

## The Future : Why Using Hydroponics For Farming?

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### **Introduction**

Hydroponics is the method of growing plants without soil. Hydroponics is a Greek word. Hydro means 'water' and Ponos means 'labor'. Plants are grown on soilless medium and nutrients are provided through water for their growth. Hydroponics is invented to rule out the influence of mother nature. Hydroponics replaces the soil with water and growing media. The growing media can be perlite, sand, rockwool etc. The main role is to transfer the nutrients in water and keep the roots oxygenated. As long as we are able of providing what they need, plants will grow.

### **History**

You all may have seen some soilless plants growing on walls, books etc however the practice has been used for thousands of years. The famous hanging gardens of Babylon in around 600 B.C. are the earliest records of Hydroponics. Other records of Hydroponics in the ancient times were found with the floating farms around the island city of Tenochtitlan by the Aztecs in Mexico in the 10th and 11th century. And in the late 13th century, the explorer, Marco Polo noted in his writing that he saw similar floating gardens during his traveling to China

John Woodward followed to study the growth of plants using water culture in 1699. 1860 & 1861 marked the end of a long search for the nutrient source essential for plants' growing when two German botanists, Julius von Sachs, and Wilhelm Knop delivered the first standard formula for the nutrient solutions dissolved in water, in which plants could be grown. This is the origin of 'Nutriculture'. Today, it is called Water Culture. By this method, plants roots were totally immersed in a water solution that contained minerals of elements like nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), sulfur (S) and calcium (Ca). They are

now seen as the macro elements or macronutrients (elements required in relatively large amounts).

The term Hydroponics was first coined in 1937 by Dr. William Frederick Gericke of University of California, aptly known as the “Father of hydroponics” he was able to grow tomato vines more than 7-meters long just by using mineral-nutrients solutions, right in his backyard.

### **Why Hydroponics?**

With the great advantages of Hydroponics such as growth rate which is higher than normal, saving the space, water efficiency and better control of pests & disease, it's no wonder that Hydroponics has been applied widely around the world.

### **Advantages**

- It saves water.
- No soil needed.
- Effective use of nutrients.

There are limitless growing media around us. Even the air can be a great material as long as it can provide plant roots with oxygen, moisture, and nutrients. When choosing a growing medium for your Hydroponic system, one should keep some traits in view:

- Good aeration and drainage - Does your medium hold the moisture and oxygen well?
- Lightweight enough to work with and carry around.
- Reusable.
- pH neutral.
- Cheaper.
- Organic and environmental friendly.

### **Hydroponics : The Future of Farming**

The population of world is continuously increasing, the challenge is to produce more food while being more sustainable. However, such a population increase comes hand in hand with the need to produce more food to feed them. FAO suggest that 70% more food will be needed in 2050. But with 80% of cultivated land is already in use and the rapid urbanization of countries set to

continue, the challenge of producing more food in a sustainable way will become ever more pressing.

Human beings have to achieve this despite the lack of lands, the increasing demand for fresh water from which agriculture consumes 70% , the expecting climate change which can lead to the alteration in temperature, lights as well as the plants and animals life cycle. Hydroponics is undoubtedly considered as an approach to the future of agriculture. Using no soil, it is a valuable culture method to grow fresh vegetables in countries or any place with little arable land and those whose area size is small yet contains a huge population. Hydroponics can help the Distant places and tourist sites like hotels, resorts can grow their own fresh food. Some successful examples that have adapted Hydroponics are the West Indies and Hawaii. People have served large tourists with their own vegetable production. We'll surely see more sites like these in the coming time.

For the scarcity of water, while desalination technology is being used, people will be able to extract fresh water from the sea to supply for the hydroponic garden as well as agriculture in general. A big disadvantage of the soilless planting method is that its expense. For large scale hydroponic farm, lights used to grow plants are a big part of the total cost. Therefore the prices of Hydroponic gardens grown indoor and those in the northern latitudes with limited sunlight are much higher. We are expecting that with the use of new technology in artificial lights, growing plants will become much more economically reduced.

In the space science industry, NASA has considered the hydroponic growing method for feeding and nourishment to astronauts on the space station and on Mars. In a world where scientists are working day by day to solve the matters of food and natural resources in a sustainable and ecological way, Hydroponics still plays a major part in human beings cope to the future survival.

### **Conclusion :**

While we don't know what the future holds exactly, we can make a couple of calculated predictions as a society. Statistics and reports already indicate that hydroponics will have a special place in the coming years. As the concept of space travel becomes closer to reality with each passing day, hydroponics will find a place in long flights across space, where agriculture is restricted due to area and soil-weight limits.