AQUAPONICS PRODUCTS

AQUAPONICS TECHNOLOGY AND DESIGN WORKSHOP

Spring and Fall 2016

Topics that will be covered during these workshops:

UVI AQUAPONIC SYSTEM & UVI-BASED SYSTEM AT AQUATIC ECO-SYSTEMS

- System design and management
- Aeration
- Blower selection and sizing
- Plumbing
- Pump Selection
- Total Dynamic Head (TDH)
- Components
- Construction techniques
- Operation
- Electric Cost

FISH PRODUCTION

- Stocking rates
- Feeding, growth and survival
- Harvesting and processing
- Water quality
- Brood stock management
- Breeding
- Fry sex reversal

MARKETING AND ECONOMICS

PLANT PRODUCTION

- Seedling production
- Importance of pest identification
- Disease and insect control
- Nutrient dynamics

HANDS-ON INSTRUCTION

- PVC work
- Pump setup and plumbing
- Plant grow tray construction
- Fish handling
- Water quality testing

Check PentairAES.com/workshops for all workshop details including dates, times and locations!

PENTAIR

AQUATIC ECO-SYSTEMS®

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

Web: PentairAES.com/workshops
Email: PAES.General@Pentair.com

2395 Apopka Blvd., Apopka, FL 32703

Common Aquatic Species Used in Aquaponics

Tilapia sp.

There is little documentation through research as to which aquatic species work best in aquaponic systems. Tilapia have the most results as they are very hardy and adaptable to poor water quality, temperature and poor handling by farmers. They also have a large market value and have developed a niche as a good-tasting white fish. The most common tilapia used are Nile tilapia (*Oreochromis niloticus*), Mozambique tilapia (*Oreochromis mossambicus*), blue tilapia (*Tilapia aureus*) or some crossbred variety of a wide number of tilapia species. They are ideal for our system here in Florida, as we have a longer warm season here than many US states, and their ideal water temperature is in the range of 75–90°F. There are a number of hatcheries in our geographic area that can supply us with fresh, affordable fingerlings. For colder temperatures, the blue tilapia has shown a wider tolerance than the other species of tilapia and will continue feeding in the 60s. However, once the water temperature starts to dip into the 50s and lower for a significant period of time, the fish will not survive for very long. If you live in a cooler climate and do not have the capability to heat the water, then perhaps tilapia is not the ideal species for you. Again, this will all go back to market demand and your own cost analysis.

Koi

Koi are ornamental varieties of the common carp (*Cyprinus carpio*) and have a large market in the United States as a decorative water feature or small pond fish for many homes and businesses. They are cultured in many states and can tolerate a wide range of temperatures and water quality parameters similar to tilapia. However, their ranges are most ideal in between 60–75°F. Similar to the tilapia, once temperatures drop below their ideal range, they will stop feeding and can eventually die. Below 50°F, they will cease feeding and their immune system will begin to shut down, so they too can suffer mortality after prolonged periods of time in those temperatures. Fortunately, in Florida we don't experience too many days with an average temperature below 50°F.

Other Common Aquaponics Species

Ictalurus punctatus is North America's most common catfish and is easily procured through the web of aquaculture hatchery suppliers in the country. It is popular in aquaculture due to its rapid growth and wide temperature tolerance of 68–85°F.

Hybrid-striped bass (*Morone saxatilis* and *Morone chrysops cross*) do well in a wide range of environmental conditions, including a temperature range of 40–90°F, but grow best in between 75 and 80°F.

Barramundi (*Lates calcarifer*) is already a fish of large commercial importance throughout the world, especially in the Indo-Pacific area. It has proven to be useful in aquaculture and aquaponic systems since its temperature ranges are similar to that of tilapia.

Jade perch (*Scortum barcoo*) is being considered more and more for aquaponic systems due to its wide tolerance for temperature fluctuations, 50–95°F. It is originally found in Australia and, like tilapia, is omnivorous.

Crappie and other sunfishes exist in almost every single US state, making access easy to farmers. Their temperature ranges are ideally between 58–68°F, but they have been located in waters much cooler and warmer than that.

Malaysian prawn (*Macrobrachium rosenbergii*) is a freshwater shrimp native to the Indo-Pacific area and is a common aquaculture food species. Temperature ranges for this shrimp are ideally between 68–80°F. One thing to note is that shrimp don't typically occupy the same space in the water column that a school of fish will occupy. They are found on the riverbed in nature as detritivores, but in an aquaculture system, their surface area can be increased with the addition of high surface area structures within the tanks or ponds.

NOTE:

It is important to understand that while these are the most commonly used aquatic species used in aquaponics, there is only limited documented information regarding their performance and production data. Should you choose to use a species outside of this list, we recommend that you contact your local aquaculture extension agent or a hatchery/farm operator to discuss the feasibility. As with any other aspect of this operation, you need to determine your market and what would work best for you. If your ambient temperature is within 68–78°F on average throughout the growing season, perhaps you should stick with a species best suited to that temperature to minimize system shock and avoid possible loss of crop. It is true that the warmer the temperature, the more the fish will eat and the more nutrients they will excrete. However, high temperatures can also inhibit the growth and nutrient uptake of the plants, so it is important to try to find a happy medium for all of your water quality parameters.

TECH TALK 134

Pest Management

Vigilance is the key to successful pest management. Make sure to inspect plants and crops on a regular basis to ensure that an outbreak does not occur. You should look for holes, speckling, browning and other damage from the bottom of the stem to the tip of the leaves and all sides of any fruit. Inspections should be increased around high-threat areas such as doors, vents and lights. Yellow sticky cards can also be hung throughout the greenhouse to help in identification of any insects. Records should be kept in order to keep track of past infestations as well as how successful prior treatments were. This will allow you to trend the occurrence of certain problems and can therefore predict future outbreaks.

