

# Do It Yourself Aquaponics

HOME | AQUAPONICS | FISH | VEGGIES | BACKYARD | COMMERCIAL



## Aquaponic System Designs

### AQUAPONIC DESIGNS & PLANS

Learn how to set it up.

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### AQUAPONIC EQUIPMENT

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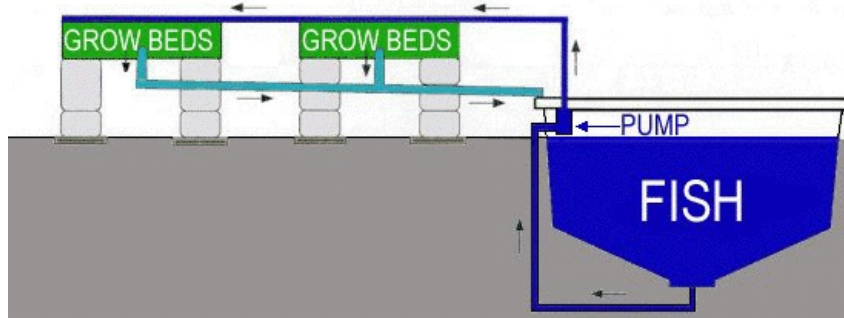
## AQUAPONIC SYSTEMS

- Sump Waste Collector
- Pumped Grow Beds
- Constant Flow System
- Aeration of Constant Flow System
- Drip System

There are many ways to get the nutrient rich fish water to the grow beds and which way is best is the one that better suites your needs; the size of your pocket book and/or space you have to allocate to a system.

### GRAVITY FEED SYSTEM

Below is a pump/gravity feed system. The grow beds are elevated slightly on one end to facilitate a downhill effect. The water is pumped from the fish tank to the grow beds where it flows to the low end of the grow beds allowing the water to flow back to the fish tank. The fish tank or trench whether it be round or other wise shaped, is sunk into the earth with a drain at the bottom. Notice the sides of the tank (we'll use tank here) are sloping toward the center where the drain is located. This particular set up will not only pump the water from the tank, but will also remove the majority of fish waste settlement from the bottom of the tank.



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### SUMP WASTE COLLECTOR

Illustrated below is a sump or settlement tank which can also be incorporated into this system. It contains a baffle which effectively allows the heavier fish waste to settle to the bottom of the tank. The waste can be allowed to collect there and removed after a period of time to be used in organic potting soil, feed your worm bed etc.



This is a good way to prevent the waste from being pumped into the grow beds where over a period of time it could possibly collect in the medium near the water outlet holes in the PVC. This could restrict or create a diverted flow of water into channels, preventing the plants the full benefit of the water or in some cases, receiving none at all.

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### PUMPING TO THE GROW BEDS

The graphics below and below are a good demonstration of how an Aquaponics system could be setup in a greenhouse if for example you are growing a number of different veggies and/or herbs. Additionally, the tanks could all be set at one end of the greenhouse if desired, but the above graphic allows for a quicker return of the water from all the beds.

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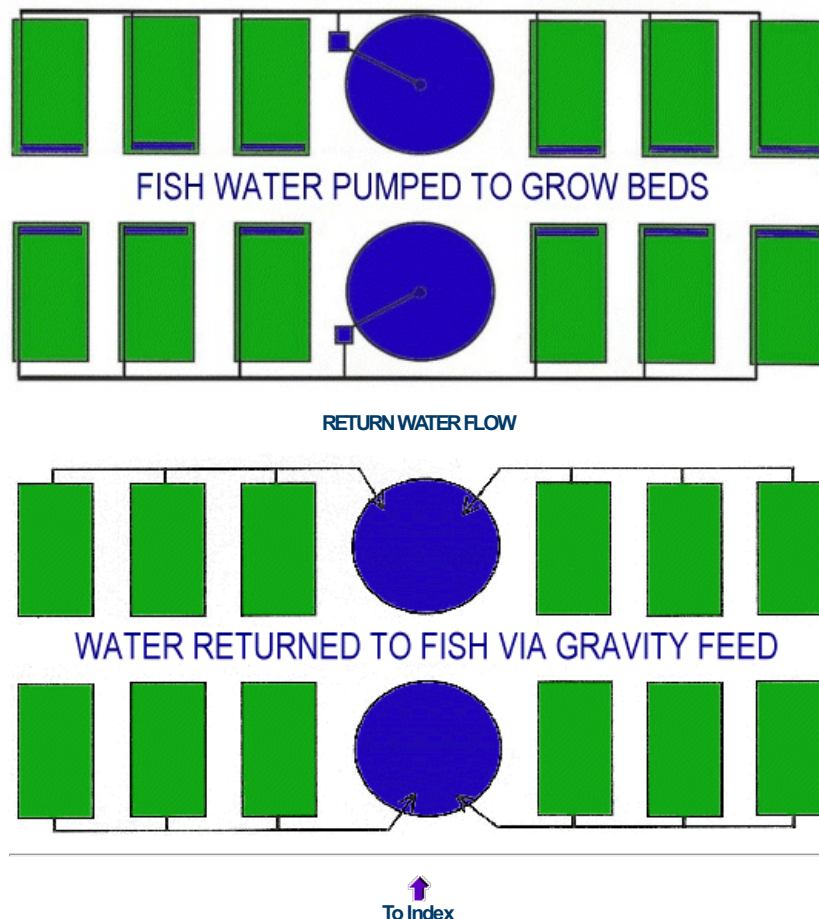
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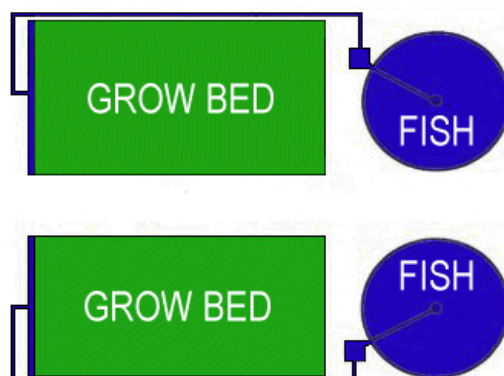


