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Greenhouse Monitoring Using Advance Sensors & Biogenetic Technology

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Abstract: **Agriculture in India is faced with many dare such as more production of food on fewer acres to keeping to outdated farming technologies. We can make rely farming on sensor technology. Sensor network has elaborated advantages in greenhouse environment.The technology shows that the network stability is good, the data is consistent with real conditional environment, and thus sensor technology can meet the requirements in the applications.**

Index Terms— **biogenetic, sensors, magnetic, vertical farming**

I. INTRODUCTION

The paper solution's simple, with modern greenhouse Sensor technology.Greenhouse avails a monitored and Controlledenvironment. so,a question arise what's going to be different with this ?we peruse to form a integrated Modern greenhouse with sensors that will Monitor temperature, soil moisture and regulate the Water supply which is channel through drip lines. The System is powered by solar panels and can also respond witha abstract of greenhouse climate parameters.

Sensors are used to monitor physical and environmental Parameters such as temperature, pressure and moisture Content in the field. Sensing unit has sensors and analogto digital converter (ADC) to convert analog sensedSignal to digital data.

World's 70% of water bis been provided for agriculture all over the world. India ranks second largest in farming in world with much less technology. A research has been made that 13.7% of gdp goes for agriculture in india in 2013.it exports 39 billion dollar i.e it is the 7th largest exporter worldwide and sixth largest net exporter which could make india to first rank in world for agriculture . also largest producer for fresh fuits,vegetables,,spices,milk,etc.second largest producer of dry fruits, textile raw materials such as roots,tubercrops,pulses,cofee,cotton,etc. India is at second rank.as agriculture has slower growth and productivity with much more technology we could make india's rank at the first position.

II. REMOTE SENSOR

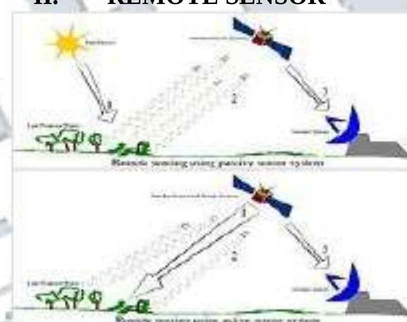

Fig 1.1

Remote sensing crops has proved to be an important factor in agriculture.it refers to a imaginary taken from field where the incident electromagnetic radiation is generally sunlight. When sunlight hits the surface of the crop, light will be reflected depending on the wavelength of the light. The most common remote sensing technique used in farming is spectral reflectance measurement where it is measured as a function of wavelength. The wavelengths measured in most applications cover the visible (400-700 nm) to near infrared (700-2500 nm) regions of the electromagnetic spectrum.

III. ELECTROCHEMICAL SENSOR

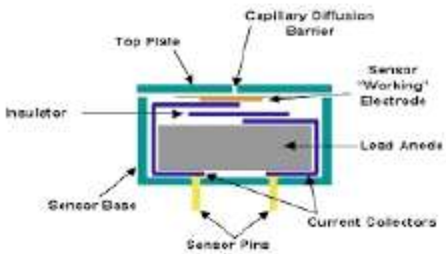

Fig 1.2

The most important application of electrochemical sensors in agriculture is the direct measurement of soil chemistry through tests such as pH or nutrient content. soil testing is importanty to obtain crop production and produce quality,tastyfood.two types of electrochemical sensors are commonly used to measure the activity of selected ions(H^+,K^-,NO^3,NA^+,ETC.) in soil.almost every sensing technique can have an application in agriculture.

IV. SILICON BAND GAP TEMPERATURE SENSOR

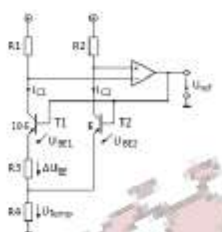

Fig 1.3

The silicon band gap temperature sensor is an extremely common form of temperature sensor used in electronic equipment. Its main advantage is that it can be included in a silicon integrated circuit at very low cost. The principle of the sensor is that the forward voltage of a silicon diode, which may be the base-emitter junction of a bipolar junction Transistor (BJT), is temperature-dependent, according to the following equation:

$$V_{BE} = V_{G0}\left(1 - \frac{T}{T_0}\right) + V_{BE0}\left(\frac{T}{T_0}\right) + \left(\frac{nKT}{q}\right)\ln\left(\frac{T_0}{T}\right) + \left(\frac{KT}{q}\right)\ln\left(\frac{I_C}{I_{C0}}\right)$$

T = temperature in kelvin
T0 = reference temperature
VG0 = band gap voltage at absolute zero
VBE0 = band gap voltage at temperature T0 and current IC0
K = Boltzmann constant
q = charge on an electron
n = a device-dependent constant

By comparing the band gap voltages of two junctions at the same temperature, but at two different currents, IC1 and IC2, many of the variables in the above equation can be eliminated, resulting in the relationship:

$$\Delta V_{BE} = \frac{KT}{q} \cdot \ln\left(\frac{I_{C1}}{I_{C2}}\right)$$

Note that the junction voltage is a function of current density, i.e. current/junction area, and a similar output voltage can be obtained by operating the two junctions at the same current, if one is of a different area to the other.