The easiest way to manage pests in your greenhouse is to keep them out. While double door systems, screens around ventilation ducts and plastic sheeting to cover greenhouses help in keeping pests out, they will not keep all insects at bay. Cleaning should be performed on each plot in between plantings. Footbaths and hand sinks will also assist in deterring transfer of pests from one area to another.

If a mild infestation has occurred and it is contained in one area, a solution of water and liquid dishwashing soap can be used to dislodge insects from your plants. When a large infestation occurs, biological controls can be used to eliminate the pest population. This means that beneficial insects (parasitic wasps, ladybugs, predator mites, etc.) are released into the greenhouse to destroy the pests. Biological control requires a lot of time dedicated to monitoring and releasing predators, as well as knowledge of pest identification and biology. Environmental factors and any previous insecticide or pesticide use also need to be taken into account.

If pesticides need to be used, make sure you are using the correct pesticide for the application and following the labeled instructions. Spraying pesticides in the early evening is the best practice, since this method allows adequate time for the area to ventilate before people will be returning to the greenhouse.

Seeding and Planting Systems

Seed Germination

Germinating seeds can be extremely easy or extremely difficult depending on the type of plant and method used. There are several ways to do this and we will describe a few below:

1. Directly into starter cubes: This is where you use a starter cube (Rockwool®, coco fiber, composted pine bark, etc.) with a small hole in the center to start your seeds. You simply wet the media, drop the seeds in the hole (or widen it a bit with a pencil for larger seeds) and then place them in a tray (with or without a humidity dome, depending on your local humidity). Make sure to read up on your starter media as some media should presoak in a mildly acidic solution for better sprouting results. Some seeds will do better when placed directly out in the sun; some will do better if left in the dark for a few days then moved into the sunlight; and some will do better with a bottom heat pad placed under the tray of starter cubes. One thing to remember is that you want to get them in the same intensity of light that you will be growing them to maturity in as soon as possible. In lower light conditions, plants stretch looking for light and become thinner/weaker and more prone to breaking. Then when you move them into more intense light, they have a tendency to get leaf burn and growth slows as the plant adjusts to the stronger light. If you're trying a new variety for the first time, plant a few test cubes, put them in direct to partial sun for a few days and watch what happens. Most seeds will sprout just fine this way as long as the temperatures are in the correct range for the plant species being grown (look on the seed packet as most of the timeall of the zone/planting times are listed on the packaging), but if you aren't having any luck or you see them sprout and start to get a bit burned, try one of the other methods until you see what works best for that particular seed. Just remember, the quicker you get the plant used to the final light intensity, the quicker it will grow.
2. Paper towel/plastic wrap method: Another popular way of sprouting seeds is by dampening a paper towel with water and placing it on a plate. You then place your seeds on the damp paper towel and cover the plate with plastic wrap. Place this in a dark place such as a cabinet and check it daily while also lifting the plastic wrap to exchange the air inside. As soon as you see the seed crack open, remove the seed from the plate and place the seed cracked end down into the starter cube. It will then shoot the tap root down into the starter cube and the seed will rise out of the cube and fall off of the sprout. This method works extremely well for all types of larger seeds such as beans, peas, sunflowers, cucumbers, etc. Using smaller seeds is not advisable, since it would be extremely difficult to pick them up and place them into starter cubes without hurting the sprouts.
3. Cuttings: Some plants take an extremely long time to grow from seeds, but their cuttings will readily root when cared for properly, eliminating a lot of valuable time spent by the grower. The procedure is fairly simple. First you want to make sure you sterilize your scissors, knife or whatever tool you plan to use to take the cuttings and also make sure to wash your hands well (especially if you are a smoker). Once you have sterilized the cutting tool, take your cuttings and remove all of the fruit from the plant (if there is any) along with the bottom 50% of the leaves/stems. Dip the cut end into either a rooting hormone powder or gel, then place directly into a presoaked starter cube. Some plants such as tomatoes will start to root within a day or two, while other plants such as rosemary may take as long as a month to show any signs of roots. You want to keep the cuttings in a humid environment by using a humidity dome or plastic wrap, and you want to make sure to exchange the air inside several times a day. Some plants will look pretty bad before looking better, but that is because you are stressing the plant and basically forcing it to either grow roots or die. You want the media moist, but not wet or waterlogged. You can also mist the plants to let the leaves take up water. Riding that fine line of wet/dry media tells the harder-to-root plants that they need to sprout roots. Once you have done it a few times you will be able to look at the plants and tell when they have started to root, then take the dome off until the plants get strong enough to move them to your main system. Where to germinate: Seeds can either be germinated directly in your system, on sprouting tables, in individual sprouting trays or by many other means. It really comes down to what works best for the area you have, labor involved and finances available.

Hortifiber Rockwool® is a registered trademark of Thermofiber, Inc.

TECH TALK 124

Compost Tea

Compost tea is exactly what it sounds like—a liquid extract prepared by steeping compost in water. Sounds delicious, right? Don't worry, it's for your plants. Just spray it on and watch them grow healthier and less susceptible to disease. Compost tea can be used on trees, shrubs, houseplants, vegetables, flowers and lawns. It can also help with seed germination and starting new plants.

Compost tea has been shown to be a source of beneficial microorganisms that protect plants and provide better nutrient availability to the plants while also improving soil condition. Several types of compost teas can be made, and they vary in the method of preparation and in the ways they are used. Examples include anaerobic compost teas, aerobic compost tea, compost leachate, manure tea and Bokashi tea, among others.

