

## Hydroponic Techniques Used in Fruit Crops

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**H**ydroponics is a soilless method of growing plants using a nutrient-rich water solution. While it is commonly associated with

growing vegetables and herbs, hydroponics can also be used for fruit crops.

Here are some hydroponics techniques that can be employed for fruit crops.

This technique has gained popularity in various agricultural sectors,

including fruit crop production, due to its numerous advantages over traditional soil-based farming. Here's an introduction to hydroponics in fruit crops:

### Nutrient Film Technique (NFT)

- In NFT, a thin film of nutrient-rich water is continuously circulated over the plant roots, providing a constant supply of nutrients.
- Ideal for shallow-rooted fruit crops such as strawberries and lettuce.
- Requires a sloping channel where nutrient solution flows, promoting oxygen exchange and nutrient uptake.

### Drip System

- Nutrient solution is delivered directly to the base of each plant through a network of tubes and emitters.



- Suitable for a wide range of fruit crops, including berries, melons, and tomatoes.
- Allows precise control of nutrient delivery and minimizes water wastage.

### Aeroponics

- Plants are suspended in air, and nutrient solution is misted onto the roots.

- Ensures excellent oxygenation and nutrient absorption.
- Effective for various fruit crops, promoting rapid growth and high yields.

### Deep Water Culture (DWC)

- Plants are suspended in a nutrient solution with their roots submerged in oxygenated water.
- Appropriate for fruit crops like tomatoes and cucumbers.
- Air stones or diffusers provide oxygen to the root zone, ensuring proper aeration.

## Vertical Farming

- Utilizes vertical space to grow fruit crops in stacked layers or towers.
- LED lighting and controlled environments optimize growth conditions.
- Efficient for space utilization and can be used for various crops, including strawberries and herbs.

## Ebb and Flow (Flood and Drain)

- This system floods the growing medium with nutrient solution periodically and then allows it to drain away.
- It is adaptable for various fruit crops and can be controlled to meet specific water and nutrient requirements.

## Aquaponics

- Combines hydroponics with aquaculture, utilizing fish waste to fertilize plants.
- Fruit crops like tomatoes, peppers, and herbs thrive in this symbiotic system.
- Promotes sustainability by recycling nutrient-rich water.

## Coir or Rockwool Substrates

## References

1. Corrêa, R. M., do Carmo Pinto, S. I., Reis, É. S., & de Carvalho, V. A. M. (2012). Hydroponic production of fruit tree seedlings in Brazil. *Hydroponics—A standard methodology for plant biological researches*, 225.
2. Rubio-Asensio, J. S., Parra, M., & Intrigliolo, D. S. (2020). Open field hydroponics in fruit crops: Developments and challenges. In *Fruit Crops* (pp. 419-430). Elsevier.

- Coco coir, a natural fiber extracted from coconut husks, is used as a soilless medium.
- Combined with a nutrient-rich solution, it provides excellent aeration and water retention.
- Suitable for crops like strawberries, peppers, and tomatoes.

## Controlled Environment Agriculture (CEA)

- Integrates hydroponics with controlled temperature, humidity, and lighting.
- Allows year-round cultivation of fruit crops, overcoming seasonal limitations.
- Enhances productivity and quality through precise environmental control.

## Conclusion

Hydroponics offers a sustainable and efficient alternative for fruit crop production, addressing challenges associated with traditional soil-based farming. As technology continues to advance, the integration of hydroponics in fruit crop cultivation is likely to play a significant role in meeting the increasing demand for fresh, high-quality produce in a resource-efficient manner.