TIME EFFICIENT AND COST EFFECTIVE AUTOMIZATION IN POLYHOUSE

[1] Nikale Priyanka, [2] Padwal Radhika, [3] Rathod Pooja, [4] Sawant Snehal, [5] Dr. Gunjal Baisa

[1] *Nikale Priyanka, BE Student, Computer Engineering, AVCOE, Sangamner, Maharashtra, India*
[2] *Padwal Radhika, BE Student, Computer Engineering, AVCOE, Sangamner, Maharashtra, India*
[3] *Rathod Pooja, BE Student, Computer Engineering, AVCOE, Sangamner, Maharashtra, India*
[4] *Sawant Snehal, BE Student, Computer Engineering, AVCOE, Sangamner, Maharashtra, India*
[5] *Dr. Gunjal Baisa, Associate Professor, Computer Engg., AVCOE, Sangamner, Maharashtra, India*

ABSTRACT

India has vast area, but current status of agriculture management is not sufficient to10 provide everything to the population, which can be problematic. The solution to this issue is the practice of protected farming which includes polyhouse farming. The greenhouse covered with simple polyethylene sheet is termed as polyhouse. The function of a polyhouse is to create the optimal growing conditions for the full lifecycle of the plants. Here our objective is to design automated polyhouse. The aim and objective of this project is to design and implement an cost effective and time efficient automatic pesticide distribution system. In this we will develop a mobile based irrigation control system .Here we will use the idea of coffeemaker which mix up two or more pesticide and distribute among crops in polyhouse using drip system.

Keyword : - *Microcontroller, Microprocessor, Fertigation system, Sensors , Drip irrigation.*

INTRODUCTION

In India 60-70 percent economy depends on the agriculture. With the different landforms, different atmospheric conditions and unplanned use of waters natural resources which causes the shortage of water forces us to think in different way. The aim and objective of this project is To develop time efficient working and costeffective designing of polyhouse model. In this work we have developed polyhouse which can be controlled through internet and To design the automatic controller circuits by using the combination of software and hardware. Here we proposed fertigation system which can offeredable to each farmer. Also use of website to control pesticide irrigation and water irrigation in polyhouse. It is microcontroller based system which also sends message on provided mobile number on any type of irrigation starts.

1.1 Drip Irrigation

This system useful in the sense of irrigate the water the root of crops ,so that it gives better advantage as effective growth of plants.It is an efficient technique which is primarily used in hot tropical conditions . It conserves water

and fertilizer .It allow water to drip slowly to the root of plants through valves, pipes, tubing etc. In this we are providing water as requirement of drop therefore there is no problem of over watering[3].

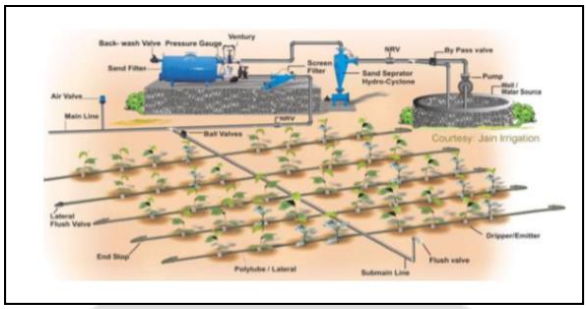


Fig 1. Layout of Drip irrigation

1.2 Fertigation System:

With the help of drip irrigation system we can also provide the fertilizers to crop. This process is called as fertigation. Fertigation has the potential to ensure that the right combination of water and nutrients is available at the root zone, satisfying the plants total requirement of water and nutrient. Here we designed computer program for estimation of irrigation water requirement, required amount of fertilizers, and capacity of fertilizer tank, capacity of drip system, injection duration and injection rates at different levels of Fertigation. Fertigation resulted in saving of 40% fertilizers as compared to the broadcasting method of fertilizer application without affecting the crop yield[1] .

LITERATURE SURVEY:

Ms. S. R. Kanawade and Prof. S. G. Galande Proposed the work to go through the techniques which will show us how to improve productivity with the minimum use of natural resources like water, and avoid leaching of soil by using fertilizers through drip.