One of the most popular of the compost teas is aerobic compost tea (no, it has nothing to do with jumping jacks). Aerobic compost tea is made by using an air pump or blower to supply your mixture with oxygen while brewing. The process enhances the production of beneficial bacteria, protozoa, fungi and other microbes. You can even add food and/or other additives to further encourage the growth of microorganisms in the tea. For example, add molasses for bacteria growth; kelp and humic acid for fungi; and peat moss and hay for protozoa.

Brewing aerobic compost tea is easy. Many commercial compost tea brewers are available, but if you take pride in your DIY ethic you can easily build your own brewer. All you need is a bucket, an air pump or blower, an air hose with check valve and a diffuser. Simply wrap the compost in cheesecloth or place it in a mesh bag (avoid fine mesh—it may keep some beneficial fungi from the tea). Fill a bucket with clean water and drop the bag in (one part compost to four parts water). Then throw in your choice of additives. Aerate the liquid for several hours.

While it brews, make sure you provide enough aeration to maintain dissolved oxygen (D.O.) content around 6 ppm. This will support the growth of aerobic microorganisms that enhance plant growth. Aerate the extract between 12 and 48 hours, depending on the type of microbes that are desired. A period of around 12 hours will favor the growth of fungi, while a 24-hour period of aeration will favor the growth of bacteria. Longer periods (36–48 hours) will favor the growth of protozoa and other microorganisms.

After aerating, pour the liquid through a strainer or cheesecloth to filter. Then dilute the concentrated tea with clean water at a ratio of 1 to 10 before dispensing in sprayers or spray bottles. One gallon of your diluted mixture will cover 800 ft^2 of planted area. For best results, apply the tea to plants and soil once every week. The whole plant and surrounding soil may be thoroughly wetted. Tea may be stored up to two weeks in a closed container before applying to plants.

To consistently make great compost tea, consider the following:

- Aerate or chemically treat clean water to remove chlorine or chloramines from water prior to adding compost.
- Keep the brewer between 70 and 75°F while brewing tea.
- The pH should be near neutral (6.5 to 7.5).
- Maintain the D.O. concentration around 6 ppm throughout the brewing cycle.

Using these methods, you can routinely make tea with high numbers of beneficial bacteria, fungi, protozoa and nematodes, time after time. The result will ensure healthier plants and better growth.

Sources of additional information on compost tea:

The National Sustainable Agriculture Information Service (ATTRA)
website: http://www.attra.org/attra-pub/compost-tea-notes.html

The Compost Tea Brewing Manual, 5th Ed., 2005. Dr. Elaine Ingham, Soil Foodweb Inc., Corvallis, Oregon 97333.

STACKABLE GRO UPS

Stackable Gro UPs are hydroponic grow pots that provide maximum growth results with minimal effort. These high-quality decorative plastic pots are designed to last a lifetime while serving as an attractive display for the plants growing inside. Whether they're used indoors or out, they provide a space-saving alternative to traditional horizontally oriented tray setups.

MODEL		EACH
TGP200	STACKABLE GRO UPS	**$15.50**

NET POTS

These plastic net pots have slits in the sides and bottom to allow root development and promote oxygen transfer. Ideal for ebb and flow systems and NFT systems, pots can be used for starting seedlings and propagation. The 2" size is ideal for use with Hortifiber Rockwool® and oasis cubes or Hydroton to start seedlings which will then be transplanted to the growing system. Plants are left in the net pot when transferred, which avoids transplant shock. Larger size net pots are perfect for use with Hydroton media.

These pots are excellent for classroom science projects and experiments, as the root system is visible when lifted out of the nutrient solution.

MODEL		EACH
NP12NL	2" H X 2" DIA., 25/PK, NO LIP	**$3.00**

BUCKET LID

Perfect for customized hydroponic systems, these sturdy Bucket Lids fit any standard 5-gallon bucket.

MODEL		EACH
BL306	6''	**$3.50**
BL310	10"	**4.00**

BL306

PLANT LABELS

Super Starter Plant Labels facilitate the identification of plants in the garden. Their textured surfaces hold pencil, ink or marker without smudging. Pencil marks can be erased, so the labels are reusable. Super Starter Plant Labels can be staked into growing media or tied directly to plants. 6", 20/pack.

MODEL	EACH
SSSPW320	**$1.50**

TECH TALK 130

Hydroponics vs Aquaponics

Hydroponics refers to using a nutrient solution to grow plants in a recirculating (closed) system. Open nutrient systems were used in the past but not much anymore. Two different ways hydroponic systems work are:

- Aggregate, which uses a solid medium (sand, Rockwool®, gravel, perlite, vermiculite, peat moss, coconut husks, etc.) for support of plant roots.
- Liquid, which uses no supporting medium for plant roots.

Aquaponics refers to growing a fish (or any aquatic animal) and plant crop together in a recirculating system. So aquaponics is really the marriage of aquaculture and hydroponics, aggregate or liquid, in a closed system.

Hydroponics and aquaponics offer these advantages over traditional farming: high productivity for the space used, conservative water usage, low environmental impact and the ability to grow plants out of season. The primary disadvantage to both is the high startup cost involved.

COCOTEK®

This organic growing medium consists of three different types of compressed coco coir. A high-quality, low-sodium, environmentally friendly alternative to sphagnum peat moss. When hydrated with water, CocoTek rapidly expands, saving time and effort. Use by itself or mix with expanded clay pellets, perlite or topsoil.

MODEL		EACH
CB310	COIR BALE, 5 KG	**$11.00**

CocoTek® is a registered trademark of General Hydroponics, Inc. and Cocogro® is a registered trademark of American Agritech, LLC.

