

I.4: Micro-irrigation system for gardens

Horticulture cell has developed gardens in an area of about 6.50 hectares spread over technical premises of RRCAT campus. The gardens developed are maintained regularly with follow up of cultural practices required to upkeep the same in colorful and dressed form. Watering in gardens plays a key role in ensuring fuller growth and greener surroundings round the year.

Water for the gardens is managed through open wells, bore wells and effluent, generated in the surrounding areas however, these resources hardly meet the requirement. During summer, the scarcity of water spoils the presentable form of gardens and restricts the future landscaping plans commensurate with ongoing development activities. In order to overcome water scarcity conditions and effectively manage watering needs, an advanced method of irrigation using micro-irrigation technique with drips as emitters has been adopted for landscaping activities especially for ornamental-gardens. The scheme involves laying of piping network, valves, tubing with drippers, thereby allowing water to drip slowly to the roots of plants on the soil surface and suitably connected to water source. According to the type of plants, water requirement, planting spacing, soil type & topography of land the system is designed for laying. A typical plan layout is shown below in Fig. I.4.1 to understand the system.

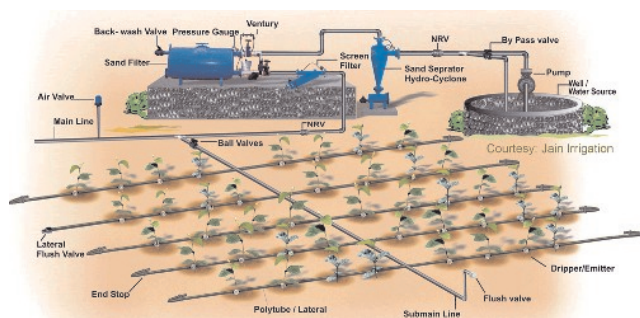


Fig. I.4.1: Micro-irrigation system layout

The system components/parts used for laying a drip irrigation system initiating from water source are listed below:

1. Pumping equipment (Electrical)
2. Water filtration system (To prevent clogging)
3. Fertigation system (Venturi injector)
4. Backwash controller (Backflow prevention device)
5. Pressure control valve
6. GI/HDPE Main line (Larger dia -pipe & pipe fittings)
7. Hand operated valves

8. LLDPE Drip line/Polytube (Smaller dia- laterals)
9. Poly fittings & accessories (to make connections).
10. Emitting devices (Inline drippers or emitters)

The micro-irrigation system, operating in RRCAT is shown in Fig. I.4.2. The network covers almost all the garden elements like trees, shrubs and ground covers etc. except grassed areas i.e. lawns.



Fig. I.4.2: Micro-irrigation system at RRCAT

Drip irrigation system is advantageous over traditional ones in the following ways.

- Saves water to the extent of 50 to 60%, thus ensuring water economy.
- Savings on maintenance & labour for fewer occurrences of weeds, pests and diseases and facilitates easier inter culture operation which is required for plant growth.
- Fertilizer and nutrient loss is minimized due to application directly at root zone without leaching.
- Water distribution is highly uniform and very well managed as per the requirement of plant by inserting suitable emitters (typical emitter flow rates are from 0.6 to 16 lit/hr).
- Slow and even flow of water to plants and soil, facilitating application of water and plant nutrients directly to the plant roots to ensure healthy and vital growth.
- Improves plant growth, making them fuller and healthier, reduces plant stress and improves soil aeration as soil particles are not washed down.
- Easy and flexible to install on undulated fields that are hard to irrigate with conventional methods.
- Delivers measured quantity of water at the root zone of each plant at regular intervals.
- Reduces water loss due to evaporation.

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