

Hydroponics: Future's New Farming Technique

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SUMMARY

Hydroponic Farming is very much in trend these days as it gives us organic produce. It can be really useful in areas that have water scarcity. Additionally, the water can be reused for growing plants. The plants obtained from this technique are high in nutrients and free of any toxins.

INTRODUCTION

The word "Hydroponics" is derived from the word "hydros" meaning water and "ponos" meaning toil or labour. It is an agricultural technique where plants are grown in a nutrient solution in the complete absence of soil. Soilless agriculture can be defined as growing plants in controlled environments in different medium other than soil which is enriched by nutrition. Hydroponics is always soil less culture, but not all soil less cultures are hydroponics. "Hydroponics" is the growing of plants without soil. The term "soil less culture" covers all types of planting technologies without soil. With soil less culture, the plants are grown in an inert growing medium where the plants do not get anything from the growing medium. The plants receive only what you give them and nothing else. There is complete control over the pH, nutrients contents and the nutrient strength. The hydroponic technique is used in determining the deficiency symptoms of various nutrients in plants and to find out essential nutrients for the plant's growth and development.



Fig: Hydroponics system

(Source: <https://www.trees.com/gardening-and-landscaping/advantages-disadvantages-of-hydroponics>)

The Main objective for hydroponics is to:

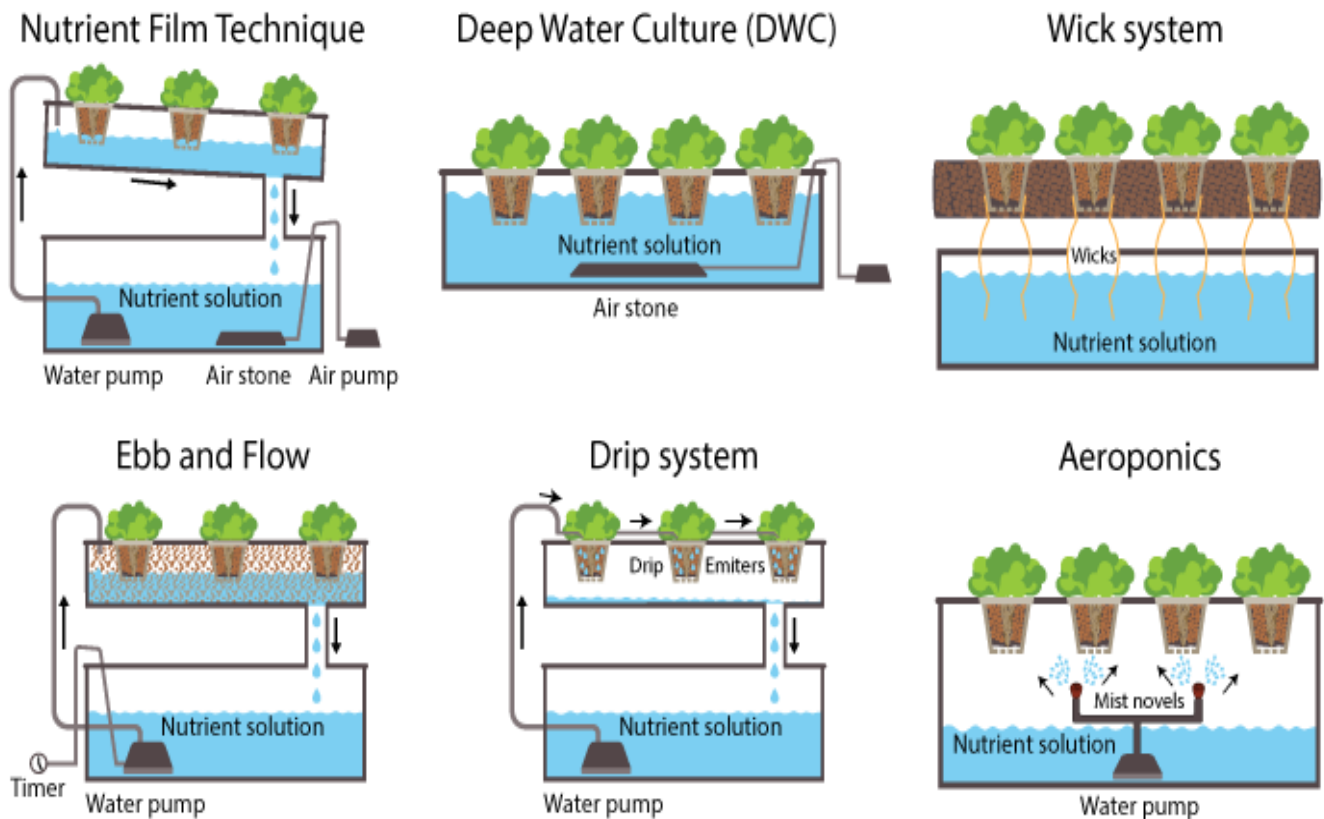
- Make farming easier to manage.
- Eliminate waste of vegetables during harvest caused by pathogens.
- Increase speed of plant growth which increases frequency of harvest as well as profit.
- Increased profit allows for reinvestment and expansion
- A substantial expansion creates more jobs and raises the standard of living.
- Eliminate seasonal dependency due to controlled climate within the green house. This increases profit due to lack of certain vegetable availability in the market within certain seasons.

