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Hydroponic for Home Nutritional Garden

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Hydroponics is the science of soilless gardening. It entails growing healthy plants without the use of typical soil media, instead relying on a nutrient such as a mineral-rich water solution. To thrive, a plant only requires a few nutrients, water, and sunlight. Plants not only grow without soil, but they often grow better with their roots in water.Plants and vegetables grow faster in a hydroponic system than in soil, and hydroponic systems can be utilised all year. Hydroponically grown plants produce more, take up less space, and use less water than conventionally grown plants. A hydroponic system is also a viable option for apartment residents and city dwellers that lack access to an outdoor growing area.

The Benefits of Growing Vegetables Hydroponically at Home

We all want to feed ourselves and our families healthy, high-quality food. Every day, there seems to be a new report regarding GMO foods or poisons in farm water, either online or on the news. What we eat and we utilised to cultivate the plant to bring to our table if you grew it our self. Hydroponically grown veggies, it turns out, have the same quantity of vitamins as those cultivated in the ground.

The list of some of the benefits of growing plants hydroponically:

- It can avoid using any pesticides.
- Hydroponic plants generally grow faster than those grown in soil.
- The yields are often greater than those grown in soil.
- Does not require garden space or much space at all to grow plants.
- Hydroponic plants generally attract fewer pests and diseases.
- There are no weeds to pull.
- Hydroponic gardening saves water.
- Hydroponics allows plants to develop up to 50% quicker than they would in soil by delivering constant and easily available nourishment. A hydroponic garden can also provide fresh produce throughout the year.

Nutrient Film Technique a popular with home hydroponic growers (Source:https://www.radongrow.com)

- When compared to traditional soil gardening, hydroponic farming completely eliminates the need for herbicides and pesticides, which is good for both the environment and the grown product.
- Any water used in hydroponic farming remains in the system and can be reused, minimising the requirement for a continuous supply of new water.
- Gardening space is becoming increasingly scarce as arable land becomes scarce. Hydroponics is an excellent choice for indoor gardening if you don't have a lot of yard area or a small balcony.

The Nutrient Solution

Primary nutrients (nitrogen, potassium, magnesium), secondary nutrients (calcium, sulphur, phosphorus), and micronutrients make up the ideal nutrient mix (iron, copper, manganese, zinc, molybdenum, boron). Here's a basic nutrient solution recipe that you may produce at home by diluting the nutrients in 20 litres of filtered water.

- 25 ml of CaNO3 (calcium nitrate)
- 1.7 ml of K2SO4 (potassium sulfate)
- 8.3 ml of KNO3 (potassium nitrate)
- 6.25 ml of KH2PO4 (monopotassium phosphate)
- 17.5 ml of MgSO4 (magnesium sulfate)
- 2 ml of trace elements

Keep your solution at room temperature and away from light in a food-grade container. Before usage, give it a good shake. Your plants will also let you know if they are getting too few or too many nutrients: too few and the leaves will turn yellow; too much and the leaves will look brown, burnt, or curled.

Important Considerations

While practically anything can be grown in a hydroponic system, some crops do better than others. Cucumber, tomato, capsicum, strawberry, lettuce, and leafy greens are examples of plants that don't hate dampness and don't get too big for their space.Also, based on the size, sturdiness, and root development of the plants to be cultivated, as well as the construction of the system, one must determine whether to use solely a solution culture or some form of growth media while building up a hydroponic garden.In solution cultures, plants with shallow roots, such as leafy greens, thrive. Foam, coconut husk, sponges, and peat moss, on the other hand, are preferable for plants with deep roots, such as beets, and heavier vegetables, such as cucumbers.Flowering and fruiting plants also require sunlight, although leafy greens thrive even under low-cost fluorescent lights put above them.

Helpful Tips for Growing Plants Indoors Hydroponically

Here are a few more things to think about while planning new hydroponic garden:

Lighting

Simply because a plant is cultivated in water does not mean it does not require sunlight. There is need to either situate the plants near a south-facing window or figure out another means to deliver them much-needed light ideally at least six hours a day especially in the case of fruits and vegetables like tomatoes and virtually everything with flowers.

pH Level

Depending on what to produce, plants' ability to absorb vitamins, carbs, and other nutrients may be severely hampered if your water doesn't have the right pH level. (For example, most of the herbs listed below grow in water with a pH lower than ordinary tap water.) As a result, it's critical to determine your plants' ideal pH preferences and modify the water

accordingly.Knowing the pH level of water is essential. To obtain the best yield and healthiest plants, the vegetables need the optimal growing environment. A range of 5.5-6.5 is suitable for most plants. Some plants, such as pumpkins, can grow successfully between 5.5-7.5.