COCOGRO® SUBSTRATE

This premium coir fiber has a low salt content and no chemical treatment. Its doublesleeved ¾" long fibers provide an optimal air to water ratio and reduced dust, which means stronger root development. Cocogro® fiber is aged at least 18 months, so it has longer usability. And it has excellent drainage properties. 100% recyclable.

MODEL		EACH
COCOB	COCOGRO® BRICK COIR FIBER	**$4.20**

SUNLEAVES ROCKS

A reusable growing medium with serious H_2O-holding power for use in any kind of garden. Both the small (.25" to .5") and large (.5" to 1.5") varieties are made by superheating shale to temperatures up to 2,000°F, rendering them pH-neutral and chemically inert. Make your life a little easier, take care of your plants and take it easy on the planet. Mined and manufactured in the USA.

MODEL		EACH
SR333	.5"–1.5", 33 LBS	**$15.00**
SR334	.25"–.5", 33 LBS	**15.00**

PERLITE

Coarse perlite (siliceous rock) is one of the best hydroponic media commonly used. It has high water-holding capacity and fertilizer retention. It has neutral pH, is sterile and weed-free. Ideal for tray systems, bag systems and deep nutrient trough systems. Sold in four cubic foot bags. Weighs 20 lbs. Made in USA.

MODEL	EACH	4+
PR40	**$17.15**	**$14.58**

GOLD LABEL HYDROCORN

This lightweight clay aggregate is an excellent growing medium for any hydroponic system. Clay aggregates are heated at high temperatures, creating an inner pore structure and ceramic shell that holds moisture for roots and helps minimize the buildup of salts and nutrients. The aggregate wicks the water/nutrient solution upward, pebble by pebble, releasing it to the plant roots as needed. The uneven shape is an ideal surface for roots and beneficial bacteria. Pebbles range from 8–16 mm.

Clay aggregate is chemically inert, odorless, will not degrade and has a neutral pH of 7.0. It's easily washed, completely reusable and will last indefinitely. Excellent in systems with potted plants and in ebb and flow system trays. It readily accepts transplanted seedlings started in oasis cubes, Hortifiber Rockwool® or other planting media.

MODEL		EACH
CA4A	HYDROCORN, 36-LITER BOX	**$38.50**

PROPAGATION CUBES

These Hortifiber Rockwool® small cubes are ideal for starting seedlings and cuttings and fit nicely into 2" net pots, seedling trays or directly into a growing media. Cubes have a small hole in the center for seed placement.

MODEL	L	W	H	CUBES/SLAB	EACH	10+
PC112	1½"	1½"	1½"	98	**$12.00/SLAB**	**$10.80**

PROPAGATION BLOCKS

Once seedlings have developed in the Hortifiber Rockwool® propagation cubes, the entire cube can then be transferred to these propagation blocks. Propagation blocks have a hole in the center that will accept the 1½" propagation cubes. Larger quantities and sizes available.

MODEL	L	W	H	CUBES/SLAB	EACH	10+
PB3	3"	3"	2½"	8	**$6.05/STRIP**	**$5.43**
PB4	4"	4"	2½"	6	**6.15/STRIP**	**5.54**

PROPAGATION MINI BLOCKS

These Hortifiber Rockwool® small blocks are ideal for both seed and cutting propagation. They are designed to be transplanted directly to other media and not intended to be used with larger Rockwool blocks.

MODEL	L	W	H	CUBES/SLAB	EACH	10+
RMB1	1½"	1½"	1½"	15	**$3.45/STRIP**	**$3.17**

PROPAGATION CUBES

Start seeds and root cuttings right with OASIS® Horticubes®, 1" Medium Thin Cut! Because cubes are pH neutral and extremely porous, they are multi-purpose and work especially well in hydroponics systems. OASIS Horticubes are designed to drain off excess water from the base of the germinating seed or cutting while maintaining a proper air/water balance.

MODEL		EACH
OHO300	2 SHEETS @ 276 CUBES/SHEET	**$24.00**

PROPAGATION CUBES

OASIS® Rootcubes® Plus, 1.25" Medium Cubes, propagation foam was created for slower-rooting cuttings. Charged with just the right amount of starter nutrient, this higher-density, lower-drainage foam gives hydro hobbyists healthy, robust plants sooner than ever before, shaving entire days off the propagation process.

MODEL		EACH
OROPT325	104 CUBES/SHEET & TRAY	**$18.00**

SUPER STARTER PLUGS

Pre-formed Sunleaves Garden Products® super starter plugs maintain a perfect air-to-water ratio and retain water incredibly well. These bioactive plugs are made of composted tree bark using a proprietary composting process and are just the thing seedlings love. Use in soil or hydroponics.

MODEL		EACH
SSSP306	6/PK	**$3.00**
SSSP355	55/PK	**18.00**
SSSP372	72/PK	**23.00**

Sunleaves Garden Products® is a registered trademark of Sunleaves, Corp., Oasis®, Horticubes® and Rootcubes® are registered trademarks of Smithers-Oasis Company.


WPT221


WER299


WREP200

PROPAGATION & GROW TRAYS AND RESEVOIRS

Great, sturdy additions to any hydrogarden. Trays have raised interior channels for superior drainage. The basin of the Eazy Drain Reservoir also features a gradual slope and can be modified with bulkhead fittings for simple hose connection and reservoir change-outs. Made of durable, UV-resistant plastic. Ship motor freight.

