

Aeroponics: Soilless production system

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Introduction

Aeroponics is a subset of the hydroponic system. However, in the case of hydroponics, plants use water as a growing source while aeroponics does not use any growing material at all. This method was developed in the mid-1940 and since then, many researchers have added to the concept and use of this method. Aeroponics is considered to be one of the best ways to grow plants in the ground and the demand for this method has been growing due to the clear need for a simple planting method.

In the aeroponic system, the roots of the plants are suspended in the air, not in the ground or water. The roots of the plants are exposed to the nutrient-rich mist that gives the plants all the Water and nutrients they need to grow. Inside the aeroponic chamber, plant roots have more Access to atmospheric levels of gases such as oxygen, which increases plant life. Just as irritating your house plant can drown, plant roots can get into the water and be deprived of oxygen when immersed - an aeroponic system ensures that this will not happen. Healthy plants, with good roots, grow fast. This results in more crop cycles per year so a higher yield is produced on your farm.

Aeroponics and aero-hydroponics

In the growing aeroponic systems, the roots of the plants are suspended in volume while the Shoots continue to spray the roots with a nutrient solution. The structure is similar to DFT (Closed square box about 1.2 m wide and 5-10 m long) but there is no water layer, instead, there is a misalignment of the roots. The same closed space is made up of triangles made of Polystyrene boards, as in the Japanese commercial design (Greenhouse Manager, 1988) and the research program (Leoni *et al.*, 1994). In a triangular structure, the relative



humidity is 100% and oxygen supply increases around the roots. However, it should be noted that the above plants receive sufficient water. Usually, a thin layer of water is formed at the bottom, which serves as a protection for the plants.

Types of Aeroponic Systems

- **Low-pressure Aeroponics (LPA)**

This is the most widely used aeroponic used by most hydroponic hobbyists due to its easy setup, availability at any hydroponic store, and low cost. Low pressure creates droplet sizes that are very different from the aeroponic system with high pressure. What you need for this system is the same as for any hydroponic system - a pump strong enough to move water to the spray heads to spray water around the root zone of the plant.

- **High-pressure Aeroponics (HPA)**

This type of Aeroponics is very advanced and very expensive to set up as it may require special Equipment. They are therefore more commonly used in commercial production than local farmers. HPA should run with the highest pressure to soften water into small drops of water of 50 microns or less. This system creates a good droplet size that creates more oxygen in the root zone than the LPA, making it the most efficient aeroponic system.

- **Ultrasonic fogger Aeroponics**

Ultrasonic fogger Aeroponics, or more commonly called fog-phonics, is another attractive form of Aeroponic system. As the name implies, farmers will use an ultrasonic fogger to make water into tiny water droplets. These are very small and you will see them in the form of a fog. Although plant roots find it easier to absorb water in smaller sizes, there is less moisture in the mist formed, and when operated over time, it can easily create more salt that can clog these forks than other Aeroponic types.

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Plants, people and planet

Aeroponic systems benefit you and your plants, but there are natural benefits such as significant Reductions in water and fertilizer use. Reuse of water and fertilizer is also used and prevents the flow of fertilizer into the waterways, a type of water pollution that can harm the environment and kill aquatic life. There is no need for any harmful chemicals or pesticides within these systems, so it is beneficial for other wildlife species as well. Want to talk more about the benefits of aeroponics and how these programs can improve the efficiency of your vertical farm? You can start a conversation with the group here.

Conclusion

In conclusion, the best benefits of aeroponics are greater crop growth and higher yields Compared to other systems. However, these benefits also come with costs. The cost of setting up a system is very expensive and also requires technical expertise and advanced knowledge (in terms of pH and nutrient density) of this particular type of crop. If you are just starting in the field of growth through power generation, I would say weigh the pros and cons and choose the best program that you think will work for you in this category.