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Smart Onion storage Using Arduino

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ABSTRACT

India ranks second in onion production in the world. Onion acquired 6% share in the production of vegetables in India. It has a wide impact on national economy and financial status of consumers/growers. The stored onions in onion in onion sheds are exposed to the hot, cold and humid air. Due to continue change in climate can rot. Once the process is iniated it grows drastically and rapidly resulting in unexpected loss. This system can help to avoid loss. Various gas sensors are used to sense emitted gases. When onions starts rotting. Developed system informs owner and also sends alert. The proposed system is performing main function measuring and monitoring the humidity, temperature and the methane concentration and notifying the user, the storage house will be ventilated and aerated sufficiently to keep the produce dry and cool.

KEYWORDS: Fresh Onions, Rotten onions, Gas sensor, Temperature sensor.

INTRODUCTION

In this paper is focuses on long time preservation of onion by using various sensors. According to National Horticultural Research and Development Foundation (NHRDF), total acreage under winter season crop would increase by 15-20 per cent this year. Onion contributes nearly 60 per cent of India's annual output. So efficient preservation technique is very important to save food.

This project is to control the environmental factors such as temperature, humidity, ammonia gas and carbon dioxide with their desired range. The essentials for curing of onion storage are heat and good ventilation, preferably with low humidity. Sprouting in onion is controlled by temperature. The temperature between 10-25°C increases sprouting. More the relative humidity more is rooting.

Weight loss is more when temperature is above 35°C. This paper introduces an advance system that will help user to control such parameters affecting positive feedback against different onion losses. Shed net is used here because it improves the thermal behavior significantly decreasing the inside temperature. The system works on the principle of sensing emitted gases by onions and attempting to control them within desired parameter range of temperature and so, humidity and also gives online record.

LITERATURE SURVEY

The Indian climate is becoming more erratic during various seasons Causing unexpected fluctuations in temperature and humidity. This makes onions more susceptible to rotting. This leads to rotting due to growth of fungi leading to bacterial rot, sprouting, rooting. To prohibit these losses, the aimed was to design and develop an electronic device to avoid onion rotting. We visited the storage sheds in markets and study the post-harvest losses and tried to find remedy to prevent it. Knowing the storage techniques and losses, we designed and developed a need based electronic circuitry that can provide early warning and capable of sending messages to owner. This paper suggests an integrated system which introduces a different and convenient option for preventing or reducing onion losses. This system works on the principle which involves sensing emitted gases by onions and processing them to obtain desired output. Emitted gases are sensed by their respective sensors & then, their signals are read & processed by microcontroller. According to programmed microcontroller Audio-visual alarm and text message will be sent to the owner. To control other
parameters like temperature and humidity we use a green color net and fan.

The rate of deterioration of onion in the tropical humid environment due to inadequate storage structure cannot be overemphasized. The storage life of onion is dependent mainly on temperature and humidity. Onion is in the northern states mostly by peasant farmers and transported to the various regions in the country. To ensure supply of the commodity all year round, adequate storage facilities must be put in place. The objective of this study is to evaluate a modified onion storage structure in terms of its potentials to reduce ambient temperature and relative humidity which would help extend the shelf life of onion and reducing post-harvest losses. A storage structure capable of storing onions in a humid tropical environment was redesigned and constructed using locally available materials and tested for nine-weeks. The structure parameters measured included temperature, relative humidity and weight of the onions and the results were subjected to appropriate statistical analysis to 31.4°C in the evening period. A recorded a 6.69% weight loss. Relative humidity within and outside the structure ranged from 74% to 96% in the morning, 54% to 95% in the afternoon and 70% to 96% in the evening. The highest relative humidity value (96%) was recorded in the morning period and the lowest (54%) was recorded in the afternoon.

A study was undertaken to examine the economics of storage in onion supply chain which is one of the major onion growing district of Rajasthan. In generally farmer's store onion in storage (under Ambien conditions) in the months April to September every year after harvesting the onion crop. The out of the total quantity of marketed (11595.20q), 3556.25q onion produce was stored by the onion growers (30.67 per cent) in onion storage at farm level by the sample farmers during April to September, 2011 period at different locations. 15.96% of onion is lost during storage period owing to post harvest losses. Maximum return from onion marketing was received during September month (36.01%) due to shortage of produce in market. An overall average profit of 12.82% was obtained by onion growers during six months storage period. The major reasons for storing onion by farmers were for home consumption (95.7%) and to reap benefits of higher prices (91.3%). Majority of farmers (65.2% %) adopted improved methods of storage. About 91.3% farmers reported that lack of knowledge about proper scientific methods for storage of onion was the major problem faced by farmers.

