



AQUAPONICS
NEW ZEALAND

Sustainable Urban Farming

EcoStation Manual



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Congratulations!

The Aquaponics Ecostation is a gateway to the future of indoor vegetable growing.

The EcoStation is an easy to use, educational, low-maintenance system that turns a fish tank into an organic garden that will produce fresh vegetables and herbs all year long.

We hope you enjoy your EcoStation and become inspired to learn more about the work of Aquaponics New Zealand.

AQUAPONICS FUNDAMENTALS

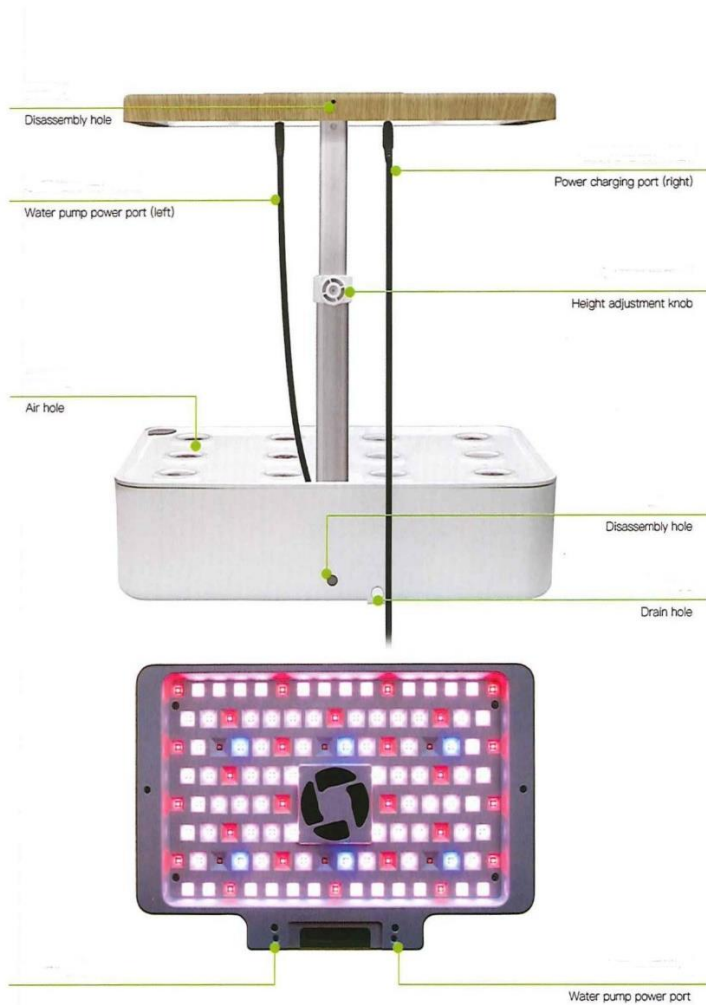
Aquaponics is a sustainable method of food production combining aquaculture (raising aquatic animals, fish) and hydroponics (cultivating plants in nutrient-rich water).

In this circulating system, fish waste acts as a natural fertilizer for plants, while plants take up those nutrients and return clean water to the fish.

BENEFITS TO GROWING AQUAPONICALLY:

- 90% reduction in water and land use compared to soil-based growing.
- 90%+ reduction in water use compared to conventional aquaculture.
- Yields high-quality organic produce, without the use of harsh chemicals such as pesticides, herbicides, water conditioners, or added fertilizers.
- Systems are versatile and can be designed to fit in almost any space.
- Easy to maintain!

