

DRIP IRRIGATION SYSTEM

A Boon For Farmers

lateral is placed after every two rows of the crop. These laterals can be removed and stored in bundles after crop maturity and before harvesting of crop. The other option can be burying these laterals at a depth of 25-30 cm, which is also improves the life of the drip lines.

8. Drippers: These are the openings which supply water to the root zone of crops in the form of droplets. These drippers are spaced 30 cms apart in case of field crops and in plantation crops these can be spread based on the plant to plant spacing. Drippers deliver water at the rate of 2.4 litres per hour and this can be adjusted according to crop demand and weather variations.

Advantages of drip irrigation system:

1. Large quantity of water can be saved using drip irrigation and this can be used to irrigate additional crop area. Minimum of 25% water saving can be realised by using this technique.
2. Water is uniformly distributed even where the land is undulated and not levelled leading to improved productivity.
3. Drip irrigation can be followed in all conditions such as crops grown in field, shade net, green houses, orchards as well as in all kind of soil types.
4. As there is limited wetting, less weed infestation and disease incidence is observed.
5. Fertilizers and micronutrients use efficiency is higher in drip than flood irrigation.
6. No soil erosion, as there is no surface flow of water.
7. Irrigation is possible even in undulated and hilly regions therefore saving of cost incurred on levelling of field.
8. Consumption of labour in drip is less than conventional irrigation.
9. In this technique crop canopy does not get wet therefore, chances of disease infection are also less.



Fertigation

- Delivery of nutrients/micronutrients in exact quantity as per the crop demand, mixed along with irrigation water and directly supplied in the root zone is called as fertigation.

- This is an advanced and beneficial system suited to countries/ regions where availability of water is a limitation.
- Fertilizer use efficiency is enhanced multi-folds compared to conventional broadcasting or drilling of fertilizers.
- In addition, loss of fertilizer in the environment is also reduced leading to avoidance of environmental pollution.
- Involvement of human labour in fertigation is negligible which in turn will add to reduced drudgery of farmers which will further improve Happiness Index of the farming community.

Cost of drip irrigation system

- The cost incurred on installing a drip irrigation system largely depends on the type of crop to be irrigated like, field crops (rice, wheat, maize, sugarcane etc.), orchards (mango, pomegranate, lemon, guava etc.) or vegetables (chilli, tomato etc.).
- The plant spacing (row to row and plant to plant) and distance of source of water from the field also contributes to the cost.
- On an average about ₹1.25 lakhs is required to establish a drip irrigation system in one hectare area.

Financial help on installation of drip irrigation system

- In India, financial help on installation of drip irrigation system is available through both central and state government schemes.
- Depending on the area available with the farmer, the amount of financial help granted varies.
- Since the schemes and amount of financial help provided varies in different states of India, the exact information on this in a particular area may be obtained from nearest office of state department of agriculture/horticulture/ Project Director of ATMA, district soil conservation officer etc.
- Small and marginal farmers coming under the Drought Prone Area Programme /Desert Development Programme can avail upto 45 per cent and 35 per cent, respectively of total cost of installation of drip irrigation system.
- Crops with wider row spacing are provided with ₹23500 to ₹58400 per hectare while crops with closer row spacing will get ₹85400 to ₹100000 per hectare.
- The benefits of financial help can be availed on individual basis or in a group of five farmers basis.



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Drip Irrigation System : A Boon For Farmers

In India wheat is grown in about 30 m ha area out of which 97 per cent is irrigated which requires 128 million cubic meters of water (16 per cent of global water use in wheat) per year. It has been estimated that to produce one kilogram of wheat in India, 1500 litres water is used whereas 3000-5000 litres of water is required to produce a kilogram of rice. This amount of water is very high, while available water resources are decreasing rapidly. It is necessary to save as much water as possible for the future generations. Adopting latest irrigation techniques like drip irrigation to save water is an important step in this direction.

Experiments conducted at ICAR-Indian Institute of Wheat and Barley Research Institute, Karnal revealed that at least 25 percent of water used in wheat can be saved. Surface irrigation methods are used in more than 80 percent of the irrigated land in the world with about 40 percent water use efficiency. Drip irrigation prevents water losses due to leaching, seepage, evaporation etc. and improves water use efficiency up to 70 to 90 per cent.



In North Western India, generally farmers make 0.5 to 1 acre sized plot/blocks to irrigate wheat by flood irrigation, which is an inefficient and wasteful method. Compared to flood irrigation making 4-5 blocks/plots per acre in a field will enhance irrigation efficiency thereby saving water substantially. Drip irrigation technique is an



improved method where irrigation efficiency is further increased. Here the water is directly delivered in root zone in the form of droplets through a network of pipelines. Only 600 litres of water is



sufficient to produce 1kg wheat using drip method and 2200 litres of water is sufficient to produce 1kg of paddy. Therefore, at least 25-30% water can be saved by adopting drip method in rice-wheat cropping system. The drip irrigation is the most effective way of applying water, and nutrients together directly in the root zone. This not only saves water but also increases the nutrient use efficiency & yield of the crop.



What is drip irrigation?

Drip irrigation system is an advanced technology which saves water as well as nutrients. In this method water droplets along with dissolved nutrients are transported directly to the roots of the plant or tree. In this technique applying fertilizers along with water is called as Fertigation. This technology does not require any additional human labour for applying fertilizer in crops/fields.

Hence, this technique increases the efficiency of water and labour as well as fertilizer. This is a successful technique for the area of low water availability, in which a permanent or temporary dripper line is placed near the roots of plants/tree.

Equipment used in drip irrigation

1. Pump: A pump whose capacity is dependent on water sources, area of the field etc. is required for water supply.

2. Filter unit: Water filtration system. It contains water and sand filters (to separate the sand or any suspended material). Filtration unit is required to avoid any type of clogging of pipes and drip nozzles.

3. Fertigation unit:

Application of fertilizers with irrigation water.

4. Pressure gauge: To monitor water pressure in drip system as for uniform spread at specific pressure in the pipeline is a must.

5. Meter : It indicates flow rate of water in drip system

6. Main pipeline: It supplies water to the laterals. Main pipeline is made of PVC or HDPE and could be buried in 1.5-2.0 feet deep trenches and covered with the soil so that the agricultural activities such as sowing and other intercultural operation can be easily done. The life of covered pipeline is also improved due to protection from direct and intense sun light, cold and other external damages.

7. Laterals: The thin tubes which supply water to drippers are called laterals. These tubes are spread along the crop rows. In case of field crops like wheat and rice, laterals are placed in such a way that they supply of water to two rows on either side of each lateral *i.e.* each

