



Deep Water Culture Hydroponic System

Materials Needed:

- Rockwool, rapid rooters, or other non-soluble hydroponic media
- One fish aquarium or a large sturdy plastic tote
- Closed Cell Styrofoam sheet (1 inch thick to place growing pots in)
- Plant seeds
- Fish tank air stone (appropriate to the size of the tank or tub you are using)
- Fish tank Air pump system
- Power drill and hole saw bit – or knife (to cut holes)
- 6-10 hydroponic net pots
- Pencils
- Popsicle sticks (optional for plant labels)
- Knife or box cutter for cutting foam to size needed
- Sharpies
- 2 2ft Grow lights: T-5 LED Lights
- 10 FT length of 1" PVC Pipe for Light Structure
- 8 1" PVC connectors, Three Way corner and 4 T
- Chain and S Hooks for Light Structure
- Spray bottles
- Hydroponic nutrients



Net Pot



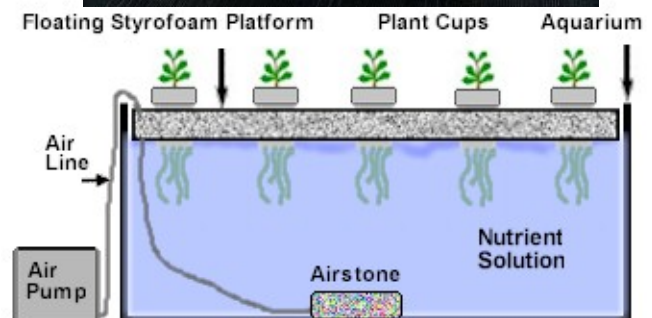
Air Stone



Air Pump



Foam Board



How Deep Water Culture Hydroponics works:

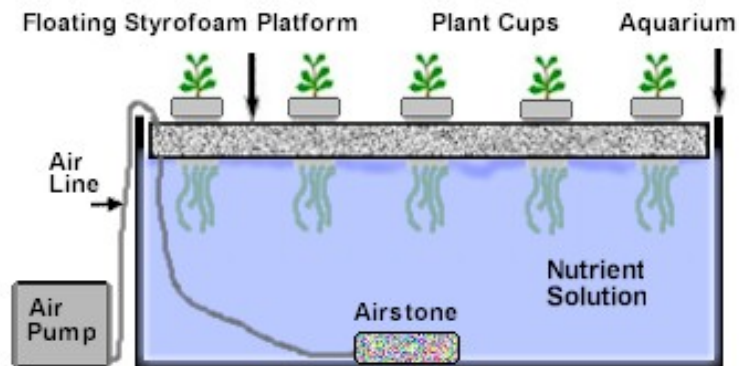
This type of hydroponics is known as deep water culture hydroponics. This hydroponic method of plant production is done by means of suspending the plant roots in a solution of nutrient-rich, oxygenated water. Traditional methods favor the use of plastic buckets and large

containers with the plant contained in a net pot suspended from the center of the lid and the roots suspended in the nutrient solution. The solution is oxygen saturated by an air pump combined with porous stones. With this method, the plants grow much faster because of the high amount of oxygen that the roots receive. - Wikipedia

Setting up the System

Preparation:

Start seeds in the rockwool or rapid rooters before you put together the system. Start your seeds in separated media in six pack containers or a full sheet in a 10-20 planting tray. Place them under lights on a shelf for 2-3 weeks before you intend to put them into your system. Plants should be grown on a shelf with lights at most 3" from the container they are grown in. Wait until they have sprouted their second set of leaves before adding them to the system. Be sure to label your plants. You should be able to do 6-10 net pots depending on size of aquarium/tote and the size of the net pots.



Procedure:

1. Gather all supplies and lay them out.
2. Measure the inside dimensions of opening of the fish tank or storage bin you are using.
3. Cut the Styrofoam float to fit the opening of the tank or tote using a knife or a box cutter. Cut the foam a $\frac{1}{2}$ inch smaller than the opening of the tank or tote so that it can float free as the water level changes.
4. Trace the net pot opening diameter on to the floating platform by placing top side down and trace with the sharpie.
5. Cut the holes in the float to the proper size for the plastic cups or net pots that you are using with either the drill and hole saw bit, or a knife. Note: you want the bottoms of the cups to hang below the bottom of the float but not fall through. If you are using plastic

cups: cut several holes (approx. 1/8" to 1/4" dia.) in the bottom and sides of your plastic cups. Set the platform aside for a little bit.

6. Attach the free end of tubing to air pump and plug in air pump to outlet, make sure that there are bubbles coming from the airstone. Set the airstone in the bottom of the aquarium or tote, sitting on top of the aquarium rocks. Note: **NEVER submerge the air pump in water as electrical shock could occur.**
7. Fill the aquarium or tote with measured room temperature water to 4-5 inches below the rim of the container.
8. Add nutrient mixture to water in the aquarium or tote. Read directions on the nutrient container for exact amounts to add based on the gallons of the tank. Stir it gently and give the nutrient time to mix with the water.
9. Add growing medium to the cup or plant pot. Note: If the growing medium falls out through the holes, you can put a small piece of non-metal window screen or small piece of cloth over the holes before adding the growing medium.
10. Place the pots into the holes on the floating platform. Add seedlings you have started ahead of time.
11. Place the floating platform on top of the water. Plug in and turn on the airstone pump.
12. Once everything is assembled, add the light structure around the tank. Add a timer and have the cycle of light be 12 hours on and 12 hours off.
13. Weekly/daily maintenance will be required including adding water and nutrients, pH monitoring, flushing out accumulated nutrients, etc. See below.

