

Study and Anaylysis of Drip Irrigation

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ABSTRACT: *Drip Irrigation is also known as Trickle Irrigation. It is one of the sub-surface irrigation method of delivering water and nutrients to crops through small emitters directly to the roots zone. It is the most efficient water and nutrients delivery system for growing crops. The drip irrigation not only delivers greater ROI but it also gives farmers an efficient way to operate their farms compared to other irrigation systems. By using Drip irrigation farmers are benefited by many things like higher consistent quality yields, there will be huge water savings with no runoff & no evaporation, farmers would be able to utilize 100% of land, there will be huge amount of energy savings as drip irrigation works on low pressure. How drip irrigation works? Water and nutrients are delivered across the field in pipes called 'dripperlines' featuring smaller units known as 'drippers'. Each dripper emits drops containing water and fertilizers, resulting in the uniform application of water and nutrients direct to each plant's root zone, across an entire field.*

Keywords: *Drip Irigation, ROI, dripperlines, dripper.*

1. INTRODUCTION

Land and water are the basic needs for agriculture and economic development of the country. According to International Water Management Institute (IWMI) it is predicted that by 2030 state that one-third of the world's population will face absolute water scarcity. Irrigation has been considered essential for the fast growth in agriculture which consumes more than 80% of the country's exploitable water resources. The overall development of the agriculture sector and the intended growth rate in GDP is largely dependent on the wisely use of the available water resources. Hence, drip irrigation technologies are aggressively promoted in India by the central government, state governments and many nongovernmental organizations (NGOs), both local and international, by providing different kinds of financial, institutional and technical support systems. These technologies are promoted primarily for one or more of the following reasons: as a means to save water in irrigated agriculture, as a strategy to increase income and reduce poverty, and to enhance the food and nutritional security of rural households. This Scheme on Micro Irrigation, which aims at increasing the area under efficient methods of irrigation viz. drip irrigation. Drip irrigation is an efficient method of providing irrigation water directly into soil at the root zone of plants and thus, minimizes conventional losses such as deep percolation, runoff and soil erosion. Unlike surface irrigation, drip irrigation is more suitable and economical if it is introduced in water scarce areas having undulated topography, shallow and sandy soils and for wide spaced high value crops. It also permits the utilization of fertilizers, pesticides and other water-soluble chemicals along with irrigation water resulting in higher yields and better quality produce. Just like humans, plants like to get their water and nutrients in a balanced way. Nobody wants to eat a

month's worth of food in one day, and the same goes for plants. Which is why drip irrigation applies water and nutrients frequently and in small doses, ensuring optimal growing conditions that helps produce the highest yields possible. Hence, drip irrigation system is regarded as solution for many of the problems in dry land agriculture and improving the efficiency in irrigated agriculture. In this direction various schemes to promote drip irrigation are being implemented. Thus, in the process of achieving higher efficiency of drip irrigation, it is necessary for the drip irrigation farmers to know the benefits and the constraints of the system. By 2050, there will be 10 billion people living on our planet and 20% less arable land per person to grow enough calories. Include increasing water scarcity, and it's clear why we need a way to increase agricultural productivity and resource efficiency. That's where drip irrigation fits in, changing the economics of global agriculture by allowing farmers to produce more calories per hectare and cubic meter of water. .

LITERATURE REVIEW

The land and water constitute the country's essential necessities for agriculture and monetary increase. The International Water Management Institute (IWMI) estimates that through the cease of 2025, 1/three of the world's population will face absolutely the water shortage. A method of irrigation became needful for speedy improvement of agriculture that consumes tons than 80 possibilities of an exploitable water materials of world. The average productiveness of the rural region and the predicted charge of increase in GDP depend in large part at the realistic use of the to be had water materials. In India, but, micro-irrigation techniques are actively supported via the national authorities, usa governments, and numerous nearby and distant places non-governmental corporations (NGOs) thru providing numerous kinds of social, administrative, and technological assist systems. Such enhancements are marketed especially a way to keep water withinside the irrigated agriculture, its main motive is to increase the nutritional values of food and vegetables Various drifferent method has been praposed regarding this theory. therefore, it's miles critical for the drip irrigation farmers to realize the blessings and policies of the technique withinside the technique of accomplishing better output of the drip irrigation. typically, the policies do now not require water to be pumped into the air that has now now not been thoroughly dealt with to the necessities of potable water. widespread floor formulations of timed-launch fertilizer are regularly inefficient due to the present day techniques the water is dealt with withinside the drip device, due to the fact the drip mechanisms once in a while mixture liquid fertilizer with the irrigation water. From modern-day university field research, the usage of the fertilizer economic savings of as an awful lot as ninety five percentage became recorded using drip fertilization and slow water distribution relative to elevated discharge and micro-spray head irrigation. well planned, built and controlled, dripirrigation can assist to carry out water performance thru minimizing evaporation and deep runoff relative to unique irrigation kinds together with overhead or flood sprinklers, as water could have delivered more at once to the plants roots. additionally, drip can dispose of many sicknesses transmitted through contact with the plants via spray. ultimately, there may be no actual water monetary financial savings in regions wherein water reasssets are distinctly reduced, however as an alternative without a doubt an growth in name for via eating the same extent of water as before. The possibility approach is to spread irrigation water as gently as viable in very arid regions, or on sandy soils.