The UK Premium Aquaponics  
Web Site  
[Aquaponic World](http://AquaponicWorld.com)



#### CONSTANT FLOW SYSTEM

The graphic below shows a single grow bed designed for using without a grow medium. These beds are flooded to an approximate depth of 12 inches and flowing continuously from and to the fish tank. The plants are secured in a floating platform with the roots extending directly into the water. With this system, you need to make sure the water is properly aerated to give the plants sufficient oxygen to the roots.



To see this system at work in a vast commercial system where they are raising lettuce, follow this link:

<http://www.youtube.com/watch?v=FHBhyqowSEc>

You will have to register as a member of [www.youtube.com](http://www.youtube.com) in order to hear the audio of this link, but it is well worth the effort to actually see and hear how such an operation functions. Of course, I should mention here that this operation isn't a true aquaponic system since they don't raise fish in addition to the lettuce, but close your eyes for a moment and just imagine the amount of Tilapia that could be produced with such a grow bed area as this to clean the water.

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#### AERATION FOR CONSTANT FLOW SYSTEMS

Building an air flow aeration system is a little labor intensive to build. I don't mean difficult though, just time consuming, but it can't be beat for creating bubbles over a wide area and oxygenating the water. Basically it is very simple.

For this system you can use an air pump or large commercial oil-less air compressor (which ever you use, it must be oil-less). It is recommended that the air be pumped through a high pressure copper tubing supply line. A regulator outlet valve can be attached and used to provide a lower air pressure to a 2 inch PVC manifold leading to the inflow end of the fish tank.

From the manifold, a piece of 1 inch PVC tubing is extended about 10 inches out over the edge of the fish

tank and elbowed at a 90° angle toward the bottom of the tank. Another 90° elbow is installed at the end and another piece of 1 inch PVC is then run across the bottom of the tank. It sits about 2 inches from the bottom of the tank and running from one side of the inflow end of the tank to the other and a capped is installed on the end.

That portion of the tube is where the actual intensive labor comes in. Before it is installed, naturally, to create this section, draw straight lines at 1/4 inch intervals around the 1 inch PVC from one end to the other; then mark them at 1/4 inch increments from one end to the other and draw a line around the tubing at each mark. Using a 1/32 inch drill bit, drill tiny pin-holes where each of the lines intersects. It is permissible to even drilled holes in the end cap just for good measure. I mean why not, it was there!

This is the difficult part as the drill bit is hardly larger than a needle. A larger pin hole can be created using a 1/8 inch bit if desired, but the smaller holes create a much finer stream. Suffice it to say, it is possible you will break a number of bits before you finished. However, the results are well worth the effort. A steady stream of foam like bubbles can be created which can actually cause the water to boil up at least 1 to 1 1/2 inches above the water level of the tank all across the end of the tank.

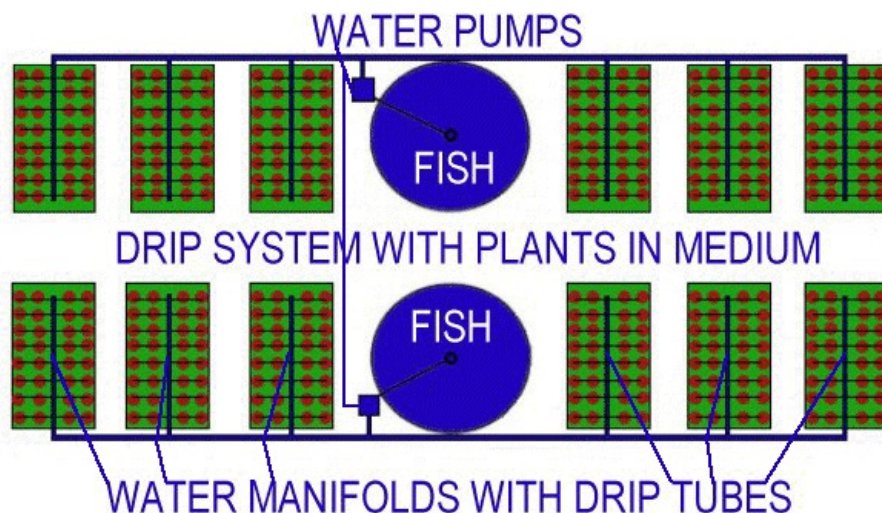
A note of caution to prevent problems later, always remember, after the holes are drilled, you must make sure there are no obstructions in the holes and also clean out the inside of the tube carefully removing all filings. A possible solution is the use of a heavy grit piece of sandpaper wrapped and tacked around a wooden dowel and rammed through the PVC. Then use a high pressure air nozzle to insure no bits or pieces of the drilling process were left to later block the air holes.

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### DRIP SYSTEM

The graphic below shows a simplified diagram of a drip system. The red spots represent the plants. This type of system is widely used to produce plants in a grow bed medium. The nutrient rich fish water is pumped from the fish tanks to provide manifolds positioned above the grow beds. Holes are drilled into the manifolds and small tubing spickets are inserted into these holes and glued into place. Drip tubes cut into the desired lengths are then pushed onto the spickets and placed in the grow medium next to each plant.

The system pumps are operated by a timer which turns them on and off at your desired period of time, pumping water to the plants and then allowing the cleaned water to return to the fish tank via the gravity feed system.



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