BLOCK DIAGRAM

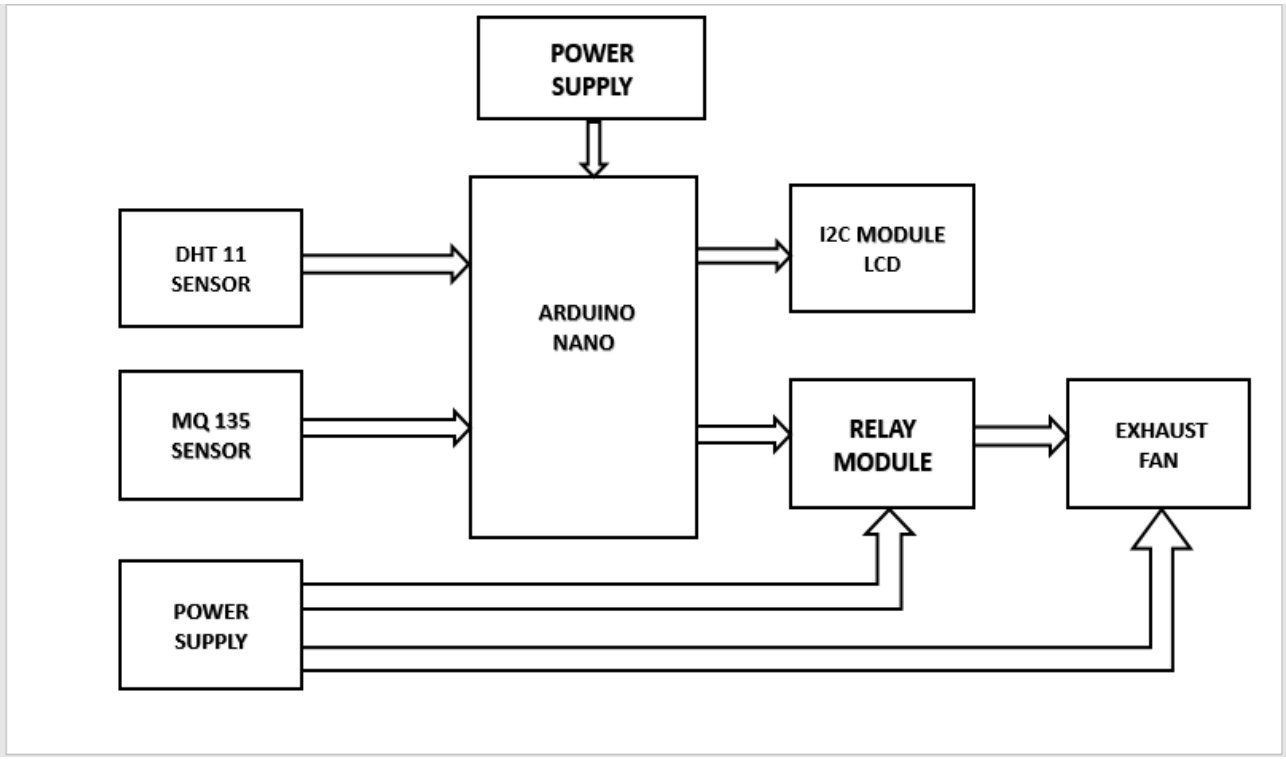

Figure 1

CIRCUIT DIAGRAM

A Circuit Diagram of Project is shown in figure 3.