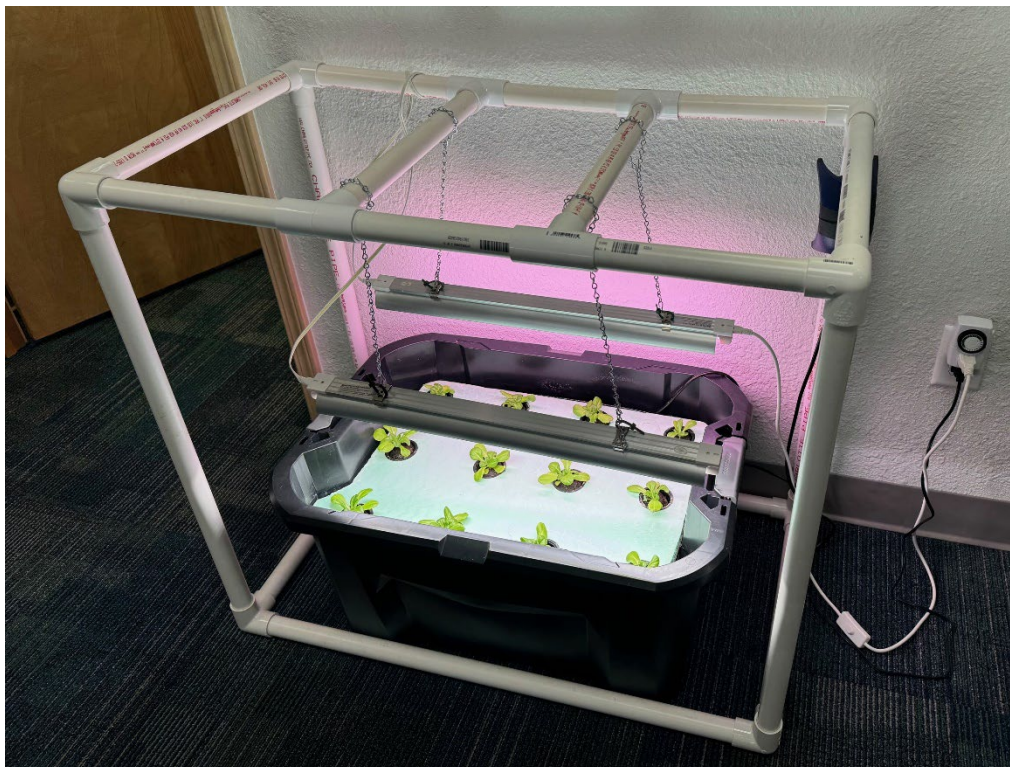
Maintenance and Feeding Instructions

1. Water the cups a couple times a week until the roots reach the water/nutrient mixture. Use spray bottle for this.
2. When you notice the water level going down, the plants have likely used up about half of the nutrient solution. Add half of the recommended nutrient per gallon of water. Check pH if plants are showing any signs of yellowing or spotting.
3. Monitor plant growth and harvest when the plants are big enough.

Building the Light Structure

Cutting the PVC Pipe:

1. Measure all the sides of your deep water culture tank/storage container.
2. Using the measurement of the height of the container, cut 4 vertical PVC pipes with a pvc cutter to be at least 2 feet above the top of the container. The vertical pipes in the picture below shows the height of the vertical pipe to be 3 feet
3. Make the light structure horizontal pipe size to be at least 8 inches wider than length the the top of the container. The picture below shows the pipe on the top and bottom of the structure to be 3 ft by 20 “.
4. Keep the bottom pipe whole. The top horizontal middle pipe needs to be cut to add the cross pipes to hold the lights.
5. Connect all the pipe using 3 way and T connectors.
6. Using the chain, suspend the lights above the plants. Make sure you can adjust the height of the lights using an additional S hook. Raise the lights as the plants grow.
7. Plug the lights into a timer. Set the timer to 12 hours on and 12 hours off.





Reccomended Supplies Needed

1. Rockwool, rapid rooters, or other non-soluble hydroponic media
Root Riot is my favorite. Amazon has bags of 100



2. One fish aquarium or a large sturdy plastic tote
Recommended: Commander 27 gallons



3. Net Pot – 2 inch size is what you want



4. Closed Cell Styrofoam sheet (1 inch thick to place growing pots in)
Comes in 2ft x 2ft square or 2ft x 8ft options at lowes or Home Depot. Green or Pink.



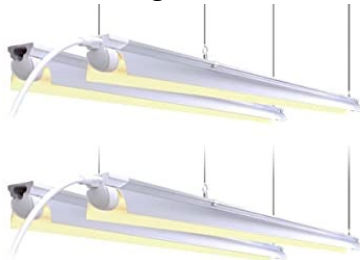
5. Fish tank air stone (appropriate to the size of the tank or tub you are using)
With a plastic holder is best for durability.



6. Fish tank Air pump system 20 gallon size works fine



7. 2 2ft Grow lights: T-5 LED Lights
Barrina with light directors are the best style and inexpensive



8. 10 FT length of 1" PVC Pipe and Three Way Elbow and T Connectors for Light Structure



9. Chain and S Hooks for Light Structure



10. Hydroponic nutrients
Recommend DynaGrow "SuperThrive: Grow"

