mushrooms - a fungi as edible Mushrooms are macro fungi with distinctive fruiting bodies which are either epigenous or hypogenous and sufficiently conspicuous to the naked eye to be hand-picked (Chang and Miles, 1982). The appraisal of mushrooms as highly nutritive foodstuff is well founded. Many kinds of mushrooms are edible, and at the same time possess tonic and medical attributes (Chang, 1999). Human use mushrooms since early to 5000 BC. About 2000 species of edible mushrooms are known all over the world. One of the most delicious and excellently edible mushrooms is the European button mushroom. The total production of edible mushrooms is about 3.75 million tones. Extensive clinical studies, conducted primarily in China and Japan, have explicitly illustrated that a number of mushroom species have medicinal and therapeutic value in the prevention /treatment of cancer, viral disease, hypercholesterolemia, blood platelet aggregation, and hypertension (Jong et al., 1991). Mushrooms have been important in human history as food, as medicine, as legends, and in folk lore and religion [5]. Mushrooms are lively in folklore as ‚witches egg and fairy egg' (Molitoris, 2001). Mushrooms are basically consumed for their texture and flavor. They have recently become attractive as health - beneficent food and as sources for the development of drugs. Many higher Basidomycetes mushrooms are known to contain a number of biologically active components that show promising antitumor and immunomodulation, cardiovascular, hepato protective, hypocholesterolemic, antiviral, antibacterial, ant parasitic and anti-diabetic effects (Didukh, 2001)

Relevance to current Research

An Effective Method for Crop Monitoring Using Wireless Sensor Network (N. Sakthipriya,**YEAR-2015**) The main aim of this paper is to propose a state of art wireless sensor technology in agriculture, which can show the path to the rural farming community to replace some of the traditional techniques. Based on the value of soil moisture sensor the mote triggers the water sprinkler during the period of water scarcity.

Relevance to current Research

Smart Irrigation with Embedded System (K Namala, Krishna KanthPrabhu A V, Anushree Math, AshwiniKumari, Supraja Kulkarni,**YEAR-2016**) This paper proposes intelligent and smart Irrigation system which can be used for controlling the watering or irrigation of flowering plants. It controls the irrigation of plants automatically where the need of human intervention can be reduced.This mainly focused on wastage of water, which is a major concern of modern era. It also aids time saving, cost effectiveness, environmental protection, low maintenance and operating cost and efficient irrigation service.

Relevance to current Research

Smart Green House Monitoring based on IOT (B. Sahana, D. Sravani, D. R. Prasad, **YEAR-2020**) Green house is used to protect plants from extreme environmental conditions and also growing plants in controlled environment. Greenhouse monitors the extreme environmental conditions in favor of plant growth. Greenhouse can be made smarter by using different techniques. This project presents wireless IoT (Internet of things) based smart greenhouse. A smart greenhouse based on IoT (Internet of Things) is implemented using Cisco packet tracer and the output is verified with the expected results.

III.METHODOLOGY OF PROPOSED SURVEY

The system flow begins with the detection of the temperature sensor. In the temperature sensor, if heat and humidity are detected, the fan and pump will ignite and do the condensation. And if normal temperature and normal humidity (22-28ºC) then the fan does not turn on, as well as cold temperatures and wet humidity then the fan also will not on. If any of the conditions are met then the results will show on the LCD and will connect to Android Smartphone with the help of Bluetooth.

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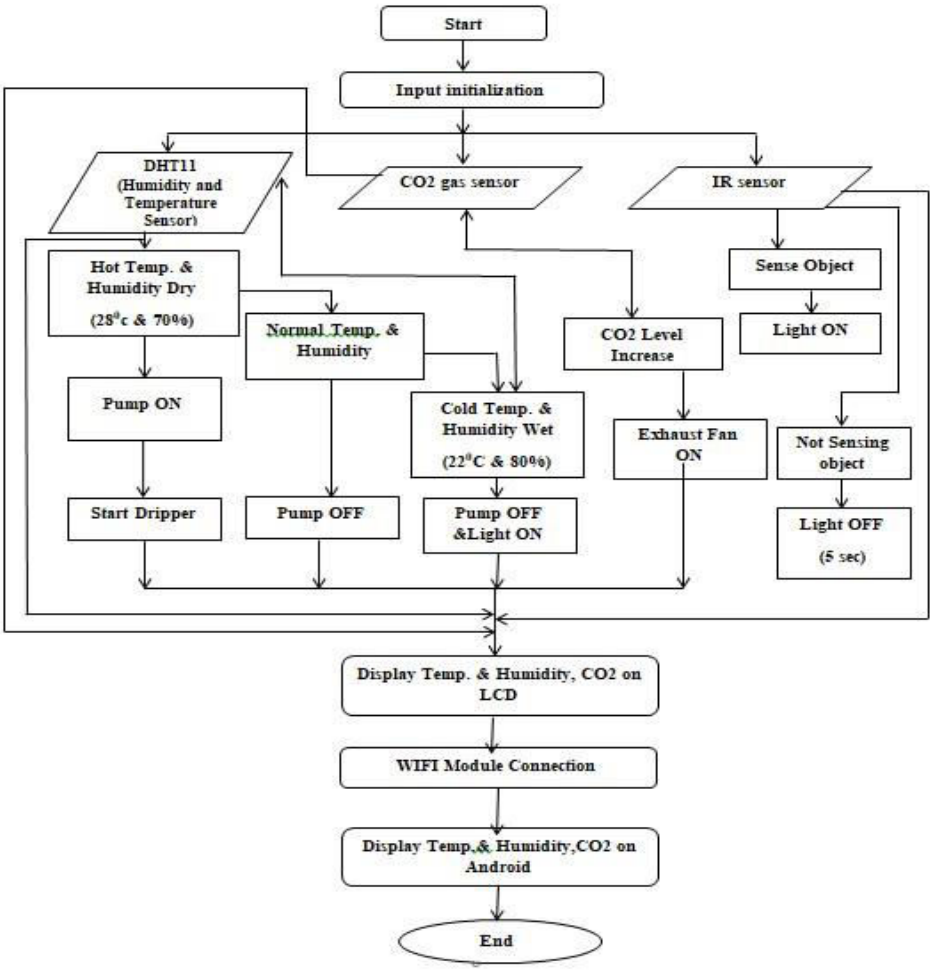