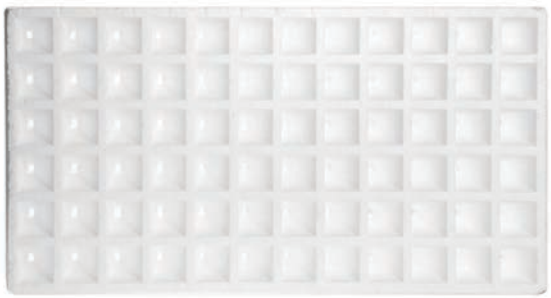
MODEL		L X W X D	EACH
WPT200	PROPAGATION TRAY	22" X 22" X 7"	**$50.00**
WPT210	PROPAGATION TRAY	44" X 24" X 7"	**75.00**
WPT220	PROPAGATION TRAY	36" X 36" X 7"	**105.00**
WPT230	PROPAGATION TRAY	48" X 48" X 7"	**143.00**
WPT240	PROPAGATION TRAY	72" X 36" X 7"	**185.00**
WPT250	PROPAGATION TRAY	96" X 48" X 7"	**267.00**
WPT221	PROPAGATION TRAY LID	36" X 36" X 7"	**100.00**
WPT231	PROPAGATION TRAY LID	48" X 48" X 7"	**135.00**
WGT200	GROW TRAY	44" X 6" X 4"	**26.00**
WGT210	GROW TRAY	42" X 8" X 4"	**33.00**
WGT220	GROW TRAY	24" X 92" X 4"	**135.00**
PDO200	PROPAGATION DOME	22" X 22" X 7"	**77.50**
WRE210	RESERVOIR, 10 GAL W/LID		**90.00**
WRE220	RESERVOIR, 20 GAL W/LID		**98.00**
WRE240	RESERVOIR, 40 GAL W/LID		**140.00**
WRE250	RESERVOIR, 70 GAL W/LID		**264.00**
WER250	EAZY DRAIN RESERVOIR W/LID, 50 GAL		**244.00**
WER299	EAZY DRAIN RESERVOIR W/LID, 100 GAL		**418.00**
WREP200	RESERVOIR PORTHOLE COVER		**9.00**

FIBERGLASS TROUGHS

Rectangular troughs are used for hatching fish eggs, coral propagation, baitfish, larval rearing (use with McDonald-type hatching jars), invertebrate holding and many other culture applications. Although not as thick as our reinforced fiberglass tanks, they are still quite durable. Inside gel coat is light blue. Troughs are stackable and ship via motor freight, FOB Orlando. Custom sizes available in quantity. Crating charges apply.

MODEL		L X W X H	EACH	4+
FT120L2	120 GAL	96" X 24" X 12"	**$282.72**	**$262.93**
FT180L2	180 GAL	96" X 36" X 12"	**489.30**	**455.05**
FT240L2	240 GAL	96" X 48" X 12"	**661.50**	**615.20**
FT320L2	320 GAL	96" X 48" X 16"	**917.70**	—


FT120L2



SPEEDLING TRANSPLANT TRAYS

Keep your plants' roots safe from damage, pests and diseases during transplant. These polystyrene trays are reusable and drastically reduce transplant shock. The angled sides of the cells encourage roots to grow downward, rather than spiraling as they would in a square cell. This allows plants to begin growing immediately after transplant. Plants and soil are easily removed, completely intact.

Trays are 26⅝" L x 13⅝" W. Ship weight 1.5 lbs.

MODEL		EACH
TR128A	128 CELLS @ 1.5 SQ.IN., 2.5" DEEP	**$10.03**
TR200A	200 CELLS @ 1 SQ.IN., 3" DEEP	**12.63**
TR242HC	242 CELLS @ 1 SQ.IN., 2.5" DEEP	**8.22**
TR72A	72 CELLS @ 1.75 SQ.IN., 2.5" DEEP	**12.92**

HEAVY-DUTY SOFT TWIST TIE

Holds anything that needs to be bunched, grouped, tied together, tied up, tied down or organized, but it doesn't damage like traditional unsheathed wire twist ties. Package contains 16' of cushioned heavy-duty wire.

MODEL	EACH
STT310	**$7.00**

Rapiclip® is a registered trademark of Luster Leaf Products, Inc.

PLANT TWIST TIE

This 164' roll of strong wire tie includes a handy cutter. 0.4 mm thick.

MODEL	EACH
PTT310	**$3.50**

PLANT YO-YO

If you're dealing with droopy plants, you'll love the plant yo-yo! When attached to an area above the plant, its line lightly hooks to a stem or branch to prevent it from falling or leaning. As the plant grows taller, the line retracts while continuing to gently hold it up. Alternately, you can use the included plastic stopper to keep the 60" line at a static length.

MODEL	EACH
PYY200	**$1.75**

BOTANICARE BENCHES

These sturdy benches are constructed from 1" square powder-coated aluminum bars. Ship motor freight.

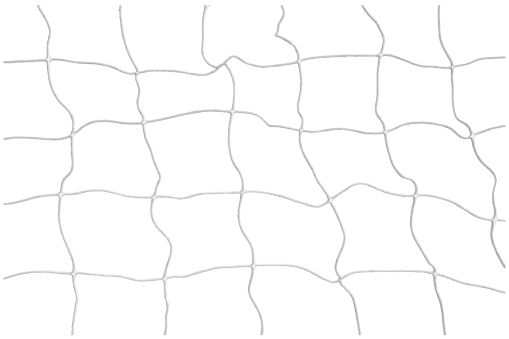
MODEL		EACH
BB250K	4' X 8'	**$380.00**

SNAPTURE TRAY STAND AND FITTINGS

Uses specially designed connection pieces to turn regular 1.25" PVC tubing into a sturdy stand for a 4' x 4' tray. Each tray stand kit contains: feet/bases (4), cross fittings (4), 90º dovetails (4), 50" long 1.25" PVC support bars (2), 32" long 1.25" PVC cross bars (2), and 17" tall 1.25" PVC support legs (4). Additional fittings (available separately) provide you with expansion capabilities, or you can combine these fittings and convert standard 1.25" PVC tubing into its own customized set up.

