

Fertigation



Application of water and fertilizer through micro irrigation system

Advantage

- Nutrients and water are supplied near the active root zone through fertigation which results in greater absorption by the crops.
- As water and fertilizer are supplied evenly to all the crops through fertigation there is possibility for getting 25-50 per cent higher yield.
- Fertilizer use efficiency through fertigation ranges between 80-90 per cent, which helps to save a minimum of 25 per cent of nutrients.

Advantage

- By this way, along with less amount of water and saving of fertilizer, time, labour and energy use is also reduced substantially.
- Prevention leaching and volatilization loss

Disadvantages

- Requires expertise ,faulty handling leads to starvation and even death of plants
- Clogging or corrosion of water lines
- Costly venture
- Urgent application to correct nutrient deficiency
- Use of inorganic fertilizers only permitted instead of organics

Fertilizer use efficiency

Fertilizer use efficiency (%)

Nutrient	Soil application	Drip	Fertigation
Nitrogen	30-50	65	95
Phosphorus	20	30	45
Potassium	50	60	80

Fertilizer used in fertigation

- Urea, potash and highly water soluble fertilizers are available for applying through fertigation.
- Application of super phosphorus through fertigation must be avoided as it makes precipitation of phosphate salts.
- Thus phosphoric acid is more suitable for fertigation as it is available in liquid form.
- Special fertilisers like mono ammonium phosphate (Nitrogen and Phosphorus), poly feed (Nitrogen, Phosphorus and Potassium), Multi K (Nitrogen and Potassium), Potassium sulphate (Potassium and Sulphur) are highly suitable for fertigation as they are highly soluble in water.
- Fe, Mn, Zn, Cu, B, Mo are also supplied along with special fertilisers.

Fertilizers commonly used in fertigation

Fertilizers	N – P ₂ O ₅ – K ₂ O content (%)	Solubility (g/l) at 20 C
Ammonium nitrate	34-0-0	1830
Ammonium sulphate	21-0-0	760
Urea	46-0-0	1100
Monoammonium phosphate	12-61-0	282
Diammonium phosphate	18-46-0	575
Potassium chloride	0-0-60	347
Potassium nitrate	13-0-44	316
Potassium sulphate	0-0-50	110
Monopotassium phosphate	0-52-34	230
Phosphoric acid	0-52-0	457

Characteristics of fertilizers for fertigation

- Must be completely soluble in water
- Must not react with dissolved elements in water especially calcium and magnesium salts.
- Should not change the pH of water leading to precipitation and clogging
- Should avoid corrosion of the system.
- Should be safer for field use and for mixing with other chemicals.

Time of fertigation

- The frequency of fertigation is governed by the nature of crop, duration, growth habit and yielding ability.
- Generally fertigation is done daily, weekly, fortnightly and can be considered depending on crop response.

Fertilizer injection Devices

1. Fertilizer tank (By pass system)
2. Venturi Injector
3. Fertilizer injection pump



Devices for fertigation



Fert. Tank
Cost: Rs.3500



Ventury
Rs.1250



Fert. Pump
Rs.12000

Fertilizer mixing tank

Fertilizer tank

In this system part of irrigation water is diverted from the main line of flow through a tank containing the fertilizer in a fluid or soluble solid form.



Venturi pump

- In this system a partial vacuum is created for suction of fertilizer through venturi action

Fertilizer injection pump

These are piston or diaphragm pumps which are driven by the Water pressure of the irrigation system and such as the injection rate is proportional to the flow of water in the system. A high degree of control over the fertilizer injection rate is possible.