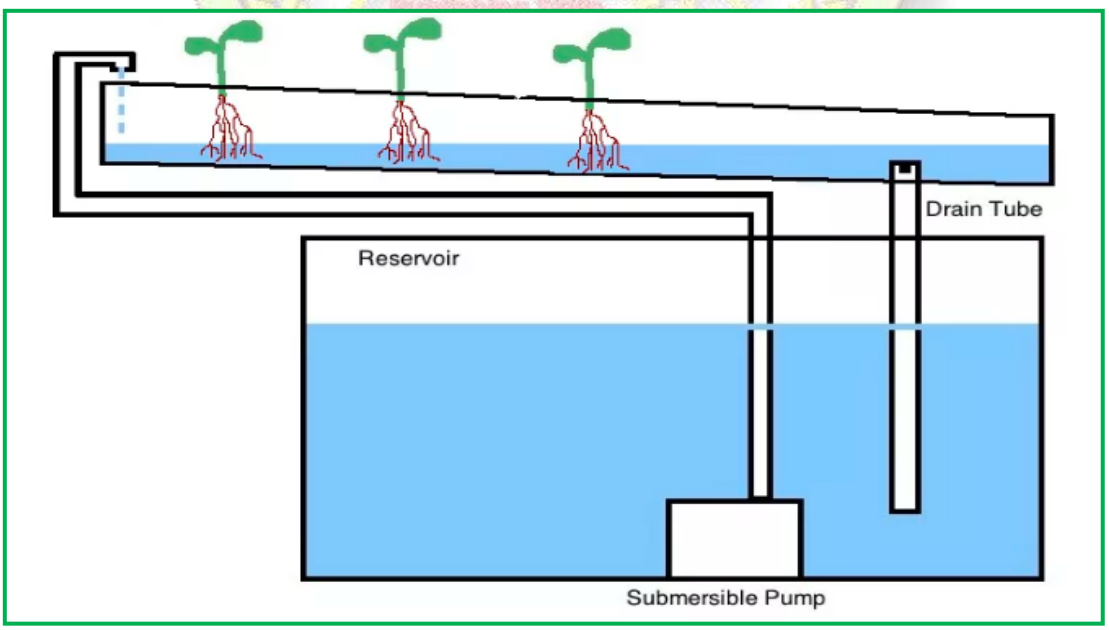
pH meter

Climate/Temperature

Because most plants prefer temperatures between 60 and 80ºF, it's crucial to keep an eye on how hot or cold it gets in the hydroponic garden. There is need to shield it from the heat created by your grow lamps or a neighbouring radiator on occasion. Even if they're indoors, you'll need to protect them from lowering temperatures in the winter.

Nutrient Film Technique (NFT)

Plants are suspended above a stream of continually flowing nutrient solution that washes over the ends of the plant's root systems in nutrient film technique (NFT) systems. Water can trickle down the length of the grow tray before draining into the reservoir below because the channels supporting the plants are slanted. The reservoir's water is then aerated using an air stone. The nutrient-rich water is subsequently pumped out of the reservoir and back to the channel's top by a submersible pump. A recirculating hydroponic system is the nutrient film technology.Even because nutrition film technology systems recycle water continuously, draining the reservoir and replenishing the nutrient solution every week or so is a good idea. This ensures that your plants receive adequate nourishment. NFT channels must have a gradual slope to them. If the gradient is excessively steep, water will rush down the channel without properly nourishing the plants. The system will overflow if too much water is pumped through the canal, and the plants will drown. NFT hydroponics are widely used commercially because they can support multiple plants per channel and are easily mass-produced. Lightweight plants like mustard greens, kale, lettuce, spinach, and strawberries are ideally suited for nutrient film technology systems.Heavier fruiting plants like tomatoes and cucumbers will require trellises to support the excess weight.



Nutrient Film Technique in Hydroponic Gardens

(Source: https://www.thespruce.com/hydroponic-gardens-nutrient-film-technique-1939220)

Nutrient Film Technique for herbal home garden (Source: https://www.growertoday.com/best-plants-for-nft-system/)

Best 25 Plants for Indoor Hydroponic Gardens

Although the idea of having a garden may appeal to anybody, the lack of outdoor space may make it seem impossible to attain.Many plants including herbs, veggies, and house plants are all possible to grow indoor hydroponically. Andcreated a list of 25 easy-to-grow plants that can be grown hydroponically or in water. Although many plants can root and develop in a glass jar with just a little water, with adequate plant nutrition and sunlight, they can grow and yield much faster than in an outdoor vegetable garden.

