



AQUAPONICS TROUBLESHOOTING QUICK REFERENCE GUIDE

	PROBLEM:	DISCUSSION:	SOLUTION:
Plant Nutrient Deficiencies	Plant growth is suffering/ deficiencies exhibited in plant appearance	Plants are deficient in nutrients, potassium, calcium, and/ or iron. These nutrients are not provided from the fish feed (however, nitrogen, phosphorus, and potassium are provided from the fish feed.)	These nutrients must be provided from other sources and additives. See Appendix B of the handbook for more.
Fish Mortality	Fish are being overfed and poor water quality	These issues are related, in that overfeeding leads to poor water quality, which stresses the fish. Because sick and stressed fish do not eat, the leftover feed further degrades the water quality and may result in a fish kill if the excess feed is not removed quickly.	<ol style="list-style-type: none"> 1. Stop feeding the fish for a day or two. 2. Remove all dead fish and bury/compost them some distance away. 3. Check water quality, reduce the water level by 1/4 to 1/3, then top up with clean water. 4. Check the pH and adjust accordingly. Lower pH causes ammonia to be in the non-toxic form, but impedes the nitrification process. Do not change pH dramatically; a sudden change is far more harmful than the pH level itself. 5. If mortalities continue after several hours, repeat steps 1-4.
Water Quality Issues	Excessively turbid (cloudy, hazy) water	Usually caused at the start-up of a system by unclean gravel or soil entering the system.	Ensure that gravel and roots of seedlings are thoroughly washed before entering the system. Soil will tend to settle out of the water if left undisturbed, where it can be siphoned out of the system.
	Dirty and foul-smelling water	Usually caused by overfeeding (excess feed sinks to the bottom and decomposes) and/or insufficient oxygen. If left for too long, will emit toxins into the water, negatively affecting fish and plants.	Stop feeding the fish and physically remove excess feed at the bottom of the tanks using fine nets or by siphoning. Additionally, an aeration system can be used to increase oxygen and discourage settling of the feed. In extreme cases, a complete water exchange may be necessary. It is a good practice to remove excess feed and waste daily, although this may limit nutrients for the plants. The waste can be added to a compost pile or mineralization tank for further processing and then added back to the system.
	Excessively clear water	Primarily caused by too much water exchange, in other words too much fresh water going into the system either by rainfall or by topping up too frequently. While this is good for your fish, it's not good for your plants, as they will become nutrient deficient.	If you find that you are topping up too often, then you likely have a leak in the pipe system that must be fixed. The solution for too much rainfall is to cover the entire system with plastic using a greenhouse-type structure (described earlier).



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Blockages, Overflows, and Leaks	Blockages in spray nozzles	If you do not follow a strict routine in maintaining the system, blockages will likely result. The spray nozzles are the first to become blocked in the system. This is caused by the build-up of sediment, fish waste, algae, and bacteria in the pipes and nozzles.	The simple solution is to regularly pull off the nozzles and flush them out with clean water outside of the system.
	Blockages in drain pipes (in the grow beds)	This is also caused by not routinely maintaining the system. You will notice this problem if the grow beds start flooding and there is no water draining back to the fish tanks.	Use a >25-foot long half-inch PVC pipe with a small enough brush or sponge attached to one end to flush out the drain pipe. The drain pipe has caps at the back end that should be removed to push the sediment blockage toward the end, away from the fish tanks.
	Blockages in drain holes	The drain holes may be blocked or too small, causing the return to take longer than 45 minutes. Usually this problem is identified at the start-up of a system.	To address this, the gravel along the drain pipe must be removed and more and/or larger holes bored into the pipe. Remember, however, that the holes must be smaller than the gravel size so as not to flush the gravel out of the grow beds.
	Fish tank overflows	The connecting tank pipes may be blocked or an isolated fish tank valve may be turned to the off position. Usually the tank with the overflow is the one with the blockage. The blockage is usually at the bottom of the affected tank where the pipe enters the tank.	If the pipe is capped, simply remove it to solve the problem. If it is not capped, then unclog the blockage by entering the tank and inserting a flexible wire or tube to dislodge the blockage.
	Leaks in pipe fittings	Pipe fittings may leak, particularly because the pipe fittings are not cemented at the joints, specifically to accommodate cleaning and trouble-shooting. If the connection is too loose, however, leaking may become excessive.	A thin plastic material may be used to wrap the inserted end of the pipe carefully, so as not to block water flow, and the pipe can be reinserted into the receiving fitting. This should make the connections fit more tightly.
	Major leaks in fish tanks or grow beds.	Major leaks in concrete and PVC pipes can occur for various reasons.	To do the repairs, one should isolate the affected tank or grow bed prior to the repair. In this manner, your operations should not be severely affected. Once repaired, the isolated tank or grow bed can be re-joined with the system for continued operation.