

Hydroponics_Challenge_Project_2004.txt

For those of you whom are new, every now and again we have an "I Dare You/Challenge Project" with some kind of project that is homesteading/farming/self-sufficient in topic. This time around it is how to make a small windowsill hydroponics system. Past projects (as well as this one) can be found in our FILES section located at <http://groups.yahoo.com/group/organichomesteadinggardening/files/> scroll down to "Challenges Dares and Projects" and open the file you are interested in. Past projects have included things such as Cast iron pans, Rug braiding, Candlemaking, Sourdough starter, Knitting boot socks, Making paper, Milk Paint, Chicken tractors (where is that file Dee?), Solar cooking, Soapmaking, Growing Sprouts, Cheese and Yogurt making.

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Hydroponics basically means working water ("hydro" means "water" and "ponos" means "labor"). Hydroponics is not just a space age new method of growing plants. Many different civilizations have utilized hydroponic growing techniques throughout history. The hanging gardens of Babylon, the floating gardens of the Aztecs of Mexico and those of the Chinese are examples of 'Hydroponic' culture. Egyptian hieroglyphic records dating back several hundred years B.C. describe the growing of plants in water. Hydroponics is hardly a new method

of growing plants. In recent years, giant strides have been made over the years in this innovative area of agriculture.

Throughout the last century, scientists and horticulturists experimented with different methods of hydroponics. One of the potential applications of hydroponics that drove research was for growing fresh produce in nonarable areas of the world. It is a simple fact that some people cannot grow in the soil in their area (if there is even any soil at all). This application of hydroponics was tested during World War II. Troops stationed on nonarable islands in the Pacific were supplied with fresh produce grown in locally established hydroponic systems. Later in the century, hydroponics was integrated into the space program. As NASA considered the practicalities of locating a society on another planet or the Earth's moon, hydroponics easily fit into their sustainability plans. Even in Antarctica they have several hydroponic gardens... there was a slight problem however...the salad vegetables froze while being taken to the kitchen .

Anyone can build a simple, automated hydroponic system without spending a lot of money. This system is compact enough to fit on a kitchen windowsill--although it can easily be expanded to accommodate any growing plant collection. All the materials that are needed for this system can be found at discount superstores, aquarium supply stores, or hardware stores for under \$25 .Materials needed: Air pump, Timer, Plastic tubing, 2-liter bottle, Straight through connectors, T connector, Bleed valve, Ice cube holding bin, Medium, Waterproof glue or silicon caulk, Drill Use a 2-liter bottle for the nutrient reservoir and an ice cube holding bin for the plant trough. Once you comprehend the logistics, feel free to experiment with other containers. To prepare your nutrient reservoir, drill two holes in the cap of the 2-liter bottle. The holes should be just big enough to snugly hold the 1/4-inch straight through connectors. One hole will be for the water

line and the other will be for the air line. Drill a hole in the side of the trough (the ice cube holding bin) as close to the bottom as possible. If you plan on expanding your system, drill another hole on the opposite side. Insert the straight through connectors in the drilled holes. Create a quality seal around the connectors with glue or silicon caulk. (it is NOT the one pictured today, it is a smaller project mentioned here for the Challenge Project)

Create your water distribution hose by drilling several small holes in a piece of irrigation tubing cut to fit the bottom of the trough. Connect one end of the tube to one of the fittings on the inside of the trough. The other end of the tube can be sealed with a dab of glue or caulk. If you plan on expanding your system, don't seal the other end. Instead, connect it to the other fitting on the opposite side of the trough. Connect the water line from the nutrient reservoir to the trough. Cut another piece of water line to about the same length as your nutrient reservoir. Then connect this line to the other side of the water line connector, on the inside of the bottle cap. The line should hang down to the bottom of the 2-liter bottle when the cap is on.

Run the air line from the air pump to the other straight through connector on the cap of the bottle. At some point in the air line, splice the line to put in the T connector. Off the T, connect the aquarium air line bleed valve.

Fill your 2-liter bottle with water until it's about three-quarters full. Reconnect it to your trough and place the trough where it will be situated. Turn on the air pump and close the air valve. The water will be pushed into the trough. Gradually ease open the valve until the water is moving into the trough very slowly. It's okay if it takes up to a half-hour for the air pump to push all the water out of the bottle. The goal here is to have the valve closed enough to allow adequate pressure to build inside the bottle to push the water

out, but open enough to allow air to escape when the pump is off, so the water can flow back into the bottle.

Now you're ready to add the medium and plants. Expanded clay or lava rock works well. Any number of plants will work in this system. Succulent herbs, such as basil and mint, are particularly easy to grow.

If you want to expand your system, simply build another trough and attach the incoming water line of the new trough to the end of the previous trough. Up to two modules of this size could be powered from the same pump and nutrient bottle.

Flooding and draining the system once a day should be adequate. But if you're growing a large plant in a sunny location, you may have to set the system to flood and drain twice a day.

Is anyone running a hydroponic system currently? Let's hear about it! What system do you run? What do you like about it? Want to change about it? Do you buy or mix your own nutrients? What plants (and is there varieties that do better than another?) are you growing? Post some pictures in our photo album.....

tenzicut - who is building a larger version this winter, but might do this windowsill one for the apartment