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Review of Automatic Detection and control of Disease for Grape Field

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Abstract— **This project gives the idea about Detection of various disease on grape field. Also provide the information about how to control this disease. India exported so many tons of grape every year. So, Grape played vital role in economic condition of country. But, because of disease the Grape quality is decrease so that we cannot exported this grape in foreign. In the Grape field there are various type of disease are attacking. From this various disease the Downey mildew disease is do the more effect on the Grape plant. This various disease affect the grape field because of some factor. These factors are Temperature, Humidity, Rain and Wind flow. This project provides the information to the farmer when the changes take place in environment by using the electronic system. Because of changed environment so many disease are attacking on Grape plant. Means this project gives information of environmental condition to the farmer and on the basis of these changes the farmer take precaution and control the attack of disease.**

Keywords— **Rainfall sensor, Wind flow sensor, Humidity sensor, Microcontroller, Hot air sprayer, GSM**

I. INTRODUCTION

In the year 2012 India exported grape around 37,000 tons. The total export from the country, out of this 99% export was from Maharashtra while Andhra Pradesh exported only 197 tons. From total export of Maharashtra Nasik contributes around 70%. Means grape played vital role in economy of Maharashtra as well as India.

Now a day there are various type of diseases are attacking on Grape field. There are six major diseases namely Downy Mildew, Powdery Mildew, Anthracnose, Gray mold, Black root, Crown Gall. Downey mildew disease is the Harmful disease to the plant of Grape. The some major factor that affect on grape field is Temperature, Humidity, Rain fall and wind flow. Wild species are more resistant. In the rainy season when humidity of environment is high so many diseases comes naturally & affect the plant. After the cutting of plants for grape production, in the first 40 to 65 days, the leaves of grapes are delicate & immature. At that time most disease comes. It can reduce profitability by 50%. The correct identification should be done in time. Little delay in identification can harm plant.

Disease effect depends on the temperature of the environment. If the temperature is low then humidity is high and heavy rain is harmful for grape field. As per conclusion we understand that disease is attack on plant when temperature is 10 to 23 degree Celsius or 23 to 27 degree Celsius.

This project aim is to provide the information about temperature, wind flow, rain fall & Humidity to the farmer. Because of this information farmer take the precaution before disease affects the plant.

II. PROPOSED WORK

This project work is dividing in two parts:

A. Transmitter Section

The following figure-1 shows that the transmitter section. In this project microcontroller played vital role. Here, different type of sensor is used for different operation.

This project contains the following important parameter:

1) Microcontroller
2) Rain fall Sensor
3) Humidity sensor
4) Temperature Sensor
5) Wind Flow Sensor
6) GSM Module
7) Hot Air Sprayer

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8) Display Unit
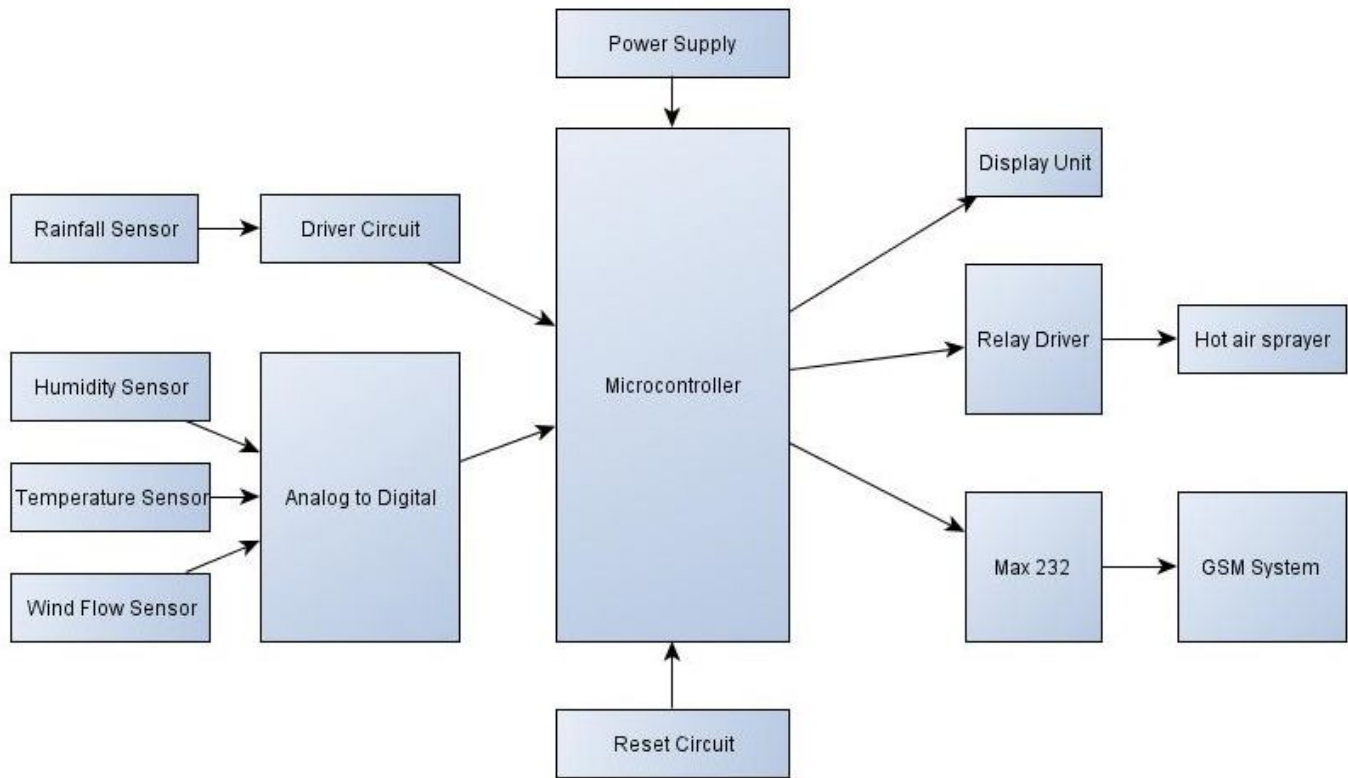9) Analog to Digital Converter (ADC)

