

# Japan Aquaponics DIY Aquaponics Guides

## Growbed Choices

### Growbed Advice



Aquaponics systems use several common components and the growbed (the hydroponic part of the system) is obviously one of the most crucial. The choice of growbed is also much debated, with newcomers to aquaponics often wondering what they can use, repurpose, build, scavenge or buy for use in their backyard aquaponics systems.

Before looking at some of these choices we should note that there are three main types of growing systems that are usually used:

- NFT channels (Nutrient Film Technique) which are usually found in hydroponics setups.
- DWC or Deep Water Channels, which are long, deep troughs that hold the floating rafts that the produce is grown on.
- The final type is the media filled growbed, and this is the type that we will concentrate on in this article.

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 is the most commonly used type of growbed as it neatly performs four separate functions in an aquaponics setup. Firstly and most obviously it provides support for the plants up and provides somewhere for the roots to take hold. In addition to this, the media provides three separate filtering functions:

- Mechanical Filtration - the media helps to filter the solid waste in the water and to trap it in the bottom of the growbed.
- Mineralization - this is the process whereby the solid waste breaks down and is returned to the water.
- Biological filtration - the media provides extensive surface area for the beneficial bacteria to colonise, allowing the nitrogen cycle to take place.

As the media filled growbed performs all of these functions in one single place, it is one of the easiest, space-efficient and also one of the most cost-effective ways to set up a new system. This is of particular concern to newcomers to aquaponics who may not feel comfortable with more complicated filtration systems, or who want the most

hassle-free way to start supplementing their diets with fresh, nutritious produce grown via aquaponics.

### So what can you use for a growbed?

The short answer is almost anything, but there are a number of things you should take into consideration, including whether your growbed will be located inside or outside. It goes without saying that the growbed needs to be waterproof, but you need to make absolutely certain of this. It also needs to be strong enough to hold the media and the water - depending on the size of the growbed this could equate to a fairly significant amount of pressure... an important consideration if you decide to make a growbed yourself.

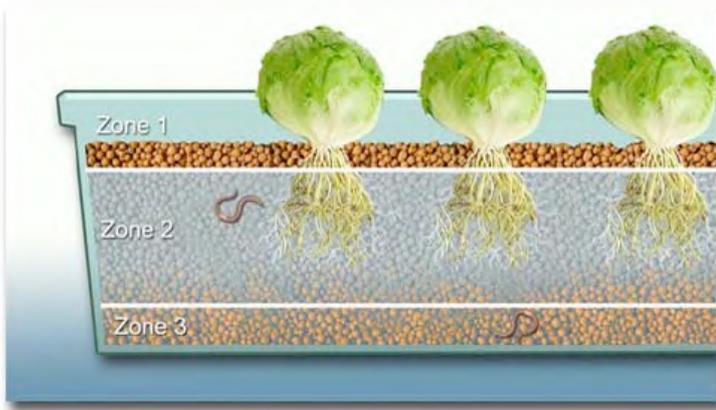
### Aquaponics Growbed Materials

A growbed can be made out of a wide variety of materials but care should be taken to make sure it fulfills certain criteria. A growbed should be safe to use first and foremost, and should be made of a materials that will not leak unwanted chemicals into the water, or that will affect the pH of the water. A growbed should ideally be made of a material that blocks out the sun, as direct sunlight can promote algae growth and can be detrimental to plant roots. If the growbed is being used outside then it will also need to be UV stabilized to ensure that it will not degrade in the sunlight and leach chemicals into the system. Commonly used materials would be certain plastics, wood, fiberglass and anything with suitable waterproof liners. Concrete can also be used but care needs to be taken to seal the concrete first as concrete can affect negatively affect the water chemistry of your system

### Growbed depth and Size

An aquaponic growbed needs to be the right size to fit your fish tank volume. It needs to be able to provide adequate mechanical filtration and biological filtration for the nutrient-rich water, and so you should always consider the growbed and the fish tank together and use appropriately corresponding sizes. A common rule of thumb is to use a 1-1 ratio. The growbed volume should be equal to the fish tank volume. This is by no means a hard-and-fast rule but serves as an outline guide. The plants in your system are also part of your filtration process and so you must ensure that you have adequate surface growing area relative to the same of your fish tank. As a rule of thumb, if 1000 litres of water needs approximately 1 meter cubed of growbed media volume for filtration, then if your growbed is 25cms deep you will need a surface area of approximately 1m x 4m to ensure that there is approximately 1 meter cubed of media volume.

A common question is how deep the growbed has to be, and again, there are some general guidelines about what has proven to be particularly effective based on experience - but we will always find exceptions to the rules. A growbed will normally end up consisting of three specific layers:



- Larger sized systems can use multiple units from above, hand built and lined wooden growbeds, and of course, commercially available aquaponics growbeds.

At the end of the day, don't feel that you have to use a specific size and type of growbed. As long as it is safe, strong and appropriately sized for the system that you are building, then it will be worth trying out. If you can build a growbed that is 30cms deep then you can be confident that this is a tried-and-tested depth that has been proven to provide very effective results - but you can also rest assured that a shallower or deeper growbed is also likely to give you good results.

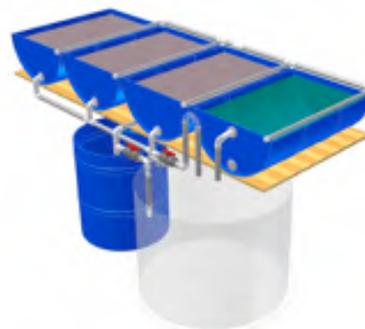
- The surface layer (5cms) - this is above the waterline and should not be wet - this reduces loss of water through evaporation.
- The root layer (20cms) - this is where your roots will be growing and where most plant activity will take place. This is layer is normally regularly flooded and drained.
- The solids layer (5cms) - this is where the solid waste will collect in your system and which will usually be constantly flooded with water.

From these layers we can work out a kind of 'ideal depth' of 30cms or 12 inches. Whilst this depth has been proven to be highly effective it is by no means then only depth that can be used. Aquaponics systems have been shown to work equally well with growbed depths of as little as 10cms or so - but care needs to be taken to always ensure that you have sufficient volume to provide adequate filtration for your system.

### What can we use for a growbed?

Any watertight, food-safe, fish-safe container can be used, and depending on the size of your whole aquaponics system that will leave you with several choices.

- Small systems can use food containers, plastic containers from the DIY store or IKEA, wooden boxes with a suitable liner - almost anything that will fit the size of your fish tank.
- Medium sized systems can use cut up IBC totes, Rubbermaid-type water troughs, animal feed troughs, concrete mixing troughs and similar things.



Keep in mind that of the four functions that a growbed traditionally performs, three of those are related to filtration, and so your main consideration when choosing a growbed size, is to ensure that it is able to provide adequate filtration for your own aquaponics system, including adequate planting area. Don't be afraid to be creative - as long as you can follow the guidelines noted above, then try anything that you have to hand - or anything that you think would look great. Put safety first and you can't really go too far wrong.