

STUDY OF DRIP IRRIGATION SYSTEM ON CROP PRODUCTION

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Abstract - Drip irrigation is the slow and application of low pressure water soil and plants using plastic tubing placed near the plant root zone . It is an alternative to sprinkler or furrow methods of irrigating crops. Drip irrigation can be used for crops with high or low water demand. Drip irrigation water contact with crops leaves, stems and fruit. A drip irrigation system can be automated . This system revealed that production of the crops became almost double after applying drip irrigation method in selected vegetable crops like Tomatos, potatos, bitter gourd and chilly . The main causes of popularity of drip irrigation was due to saving in water.

Key Words: Drip Irrigation System , Crop Production , Optimized Water Utilization , Crop Yied , Quality

1. INTRODUCTION

Water is the precious natural resource, a basic human need and a prime national asset. The extent to which the water is plentiful or scarce, clean or polluted, beneficial or destructive, profoundly influence the extent and quality of human life. The relentless increase in population and the resulting spurt in the demand for water require careful planning and management of the limited water resources. Drip irrigation, also known as trickle irrigation is a method which minimizes the use of water and fertilizers by allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, through a network system of valves, pipes, tubing, and emitters. As the drip systems are found giving some troubles in some of the farmer's fields and farmers experience some maintenance problems under drip irrigation system.

1.1 DRIP IRRIGATION

Drip Irrigation System is defined as any Watering System that delivers a slow moving supply of water at a gradual rate directly to the soil. In other words, it is a method of crop irrigation that involves a controlled delivery of water to plants through system of pipes, valves, tubing and emitters. The water is delivered from a source directly to the root zone of individual plants or to the surface of the soil. Water drips constantly onto plants to keep them well watered. Drip irrigation is also called trickle irrigation. Drip Irrigation

System is the most efficient water and nutrient delivery system for growing crops. Irrigation may be defined as the process of supplying water to land by artificial means for the purpose of cultivation. Ordinarily water is supplied to land by nature through rain but generally it is not enough for the proper growth of plants. Drip Irrigation System distributes water through a network of valves, pipes, tubing, and emitters. Drip irrigation systems can help reduce evaporation and runoff, and contribute to water conservation. However, before this system can work correctly it must be properly installed and managed.

1.2 Components of drip irrigation

- Bottle
- Crop bowel

1.3 Types of Crops used

1. Moong
2. Millet
3. Paddy

2. Need of Drip Irrigation:-

Water Efficiency - Drip Irrigation will deliver water directly to the root zone of the plant. The water will seep slowly into the soil one drop at a time. You will see that almost no water is lost from evaporation or through water running off into other direction, rather than the plant you are actually trying to nourish.



Reduce costs - Yards, Gardens and Drip Irrigation System are all so different, its hard to calculate the savings on the bill. The studies say that, on average, a person will use about 50% less water, and depending on different features and how efficiently the drip system is planned and set up, it can save upto 70%.

Save time - Drip Irrigation can eliminate the need to drag around hoses and sprinklers, set timers, and make sure you remember to rotate and shut them off when all the rotation is done. Even if you don't want to invest in a timer, you will really only need to turn it on once and remember to shut it off anywhere from 5-10 minutes later, So much easier than rotating sprinklers.

Reduce growth of Weeds - Drip Irrigation delivers water directly to the plants you want to grow, less water is wasted on weed. The soil between the plants will remain drier, which discourages weeds from sprouting.



3.1 Advantages of Drip Irrigation:

- Maximum use of available water.
- No water being available to weeds.
- Maximum crop yield.
- High efficiency in the use of fertilizers.
- Less weed growth and restricts population of potential hosts.
- Low labour and relatively low operation cost.
- No soil erosion.
- Improved infiltration in soil of low intake.
- Ready adjustment to sophisticated automatic control.
- No runoff of fertilizers into ground water.
- Less evaporation losses of water as compared to surface irrigation.
- Improves seed germination.

3.2 Disadvantages of Drip Irrigation:

- Sensitivity to clogging.
- Moisture distribution problem.
- Salinity hazards.
- High cost compared to furrow.
- High skill is required for design, install and operation.

