

Introduction to Hydroponics

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Introduction

Hydroponics is the method of farming where plants can be grown in nutrient-fortified water, instead of in soil. Currently hydroponic cultivation is gaining popularity all over the world because of efficient resources management and quality food production. Soil based agriculture is now facing various challenges such as developmental activities (urbanization, roads, buildings etc.), natural disaster, climate change, indiscriminate use of chemicals and pesticides which is depleting the land fertility. Commercially NFT technique has been used throughout the world for successful production of leafy as well as other vegetables with 70 to 90% savings of water. The aeroponic technic is popular in developed countries. Leading countries in hydroponic technology are Netherland, Australia, France, England, Israel, Canada and USA. For successful implementation of commercial hydroponic technology, it is important to develop low-cost techniques which are easy to operate and maintain, requires less labour and lower overall setup and operational cost. Several benefits of this technique are less growing time of crops than conventional growing, round the year production, minimal disease and pest incidence and weeding, spraying, watering etc. can be eliminated.

Other Benefits in hydroponics (Bulgari *et al.*, 2016)

Following are 5 advantages of a hydroponic farming business plan.

a. Space utilization

A hydroponic plantation needs less space than plants filled in soil. Therefore, contingent upon the framework, when hydroponic vegetable farming joins with vertical cultivating strategies, they can utilize close to 100% less ground than regular cultivating processes.

b. Less labour

Without the need for ploughing, herbicide, weeding and insect poison application, and other work concentrated farmer occupations, hydroponics farming offers a lighter burden for workers. It can

undoubtedly be dealt with far fewer worker hours. This reduces the expense of delivering harvests and saves time for different pursuits. Indeed, a little hydroponic farming can be completely overseen by a solitary low maintenance labourer.

c. Require no soil

The world is rapidly losing useful soil. It's assessed that a portion of the world's land has been lost in the past 150 years. This is because of disintegration, compaction, loss of soil structure, supplement corruption, and saltiness. With new hydroponic technology, the soil isn't a worry, so farmers can develop whatever harvests would be generally useful to their local area without worrying about soil degradation.

d. Crops grow faster

With hydroponic farming, supplements are all the more effectively accessible for the plant to assimilate. The cultivator can handle light, heat, supplements, hydration, bugs, and any remaining parts of the developing system. This implies the entire cycle can be smoothed out for bigger, more quickly developing plants with a better return.

e. Produces quality food

Food that ages typically, on the plant, commonly has more supplements and better taste as well. Since hydroponic cultivation contains its microbiomes, these harvests can become pretty much any place. This implies they picked at the pinnacle of readiness.

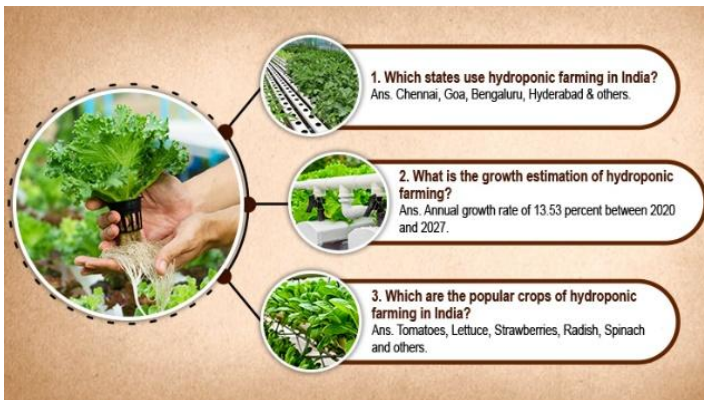
Hydroponic farming setup cost in India

The last expense for setting up commercial hydroponic farming in India will be Rs. 110 lakhs to Rs. 150 lakhs, barring the cost of land. This expense fluctuates as indicated by innovation and the technology utilized.

Hydroponics in India

Shockingly, the increase in Hydroponics farming established an all-new record. They have operationalized in excess of 19 ventures in 7 States or 13 distinct urban communities of India and are

likewise helping over 30 business cultivators/farmers in India with services and administrations.



