

Pretty Home Aquaponics System - Jarrah Wood

(developed by A. Riebau with advice and supplies from Nerabup Organic and Hydroponics Supply)



Figure 1 Complete system with 1000 litre fish and about 1200 litre growbed volume. Almost 550 litres of sump (water) system in below the growbeds, along with all pumps and hoses.

This system uses a 1,000 litre standard industrial tank for fish and four 300 litre growbeds. The growbeds are base tanks used in a hydroponic system sold by Acme in Western Australia. Aluminium shelving stock was used to make stands for the grow beds, then each of the stands had Jarrah wood decking screwed onto it. On the front of each stand two inspection doors were mounted, so that a sump system (three 280 Litre plastic barrels used for apple cider) could be placed under the growbeds.

Each bell siphon allows the growbeds to fill and then drain almost completely. The water from the growbeds is drained by the siphons into the sumps below each growbed.

The system uses 19 mm flexible pipe to connect all the blue sump barrels together. Two complete hose systems were plumbed, connecting all sump barrels (two barrels on their sides and two half barrels sitting on their ends) with the over-flow of the fish tank. The system is a modified 'chop' system, meaning that water is pumped into the fish tank and then overflows out of the tank when a specific water level is reached; this insures that it will be impossible to ever pump the fish tank dry and thus kill the fish. There is no pump in the fish tank!



Figure 2 Bell siphons were placed in each growbed. The siphons fasten a 100 mm pipe cap to the base of the Acme tank using a tank tap. The stand tube screws up or down for slight height adjustments and the slotted siphon shield is made of 100 mm drainage pipe.



Figure 5 This shows the Acme tanks (with hydroponic covers) on the aluminium frames. A stepped design (one bed higher than the other) was chosen for aesthetics, although this may make maintenance of the system more difficult.

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Figure 4 There is a 30 mm pipe running from the bottom inside of the fish tank to a hole at the top. As water is pumped in the tank it is forced from the bottom up the pipe and out the back where it drains into the sump system



Figure 3 Tank with Jarrah wood decking screwed onto frame and insulated lid attached. Note that the insulation was stapled to the wood to block light and heat from the tank except for the front of the tank, to allow some light in for fish health

The system is estimated to use about 80 watts of electric (two water pumps and two small air pumps), only about as much as one light bulb. The goal was to make it very easy to maintain, nice looking, quiet, and with very low water and electricity consumption. Although not measured yet, flows into the fish tank are estimated at about 600 to 800 litres per hour, which is hoped won't be too high a rate of water turn-over in the tank. The growbeds cycle at about 3 times an hour, estimated. As the system is adjusted over time, these factors will be measured precisely.



Figure 6 The sump system uses one full and one half blue barrel on each side. The water pump, a 2400 Litre per hour 35 watt submersible pond pump, pumps water three places - into the upper growbed, the lower growbed, and the fish tank



Figure 7 Bell siphon in growbed surrounded by expanded fired clay grow media



Figure 8 A Step and deck of jarrah wood was made to make maintenance easier