A circuit that forces IC1 and IC2 to have a fixed N:1 ratio, gives the relationship:

$$\Delta V_{BE} = \frac{KT}{q} \cdot \ln(N)$$

An electronic circuit, such as the brokawbandgap reference, that

Measures ΔVBE can therefore be used to calculate the temperature of the diode. The result remains valid up to about 200 °C to 250 °C, when leakage currents become large enough to corrupt the measurement. Above these temperatures, materials such as silicon carbide can be used instead of silicon.

V. BIOSENSOR

Biosensors have widely investigated for detecting chemical contaminants and food-borne pqathogens. Current bvacteria detection method.the biosensor is a combinaytion of a biomolecule recognition element that recognize and react with target pathogen.there are four main types of transducer are used in biosensors which are mostly used in biosensors namely electrochemical,optical,thermal transducer and acoustic wave(AW)device.in biomedical development and peptides have long seem used as biological recognition structure.

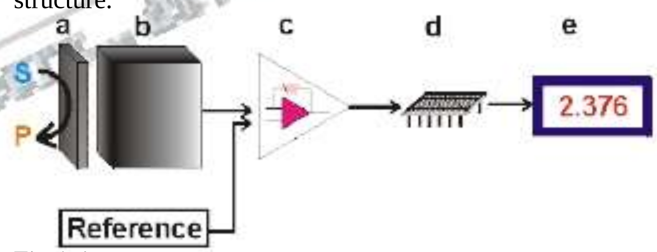

Fig 1.4

WIRELESS SENSOR

The advance wireless technology sensor have developed. It is used to enable to new precision in agriculture practice. Wireless sensor network contain radio frequency trans receiver. Soil,water,ion and VOC sensor,microcontroller global positioning sensor and power source are designed and are undergoing field trails .this technology is providing revolutionary that means for

Observing ,accessing and controlling agricultural practices. This technology is in its earliest development stage

Fig 1.5

VII.LEAF SENSOR

Fig 1.6

A leaf sensor is a phytometric device (measurement of plant physiological processes) that measures water loss or the water deficit stress (WDS) in plants by real-time monitoring the moisture level in plant leaves.

the leaf sensor technology has the potential to save between 30% and 50% of irrigation water by reducing irrigation from once every 24 hours to about every 2 to 2.5 days by sensing impending water deficit stress. Leaf sensor technology indicates water deficit stress by measuring the turgidity of a leaf, which decreases dramatically at the onset of leaf dehydration. Early detection of impending water deficit stress in plants can be usedas an input parameter for precision irrigation control by allowing plants to communicate water requirements directly to humans and/orelectronic interfaces. For example, a base system utilizing the wirelesslytransmitted information of several sensors appropriately distributed over various sectors of a round field irrigated by center-pivot irrigation system could tell the irrigation lever exactly when and what field sector needs to be irrigated

VI. MAGNETIC LEVEL SENSOR

A magnetic levelgaugeis used to measure the level of fluids. A magnetic level gauge includes a "floatable" device that can float both in high and low density fluids. Magnetic level gauges may also be designed to accommodate severe environmental conditions up to 210bars at 370 °C.Magnetic float level sensors involve the use of a permanent magnetSealed inside a float whose rise and fall causes the opening or closing of a mechanical switch, either through direct contact or in proximity of a reed switch.With mechanically actuated floats, the float is directly connected to micro switch. For both magnetic and mechanical float level sensors, chemical compatibility, Temperature, specific gravity (density), buoyancy, and viscosity affect the selection of the stem and the float.

CONCLUSION

Thus in the field of agriculture sector we need to look for different technologies which can solve all the upcoming problems and present problems with the help of greenhouse technologies with better productivity and quality of food products in every possible way with the use of minimum possible toxins and chemical fertilizers.there are always two side of technologies one gives us advantage and other gives disadvantages because no technology is perfect in real world.so the scientist and researchers have been trying to develop such a technology with alots of benefits to mankind with minimum acceptable loss.

REFERENCES

1.www.wikipedia.com
2.www.youtube.com
3.www.coursera.com
4.www.edx.com
5.Sensor Technology Handbook: Jon S. Wilson
6.www.nptel.com