

ECO-CYCLE AQUAPONICS KIT INSTRUCTION MANUAL



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THANK YOU!

Thank you for reducing your environmental footprint and protecting natural resources by growing aquaponically! Your ECO-Cycle Aquaponics Kit® converts fish waste into a natural plant fertilizer, while using 90% less land and water compared to traditional growing methods.

The ECO-Cycle Kit® is an easy, low-maintenance system that turns your 12"x24" fish tank into an organic garden that will produce fresh vegetables and herbs all year long.

We hope you enjoy your ECO-Cycle® and become inspired to learn more about the work of ECOLIFE Conservation at www.ecolifeconservation.org.

AQUAPONICS 101

Aquaponics is a sustainable method of food production combining aquaculture (raising aquatic animals) 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.
- 97% reduction in water use compared to conventional aquaculture.
- Recirculating design helps to keep waste out of watersheds.
- 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:

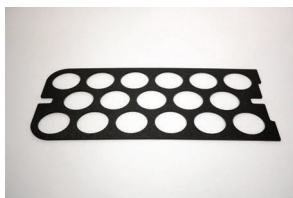
Your new kit includes everything you need to convert a 12"x24" aquarium into a blooming indoor garden.



Grow Tray



Grow Tray Door



Net Pot Holder



T-Bars



Filter Cover



1/2" Drain Fitting



Water Pump



LED Grow Light



LED Tank Light



Net Pots



Grow Light
Controller



12" Pump Hose



Grow Light Display



2 Pre-Filter Sponges



Bio-Filter Brick



Power Supply



Clay Pebbles



Assembly Screws

GETTING STARTED

Before getting started, have the following ready:

- 12" x 24" tank
- 2 - 3 fish
- Powdered Vitamin C
- Fish food
- 1 - 2 packets of seeds
- Paper towels
- Phillips screwdriver
- Gravel and decor (Optional)
- Water heater (Optional)
- Siphon (Optional)

WHAT CAN I GROW?

Leafy greens and herbs grow best because they thrive in the nitrogen rich fertilizer produced by fish waste. Customers 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 an outdoor vegetable garden, native plants for landscaping, tropical house plants, and even trees.



WHAT KIND OF FISH WORK BEST?

The ideal fish for your system are goldfish and smaller tropical aquarium fish. One inch of fish per gallon 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
- Small Tetras
- Guppies
- Danios
- Platys
- Rasbora
- Swordtails



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 (NO_3) - which is utilized 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 blue bio-filter brick in your ECO-Cycle® 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 KIT:

ADD DECOR AND WATER:

- 1) Rinse aquarium gravel and decor. Arrange the interior of the aquarium.
- 2) Fill the tank with water to 95% capacity.

INSTALL AND CONNECT LED TANK LIGHT:

- 1) Remove the protective tape from the adhesive strips on the bottom of your LED bar and press against the bottom of the grow tray for 20 seconds.
- 2) Route the cord through the accessory port on the right side of your grow tray.

Connect and adjust the water pump:



- 1) Attach the hose to the water pump.



- 2) Attach the other end of hose to the drain fitting on the right side of the grow tray.



- 3) Feed the pump power cord through the square accessory port on the back right side of the unit.



- 4) Set flow rate of pump to the minimum output by sliding the flow slider towards the nozzle of the pump. If the flow rate is too strong it may cause tray to overflow.

- 5) Place the tray on the top of the aquarium, making sure that the tray sits flush along the entire rim of the tank. Any other accessories, such as an aquarium heater or airstone, can be installed at this stage.
- 6) Route all power cords and airlines through the accessory port on the back of the tray.

ASSEMBLE THE GROW LIGHT RACK:

- 1) Place the base of the T-bars against the sides of the grow tray. Align the holes on the bars with the holes in the grow tray.
- 2) Reaching inside the grow tray, thread the nuts around the screws to secure the T-bars in place.
- 3) Secure the light bars in place by lining up the holes at the top of the T-bars and fasten with the provided screws.
- 4) Start grow light height at the lowest setting by unscrewing the locks at the top of your light stand and adjusting the light bars. It is easiest to make this adjustment one side at a time.
- 5) As the plants germinate and grow, raise the light to keep a 2" - 4" distance from the top of the plants. This will ensure rapid germination and full plant growth. If you notice your plants begin to burn, adjust accordingly.
- 6) Connect two cords from grow light display to grow lights.



PLACE FILTERS IN GROW TRAY:

Place two pre-filter sponges and bio-filter brick on the right side of the grow tray. The pre-filter sponge should be placed in the back and middle compartments, and the bio-filter brick should be in the largest rectangular compartment.

More information about the pre-filter and bio-filter sponges can be found on Page 10.



HOW TO ASSEMBLE GROW LIGHT DISPLAY:

- 1) Remove the grow-light controller from packaging. Apply velcro to the side of the T-Bar and on the back of the remote.