Types of hydroponics:

There are six basic types of soil less culture systems, namely:

- 1. Wick system:** The wick system is probably the easiest kind of hydroponic system to get started with, and they require very little effort to maintain. It is a completely passive system, so it has no moving parts to keep track.
- 2. Drip system:** The drip system is another common and versatile kind of hydroponic system. It's similar to ebb and flow systems, in that the nutrient solution is set apart, in a reservoir, and the plants are grown separately in a soil-less medium. Unlike other kinds of hydroponic systems, drip systems dispense nutrients at a very slow rate, through nozzles. Any extra solution can either be collected and re-circulated, or merely allowed to drain right out. Since the drippers flow can be adjusted, it's possible to grow several kinds of plants using this technique.

Types of Hydroponic Systems:



Plants need water, mineral nutrients and oxygen to thrive. There are six hydroponic setups, based on different ways by which these requirements are fulfilled

- 3. Ebb and Flow:** This type of hydroponics system utilizes a growing tray and a reservoir that is filled with a nutrient solution. A pump periodically floods the grow tray with nutrient solution which then slowly drains away. This lets the plants get regular infusions of nutrients without requiring special oxygenation. Since the plants don't stay submerged, they have to be grown in a medium like rock wool or gravel. Plants that need a lot of moisture can be grown in vermiculite or coconut fiber as they retain more moisture between flooding.
- 4. Water culture system:** Water culture systems have a simple hydroponic set-up where the plants are exposed directly to the nutrient solution. Just like in a dripper system, air pumps and stones are used to keep the oxygen circulating through the solution. Plants that are very thirsty, or plants with a fast growth rate, do very well in this kind of system.
- 5. Nutrient Film Technique:** This type of hydroponic system supplies a constant flow of nutrient solution directly to the exposed plant roots. Given the system uses a pump 24 hours/day, no timer is necessary. Additionally, no medium is required to support exposure to the nutrient. Plants are held in place by a basket.

6. Aeroponics: This is a most sophisticated and high-tech method which entails suspension of the plants above special nozzles that mist the nutrient solution directly on the roots. This provides the roots a light layer of nutrient every few minutes. Similar to other pump based systems, aeroponics systems must be monitored for pump failure.

Benefits of Hydroponic Farming

The technique of hydroponic farming 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.

Drawbacks of hydroponics:

- Startup investment is high.
- Requires technical knowledge
- Water borne diseases spread rapidly.

CONCLUSION

Plants can be grown anywhere in small area, better control over plant growth, less work with soil less farming, water and nutrients are conserved, pest and disease problems are reduced, transplanting shock is reduced for seedlings are the benefits of soil less farming.

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