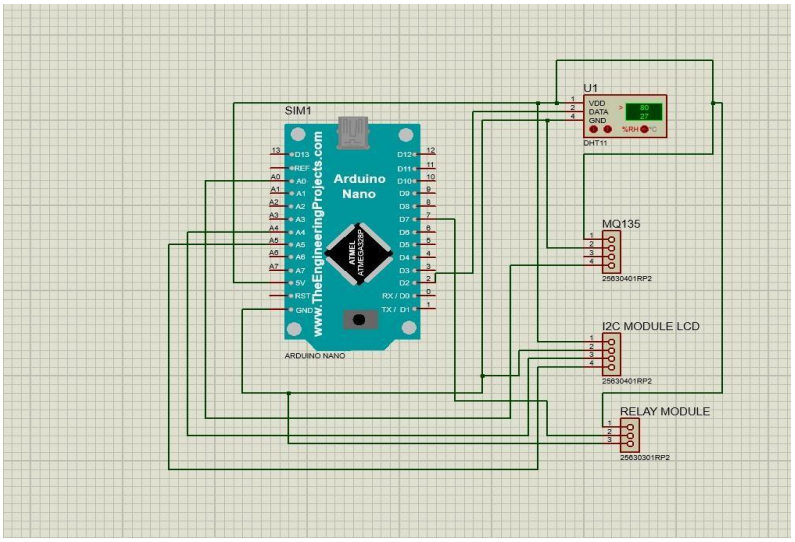

Figure 2

FLOW CHART

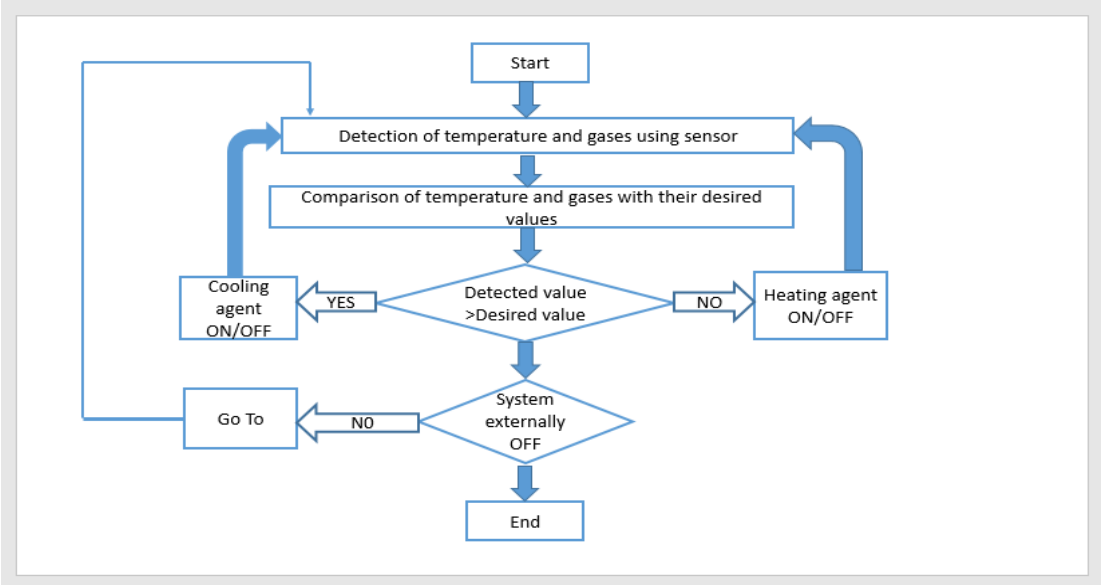

Figure 3

ADVANTAGES

1. Solve the storage related spoilage, rotting and losses through a cost effective.
2. We can also use IOT.

DISADVANTAGES

1. This project is used for only small scale area.

ACTUAL SETUP

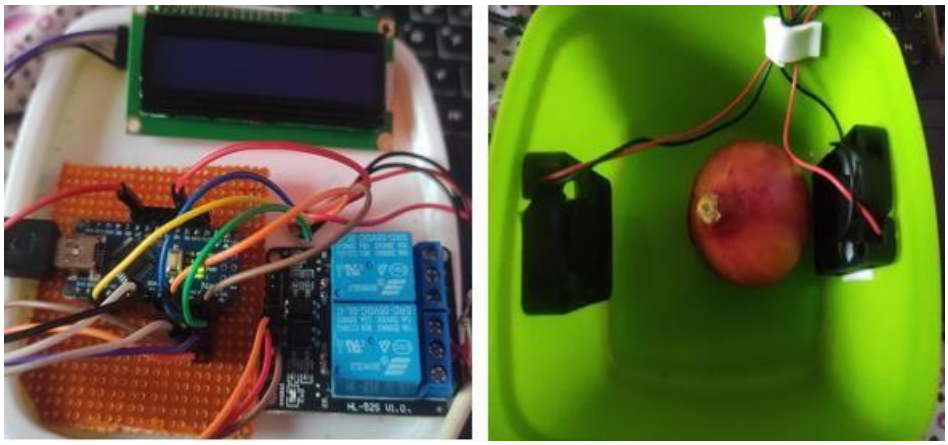

Figure 4

CONCLUSION

Different gases emitted by onions will be used to predict the health (i.e. Emitted Heat, Rotting, and Weight loss, Rooting, Sprouting and Onion Decay etc.) status of the onion. If there is any health issue observed, wireless reporting and important primary action i.e. attempt to control temperature (or say heat & ultimately humidity) will take place against it to prevent this loss. Using this system we can preserve onions for 11 to 13 months.

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