Fig 1: Transmitter section present at a Farm

1) Microcontroller
Microcontroller played vital role in this project. All the operation of sensors handled by microcontroller & sends the data to receiver side by using the GSM Module.

2) Rain Fall Sensor
Rain fall sensor is used for sense whether rain fall or not. When rain is falling then it give 5v output to microcontroller otherwise no output.

3) Humidity Sensor
Humidity sensor sense humidity in atmosphere. We use humidity sensor in field measuring humidity and send reading to microcontroller. Which operate in DC 5.0v and operating temprature is 0-60°C.

4) Temperature Sensor
Temperature sensor (LM 35) is used for measure temperature in farm. That reads temperature and sends to receiver by using microcontroller & GSM module. Which is Calibrated directly in ° Celsius (Centigrade). Which have range rated for full −55° to +150° C. Suitable for remote applications. Operates from 4 to 30 volts.

5) Wind Flow Sensor
Wind flow sensor is used to detect directional flow of air. Which gives speed of wind and direction. Which is done by using dynomo that convert mechanical energy to electric form further converted this voltage in digital form using ADC.

6) GSM Module
GSM interface is the main feature of system. The readings taken through the sensors are given to the GSM modem to send by SMS. There are two GSM kit for transmission side which send SMS to user about weather condition and second one is at receiver side which is connect to PC receive message and display on PC.

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7) Hot Air Sprayer

Solar tube is used to generate hot air naturally. Generated hot air in solar tube is further compressed by air compressor which is mounted at top of solar tube. This compressed hot air is sprayed on crop.

8) Display Unit

It is an Alphanumeric Display. Used for displaying various messages. We have used 16 x 2 Alphanumeric Display.

9) ADC (Analog to Digital Converter)