What's included: The EcoStation



Seedling cover



Water inlet



Water level window



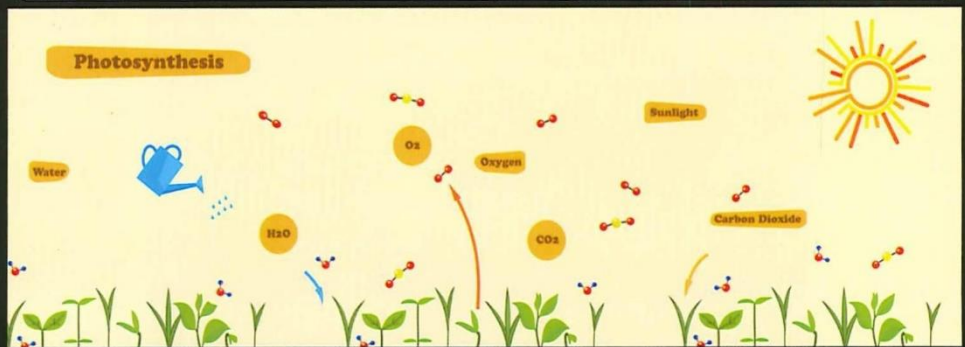
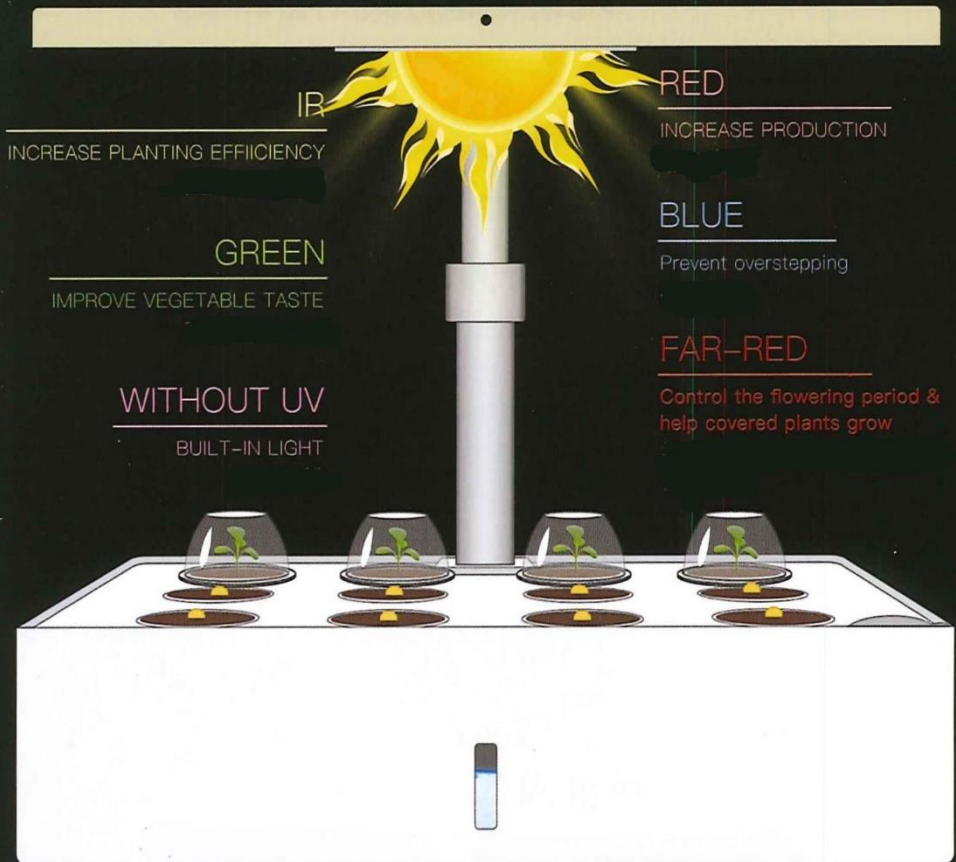
Water circulating pump



Touch panel



Full Spectrum LED for best results



Before Starting your EcoStation

Before getting started, have the following ready:

- 250mm x 450mm fish tank ideally
- 400l - 800l aquarium water pump
- 2 - 3 fish
- Fish food
- 1 - 2 packets of seeds
- LED tank light for the fish
- Gravel and decor
- Water heater (Optional)
- Siphon (Optional)

Automated Settings on your EcoStation

Once the power supply is turned on for the first time, the fan and water pump are turned on, and the LED light timer begins.

After working for 30 minutes, the fan and water pump will automatically sleep for 30 minutes and start and stop automatically. After manually turning off the fan and water pump for 10 hours, it will restart automatically.

Vegetable mode: Select this mode for planting leafy vegetables and herbs, it lights for 16 hours and then sleeps for 8 hours. When the power is on, you can manually turn off the light mode, it will then automatically turn on after 10 hours and resume the 16 hour 8 hour cycle.

Flowers & Fruits mode: Choose this mode for planting fruits and flowers. The timer operates the same as above but the light array is tailored towards fruit production.



What can I grow?

Leafy greens and herbs grow best because they thrive in the nitrogen rich fertilizer produced by fish waste. Most people have experienced great results with lettuce, basil, chard, kale, arugula, mint, cabbage, and a wide variety of leafy greens and herbs. The kit may also be used to start seeds for a bigger outdoor or green housed Aquaponic System.



What kind of fish work best?

The ideal fish for your system are goldfish and smaller tropical aquarium fish. One inch of fish 4 litres of water is a common aquarium stocking recommendation. The actual number of fish will vary depending on the type(s) of fish and their species-specific care requirements.