Media used for hydroponics/ Soil less culture (Sagar et al., 2018)

Soil is a medium in which plants may grow. It provides the minerals needed for plant growth and development. Soilless culture can be defined as "any method of growing plants without the use of soil as a rooting medium, in which the inorganic nutrients absorbed by the roots are supplied via the irrigation water". Media used in Soil less culture

1. Coco Coir: it is a by-product of coconut husk. Now a days it is commercially used in the pot cultivation of vegetables in the poly houses. Has an excellent air to water ratio with great water retention. Cocopeat is considered best in providing aeration, drainage and life to media.

2. Rockwool: It is produced by burning a mixture of coke, basalt, limestone and possibly from iron production. It is formulated to prescribe higher density to provide the air and water holding requirements of plants. It has advantages like excellent water retention, pH balanced, it has negligible CEC, not buffered and not biodegradable.

3. Peat: Partially decomposed material mined from the swamps, hold moisture. It does not decompose quickly and it has a very stable source of Organic material.

4. Perlite: natural volcanic material that helps aeration and water-holding capacity. It is neutral in pH and has negligible CEC. Although costs are moderate but perlite is an effective amendment for growing media.

5. Vermiculite: mica mineral matter used to start seeds and cuttings, vermiculite is very desirable component of soil less media because of its high

nutrient and water retention, good aeration, has neutral pH and low bulk density.

6. Sphagnum mass: dehydrated remains of acid bog plants. It is relatively sterile and light in weight with high water holding capacity and as being able to absorb 10 to 20 times its weight of water. It also contains small amount of minerals.

7. Leaf mould: After the composting of leaves to 12 to 18 months leaf mould is ready for use. It may contain nematodes as well as weed seeds and noxious insects and diseases, so it should be sterile before use.

8. Bark: is partially composted and screened material plant origin. When bark is removed from logs, varying quantities of cambium and young wood are included.

9. Sand: Fine sand (0.05mm to 0.25mm) does little to improve the physical properties of a growing media and may result in reduced drainage and aeration. Sand is a valuable amendment for both potting and propagation media.

10. Rice hulls: these are by product of the rice milling industry. Rice hulls are extremely light in weight and very effective in improving drainage.

11. Calcined clays: they have relatively high CEC as well as water holding capacity. It is very durable and useful amendment. This inorganic soil amendment is generally used to increase the number of large pores, improve aeration and drainage.

12. Sawdust and Shavings: These are by product of lumber mills. These materials decomposes faster rate than bark and because of its wider C: N ratio. It is close to neutral pH when thoroughly composted.

How to start hydroponic

There are 3 process to do a hydroponic farming in your backyard.

1. Hydroponic Raft

A basic Hydroponic Raft is great. It's not difficult to make, doesn't cost a lot to get rolling and will give you vegetables significantly more rapidly than standard cultivating techniques.

2. Vertical hydroponics

Vertical hydroponic frameworks give an incredible choice to nursery workers lacking space. Attempt to utilize reused materials to assemble the

framework and make your hydroponics framework green.

3. Aquaponics

A small corner garden or an unused space in your home can undoubtedly be transformed into a flourishing aquaponic farm for vegetables and fish. An aquaponic framework joins components of hydroponics and aquaculture in a cooperative climate by giving fish squanders something to do as manure for crops. The framework is generally encased, with practically no waste and no requirement for compost or pesticides.

Hydroponic farming training centres in India

The most popular hydroponic farming training centres in India.

- Institute of Horticulture Technology (Delhi)
- Kamala Farms (Hyderabad)
- Living Greens Organics Pvt. Ltd. (Jaipur)

- Bihar Agricultural Management and Extension (Patna)
- Brio Hydroponics (A Unit of Brio Agri Producer Company Ltd. (Ahmedabad)
- Bellesiri - Hydroponics Training & Consultant (Bengaluru)
- Tichxelons Agrotech. Techxellance Solutions Pvt Ltd. (Mumbai)

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