Days	Mug(cm)	Millet(cm)	Paddy(cm)
01/03/2019	0.00	0.00	0.00
02/03/2019	0.00	0.00	0.00
03/03/2019	1.20	0.90	0.70
04/03/2019	2.40	1.80	1.55
05/03/2019	4.10	3.10	2.25
06/03/2019	5.40	4.20	3.90
07/03/2019	7.20	6.60	4.40
08/03/2019	9.40	7.10	5.20
09/03/2019	10.60	8.00	6.3
10/03/2019	12.00	9.00	7.00
11/03/2019	13.40	10.60	8.30
12/03/2019	14.60	11.40	9.95
13/03/2019	16.00	13.50	11.50
14/03/2019	17.40	14.96	12.45
15/03/2019	19.00	16.30	14.00
16/03/2019	19.10	17.10	14.10
17/03/2019	19.50	17.50	14.50
18/03/2019	21.00	19.50	14.9
19/03/2019	22.50	20.00	15.20
20/03/2019	23.00	20.5	15.50

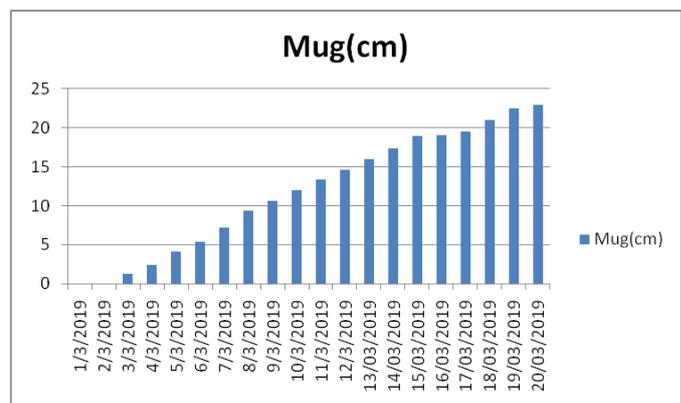


Chart -1: Mug crop height

Table -1: Results of crop heights

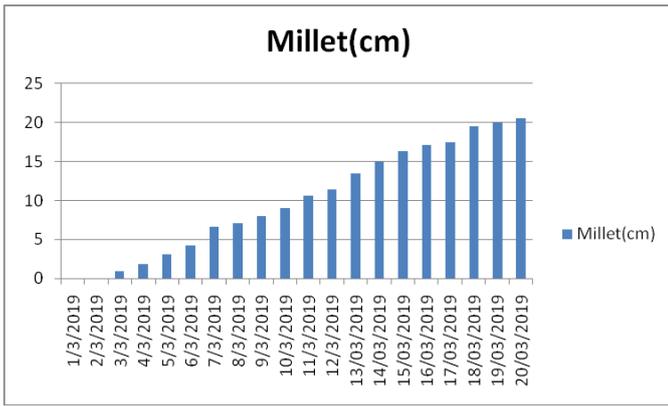


Chart -2: Millet crop height

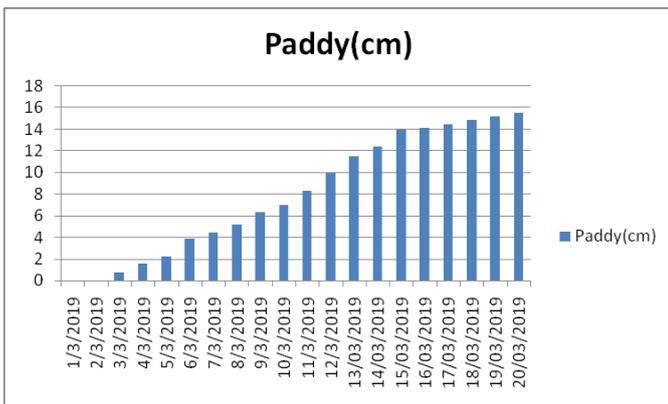


Chart -3: Paddy crop height

[3]Giuseppe P, Domenico P and Pietro D (2005). Simplified procedure to evaluate head losses in drip irrigation laterals. Journal of Irrigation and Drainage Engineering 3(131) 525-532. •Engineering 2(128) 376-384.

4. CONCLUSIONS

Drip irrigation is a latest sub –surface method of irrigating water with higher water demands in arid region. It may not be applicable to all farms. Yet, when properly designed , installed and managed, drip irrigation may achieve water conservation by reducing evaporation and deep drainage when compared to other types of irrigation such as flood or overhead sprinklers since water can be more precisely applied to the plants root. In addition , drip can be eliminate many diseases that are spread through water contact with foliage. The paddy’s crops require more water so the this method is not suitable for this crop. Drip irrigation is suitable for a moong and millet crop.

REFERENCES

- [1]Krishna Reddy, Y.V., Sirisha Adamala and Bachina Harish Babu. 2017. Case Study on Performance Evaluation of Drip Irrigation Systems in Selected Villages of Guntur District, Andhra Pradesh, India. Int.J.Curr.Microbiol.App.Sci. 6(2): 437-445.
- [2]Badr MA and Taalab AS (2007). Effect of Drip Irrigation and Discharge Rate on Water and Solute Dynamics in Sandy Soil and Tomato Yield. Australian Journal of Basic and Applied Sciences 1(4) 545- 552.