- Goldfish
- Koura
- Kokupu



As with any aquarium, biological filtration is required to keep the system balanced and safe for fish. Nitrifying bacteria process the fish waste (ammonia), eventually converting it into nitrate (NO₃) - which is utilised by the plants.

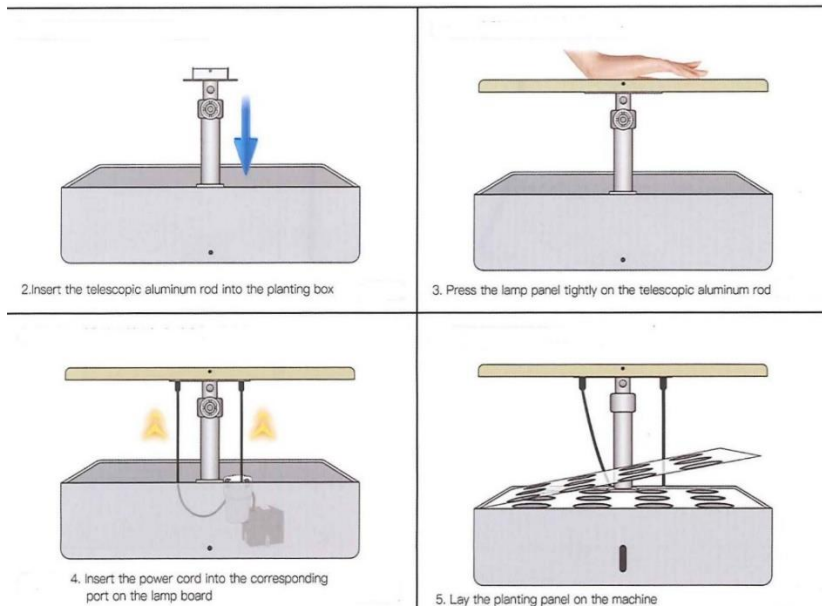
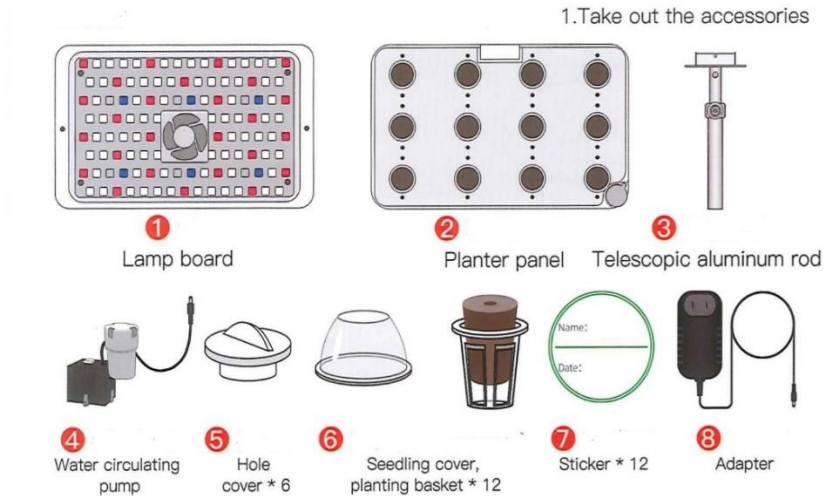
Bio-filtration is accomplished by moving oxygenated water through a substrate or media with a high surface area, on which nitrifying bacteria colonize. The black bio-filter brick in your EcoStation provides this surface area. "Cycling" is the process of building up nitrifying bacteria colonies in the bio-filter, which can take up to six weeks.

It is important to introduce the fish incrementally, starting with just two or three. Once the system has "cycled", the tank will be ready to handle a larger bio-load. From there, fish may be added incrementally in small numbers until the target number is reached.

Assembling your system - EcoStation Grow Bed

Section 1: Included in the EcoStation provided:

- 1) Soak the black loam in water for a minimum of 6 hours
- 2) Use the tweezers provided to place your seed into the black loam, planting basket, and cover with the seedling cover until it sprouts. Label the cover so you can track. Seeds should take between 7-10 days to sprout. You may need to re-seed some baskets.