MODEL		EACH
SNA200	TRAY STAND, 4' X 4'	**$90.00**
SNA201	CROSS FITTING	**5.00**
SNA202	FOOT/BASE	**5.00**
SNA203	DOVETAIL	**4.00**

SNA200



HOR810

HORTI-TRELLIS

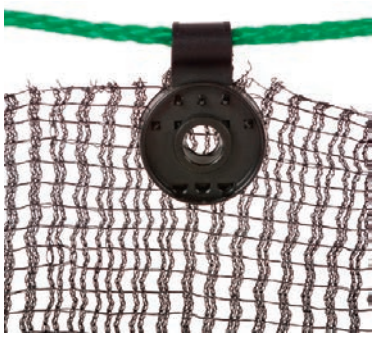
The simple solution to horizontal and vertical trellising problems. For use indoors or out, in aesthetic or purely practical applications. They're durable but flexible, and you can reuse them over and over again without worrying about tangling.

MODEL		EACH
HOR810	4' X 16'	**$17.00**
HOR820	4' X 50'	**37.00**
HOR830	4' X 100'	**65.00**

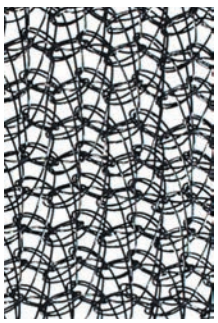
POLYCLIPS

These unique fasteners are ideal for attaching predator netting and shade cloth to support rope and wires. Constructed of tough polypropylene, they can be used over and over again. Simply snap over the edge of the material and attach to ⅜" support wire. Recommended spacing is one polyclip per 2' (depending on load). Bulk quantity available.

MODEL		EACH
PC1	EACH	**$.60**
PC125	25-PK	**9.90**



SC30



SC50

SC70

SHADE CLOTH

Our premium shade cloth is the knitted type, which will last over 15 years in the tropical sun. This cloth is useful for shading tanks to reduce algae, prevent sun damage to fish and reduce water temperature. It is also useful for predator control, visibility screening and, of course, shading plants.

Offered in 3 densities to block 30, 50 or 70% of the sun. Made of UV-resistant plastic. We stock 12' wide rolls that are sold in 10' L increments or full 300' rolls only. 10' and 20' widths are also available in full rolls.

MODEL	SHADE	FULL ROLL LENGTH	WIDTH	SHIP WT (LBS)	EACH	
SC30	30%	—	12'	2.8/120 FT²	**$36.00/10'**	**—**
SC30R	30%	300'	12'	83/3,600 FT²	**720.00/ROLL**	**647.86/2+**
SC50	50%	—	12'	2.8/120 FT²	**42.00/10'**	**—**
SC50R	50%	300'	12'	83/3,600 FT²	**948.00/ROLL**	**852.30/2+**
SC70	70%	—	12'	4.6/120 FT²	**54.00/10'**	**—**
SC70R	70%	300'	12'	138/3,600 FT²	**1,265.00/ROLL**	**1,201.75/2+**

PNR-400-PAR

PNR-400-PON

PNR-400-PAR-PON

INDUCTION GROW LIGHTS

Energy saving, full spectrum lighting ideal for aquaponics!

Introducing Pentair Aquatic Eco-Systems' new line of induction grow lights. Induction lighting is an emerging technology that is replacing metal halide and high pressure sodium lighting in aquaponics. Induction lighting offers many benefits to crop production including a broad spectrum, greater canopy penetration and lower operating temperatures.

- Consumes up to 70% less power than traditional HID lamps
- One lamp from vegetative thru flowering reduces plant stress
- PAR rated spectrums: 90% UV – 95% Carotenoid – 80% R/FR/IR
- 98% specular reflectance for greater canopy penetration
- Low operating temperatures reduce cooling costs
- Longer lamp life (100,000 hour rated)
- 10 year lamp and driver warranty

40W PONTOON ACCESSORY

Designed to work as an enhancement accessory to the induction lamps' broad spectrum phosphor blend. They are a low wattage addition to our induction lamps' spectrums and should be considered when the gardener is seeking optimized quality, yield and reduced time to harvest.

- Flowering enhancement accessory
- Comes fully assembled No Tools Required for Easy Installation
- 5 Year Warranty

LIGHTING CONVERSION REFERENCE
PNR-100-PAR (100W) REPLACES 200W METAL HALIDE OR HP SODIUM LIGHTS
PNR-200-PAR (200W) REPLACES 400W METAL HALIDE OR HP SODIUM LIGHTS
PNR-400-PAR (420W) REPLACES 1,000W METAL HALIDE OR 750W HP SODIUM LIGHTS

Grow Lights

MODEL		VOLTS	HZ	WATTS	COVERAGE AREA L	COVERAGE AREA W	DIMENSIONS L	DIMENSIONS W	DIMENSIONS H	SHIP WT (LBS)	EACH
PNR-100-PAR	100W GROW LIGHT	120-277	50/60	100	24"	24"	19"	14½"	6¾"	8	**$480.00**
PNR-200-PAR	200W GROW LIGHT	120-277	50/60	200	36"	36"	26½"	14½"	6¾"	11	**610.00**
PNR-400-PAR	420W GROW LIGHT	120-277	50/60	420	48"	48"	41"	14½"	6¾"	15	**795.00**
PNR-400-PON	40W PONTOON ACCESSORY	120-277	50/60	40	—	—	40"	20"	5½"	4	**745.00**

Combo Light Kit

MODEL		VOLTS	HZ	WATTS	COVERAGE AREA L	COVERAGE AREA W	DIMENSIONS L	DIMENSIONS W	DIMENSIONS H	SHIP WT (LBS)	EACH
PNR-400-PAR-PON	420W LIGHT & 40W PONTOON	120-277	50/60	420+40	48"	48"	41"	20"	6¾"	19	**$1,510.00**

GENERAL HYDROPONICS® PH UP AND PH DOWN

High-quality pH solutions specifically designed for hydroponics. Solutions are formulated from nutrients that plants can use. Super-concentrated.

pH Up is base formulated using Potassium Hydroxide and Potassium Carbonate. Add a little at a time if your nutrient pH is too low in order to raise the pH to the proper level. pH Down will lower the pH of nutrient solution and plant fertilizers.


