Automated Drip Irrigation System Using Soil Moisture Sensors

ANAND B KUDOLI [1], KUMAR AWNI [2], ASHISH VALVI [3], KRISHNA WADLE [4], TUSHAR YELMAR [5], RIO LAITONJAM [6]

[1, 2, 3, 4, 5, 6] *Department of Civil Engineering, Pimpri Chinchwad College of Engineering and Research, Ravet-Pune 412101*

Abstract- Use of soil moisture sensors to optimize the drip irrigation system and increase the efficiency of conventional drip irrigation system. The wastage of even little amount of water is also not there and it can be useful in reducing the wastage of water.

Indexed Terms- drip irrigation, soil moisture sensors

I. INTRODUCTION

1) As the current drip irrigation system is the advanced and most modern technique of irrigation in INDIA, so it is used mostly in irrigation of almost all the crops. Sometimes, in this system also there are some difficulties and the most seen difficulty is not giving the exact amount of water to the crops and it gets extra and there is loss of some amount of water.
2) To solve this problem soil moisture sensors are introduced in the drip irrigation system.
3) They detect moisture easily and a programmed system beside the drip irrigation makes it possible to reduce the wastage of water.

II. RESEARCH METHODOLOGY

Various fields were visited to enquire about the drip irrigation system and all setup with the problems associated with it.

The problems associated with the conventional drip irrigation system were studied in detail and solutions were made out from them.

Soil moisture sensors were introduced to reduce the water wastage problem so that the efficiency of the system can be increased.

III. ANALYSIS

Various parameters of soil were studied and the moisture parameter is being studied for resolving the problem.

Different plants' duty, delta and base period and moisture were also studied and it was found that most of the plants average range of moisture goes between 20%-60%.

Exception comes for some crops which sometimes need excessive water and some plants need less than the average initial value i.e., <20%

Fig 3(a) - conventional drip irrigation system
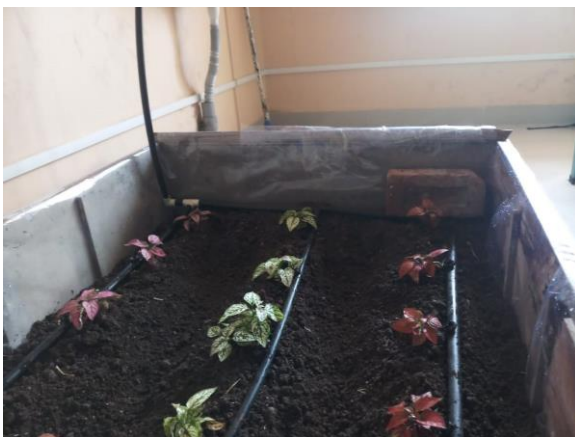
Fig 3(b) - drip irrigation piping system

Fig 3(c) - automated drip irrigation system.

IV.   CONCLUSION

From analysis and results we can conclude that the moisture parameter can be taken to resolve the water wastage problem in the fields in which thw drip irrigation system is installed within a range of 20%-50%. The higher limit is 50% and the lower limit is 20%

REFERENCES

[1]   Ling, Peter. "A review of soil moisture sensors." Assn. Flor. Prof. Bull 886 (2004): 22-23.

[2]   Khanna, Neha, Gur Mohan Singh, D. K. Jain, and Manjit Kaur. "Design and Development of Soil Moisture Sensor and Response monitoring system." *International Journal of Latest Research in Science and Technology ISSN (Online)* (2014): 2278-5299.

[3]   Kumar, D. Suresh, and Kuppannan Palanisami. "Impact of drip irrigation on farming system: Evidence from southern india." *Management, Performance, and Applications of Micro Irrigation Systems* (2014): 19.

[4]   Abbasi, Abu Zafar, Noman Islam, and Zubair Ahmed Shaikh. "A review of wireless sensors and networks' applications in agriculture." *Computer Standards & Interfaces* 36, no. 2 (2014): 263-270.