Assembling your system - EcoStation Aquarium

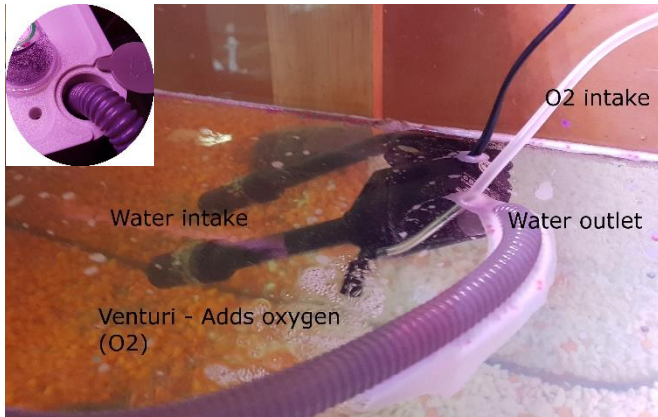
Section 2: Items you need to complete your system:

- 1) These items are readily available from retailers.
 - 250mm x 450mm fish tank or one between 50 - 75l
 - 400l - 800l aquarium water pump to circulate water through the system
 - 2 - 3 goldfish fish or Koura from your local stream. Refer to page 6
 - Fish food at least 32% protein content
 - 1 - 2 packets of seeds of your choice
 - LED tank light for the fish if the system will not have any natural light
 - Gravel and décor to provide a nice home for the fish. Koura need refuge
 - API freshwater test kit for PH, Ammonia, Nitrite, and Nitrate. Refer to page 8

Now that you have all the equipment, you're just a few simple steps away from officially becoming an Urban Aquaponic Grower So what do you say? Ready to get setup?

- Thoroughly wash aquarium gravel, rocks and ornaments with warm water, then add them to your tank. Do not use soap or detergents—they are highly toxic to fish.
- To wash the gravel, put it in a colander over a plastic pan or bucket and add water. Stir the gravel, drain, and repeat until the water stays clear and is free of debris
 - Fill your tank approximately one-third full with room temperature water from a clean bucket.
 - Pouring the water onto a plate or saucer sitting on the gravel will help keep the gravel in place.
 - Add vitamin C to de-chlorinate the water or water conditioner, like Tetra® AquaSafe® Solution. Chlorine is fine for you, not your fish!
 - Aquascape with plastic plants if wanted. These should be arranged to hide your equipment.
 - Add the rest of the water. Fill your tank to the about 5-10cm below the top of the tank —leaving some air space between the water and the EcoStation.

- Secure the submersible water pump as pictured below.



- Set up your EcoStation with black bio-filter inside and “cycle” your new tank.
- Important: “Cycling” your tank means growing the correct, healthy bacteria in the EcoStation system to remove dangerous toxins. Talk to us about getting some inoculated bio-filter bricks or Add something like Tetra® SafeStart® Solution, and you can quickly cycle your tank and add fish quickly.
- Wait 24 hours to ensure all equipment is working properly before adding fish.
- Check the conditions and temperature after a few hours.
- Water in new aquariums will often turn cloudy for a day or two. This is caused by a harmless bacterial growth and should disappear naturally.

Congratulations! Your new EcoStation is fish-safe, fish-ready and ready for Aquaponic Growing.



Caring for your EcoStation

THE GROW TRAY / TANK:

Check the tray regularly to make sure the drain is free of any roots or other debris that could cause an overflow. Ensure the water flow is properly adjusted and not overflowing the filter section. If needed trim the roots of your plants to contain root growth.

THE FILTER SECTION:

The filter should be placed along the front wall and through the middle of the grow tray, between the net pots. The aquarium water flows through this prior to returning to the fish tank.

Pre-Filter Sponge - Attached to your aquarium pump

The pre-filter sponge serves to trap solid waste and should be removed and rinsed weekly in warm water or more frequently if necessary. Visually inspect the sponge regularly for discoloration and accumulated debris.

**VERY
IMPORTANT
to keep your
kit clean!**

Brick (Black)

The black bio-filter brick. This filter provides a high surface area for beneficial nitrifying bacteria to colonize. This filter should not be removed or cleaned more than once every six months. Prefiltration by the pre-filter sponge will prevent the majority of solid waste from reaching the bio-filter.

Should the bio-filter become clogged, it can be removed and rinsed in a cup of water taken from your EcoStation or tap water that has been treated to remove chlorine and chloramine. Rinsing in untreated tap water is detrimental to the bacteria that live on the filter.

FEEDING FISH:

Feed fish according to their specific feeding requirements. Most community fish will accept high-quality flake, freeze-dried, and frozen foods. Only feed as much as fish will eat in three to five minutes.

