

## Drip Fertigation: A Game Changer in Fruit and Vegetable Cultivation

**Bhawna<sup>1</sup> and Akash<sup>2</sup>**

<sup>1</sup>Horticulture Development  
Officer, Department of  
Horticulture, Haryana

<sup>2</sup>Senior Research Fellow, ICAR-  
Central Soil Salinity Research  
Institute, Karnal, 132001,  
Haryana



Open Access

\*Corresponding Author

**Bhawna\***

**Available online at**

[www.sunshineagriculture.vitalbiotech.org](http://www.sunshineagriculture.vitalbiotech.org)

### Article History

Received: 3. 2.2026

Revised: 7. 2.2026

Accepted: 12. 2.2026

This article is published under the  
terms of the [Creative Commons  
Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

### INTRODUCTION

India is one of the largest producers of fruits and vegetables in the world, yet farmers often face problems related to water shortage, irregular rainfall and poor fertilizer use efficiency. Traditional irrigation methods such as flooding or furrow irrigation waste a large amount of water and do not distribute nutrients evenly. As a result, crops suffer from poor growth, nutrient deficiencies and lower yields. One simple and effective method that has transformed horticulture in many parts of the country is drip fertigation a technique in which water and fertilizers are supplied together directly to the root zone of crops through a drip system. This approach saves water, reduces fertilizer wastage and ensures healthier crop growth.

Drip fertigation combines the advantages of drip irrigation with the precise delivery of nutrients. Since water reaches the plant slowly and steadily, the soil remains moist without becoming waterlogged. When fertilizers are dissolved in water and applied through the drip system, the plants absorb them more efficiently. This method has proven particularly beneficial for high-value fruit crops like pomegranate, banana, papaya, citrus and guava, as well as vegetable crops such as tomato, chilli, brinjal, capsicum, cucumber and watermelon. In many regions, farmers who adopted drip fertigation observed 20–40% higher yields compared to traditional methods.

### Why Drip Fertigation is Effective

One of the main reasons drip fertigation works so well is the accuracy with which it delivers nutrients. In normal field application, fertilizers often get washed away or remain unused because the entire field is irrigated at once. Every plant receives a different amount of nutrients depending on its position in the field. But in drip fertigation, a small but regular dose of fertilizer is supplied near the plant roots. This improves nutrient uptake and reduces wastage. Farmers need smaller quantities of fertilizers, making the method economical in the long run.

Water savings are another major benefit. Drip irrigation reduces evaporation and prevents runoff. Each dripper supplies water only where it is needed. This is a big advantage in drought-prone and semi-arid regions. With drip fertigation, farmers can irrigate their crops even when water is limited. Better moisture management also creates a favourable environment for root growth, which improves overall plant health.

The method also helps reduce weeds. Since water is applied only near the plant and not across the entire field, weed germination is much lower. This reduces labour costs and the need for weed control operations. In vegetables like tomato and chilli, drip fertigation also reduces the chances of foliar diseases because the leaves remain dry.

#### **Fertigation Scheduling and Practical Tips**

While fertigation is easy to implement, it is important to follow proper schedules for different crops. Generally, fertilizers are applied in smaller doses at frequent intervals rather than at once. For example, in fruit crops like pomegranate and citrus, nitrogen is applied weekly, while phosphorus and potassium are added during flowering and fruit development stages. In banana, fertigation schedules are designed month-wise, with more nutrients supplied during active growth.

In vegetable crops, fertigation is usually done 2–3 times a week. For tomato and chilli, nitrogen is supplied regularly to promote vegetative growth, and potassium is increased during fruiting to improve size, colour and shelf life. Cucurbits like cucumber and watermelon respond well to potassium-rich fertigation schedules.

Farmers should ensure that fertilizers used for fertigation are completely soluble. Common fertilizers suitable for fertigation include urea, 19-19-19, potassium nitrate, calcium nitrate and magnesium sulphate. The fertilizer tank or venturi system should be cleaned regularly to avoid clogging. It is also important to flush the drip lines with plain water after fertigation to prevent accumulation of salts.

Before starting fertigation, farmers should test their soil to know existing nutrient levels. This helps in preparing an appropriate fertigation plan. Water quality should also be checked, especially in areas with high salt content. Filters should be maintained properly to ensure smooth water flow.

#### **Success in Fruit and Vegetable Crops**

The impact of drip fertigation is clearly visible in fruit orchards. In pomegranate, farmers report uniform fruit size, shiny peel and more number of marketable fruits. Banana shows vigorous growth and better bunch development when fertigation is followed. In papaya, fertigation improves fruit sweetness and reduces fruit drop. Citrus orchards under drip fertigation develop healthier canopies and yield better-quality fruits.

Vegetable crops respond even faster. Tomato plants grown under drip fertigation produce more fruits with good colour and firmness. Chilli plants become stronger and bear fruits for a longer duration. Cucumber and capsicum show excellent performance in both open fields and protected structures. Watermelon and muskmelon grown with drip fertigation develop uniform sweetness and larger size, making them more profitable in the market.

Apart from yield improvement, farmers also notice better crop health, reduced pest attacks and improved soil structure. This is because fertigation avoids over-irrigation, which often causes root diseases and nutrient leaching.

#### **Economic and Environmental Benefits**

Drip fertigation helps farmers save up to 40–60% water and 25–40% fertilizers. With lower input use and higher yields, profits increase significantly. The system also supports sustainable farming because it prevents excessive fertilizer use, reduces groundwater contamination and helps crops withstand dry spells.

In regions with unpredictable rainfall, drip fertigation acts as an insurance system. Even during long dry periods, the crops receive enough moisture and nutrients to survive. This improves the stability of farm income and reduces the risk of crop failure.

Government schemes like PMKSY (Per Drop More Crop) provide subsidies for installing drip systems, making it easier for small and medium farmers to adopt the technology.

### **CONCLUSION**

Drip fertigation is truly a game changer for fruit and vegetable cultivation. It ensures efficient use

of water and fertilizers, supports healthy crop growth and increases yield and quality. The technique is simple, economical and suitable for various climate conditions. With proper guidance and adoption, farmers across India can benefit greatly from drip fertigation and move towards more productive and sustainable horticulture.