

Hydroponic

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In News: Hydroponics, the art of soil-less farming, is trending this year.

What is Hydroponic farming?

- It is a new kind of farming in which the **plant's growth and productivity are controlled by water and its nutrient levels in the water.** In general, it is the **farming without soil and growing crops on water**
- The objective of hydroponic farming is to cultivate vegetables with **minimal use of soil and water.**

How Hydroponic works

- In hydroponics, it takes an average of **45 days to harvest crops like lettuce, basil, and baby spinach.** The same would take around 90 days when grown the traditional way. **Water consumed to grow these crops is 90% less.**
- A nutrient solution is mixed into the water in the control room.
- From here it is pumped into troughs which house the net pots with the crops.
- Since the water directly reaches the roots, it is absorbed much better and you need much less water as well since nothing is lost in the soil absorption
- **Plants take the nutrients from the water using sunlight, then they produce the output.**

Hydroponics Method

- It is a method of growing plants without soil in which plants get their nutrients from a mineral solution.
- The method is suitable for growing greens and herbs as

they don't have deep roots. Tomatoes and strawberries are other popular items

Costs Involved

- **The initial costs of setting up a hydroponic farm is very high.**
- A physical outer structure is required to grow the plants. This can be trays or tubes, which are typically made of food-grade plastic. The cost of this is typically Rs. 50,000-75,000 for 1,000 sq ft.
- High costs involved in plumbing systems and automation such as sensors, controllers, water pump etc.
- Money paid to consultants for help and guidance.
- **Cost involved in maintaining ambient temperature and moisture**
 - Depending on the type of enclosure, costs can vary from ₹25,000 to ₹1.5 lakh.
 - In some cases, LED lights are used to mimic sunlight, this further increases the cost.
- **Cost from Water**
 - If water of an area has dissolved minerals or is hard, purification devices will be needed to make it usable, thus adding to the costs.
- **In-Process Costs**
 - Power costs due to regular water supply , LED lights and climate control.
 - Plants also require nutrient feed from time to time which is either prepared at home or purchased from manufacturers.

Benefits of Hydroponic Systems

- Hydroponics has been used since ancient times. Hanging Gardens of Babylon is one such example. There are many benefits of growing plants hydroponically.

- Plants grow faster so the yield is high
- Can be grown anywhere, underground, rooftops and greenhouses
- Plants can be grown where traditional farming is not possible
- Water and nutrients are recycled and reused
- Organic food can be produced without using fertilizers or pesticides
- Hydroponics is extensively used in space research programmes.
- Hydroponics can be used to grow food away from earth where soil is unavailable

Few drawbacks of using hydroponics:

- High upfront investment
- Requires technical knowledge
- It can be misused to grow banned products like marijuana