PHR2

GPUD500


PHL1

MODEL	TYPE	SIZE	EACH	
PH UP				
GPU502	LIQUID	8 OZ	**$7.50**	HAZMAT A
PHR1	LIQUID	QUART	**11.00**	HAZMAT A
PHR2	LIQUID	GALLON	**27.00**	HAZMAT A
GPUD500	DRY POWDER	2.2 LBS	**14.00**	
GPUD510	DRY POWDER	16 LBS	**98.00**	
PH DOWN				
GPD502	LIQUID	8 OZ	**$7.50**	HAZMAT A
PHL1	LIQUID	QUART	**11.00**	HAZMAT A
PHL2	LIQUID	GALLON	**27.00**	HAZMAT A

General Hydroponics® is a registered trademark of General Hydroponics, Inc.

CHELATED LIQUID IRON SUPPLEMENT FOR PLANTS

If you have alkaline soil, then iron chlorosis may be causing new growth to have a pale green or yellow color. Iron chlorosis is caused by the lack of iron in the soil, or because iron is unavailable for uptake by your plants. This liquid iron supplement provides iron that is immediately available to your plants and remains in the soil for extended feeding. Liquid iron for plants is compatible with most tank mixes of fertilizers or pesticides. Mix 5 to 10 gals. of liquid iron for plants with enough water to cover one acre for turf application. For root feeding trees and shrubs, mix 4 oz. per inch of trunk diameter with 5 to 10 gals. of water and pour or inject around the drip line. Use 1 gal. in 64 gals. water for foliar applications. 1-gal. container. 4.7% iron oxide. Made in USA.

- Prevents or cures iron deficiency in plants, makes iron immediately available to plants
- Ideal for turf, ornamental shrubs and trees

MODEL	EACH
LIG2	**$22.20**

#10 WHITE CALCIUM CARBONATE DUST

Due to the nitrification process that occurs in the biofilter of a healthy aquaponics system, pH of the system tends to steadily decrease over time as the nitrifying bacteria create acid. Regularly adding calcium carbonate increases pH, and adds beneficial nutrients for plant uptake as well.

MODEL		EACH
MD	50 LB BAG	**$49.99**

GREENCURE

A potassium bicarbonate-based fungicide used to control powdery mildew, black spot and other common plant diseases. Recommended as a foliar treatment for more than 85 different plant varieties including vegetables, trees, ornamentals and houseplants. One tablespoon of powdered GreenCure to one gallon of water will cover approximately 450 ft^2. GreenCure is registered "for organic production" by the USDA's National Organic Program (NOP).

MODEL		EACH
GC700	8 OZ	**$17.00**

PROLINE® SUPER SALT CONCENTRATE

Contains everything but the salt—save on shipping!

This synthetic salt mixture contains all the necessary elements and buffers (except sodium chloride) required to make up to 4,400 gallons of synthetic seawater. Each phosphate- and nitrate-free batch is individually tested to generate consistency and high quality. Because sodium chloride is a major component of most synthetic sea salt mixtures, it is also responsible for a large amount of the weight. This concentrated mixture contains everything but the sodium chloride.

ProLine Super Salt Concentrate is packaged in a semiliquid form and sold in resealable buckets. One bucket mixes with 80 lbs of noniodized, high-purity sodium chloride to make 400 gallons (1,514 liters) of salt water. Pallet quantities available.

MODEL		SHIP WT (LBS)	EACH	4+
239500	400 GALLONS	63	**$75.50**	**$68.79**
239510*	4,400 GALLONS	600	**638.00**	—

*Ships by motor freight.


239500

APPLICATIONS
Public aquariums.
Saltwater fish holding systems.
Aquarium stores.
Recirculating systems.
Seafood holding systems.
Research labs.

HM10


HM20

SUPERSPROUTER SEEDLING HEAT MATS®

Seedling Heat Mats provide the ideal, constant rooting temperature for sensitive seedlings and cuttings. The 10" x 20" mat fits perfectly in our TY1 trays. Available in 17-watt and 45-watt sizes. Optional Heat Mat Thermostat provides a 70–90°F control range. Mats are 115V/60 Hz.

MODEL		EACH
HM10	10" X 20" HEAT MAT, 17 WATTS	**$31.30**
HM18	18" X 20" HEAT MAT, 45 WATTS	**47.00**
HM20	THERMOSTAT	**43.00**

SuperSprouter Seedling Heat Mats® is a registered trademark of IP Holdings LLC.

HOUSEPLANT STICKY STAKES

Houseplant Sticky Stakes are great tools for early detection of flying insect infestations. Insects are attracted to the bright yellow Houseplant Sticky Stakes and then get caught on the surface. The stakes conveniently fold to stick in the soil and can even hang from the plant itself. To clean up, simply wrap the stake in paper and throw away. A safe, mess-free way to take care of houseplant pests. Seven strips per pack.

