

# Hydroponics as a Hobby

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Hydroponics, growing plants without soil, has long been a hobby among gardeners interested in the precision of science, especially those with home greenhouses. Almost any plant can grow in a hydroponic system if the grower is careful and plans well. Tomatoes, lettuce, spinach, and ivy are a few of the many plants that a gardener can successfully grow hydroponically at home.

## Require More Attention

Generally, hydroponically grown plants require a little more attention than those grown in soil. Nutrient solutions must be applied regularly. Care must be taken that fertilizer salts do not build up within the system. Close observation is necessary to prevent rapid spread of disease through the water. But many home growers find it is worth the extra effort in order to grow plants without the threat of soil-borne diseases and other organisms. Some like the exacting nature of fertilizer application in a hydroponics system. Others like the predictability of hydroponics and the neat, clean approach to growing flowering plants and vegetables.

A small, homemade water culture system can be built with only a few materials. The tanks and pipes must be made of non-corrosive materials, such as plastic, glass, ceramic, fiberglass, concrete, wood with thick plastic linings, or stainless steel. Quart jars or glazed-porcelain crocks are adequate for a small project. Trays with some type of netting to support the plants have been employed by students in botany laboratories for years. Plant trays can be constructed from wood and lined with 6 mil plastic film.

## Use Plastic Parts To Avoid Corrosion

Metal parts, particularly pumps that are not made for hydroponic use, will wear out in a short time or become clogged due to the corrosive nature of fertilizers. Galvanized materials may release sufficient zinc to cause toxicity symptoms in plants. Copper materials cause the same problem.

Therefore, plastic pipes and fittings, pumps with plastic impellers, and plastic tanks should be utilized. Glass should be painted a dark color to prevent chemical reactions and algae growth. Nutrient storage containers and delivery lines should also be opaque.

Good quality water with the proper pH and a low salt, minimal metal content should be used. Rainwater can be collected for the system. "Hard" water or water run through a "softening" device can damage plants.

Inexpensive pH and "hardness" testing kits can be purchased at aquarium or garden supply stores. The pH can be adjusted easily by adding white vinegar to increase acidity or baking soda to increase alkalinity. The best pH for growing vegetables and most other plants hydroponically is between 5.8 and 6.2. Almost any material may be used as a support media for roots if it is inert, does not decompose, and is not too fine. Fine sand does not permit proper aeration, so the aggregate should range between very coarse sand and dime-sized gravel. Pea gravel works well. Coarse vermiculite and perlite can be used in some systems, but they have several disadvantages. Vermiculite may contain considerable potassium and tends to collapse and lose its structure after six to twelve months. Perlite is acceptable, but it tends to float out of a flooded tray and offers little support until the root system is firmly established.

### **Success Depends on Getting Nutrients To Plants, Precisely**

Hydroponically grown plants must obtain all their nutrients, including trace elements, from the nutrient solution. Success or failure may depend on precise and complete fertilizing practices. Complete nutrient solutions, specifically made for hydroponics, take the guesswork and the mess out of mixing one's own formulas. All hydroponic nutrient solutions must be changed after a short period since evaporation causes concentration of salts in the water. Adding fresh solution to old solution would only make things worse. During spring and summer, pour spent nutrient solution around trees and shrubs.

Since water does not retain sufficient oxygen necessary to sustain most plants, a means of aeration must be provided, such as a small pump similar to the ones used in fish aquariums. Small containers could be aerated best by using a "porous air stone" from an aquarium store. A small, continuous stream of air bubbles should be adequate.

Observation is a key element in hydroponic growing. The gardener must watch very carefully for signs of disease when growing several plants together in the same container of water. Because the water flows throughout the medium and/or is recycled, disease organisms can spread very rapidly.

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More gardening information is available in the [Virginia Gardener Newsletter](#).