

## Fertigation: For Higher Nutrient Use Efficiency

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Indiscriminate use of fertilizers in agriculture has been more nutrient losses resulted causing low nutrients use efficiency. Therefore, application of fertilizers through water with suitable fertilizers enhances nutrient use efficiency. Fertigation has an importance practice to applied nutrient for increase fertilizers efficiency in sustainable way.

### Introduction

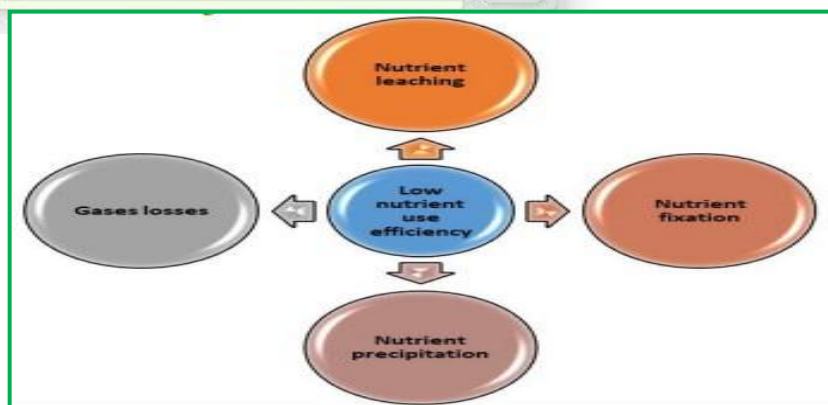
Blanket application of fertilizers by farmers has leading to reduce nutrient use efficiency and more losses of nutrient due to leaching, denitrification, surface runoff, fixation in soil, nutrient precipitation and volatilization. At present, the farmers are using the conventional fertilizers of various grades which are not completely soluble in water and hence, it is unsuitable for fertigation. The high salt index of most conventional fertilizers which restricts their use in sensitive vegetable crops. So therefore, need to precise application of fertilizers for improve nutrient use efficiency as well as reduce nutrient losses.

### Fertigation

Fertigation implies the application of fertilizers through pressurized systems; thus, forming nutrient containing irrigation water desired concentration as per the crop need. It is a controlled system to supply irrigated greenhouse vegetable crop with soluble plant nutrients at the root zone.

### Need

1. Boost the productivity of crop by drip irrigation
2. Timely supply of nutrient in crops
3. Conventional fertilizers insoluble in water and it is unsuitable for fertigation
4. The high salt index fertilizers damage the crop
5. Convention application fertilizers are labour intensive.
6. The limited root zone and reduced level of mineralization in the restricted wet zones
7. Broadcasting of fertilizers for the reduced nutrient availability to the plants
8. The annual application of the fertilizer need is splitted into one to three doses.



**Why Low Nutrient Use Efficiency with Conventional Fertilizers?**

## Method of Fertigation

There is adding of fertilizers into the irrigation water by various numbers of techniques available. There are drip irrigation, micro-sprinklers, micro-jets or sprinkler irrigation. While fertigating, it should be ascertained that the optimum concentration is maintained taking into consideration the crop growth. The 100 per cent water soluble solids and liquid fertilizers are to be added into bucket full of water. Water tank are used for mixing of fertilizers and water.

## Component of Fertigation

- 1. Ventury:** The system of injection is of very low cost; grid works by creation of a practical vacuum in the system and suction of the fertilizers into the irrigation stream.
- 2. Fertilizer Tank:** In this system a part of irrigation water is diverted from the main line to flow through a tank containing fertilizer in fluid or soluble solid forms, before returning into the main line.
- 3. Fertilizer Injector:** These are piston or diaphragm pumps, which are driven by the water pressure of the irrigation system, and as such injection rate is proportional to the flow of water in the system.

## Special Care During Fertigation

1. Fertilizer tank are used to inject water soluble fertilizer solution
2. It is necessary to use pressure compensating drippers instead of micro-tubes
3. Fertigation should be done in the last half an hour of the total irrigation period
4. The continue drip system for another about 5-6 minutes after completion of fertigation.
5. The concentration of the solution should never exceed more than 10 per cent.

## Advantages of Fertigation

1. Fertilizers are completely dissolved in water leaving no precipitate
2. Improving growth and increasing the productivity crops
3. Nutrients can be applied as and when required to meet specific crop nutrient demand
4. Nutrients directly reach to rhizosphere in liquid form and higher nutrient use efficiency
5. The higher yield and good quality and saving labour, time, energy and application cost
6. Reduce the burning effect of fertilizers in various crops.

## Constraints of Fertigation

Non-availability of liquid fertilizers at reasonable rates, Lack of research and development efforts in developing fertilizers for fertigation and inadequate policy of government for promoting the use of fertigation technology.

## Conclusion

This is concluded that adaptation of fertigation for nutrient application to enhances nutrient use efficiency as well as higher crop productivity and same time reduce the nutrient losses and cost of fertilizers.