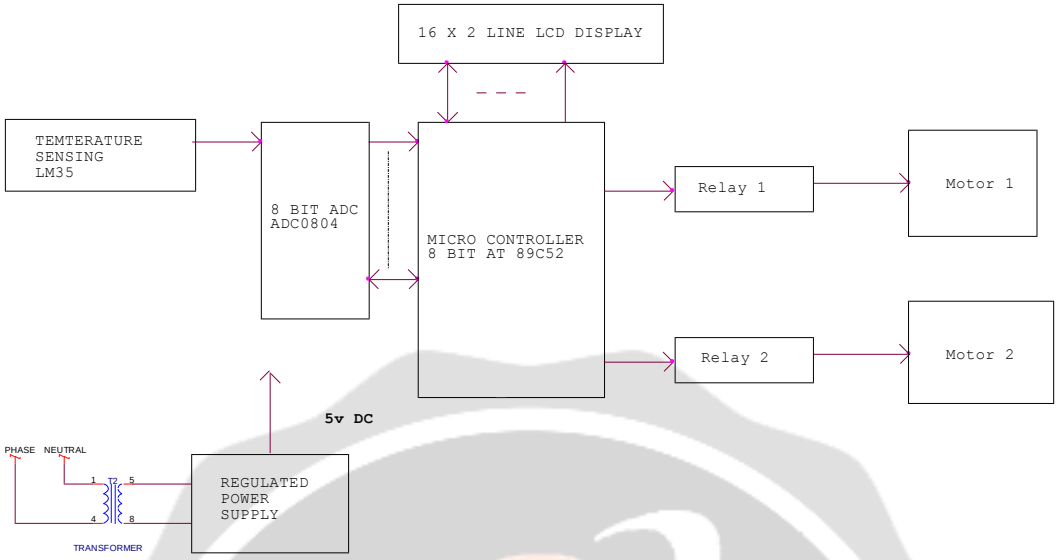
Vimal.P, Priyanka.V, Rajshree.M, Santhiya Devi.P.T, Jagadeeshraja. M, Suthanthira Vanitha.N Proposed the work on the automatic irrigation and fertigation using embedded system in the field of both plain and slope areas. The main objective is to provide uniform and required level of water avoid water overflow at the slope areas.

Mr. S.G. Galande, Dr. G.H. Agrawal Proposed the conventional irrigation methods like overhead sprinklers, flood type feeding systems usually wet the lower leaves and stem of the plants. The entire soil surface is saturated and often stays wet long after irrigate on is completed. Such condition promotes infections by leaf mold fungi.

Rashid Hussain, JL Sahgal, Anshu lgangwar, Md. Riyaj Proposed the work to get the information about the fertility of soil and secondly moisture content of soil. After measuring these two factors a farmer can start sowing of seeds.

Baljit Kaur and Dilip Kumar Proposed the work In efficient management of nutrient inputs has put a large constraint on the environment and humans health So the farmers has to pay close attention to nutrient management and incorporate the concept of balanced plant nutrition in to their farming techniques. The balanced nutrition level to plant is provided by managing pH and Electrical conductivity level of fertilizer solution according to soil pH and electrical conductivity.

PROPOSED SYSTEM:



ALGORITHM

Login:

1. Start
2. Enter User name and Password
3. If user enter valid user name and password
    a. goto step 4
    b. else goto setp 2
4.
    a. Automatic =0
    b. manual =0
5. If automatic= 1
    a. goto step 6
    b. else if manual =1 goto step 7
    c. else stop
6. Start automatic control
7. Start manual control
8. stop

Manual control Algorithm:

1. Start
    a. if manual ==1
    b. goto step 2
    c. else step 8

2.

a. Start =0

b. Stop=0

3.

a. DI=0

b. FI=0

4. If start ==1

a. goto step 5

b. else if stop==1

c. goto step 8

5. If DI==1

a. then goto step 6

b. else if FI==1

c. goto step 7

6. Start drip irrigation

7. Start pesticide irrigation

8. stop

Automatic Control :

1. If automatic ==1

a. got step 2

b. else step 8

2. Select crop

3. Initialize

a. Cd=Current date

b. Ct=Current time

4. Initialize

a. c= crop day's

b. t=crop time

5. Check previous irrigation date

a. where pdate=previous irrigation date

6. If (Cd==pdate+c && Ct==t)

a. then goto step 7

b. else goto step 8

7. Start irrigation

8. stop

Drip Irrigation:

1. Start irrigation module
2. Sence temperature from soil of polyhouse
3. Check current crop and max Temperature
4. Stemp=sensed temperature
    a. if(stemp>maxtemp)
    b. goto step 5
    c. else goto step 6
5. Start motor and irrigation of water
6. Goto step 2
7. Stop

Pesticide Irrigation:

1. Start Fertigation module
2. Check for availability of pesticides
    a. CP1= Required pesticide 1 for crop
    b. CP2=Required pesticide 2 for crop
    c. p1=amount of pesticide 1
    d. p2=amount of pesticide 2
        i. if((cp1<p1)‖(cp2<p2))
        ii. then goto step 3
        iii. else goto step 5
3. Fill available pesticide
4. Mixture p1 +p2
5. Irrigation pesticide through drip
6. stop

RESULT

The scenario for context aware agriculture is as follows.