Figure.1 Flow Chart

IV. RESULT AND DISCUSSION

Manual testing has also been done by giving commands through applications that have been designed in the Android Smartphone. To run the system manually is done by clicking a selection of manual buttons on the smartphone. In this way, the system will be able to run the water pump by the user if the user wants to drain water or to heat the room temperature. By this manual system, the user can also adjust the system performance by directly activating or disabling the options button for a lamp, pump, or fan anytime. Users can also turn off the feature if needed to set the temperature and humidity in the room oyster mushrooms.

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Figure.2 Experimental Setup

V.CONCLUSION AND FUTURE WORK

In this project, we have described how to control the temperature and humidity of air in oyster mushrooms, whether done automatically by using a microcontroller run through a smartphone or to flow the water manually. All components of automatic temperature control device in the cultivation of oyster mushrooms can run as planned. An Arduino microcontroller tool can work well that iscontrolled via handphone. At temperatures greater than 29 ^{0}C the pumps appear to live automatically to perform the fogging (condensing) temperatures in the room of the fungus. Data communications made to transmit temperatures or moisture to Android smartphones can be done via Bluetooth or with available Wi-Fi or using a Thing-Speak online cloud for monitoring and storage. The data could be accessed by the user anytime by using a computer that is connected to the Internet. The control system was able to control ac-powered humidifier, light, and fan based on the feedback of the sensors tomaintain temperature, humidity, light intensity and CO_2 at optimum growth condition in an actual mushroom farm. The experimental results show that at 67% humidity and the temperature is 30 ^{0}C, thesystem starts to turn on the cooling fan and turn on the water pump to lower the room temperature and anticipate staying within the range of 25-29 ^{0}C.

REFERENCES

[1] Ashton, K. (2009). That _internet of things‘ thing. RFiD Journal, 22(7), 97-114. Atzori, L., Iera, A., &Morabito, G. (2010). The internet of things: A survey.Computer networks, 54(15), 2787-2805.
[2] A.N. Harun, M. R. M. Kassim, I. Mat and S. S. Ramli, "Precision irrigation using Wireless Sensor Network," 2015 International Conference on Smart Sensors and Application (ICSSA), Kuala Lumpur, 2015, pp. 71-75.
[3] Chandrakasan, R. Amirtharajah, S. Cho, J. Goodman, G. Konduri, J. Kulik, W. Rabiner, A. Wang, Design considerations for distributed micro-sensor systems, Proceedings of the IEEE 1999 Custom Integrated Circuits Conference, San Diego, CA, May 1999, pp. 279–286.
[4] Bahga, A., &Madisetti, V. (2014). Internet of Things: A Hands-on Approach. VPT.
[5] Herring, S. Kaplan, Component-based software systems for smart environments, IEEE Personal Communications, October 2000, pp. 60–61.
[6] D. Estrin, R. Govindan, J. Heidemann, S. Kumar, Next century challenges: scalable coordination in sensor networks, ACM MobiCom‘99, Washingtion, USA, 1999, pp. 263– 270.
[7] Definition of wireless sensor, available from omega.com/prodinfo/wirelesssensors.html.
[8] G. J. Pottie, W. J. Kaiser, Wireless integrated network sensors, Communications of the ACM 43 (5) (2000) 551–558.
[9] I. A. Essa, Ubiquitous sensing for smart and aware environments, IEEE Personal Communications (October2000) 47–49.
[10] I. F. Akyildiz, W. Su, Y. Sankarasubramaniam, E. Cayirci. Broadband and Wireless Networking Laboratory, School of Electrical and Computer Engineering, Georgia
Institute of Technology, Atlanta, GA 30332, USA. Wireless sensor networks: a survey. Computer Networks 38 (2002) 393–422.

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