ADVANCE ROTTEN ONION DETECTION SYSTEM BY USING GAS AND TEMPERATURE SENSOR

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Abstract - Onion production in India has wide impact on financial set-up and financial status of growers/consumers [1]. India ranks second in onion production within the world.Under ambient conditions the onions are stored at a temperature of 31-36 OC with ratio i.e. RH of 66-71%[3]. Which means temperature and humidity are two major parameters that ought to be controlled within desire range. But because of continue change in Indian climate onions can rot [6]. Once the method of rotting starts, it grows rapidly and causes huge amount of loss. Onion is extremely important vegetable crop not just for internal consumption but also as highest exchange earner among the fruits and vegetables. So it's essential to stop onion losses like weight loss, rooting, sprouting, decay and rotting . Hence,So , authors have studied different conventional storage techniques and different losses through online survey, visual observations and through field visits and intended to introduce a system to manage onion losses. During this system authors have used basic sensing elements (sensors), controlling components (Microcontroller) with online feedback and parameter controlling agents to manage this parameter with an extra addition of onion shade covered by shade-net. During this system, major gases like ammonia , carbon dioxide , temperature & humidity emitted by onions [6] are detected and used for temperature control.

Key Words: Rottening, onion losses,controlling components, reliable adaptability,microcontroller

1. INTRODUCTION

Losses in stored onion in Indian state are higher the onion bulbs are having higher water content [2]. decay and sprouting in storage(Kukanoor , 2005). This finally ends up in raise in their price to the tune of 4 to five times [4]. India produces all three kinds of onion viz. red, yellow and white. However, onion price are highly volatile and more recently the worth are sluggish. This has resulted in Maharashtra State Agriculture Marketing Board (MSAMB) seeking subsidy [5]. The temperature between 10-25 °C increases sprouting. More the ratio, more is rooting. Weight loss is more when temperature is above 36 °C . Under ambient conditions the onions are stored at a temperature of 30OC-35OC with ratio i.e. RH of 75-80% [3]. That means, maximum approximate temperature range for onion storage is 25OC to 40OC.So , author have studied the parameters that affect the onion storage through field visits, visual observations and also referred the literature and concluded that each one these losses arises due to continuous change in temperature.

This paper introduces an advance system which will help the user to manage such parameters affecting a regeneration against different onion losses. Shednet is employed here because it improves the thermal behavior significantly decreasing the within a temperature [10]. The system works on the principle of detection of emitted gases by onions and trying to regulate them within limit parameter range of temperature .is grown altogether three crop seasons. In line with ICAR - Directorate of Onion and Garlic Research, the cultivation in India is growing day-by-day[1]. Hence, it's a good impact on economic system and financial status of growers/consumers [6]. The Indian climate is becoming more erratic during various seasons causing unexpected fluctuations in temperature and humidity. This makes onions more liable to rotting. This leads to rotting thanks to growth of fungi resulting in bacterial rot, sprouting, rooting. To stop these losses, the main thing was to design and develop a device/system to avoid onion rottening . We visited the storage sheds in markets and study the post harvest losses and tried to search out remedy to forestall it. Knowing the storage techniques and losses, we designed and developed a requirement based electronic circuitry that may provide early warning and capable of sending messages to owner.

This paper suggests an integrated system which introduces a definite and convenient option for preventing or reducing onion losses. This method works on the principle which involves sensing emitted gases by onions and processing them to get to desire the output.in step with programmed microcontroller Audio-visual alarm and the text message are visiting be sent to the owner. To manage other parameters like temperature .

India is second-largest producer within the world after china. Onion in India is grown across the country and also consumed altogether parts of the country [5].J Food Sci Techno . In Jun 2013 given a view on on.ions that the Indian onion bulbs have

higher water content [7] making them more at risk of rotting. Plant disease may be a major threat to raising healthy onion seedlings during Khariff (October?December) season altogether onion growing areas of the country.

Generally 20-25% onion seedlings get damaged because of different disease. Storing onion for long period of your time with low expenditure could be a challenging thing. Dr. V. G. Wagh introduces a system [6] that tries to regulate the temperature within the traditional onion sheds. The low-cost domestic onion storage structure could also be beneficial to small growers. This might be profitable to those growers who are growing onion at two or three years interval thanks to shortage of irrigation water and inclusion of rotation of crops [8]. For such farmers, cost could be a major issue. On the view of this scenario, author proposes a coffee cost system which attempts to keep up the temperature range to store onions in shed for while within desired temperature range i.e. 30 0C to 37 0C (say, approximately 40 0C)

3. SYSTEM DETAILS :

While developing any microcontroller based electronic system, there are some steps which must be followed. These steps are:

1. Deciding system specifications i.e. Block diagram
2. Selection of system components
3. Design of circuit diagram
4. Design of PCB layout

