

Japan Aquaponics DIY Aquaponics Guides

Growbed Media Choices



Aquaponics systems use several common components, the growbed (the hydroponic part of the system); the fish tank (the aquaculture part of the system); the plumbing; and the growbed media are some of the main

ones. There are three main types of aquaponics systems that are generally used and it is perhaps worth noting this in advance:

NFT channels (Nutrient Film Technique) which are usually found in hydroponics setups.

DWC or Deep Water Culture (or Channel), which are long, deep troughs that hold the floating rafts.

Media filled growbeds

An aquaponics media filled growbed is simply a suitable container that is filled with a growing media such as gravel, hydroton or lava rock, and this article will specifically concentrate on the growbed media, its function in an aquaponics system and the types and pros and cons of each type of media.

What does the growbed media do?

- The growbed media provides the plants with a foundation in which to grow and anchor their roots.
- The growbed media also serves to moderate the temperature around the plant roots.
- The growbed media provides a surface area for the nitrifying bacteria to colonise.
- The growbed media facilitates the mechanical filtration for the solid waste in aquaponics systems.
- The growbed media provides a home for beneficial worms in aquaponics systems.

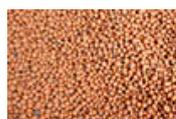
What are some key considerations?

There will be a relatively wide variety of media choices available to you, but you need to think about a couple of key issues:

- The growbed media must be pH neutral as it must not affect the water chemistry in aquaponics systems.
- The growbed media must not contain any other types of contaminants that could affect the water chemistry.
- The growbed media needs to be able drain water well so that roots don't get waterlogged.
- The growbed media needs to be well sized to allow oxygen to be drawn down into the growbed.
- The growbed media with a high surface area will be best for the beneficial bacteria in your system.

So what can you use?

Lightweight Expanded Clay Aggregate (LECA)



LECA is a type of porous clay pellet that expands when wet and forms a dense soil-like layer that roots can easily grow into. Additionally, the pebbles are relatively smooth, making them easy on hands and sensitive roots. Hydroton also has a very high surface area, which gives the beneficial bacteria somewhere to live, enabling it to be a very effective biological filter. It is also pH neutral, meaning that it will not affect the water chemistry, thus adversely affecting plant growth. It will also drain freely, aiding in the oxygenation of roots.

N.b. Hydroton is the most famous brand name for expanded clay pebbles, but this company has recently ceased production completely.

There are alternatives like Canna Aqua Pebbles that are almost exactly the same in composition. Hydroton can be bought in various sizes and the larger diameter is normally recommended to avoid clogging.

Lava Rock



Lava rock is widely used in many areas due to its availability and cost. In many ways it is natural version of hydroton as it is a lightweight, porous material that exhibits all of the characteristics of hydroton. It is not quite as easy to work with as the clay pebbles are, as it is usually irregular in shape, and you also have to be careful to ensure that there are no impurities or chemicals present. We use lava rock for most of our installations as it has almost all of the qualities of hydroton but is about 75% cheaper (but your mileage may vary depending on its availability in your area)

River gravel or Pea gravel



While not as easy to work with as other alternatives, river gravel (gravel from rivers is generally more rounded and friendly on the hands) is a cheap and readily available growbed media. In addition, its higher density enables allows gravel to support taller plants than clay pebbles would be able to. Aquaponics gardeners who cultivate corn and other stalked plants tend to prefer the density of gravel, as well as backyard aquaponics enthusiast who are on a budget. Gravel does not hold water well, is very heavy, and has a much lower

surface area than hydroton so it is not able to support bacterial colonies to the same degree - thus lowering its bio-filtration capacity. Gravel should be tested before you put it into your aquaponics system to make sure that it does not contain things like lime. You can take several random samples (different types of stones) and add vinegar to see if it reacts with the stone (It must not).

Perlite / Vermiculite / Sand / Coir / Glass beads



These have all been used as either a complete growbed media - or in addition to one the main ones noted above. In each case you need to be confident that none of these media types will leach anything into your system

and so sold pay close attention to where the media comes from. You may find that perlite, vermiculite and sand are relatively small in size and so could cause clogging in your system and may also impede the free flow of water in your growbed. Coir can also cause discolouration of your water and as an organic media will break down over time and may introduce unwanted organisms into your system. You also need to be sure that any of these media is pH neutral and that it will not affect your water chemistry.

Washing the growbed media

There are different schools of thought about whether you should wash your growbed media or not. On the negative side, it is a time-consuming, labour intensive activity that generally uses a significant amount of water. On the positive side it improves the quality of the water in your system from the very beginning and it ensures that any bugs or detritus is washed away before it gets in your system.

I think that ultimately the choice of whether to wash or not will depend on your personal circumstances. If water is scarce or expensive then there is no real need to wash the media as the water will clear up on its own in a few days or so. If you are buying from a reputable source then you should not need to worry about foreign objects in your media. The truth is that some people wash their media, and some don't but there seems to be no adverse affect on an aquaponic system either way.

So which growbed media is best?

This will depend on your personal circumstances, your location and what you want to grow. LEIC (Hydroton or Canna Pebbles) is a popular, if slightly expensive choice, and where possible we prefer to use lava rock to get the same benefits for a fraction of the cost.

River gravel is also commonly used due to its availability worldwide and its cost-effectiveness. Look in your local homestores and builder's merchants and find out what is available locally - if you join a forum you may find fellow aquaponics near you who would be happy to point you in the right direction.

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