Growing Herbs Hydroponically

Consider having fresh herbs available whenever need them. This may change the flavour of meals as well as the nutritional content of the foods prepared. It's also worth mentioning that, while seeds can be utilised in most situations, cuttings are the preferred option. The plant grows not only stronger but also faster as a result of this method. Obtain a cutting from friends or family members who have this growing

Herbs Well Suited to Hydroponics

Common Name	Latin Name	Seeds	Cuttings
Tarragon	*Artemisia dracunculus*	No	Yes, from spring shoots
Peppermint	*Mentha piperita*	No	Yes
Green Mint	*Mentha*	Yes, but difficult	Yes
Oregano	*Origanum vulgare*	Yes	Yes
Basil	*Ocimumbasilicum*	Yes	Yes
Sage	*Salvia officinalis*	Yes	Yes
Stevia	*Stevia rebaudiana*	Yes	Yes
Lemon Balm	*Melissa officinalis*	Yes	Yes
Rosemary	*Rosmarinus officinalis*	Yes	Yes (preferred method)

		
Tarragon	**Green Mint**	**Oregano**
		
Basil	**Sage**	**Stevia**
		
Lemon Balm	**Rosemary**	**Peppermint**

Growing Vegetables Hydroponically

In addition to the herbs indicated above, a water-based growing medium can be used to grow a variety of plants, including vegetables. Many of the types are the same as the backyard garden, while others are cultivars bred to flourish in small settings. Plants will thrive as long as they are given food and light. Some gardeners struggle with this concept because they believe soil must be present. To support larger plants like tomatoes, clay pebbles are suggested so that the roots have a firm hold on something. The table below lists some of the vegetable plants that can be cultivated hydroponically.

Vegetables Well Suited to Hydroponics

Common Name	Latin Name	Seeds	Cuttings
Lettuce	*Lactuca sativa*	Yes	Yes
Spinach	*Spinacia oleracea*	Yes	Yes
Bok Choy	*Brassica chinensis*	Yes	Yes
Tomatoes	*Solanum lycopersicum*	Yes	Yes
Peppers	*Capsicum*	Yes, sometimes	Yes
Cucumber	*Cucumis sativus*	Yes	Yes
Celery	*Apium graveolens*	Yes	Yes

		
Lettuce	**Spinach**	**Bok Choy**
		
Celery	**Peppers**	**Cucumber**

Growing House Plants Hydroponically

A list of home plants that can be grown without soil is provided below. In a hydroponic system, these will thrive and many of these are already known and also grown. Houseplants are not only attractive in the home, but they also help to purify the air by absorbing carbon dioxide.

House Plants Well Suited to Hydroponics

Common Name	Latin Name	Seeds	Cuttings
Devil's Ivy	*Epipremnumaureum*	No	Yes
Arrowhead Vine	*Syngonium podophyllum*	No	Yes
Philodendron	*Philodendron bipinnatifidum*	Yes	Yes
Peace Lily	*Spathiphyllum*	Yes	Yes
Chinese Money Plant	*Pilea peperomioides*	Yes	Yes
Female Dragon	*Dracaena draco*	Yes	Yes, but difficult
Dumb Cane	*Dieffenbachiaseguine*	No	Yes
Chinese Evergreen	*Aglaonema commutatum*	Yes, but difficult	Yes
Spider Plant	*Chlorophytum comosum*	Yes	Yes

		
Devil's Ivy	**Arrowhead Vine**	**Philodendron**
		
Peace Lily	**Chinese Money Plant**	**Female Dragon**
		
Dumb cane	**Chinese Evergreen**	**Spider Plant**

Conclusions

There are numerous other compelling reasons to begin hydroponics now. LED technology is improving and becoming more affordable, farmers markets are growing in popularity, people want fresh and healthful foods, and people want to know who their farmer is and where their food originates from, and so on.We need to rethink how we will feed another 2 billion people by 2050 as the population grows geometrically and food production grows arithmetically. Perhaps decentralising our food supply can help, and hydroponics can help with that. Anyone may become a year-round food producer with hydroponics.

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