

Fenugreek Production using automatic Hydroponics System

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Abstract :- Hydroponics is a technique to grow the plants without using the soil. The main aim of the work is to automatic recycle of water by adding lack of nutrients in water. This technique ensures the plants get all nutrients needed from the water and it continuously monitoring the pH value and water level using sensors and it displayed on LCD. Calcium and Magnesium value is recorded manually. Arduino software is used for implementation.

1. INTRODUCTION

Agriculture sector is a major source of income in country like India. Smart forming is seen to be the future of agriculture as it produces higher quality of crops by making farms more intelligent in sensing its controlling parameters

like minerals in a water. Hydroponics comes from the Greek Hydro –“Water and Ponos -labor”. [1] Plants can grow using mineral nutrient solution only or in an inert medium such as gravel mineral wool,coconut husk or rice husk

The soil itself is not essential to plant growth. Basically soil acts as mineral nutrient reservoir. We only need the mineral nutrient in the soil but dissolve in water. Plant roots are able to absorb them we the required mineral nutrients are introduced into a plant’s water supply artificially. Soil is not longer required for the plants to thrive.[1]

2.BLOCK DIAGRAM

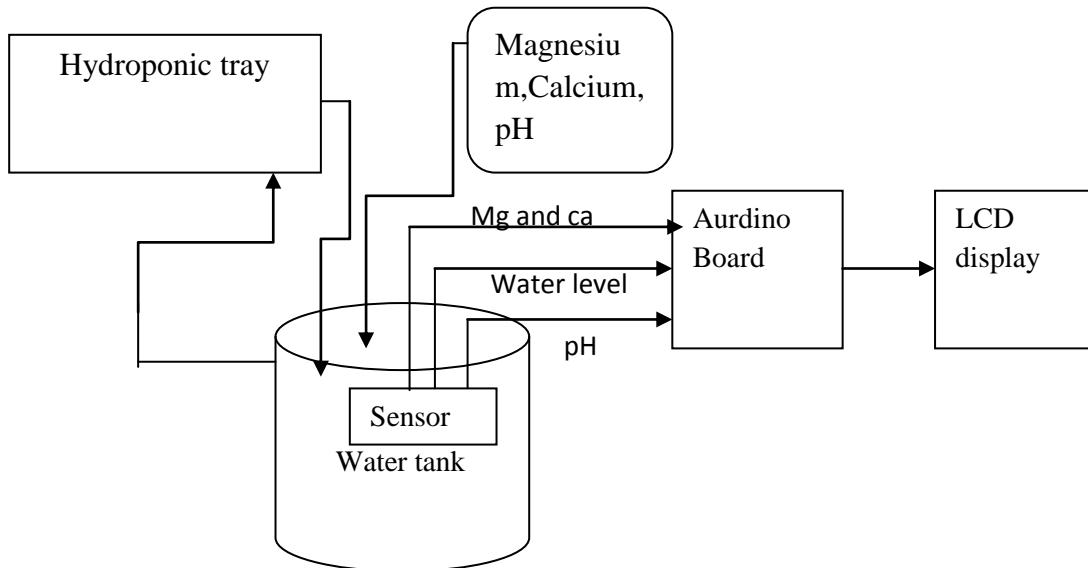


fig 2.1. Block diagram of fenugreek production using automatic hydroponic system

3.HARDWARE WORKING

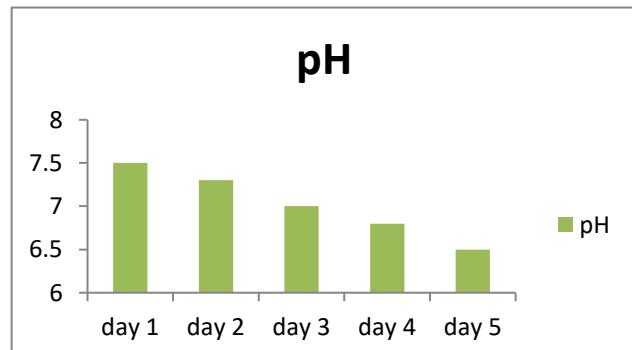
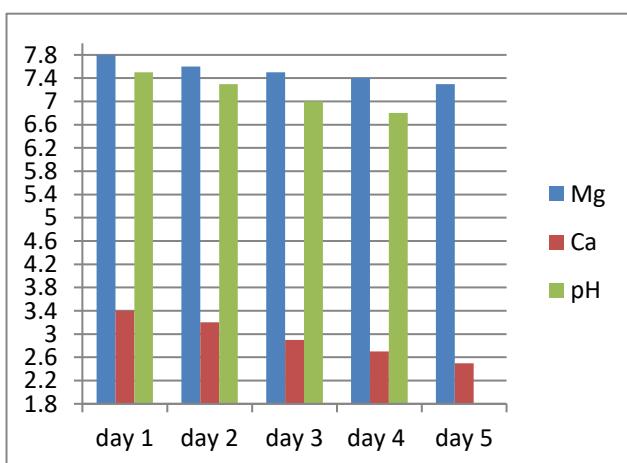
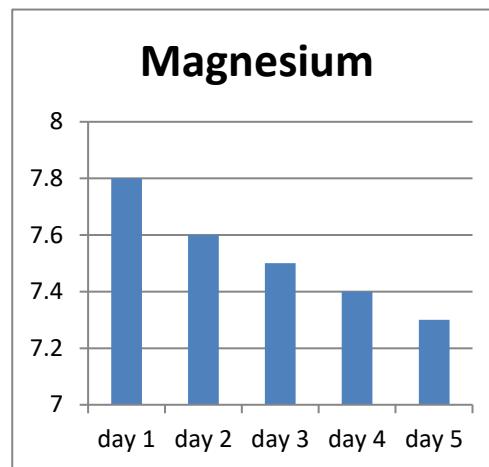
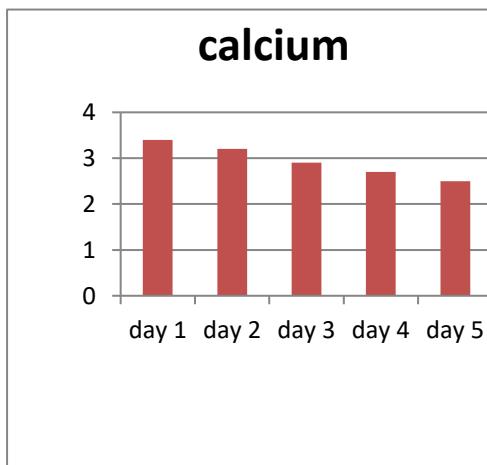
