

JOB ROLE – FLORICULTURIST (PROTECTED CULTIVATION)

Sector – Agriculture

(Qualification Pack Code: AGR/Q0702)



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UNIT 4: IRRIGATION AND FERTIGATION IN GREENHOUSES

Session 1: Micro Irrigation Systems and Their Application

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Session Objectives

The student will be able to

- Explain irrigation water quality
- Describe micro irrigation systems

Introduction

An efficient irrigation system, preferably micro irrigation, combined with fertigation system is required for any type of greenhouse cultivation. The quality of water is an important parameter to be considered when micro irrigation systems are used. Poor quality water may clog the emitting points of micro irrigation systems.

In micro irrigation systems, less quantity of water is used precisely to meet the crop water requirement.

Irrigation Water and It's Quality

- The quality that influences its suitability for specific use, i.e., the quality is suitable for drinking, irrigation, industrial use, etc.
- Ensure the perennial source of water
- In general, peak water requirement for flower cultivation is 40,000 l per acre per day

Irrigation Water and It's Quality

- pH of the irrigation water should range from 6.5 – 7.0
- EC of the irrigation water should not exceed 1 dS/m
- The irrigation water should be free from leaves, dirt and dust

Irrigation Water Requirement

Irrigation water requirement is depends on:

- Plant density and spacing
- Canopy
- Climate
- Growing media
- Stages of the plant

Irrigation Water Quality and Quantity for Various Flower Crops

S. N.	Description	Rose	Gerbera	Carnation
1	Number of plants per sq m	6	6	20
2	Spacing	30 × 37.5 cm	30 × 37.5 cm	15 X 15 cm
3	Water pH	6.5–7.0	6.5–7.0	6.5–7.0
4	Electrical Conductivity (EC), dS/m	<0.7	<0.7	<0.7
5	Life-cycle	50–60 months	30–36 months	24 months
6	Water requirement per day	3–4 l/m ² m/day	3–4 l/m ² m/day	3–5 l/m ² /day

Micro Irrigation System and Their Application

Micro irrigation refers to the **low pressure irrigation systems** that drip and sprinkler.



Drip



<https://bit.ly/2L6cdSh>

Sprinkler

Drip Irrigation:

Application of water in the form of discrete, continuous drops at slow rate through emitters, either onto the soil surface or directly on to the root zone.

There is direct and continuous wetting of the root region.



Selection of Drip Irrigation System

Selection of drip irrigation system depends on following factors:

- Crop spacing
- Peak Crop water requirement
- Growing media
- Where to grow: beds/pots/trough etc

Selection of drip irrigation system depends on following factors:

- Bed size
- Plant density
- Electricity availability
- Water quality
- Fertigation requirements of a crop

Benefits of Drip Irrigation System

- Efficient water use
- Efficient use of fertilizers
- Less energy requirement
- Less chemical uses
- Less labour requirement
- Better crop production interms of quality and quantity
- Better uniformity of water & fertilizer distribution

Types of Drip Emitters

- Non Pressure compensating (NPC)



Figure : NPC Dripper

➤ Pressure Compensating (PC)



Figure: PC Dripper

➤ Pressure Compensating with antileak (PCCNL)



