

A successful hydroponic system requires a balanced approach to various factors including moisture, nutrients, and airflow – both for the roots and the leaves. The ideal system for your crops depends on factors such as root sensitivity to air versus water, your ability to control algae and bacteria, as well as your available budget and space.

Each system relies on a nutrient reservoir that maintains the correct pH and conductivity (EC) levels for your crops. Bluelab offers a range of solutions, from convenient handheld devices, monitors, to wall-mounted controllers, all designed to ensure optimal plant health in growing environments.

Tip

Each system has different costs: substrate, power and maintenance: take these into consideration when determining what to grow and the system to install.

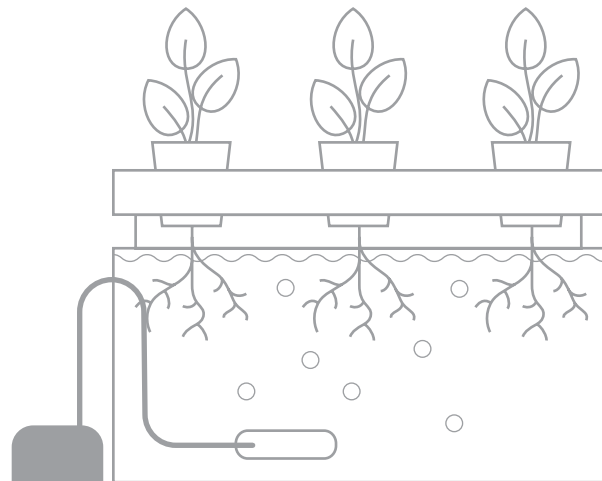
Deep Water Culture (DWC)

In the simplest form of hydroponics, plants are suspended over a nutrient solution with their roots submerged in the water. DWC systems are typically refreshed with a pump from a separate nutrient reservoir or filled by hand. Regular monitoring of algae and water levels is essential.

Roots remain submerged, requiring an air pump to evenly oxygenate the solution. Floating raft systems are a common example of DWC and are often used in commercial leafy green greenhouses. Diligent care is necessary to maintain the system's balance, ensuring the plants receive adequate oxygen while keeping algae growth in check.

Tip

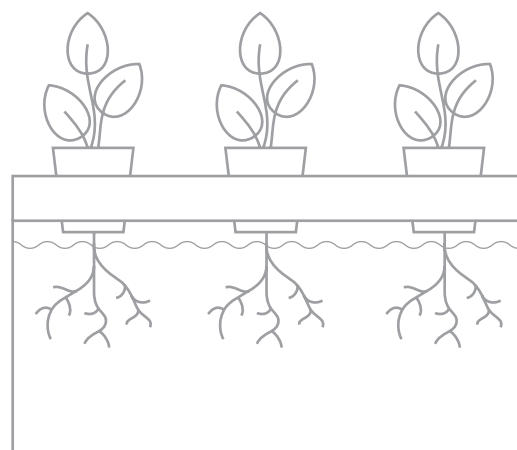
Circulating air increases evapotranspiration increasing nutrient uptake and strengthens plant stems. Look for a fan that can rotate to mimic a light breeze.



Kratky Method

The Kratky method is a subset of DWC, but without the need for an air or water pump. This system requires careful calculation of water usage until harvest, as aeration is achieved by allowing the nutrient solution to decrease as the plants grow. The roots are suspended in the air, with the solution level gradually dropping.

As water temperature rises, oxygen levels decrease, making the system harder to maintain during warmer months. Bluelab's handheld pH and Conductivity (EC) pens, or the Bluelab Combo Meter are ideal for Kratky systems, offering accuracy and ease of use.



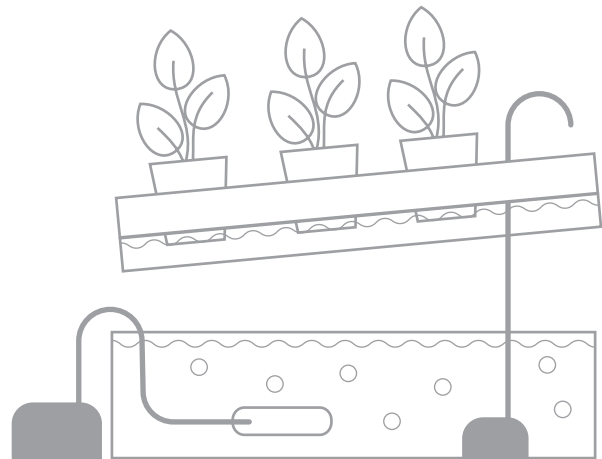
Nutrient Film Technique (NFT)

NFT is a popular system that uses gutters or pipes to pump a thin film of nutrient solution over the plant roots, which are aerated between the pumping cycles. Most NFT systems use minimal or no substrates and achieving the correct pump cycle timing is crucial—pump failures can result in the loss of crops as roots dry out quickly.

NFT is commonly used in vertical garden setups to maximise space. The pump strength is important, especially in taller systems. Bluelab's Pro-Controller Wi-Fi is an excellent choice for monitoring pH and conductivity (EC) levels and can be accessed remotely through Bluelab's Edenic app.

Tip

Don't use a temporary system for a perennial for example, a flimsy plastic pot for a citrus tree that will want to spend years in the same pot.



Flood and Drain / Drain to Waste

Flood and Drain systems work similarly to NFT, regularly pumping nutrient solution to the plants. However, the roots are supported by a substrate, and the solution is irrigated from the top using gravity to flow through the medium. This system is especially popular for fruiting plants and perennials, with individual plants often placed in separate pots.

The substrate in this system allows for longer pump cycles, reducing the risk of crop loss if the pump fails. Drain to Waste systems do not recycle nutrient solution, which can increase water and nutrient costs but ensures precise nutrient delivery and reduces the risk of disease transmission. Drain to Waste can run 24/7 if the substrate allows proper airflow, whereas Flood and Drain systems require drying cycles based on the substrate, crops, and environment.

In both systems, it's vital to test pH and conductivity (EC) levels both before the solution reaches the plants and at runoff to ensure the plants are receiving the correct nutrients. Bluelab's IntelliDose system has the flexibility to automatically adjust pH and conductivity (EC) while managing irrigation cycles, making it ideal for recycled water systems. The Bluelab Guardian Wi-Fi is perfect for monitoring runoff in either system.