This paper explain the growth of a plant without using a soil. Here it uses only a water to sprout the seeds and grow the plants. Hydroponic system is used tray to grow the plants and tray should be filled with water then put the seeds into tray. So the seeds start to sprout after one day and here seeds absorbs the minerals from the water[2]. Day by day the mineral contents in the water starts reducing. This data of Mg, and Ca has checked by using titration method. pH value by pH meter and water level in the tray using

water level sensor is continuously monitoring. If mineral content, pH level is less than normal level in water, then plants failed to grow. Hence this experiment automatically add the minerals to the water to grow the plants[2], And if water level is reduced, then water is pumped to the tray up to required level. Minerals are added according to the data displayed in LCD screen. This hydroponics tray can place inside the house, and because of sufficient nutrients healthy plants can grow.



Fig 3.1. LCD Display

4. ANALYSIS OF NUTRIENTS



The normal water having a minerals such as Magnesium(Mg), Calcium(Ca), pH and so on. The mineral content in the water should be normal, if the value level of mineral is varied it becomes insufficient to sprout seeds in the water [3]. By titration method Magnesium (Mg) and

Calcium (Ca) level in water is checked. According to the titration method, the Mg level for first day is 7.8 and day by day the value of Mg level is reducing to 7.3 and similarly, Ca level for first day is 3.4 and decreased upto 2.5, and also pH value is 7.5 to 6.5.

CONCLUSION

The mineral values are monitored everyday and the values of magnesium, calcium and pH is decreased day by day. when values comes below the normal level .Externally supplies the minerals to the water. So that plants will get sufficient minerals to grow.This hydroponics tray can place inside the house, and because of sufficient nutrients healthy plants can grow.

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