1 .Provides system access by remotely and manually.

2. Sensor are placed in polyhouse, used for sensing temperature .

3. Depending on temperature drip irrigation on/off.

4. Pesticide irrigation start /stop on basis of calendar date and clock time.

4. CONCLUSIONS

The Microcontroller based automatic irrigation and fertigation system that has been implemented at relatively low cost technique proves to be a real time feedback control system which monitor sand controls all the activities of drip irrigation system efficiently. The irrigation automation system can be used in several commercial agricultural productions since it will obtained in low cost and in reliable operation. This application o f sensor-based irrigation has showed that each drop of water gives good crop yield, proper and required amount of nutrient for crop

which also avoid leaching. Based on the rules and context situations different treatments were performed to properly irrigate the area under consideration. This system can also transfer fertilizer and the other agricultural chemicals (calcium, sodium, ammonium, zinc) to the field with adding new sensors and valves. Using this system, farmer can save manpower, water to improve production and ultimately profit.

6. REFERENCES

[1]Ms. S. R. Kanawade, Prof. S. G. Galande," Fertigation Through Drip Irrigation using Embedded System",International Journal of Technical Research and Applications, ISSN: 2320-8163,Vol. 3, No. 1, PP. 14-17,Jan-Feb 2015.

[2]VimalP., PriyankaV., RajyashreeM., SanthiyaDeviP.T., JagadishrajaM., Suthanthira Vanitha N., "A Novel Approach for Automatic Irrigation and Fertigation Using EmbeddedSystem", International Journal of VLSI and Embedded Systems,ISSN:2249 6556 Vol 05,No. 03257,PP.855-859 March 2014.

[3]R.K.Yadav, P.Kalia, H. Choudhary, Zakir Husainand BrihamaDev ,"Low-Cost Polyhouse Technologies For Higher Income and Nutritional Security",International Journal of Agriculture and Food Science Technology, ISSN 2249-3050, Vol.5,No.3, pp.191-196 , 2014.

[4]Tanvir Manhotra, Nikhil Gaikwad, Rohit Dudi, Rohit Gupta," Automated Polyhouse for Optimal Growth of Plants", International Journal of Emerging Technology and Advanced Engineering, ISSN2250-2459,ISO9001:2008Certified Journal, Vol.4, No. 5, PP.563-567, May 2014.

[5]Mr. S.G. Galande, Dr. G.H. Agrawal,"Embedded Controlled Drip Irrigation System ",International Journal of Emerging Trends Technology in Computer Science (IJETTCS) ISSN 2278-6856 , Vol. 2,No. 5,PP.37-41 Sept Oct 2013

[6]Baljit Kaur, Dilip Kumar,"Development of Automated Nutrients Composition Control Fertigation System ", Centre for Development of Advanced Computing (CDAC) Mohali, International Journal of Computer Science, Engineering and Applications (IJCSEA) Vol.-3, No.-3,pp.67-78, June 2013.

[7] Rashid Hussain, JL Sahgal, Anshulgangwar, Md.Riyaj," Control of Irrigation Automatically By Using Wireless Sensor Network", International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Vol.-3, No.-1, pp.324-328, March 2013.

[8]Deepti Bansal, S.R.N Reddy ,"WSN Based Closed Loop Automatic Irrigation System", International Journal of Engineering Science and Innovative Technology (IJESIT) ISSN: 2319-5967 ,ISO 9001:2008 Certified , Vol. 2, No. 3,PP.229-237 May 2013

[9] Yogesh R. Sonawane, Sameer Khandekar , Bipin Kumar Mishra , K. K. Soundra Pandian, "Environment Monitoring and Control of a Polyhouse Farm through Internet", Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur (UP) 208016, India Indian Institute of Information Technology, Design and Manufacturing, Jabalpur (UP) 482005,pp. 1-6, India-2009.

[10]"Jain Greenhouse,Polyhouse and Nursereis" ,Tchnical manual,PP.85-94.