CLEANING YOUR AQUARIUM:

Growing with the EcoStation helps ensure a balanced aquarium, where there are little to zero excess nutrients. That means less algae growth and reduced maintenance requirements in comparison to conventional aquariums. Biofilm, however, can gradually grow on the glass and solid waste will accumulate on the gravel. These are best removed using a clean sponge, an algae pad on a stick, and a gravel vacuum. Avoid algae build-up by choosing a location for your EcoStation that is not in direct sunlight.

HARVESTING PLANTS:

Plants may be harvested all at once or by clipping a few leaves at a time. In either case, the plants should remain in place when harvesting, rather than removing the pots first. This will keep leaves clean from aquarium water. While your kit will produce safe, organic produce and herbs, always wash plants with clean water prior to eating.

Many greens will keep growing after being cut, but eventually the root mass will distort the net pot so it is best to re-seed after every couple of harvests.

ADDING WATER:

Over time the water level will come down due to evaporation and transpiration. To keep water level consistent it should be added as needed.

TESTING WATER QUALITY:

A well-functioning system will stay within the parameters of the chart to the right once it has gone through it’s initial “cycle” - up to a 6 week process.

We recommend using the API Freshwater Master Test Kit to test your water.

pH	6.5 - 8
Ammonia	0 ppm
Nitrite	0 ppm
Nitrate	5 - 80 ppm

FREQUENTLY ASKED QUESTIONS

Q: What size tank do you recommend?

A: Tank size is also determined by the type of fish you want to keep in your tank. The general rule of thumb is one inch of fish per gallon - a little less for goldfish. The EcoStation was designed to sit on top of a 250mm x 450mm tank. If a bigger tank is selected you can easily put some stands or supports across the top of the tank to hold the EcoStation

Q: What power source do you recommend?

A: The EcoStation can plug directly into a normal wall jack.

Q: What kind of water should I use in my kit?

A: Rainwater and pH neutral well water are the best choices for filling your kit. However, many people are limited to municipal tap water. Most municipal sources add chlorine and chloramine to water for disinfectant purposes. These compounds make water safe to drink but are toxic to fish and to the nitrifying bacteria in the bio-filter. There are several water conditioners available through aquarium shops, but most of these products are not certified for use with fish and plants intended for human consumption. A safe alternative is powdered Vitamin C (ascorbic acid). 1 teaspoon of Vitamin C will treat 70 litres of water, effectively neutralizing the chlorine and chloramine.

Q: What kind of fish food should I use?

A: There are several sources for fish food that contain high quality protein without artificial coloring. Fish food that contains feather meal has low nutritional value and can create a dirty tank.

Q: Why is there some water gathered on the lid of my tank?

A: If there is a heater in your tank and the room is cold, condensation is likely to increase. Lowering the aquarium temperature a few degrees should alleviate this issue. Another cause of condensation may be the flow rate of your pump. To reduce moisture build-up on the bottom of the tray, set the pump to its lowest setting. This reduces splashing from the drain. Also check to see if the drain fitting is clear.

Q: What is the brownish stuff growing on the glass and decor in my tank?

A: The growth of brown diatomaceous algae and biofilm is a normal phase in a new aquarium. This will usually die off naturally and is later replaced by much slower growing green algae. All of these are easily wiped from the glass using an algae magnet or algae pad. The addition of a small algae-eating fish, such as a bushy-nose plecostomus, can also help to keep algae growth in check. In any case, algae growth will be significantly reduced once your plants are well established in the grow tray.

Q: Why is my tank getting cloudy?

A: Cloudy water is not uncommon in a new system. It is usually caused by a bacteria bloom due to overfeeding, overcrowding, or adding fish too quickly. It is important to provide enough food without overfeeding the fish. Most fish should be fed 2-3 times per day, but only as much as the fish will consume in three to five minutes. If you have a cloudy tank, do one or two 30% water changes and reduce the feeding amount.

Q: Can this system be used with turtles or aquatic frogs?

A: Yes. However, due to the salmonella risk associated with reptiles and amphibians, we do not recommend growing edible plants.

Q: Can I use saltwater?

A: Our EcoStation is primarily designed for use in freshwater aquariums and using freshwater fish to grow edible plants. However, it's possible that caulerpa or other marine algae could be cultured in the grow tray, if the pots are removed to open up the space. A marine system of this type would serve scientific or ornamental purposes only and would not be for food production.

Q: What do I do if a part breaks? Do I have warranty?

A: The grow lights have a one year warranty from your original purchase date. All other components may be replaced up to six months from the original purchase date.

Q: My question wasn't answered! What now?

A: We want you growing! If you experience any issues with your kit, please call our office for a custom troubleshooting session. We're happy to help!

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