In this project so many sensor are used for sense the data but all these sensor are analog. So, this analog data are required to convert in digital form because Microcontroller operates on digital signal. For that purpose ADC is used for interfacing of Different Sensor to microcontroller.
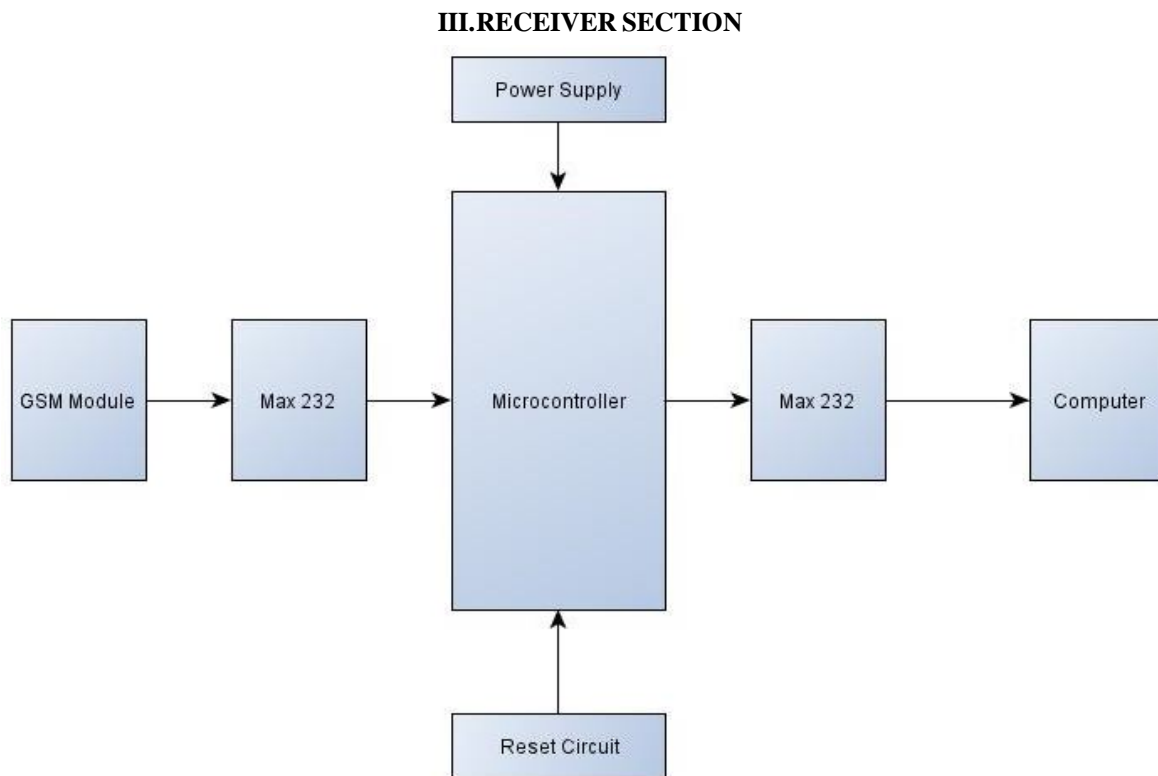
III.RECEIVER SECTION

Fig 2: Receiver Section

Figure-2 shows the receiver section of project. Receiver section contains the GSM module, Microcontroller and Computer. The GSM module receives the information from transmitter section & provide to the personal computer through microcontroller. This information monitors the former on the personal computer.

IV. WORKING OF PROJECT

This project work divides in two sections, i.e. Transmitter section & Receiver Section. Transmitter section played important role which is present in farm send the information about temperature, humidity, wind flow & Rain fall by using the different sensor. This information is also displayed on display which is present in Farm through microcontroller.

This information is send to receiver side by using GSM module. This received data is connected to personal computer for monitor. If any changes are take place in above information below or above the value which is set in microcontroller then the farmer take the respected precaution.

The following figure from figure 3 to 6 shows the effect of downey mildew disease. Figure 3 show the white spot on the back side of leaf of grape crop. Figure 4 show the yellow spot on the upper side of leaf. Figure 5 show the dark yellow spot on the upper side of leaf. Figure 6 show the dark yellow spot kills the tissue of leaf. Means finally when the tissue of leaf are kills by downey mildew disease then the production of grape is reduced.

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Downey mildew disease is effected grape field, when the condition of weather is changed. So this system provides the information about weather to farmer. Because of this project the farmer take the care of Grape field before any loss take place.

Fig 3: White spot of Downey mildew disease on backside of leaf

Fig 4: Yellow spot of Downey mildew disease on upper side of leaf

Fig 5: Dark Yellow spot because of Downey mildew disease on leaf

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Fig 6 : Dark Yellow spot kills the tissue of leaf

The following table shows the different disease affect on the grape field in different temperature & different weather condition. This system provides the information to the farmer like temperature, Humidity & weather condition through GSM module. On this information a farmer take the action to avoid the affect of disease on the grape field.