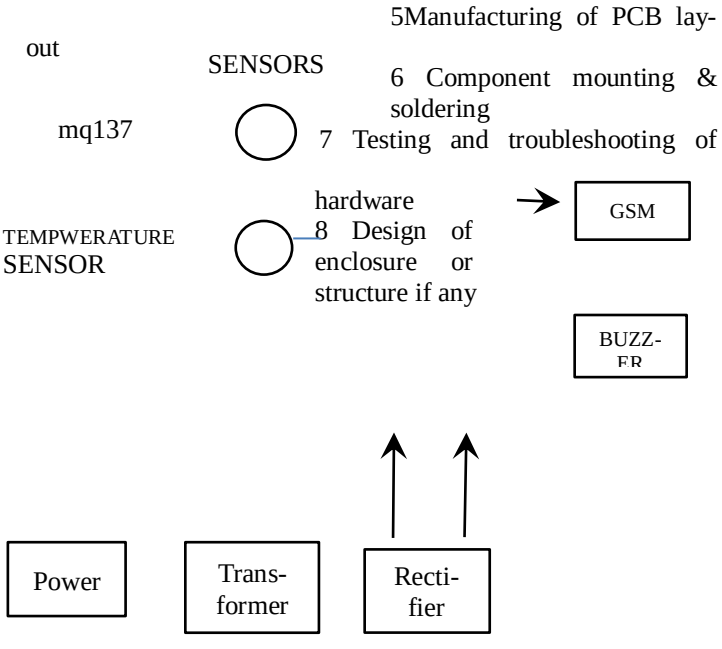

Figure 1: System Block Diagram

4. SYSTEM DESIGN

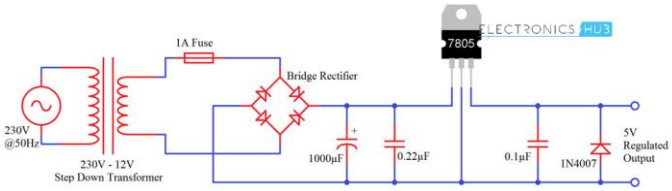

figure 2: 230v AC to 15v DC,5V Dc converter circuit using Bridge Rectifier

Rectifier unit could be a ckt . Which converts A.C. Into pulsating D.C. Generally semiconducting diode is employed as rectifying element because of its property of conducting current in one direction only Generally there are two sorts of rectifier. Half-wave rectifier Full wave rectifier. So we use full wave bridge type rectifier, within which four diodes are used. In each half cycle, two diodes conduct at a time and that we get maximum efficiency at o/p.

Interfacing of Buzzer with Microcontroller:

The digital buzzer needs a supply of 5V and 50mAmp maximum to generate sound at full intensity. The HIGH signal at the microcontroller output pin generated 5V and 200mAmp maximum current which is sufficient for buzzer. So it can be directly connected to the output pin of microcontroller.

5.Proposed System:

This system consists of Sensors, Microcontroller and Actuators. After rotating of onions they emits different gases this gass detect by different gas sensors. . A microcontroller is employed as a heart of the system, having program integrate it. It'll work in keeping with program designed. System consists of LCD , Alarming Device (speaker) and a wireless data transmission device. Rotten Onions emit different gases & heat too. Ammonia and carbon dioxide are few of these gases are emitted by onions & are mainly chargeable for onion rotating . Detecting gases, we are able to sense the amount of rotating onion. At specified first level (also are often called as warning level) of gas sensed (in ppm) by sensors & controller, audiovisual alarming are going to be there using actuators & transducers. If detected gas exceeds second level (also may be called as hazardous level for onions to urge rot), a wireless text message sending device with temperature controlling device .

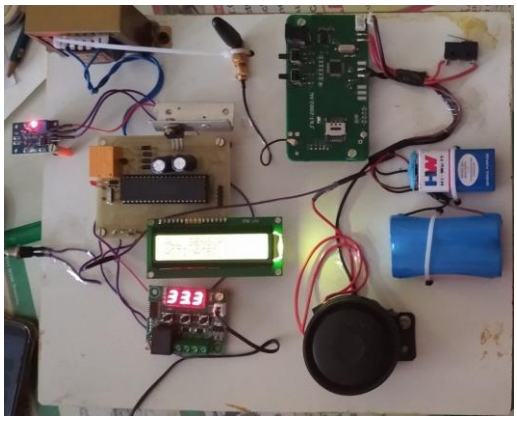

Fig 3: Circuit for Rotten Onion Detection

An algorithm of Advance Rotten onion Detection Systen:

An algorithm of Advance Rotten onion sniffer:
1. Start
2. At beginning sensors to sense emitted gases by onions. Sensors utilized in this method are a. carbon dioxide &/or ammonia [mq -135]
b. the temperature
3. Convert analog input into digital (used inbuilt ADC) using a microcontroller (PICF16F877A)
4. If it is less, then display the level and repeat step 2.
5. If it's greater, then switch four way alarm (GSM , LCD and BUZZER) and repeat step

6 .Result

Teble-1

	Co2 & NH3 snesor	Temperature
Very min (@ 9am)	not activate	24
MIn(+2 hours)	not activate	25
Medium(+4 hours)	not activate	26
Max (+6 hours)	not activate	27
Very max(+ 8 hours)	not activate	27

7.Conclusion:

Detection of varied gases emitted by onions are visiting be used to predict the health (i.e. Rottening , and Weight loss, Rooting, Sprouting and Onion Decay etc.) status of the onion. If there's any health issue observed, wireless reporting and important primary action i.e. try and control temperature (or say heat & ultimately humidity) will occur against it to forestall this loss.Developed advanced rotten onion sniffer system are useful for long lifetime of onions under harvesting. With the help of this system we'll store onion for duration 8 to 10 months. If there's rotting problem because of water contact, action system will immediately take action further because it'll inform owner.It is essential that for proper onion storage/harvesting temperature in specific range (37 to 45 degree celcious) . Because of change in temperature, different losses &/or diseases can occur . To avoid these losses we tried to manage the temperature the most amount as possible.The project supported ADVANCE ROTTEN ONION Detection System was interesting to figure on and was also gained during this project work. This information of project will definitely be helpful in our future. So we must maintain that this final year project was a significant an element of our engineering education enhancing our technical knowledge and practical skill.

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