Figure : PCCNL Dripper



Figure: PCCNL Dripper with Stake

Types of Drippers

Types of drippers are

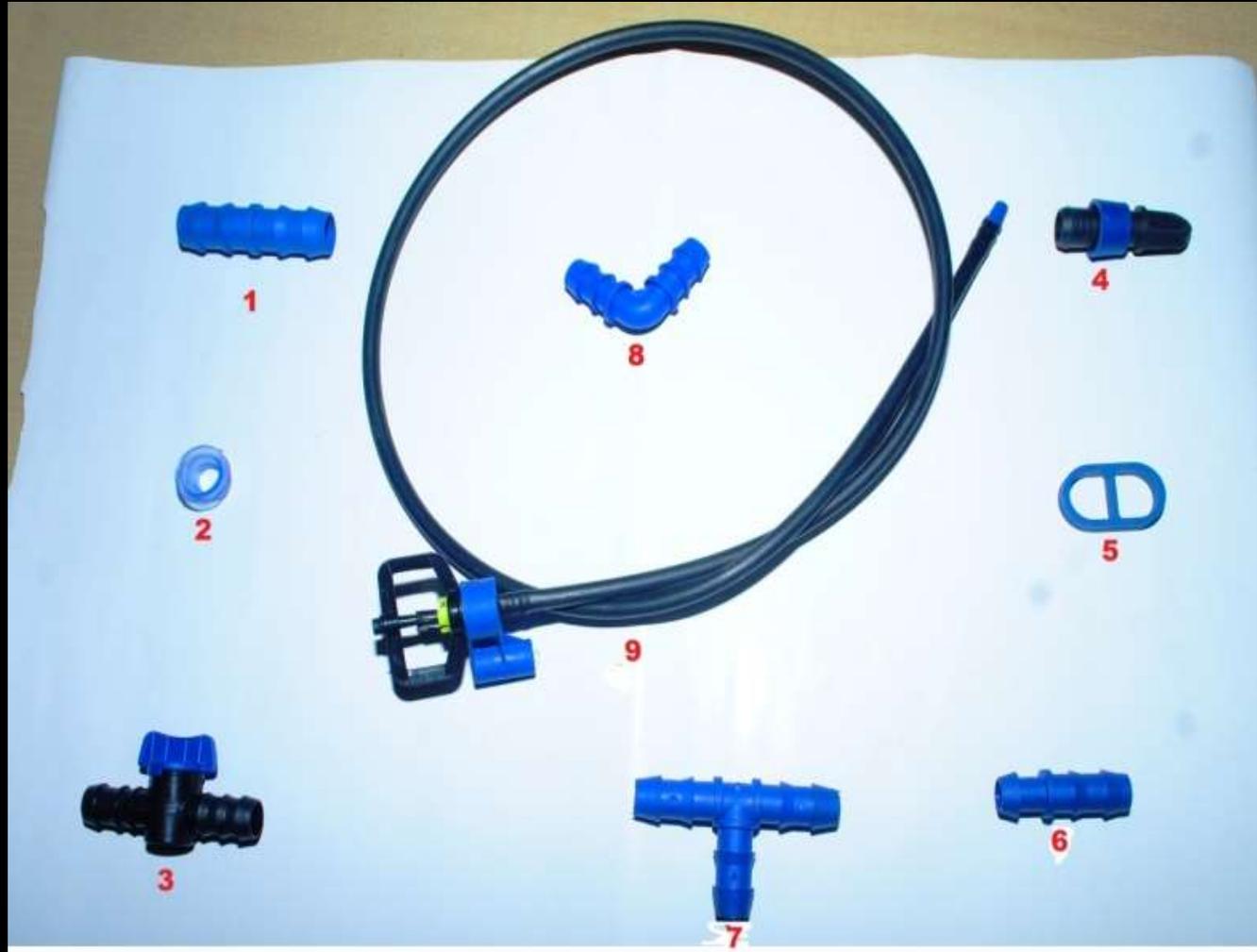
➤ On-line

➤ In-line

- A) Strip dripper
- B) Round dripper
- C) Stake dripper

Accessories of drip line

1. Start connector
2. Rubber Grommet
3. Lateral control valve
4. Lateral end plug
5. End Cap
6. Start connector
7. Tee
8. Elbow
9. Mini sprinkler



Sprinkler Irrigation System

In floriculture, it is mainly used in nurseries and orchids cultivation, where the spacing remains very close, plants are too small and density is very high.

Two types of systems are commonly used:

- Irrigation System placed on ground
- Over head irrigation with anti-leak

Summary

In this session you have learnt about irrigation water quality and quantity, drip irrigation and sprinkler system

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