TABLE I
SHOW THE DIFFERENT DISEASE WITH TEMPERTURE & WEATHER CONDITION

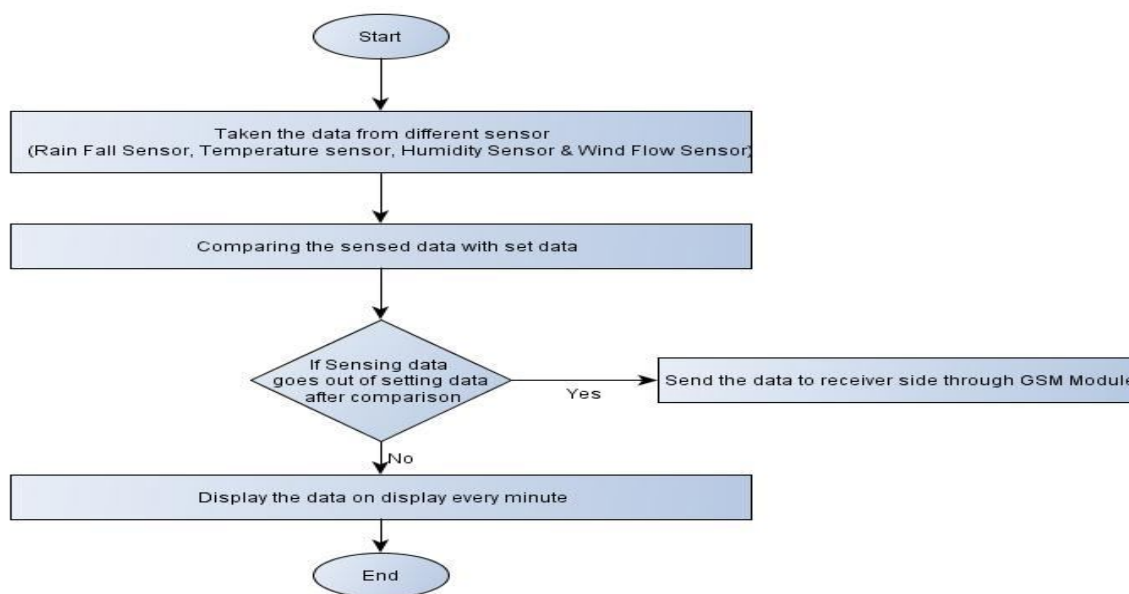| Disease	Temperature (in degree celcius)	Weather condition
Downy Mildew	22-26	Heavy Rain
Powdery Mildew	20-28	cloudy
Anthracnose	20-26	Rainy & heavy rain
Grey Mold	16-26	Cloudy , rainy & heavy rain
Black Rot	20-28	Rainy & heavy rain
Crown Gall	20-32	Heavy rain

V. FLOWCHART

Fig 7: Flowchart of Transmitter

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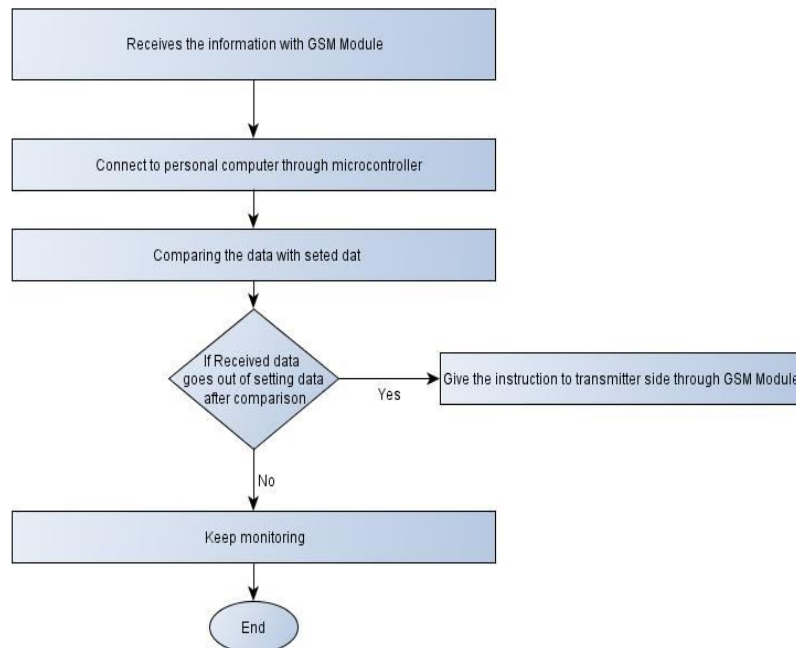
Fig 8: Flowchart of Receiver

VI. CONCLUSIONS

This system is used to prevent the grape field from so many disease. This system provides the information about the weather condition. When weather is changed then so many disease are affect the grape field. So, this system gives the idea about the humidity, temperature, Wind flow & rainfall. Hence, because of this system farmer take the prior precaution of the grape crop before the disease affect on the grap field. Because of this system the production of the grape fields increase & also the economy of farmer & country increase. The cost of this system is less & easy to handle.

VII.   ACKNOWLEDGMENT

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