- 2) Slide the square brackets into the track on the front of your grow light.



- 3) Using the screws provided and a Phillips screwdriver, fasten the clock display to the square brackets on the front of your grow light.

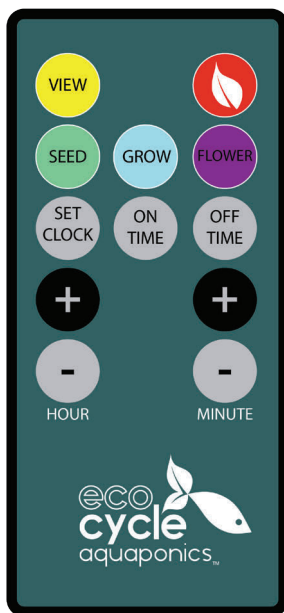
HOW TO SET CLOCK AND TIMER:

- 1) Press the button labeled "SET CLOCK" on the controller. Using the hour and minute buttons set the clock to the current time. Please note the clock operates in military time (1-24) .
- 2) Press the button labeled "ON TIME" on the controller. Using the hour and minute buttons set the clock to the desired "ON TIME".
- 3) Press the button labeled "OFF TIME" on the controller. Using the hour and minute buttons set the clock to the desired "OFF TIME".

We recommend
a 16-hour
growth cycle!

OPERATING YOUR GROW LIGHT:

The ECO-Cycle® offers three separate grow settings designed to optimize plant growth at each stage of development.



SEED

Stage 1: Seed

This setting will be used during the first two weeks following the initial planting until the first true leaves develop.

GROW

Stage 2: Grow

If your plant is non-fruit-bearing you can leave it on this setting for the remainder of your plants' life cycle.

FLOWER

Stage 3: Flower

Turn on once vegetative growth is fully established (after 4-6 weeks).

PLANTING YOUR SEEDS

Your system is designed to germinate seeds and grow a variety of plants. Leafy greens and herbs can be grown from seed all the way to harvest.

Plants are grown in reusable expanded clay pebbles, which are contained in 17 net pots. Net pots allow the nutrient rich water from the aquarium to flow through the media to the roots of the plants.



START SEEDS USING THE WICK METHOD:

Seeds may be germinated directly in the system by creating a simple wick of paper towel to provide moisture to the seeds.

1) Rinse clay pebbles in water to remove dust build-up.



- 2) Cut a paper towel into strips of 1.5" x 5". Place one end of the strip in the bottom of net pot, with the rest positioned along the side, forming an L-shape.



- 3) Add a thin layer of clay pebbles in the pot on top of the paper towel, about halfway up the net pot.



- 4) Fold the rest of the paper towel over on top of the clay pebbles. Using a spray bottle, dampen the paper towel with a light mist of water to help the seeds stay in place.



- 5) Add seeds to the top of damp paper towel. The number of seeds will vary depending on the type of plant - three to five seeds works well for most leafy greens and herbs.



- 6) Cover seeds with another layer of clay pebbles, filling the net pot to the top of the perforated area.



- 7) Place the seeded pot into the system.

When all pots are in place, lower the grow-light fixture to its lowest setting at eight inches above the pots. Adjust grow light setting to 'seed' until all plants have sprouted. The seeds will germinate over the next few days, and in most cases, the first sprouts will emerge from the clay pebbles in four to seven days, depending on plant variety. As your plants grow, raise the light to 2" - 4" over the top of plants. Switch light setting to 'grow' once plants have reached two inches tall and true leaves are established.

CARING FOR YOUR ECO-CYCLE

THE GROW TRAY:

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.

THE FILTER SECTION:

The filter section is on the right end of the grow tray. It is comprised of a pre-filter sponge (white) and a bio-filter brick (blue). The aquarium water flows through these integrated filters prior to reaching the plant roots in the grow tray.



Pre-Filter Sponge (White)

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!**



Bio-Filter Brick (Blue)

The blue bio-filter brick is composed of Matala® media. 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 white 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 ECO-Cycle® 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 ECO-Cycle® Kit 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. These pieces of equipment can be easily maneuvered through the front door of the grow tray. Avoid algae build-up by choosing a location for your ECO-Cycle® 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, water treated with Vitamin C 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: Any 15-30 gallon aquarium with a 12"x24" footprint. The standard 20-gallon tank is widely available with these dimensions. The tray can accommodate aquariums with top dimensions of between 23.75" - 24.25" x 11.8" - 12.5"/ 60.3 - 61.6 cm x 30 - 31.8 cm). 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.

Q: What power source do you recommend?

A: The ECO-Cycle® can be plugged into either 110V or 220V power sources, which is common in most household outlets.

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). 1/8 teaspoon of Vitamin C will treat 20 gallons 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 line, and water draining through the extra overflow holes. 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 ECO-Cycle® 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: 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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