COMPONENTS AND FUNCTION

A. Water Pump

A pump of a appropriate capability water pump is used to deliver water via the drip irrigation

device additives at a particular stage of strain. If the supply of a water deliver is a bore well, open well, or a Canal, there's the opportunity of natural and inorganic overseas our bodies withinside the water. In this case, use the suction clear out out to get exceedingly easy water. The electric powered cars or diesel engines are the not unusualplace high mover of the pump. Recently the sun pump is getting used to popularize it for drip irrigation purposes.

B. Filter Unit

These filters come because the number one clear out out unit, and that is effective towards inorganic suspended solids, organic substances, and different natural materials. Media Filter includes quality gravel and sand of decided on sizes positioned in a pressurized tank. It allows to cast off natural materials along with algae and different vegetative materials gift withinside the water. The media filters are to be had in unique sizes starting from 500 to 900 mm diameter with an output of 15 to 50 Cu.M., respectively. A gravel clear out out or sand clear out out is crucial for the open reservoir, even in which algae increase takes place withinside the water supply

C. Main Line

The mainline transfers the full quantity of water for the irrigation device. It connects the unique sub-mains to a water supply. The fundamental pipes are typically made from bendy substances along with PVC (polyvinyl chloride) or plastics. The mainline pipe passes water from the filtration unit to the sub-fundamental pipe. This pipe diameter relies upon upon drips irrigation device float capability, typically 2.5 to four Inch diameter PVC pipe used as fundamental-line. Mainline & sub-fundamental have to be hooked up in a Telescopic manner; that is, the pipe with a bigger diameter have to be linked first, accompanied through pipes with a smaller diameter. This association allows to keep uniform strain withinside the device. The Mainline have to be buried at the least forty five centimeters to save you them from getting broken at some point of cultural operation.

D. Submain Line

The sub-fundamental feed to the laterals on one or each sides. It is made from both medium-density polyethylene (PE) or PVC. There have to be a stability among the diameter of the principle and sub-mains. These are decided in attention of the charge of discharge, variety of sub-mains, and friction losses in pipes

E. Laterals

Laterals are made from low-density polyethylene (LDP) or linear low-density polyethylene (LLDPE) cloth and are to be had in unique sizes, 12 mm, 16mm, and 20 mm. Based at the availability of water, crop, and spacing, 12 millimeter 16-millimeter laterals install.

F. Dripper

Drippers also are referred to as emitters. The work of dripper is to drop the water steadily at near the root of plant to avoid loss of water. drippers release the water drop by drop depending upon the length and pressure of on pipe.

Online Dripper: Online drip emitter outlets are installed at or near the plants root zone, this helps to eliminate wasteful irrigation between plants. This method gives you a little more flexibility. It is equally as important to consider the hydraulic limitations and recommended installation techniques when installing emitters online. the capability to discharge water to be had is 2L/hour, 4L/hour, and 8L /hour.

Inline Dripper: In this type, the dripper is positioned in the lateral pipe. The distance among

the 2 drippers is the identical. There are 3 varieties of to be had inline drippers. Non-Pressure Compensating Drippers (NPC): This is a completely easy dripper, in this dripper water release uniformly.

G. Pressure Compensating Drippers (PC)

This dripper is extra advanced; it keeps uniform strain in all drippers. It commonly makes use of for the greenhouse crop, the rate of this dripper is barely high. Non-Draining Drippers: This dripper is specifically utilized in a soilless-like mediums like cocopits, Perlite, and Vermiculite.

H. Fertilizing Unit

The direct utility of fertilizer via drip irrigation has extended the green use of fertilizer and saving in labour and money. With this fertilizing unit assist, liquid fertilizer is supplied to the plant via a drip irrigation device. Application of fertilizer into irrigation device is made through both a through- byskip strain tank or through task pump or direct injection device.

I. Pressure Gauge

It is used to decide water strain withinside the drip irrigation device.

J. Controls Valves

This cost is used to govern water float. They made from plastic and iron cloth.

K. Flush Valve

The flush valve is positioned on the cease of the sub-Maine pipe it makes use of to flush out dirt.

L. Non-Return Valve

Non-go back valve is beneficial to prevent go back water in the direction of the water pump.

M. Air Valve

It allows save you the sucking of dust through the drippers and launch air into the drip irrigation device.

N. Endcap

The cease cap is used to shut one cease of the lateral pipe; they cast off it on the cleansing time.

2. CONCLUSION

The benefits confronted through the farmers are water-saving, standardized implementation & easy irrigation device, & the regulations are the problems of the non-availability of high-satisfactory content & the dearth of drip agent comply with-u facilities. From the report, it's miles clean that the drip irrigation companies, investment corporations and others have enough version spare components and different essential steps to make certain a appropriate state of affairs for correct implementation of the drip irrigation structures.

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