MODEL	EACH
HSS707	**$6.00**

INSECT KILLING SOAP CONCENTRATE

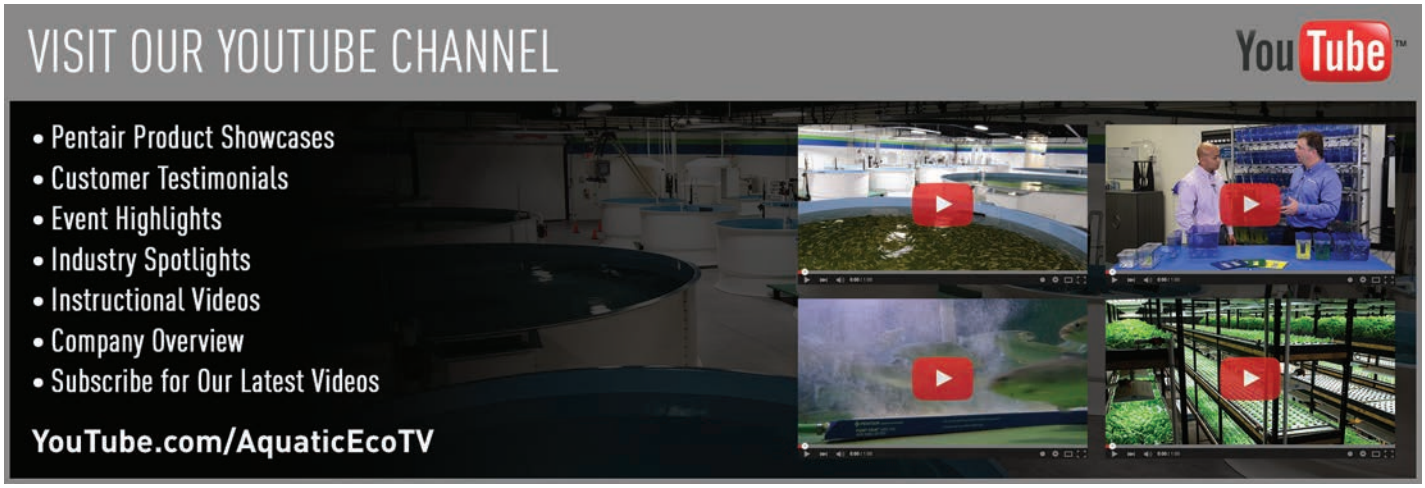
Safer Insect Killing Soap is a good solution for tough insect pest infestations. It works as a contact insecticide and has no residual effect. Thoroughly spray a diluted mixture onto your plant every 7-10 days and apply at least three times to break the pests' reproductive cycle.

MODEL	EACH
IKSC716	**$12.00**

SAFER GARDEN DUST

OMRI® Listed and compliant for use in organic gardening, Garden Dust effectively kills caterpillars, corn earworm, bollworm, and more than a dozen other types of worms. Once ingested by the wayward pests, the active ingredient, Bacillus thuringiensis, kills them within a few days. Gardeners are recommended to apply late in the afternoon or on cloudy days, as *Bacillus thuringiensis* breaks down in the sunlight. 8-oz bottle.

MODEL	EACH
SGD708	**$8.50**



BLUELAB® CLEANING KIT

Conductivity is only accurate if the probe is kept clean. This kit contains everything you need to clean probes and get the most out of your investment. Comes with detailed instructions, decanter vessels, probe cleaner, solutions and more to keep probes working right.

MODEL		EACH
BCK510	CONDUCTIVITY CLEANING KIT	**$27.00**

2-YEAR WARRANTY

BLUELAB® GUARDIAN MONITOR

A constant indicator of the desired levels of EC, pH and temperature, enabling you to optimize these parameters as the crop progresses through each growing phase. A flashing display lets you know if one parameter moves away from the desired level, allowing them to make the required adjustments quickly. It monitors crops 24 hours a day with a built-in alarm system, and also features large, easy-to-read displays with adjustable "Plant Safe" green LED lights, adjustable conductivity and temperature values, pushbutton pH calibration, a silent alarm for both high and low settings, setting retention even during power failure, automatic temperature compensation and a water-resistant design.

Meter ranges: pH from 0 to 14.0 with a 0.1 resolution; EC from 0 to 5.00 with 0.01 resolution; temperature from 0 to 50°C (32–122°F) with 1° resolution. The accuracy is ±0.1 for pH and EC, ±1°C (±2°F) for temperature. Two-year warranty.

MODEL	EACH
BGM500	**$364.00**

BLUELAB® COMBO METER

Conductivity, pH and temperature all in one portable meter. Pushbutton pH calibration and auto-off function to extend battery life. Meter will display temperature (°C or °F), pH 0–14, and conductivity as EC, CF or ppm 500. Includes probes, pH calibration solution and two AAA batteries. Five-year warranty on the meter, six months on the probe.

MODEL		EACH
BCM500	BLUELAB COMBO METER	**$308.00**

5-YEAR METER WARRANTY

TECHNICIAN PROFILE

Jason Danaher

Jason received his Ph.D. in fisheries and aquaculture from Auburn University. He has worked with warm water aquaponic systems for the past 8 years and other methods to integrate aquaculture with horticulture. He also has experience with tilapia and freshwater prawn production systems.

Bluelab® is a registered trademark of Bluelab Design LLC.

POLYETHYLENE TANKS

These polyethylene, marine blue, open top tanks are economical with long life expectancy. The smooth surface makes for easy cleaning, and their light weight allows for quick set-up and relocation. Edge lips provide wall strength and minimize deformation. Most of these tanks are nestable, which reduces shipping costs. FDA compliant; safe and non-toxic to aquatic and animal life. All tanks have ultraviolet inhibitors for outdoor use. Because they have superior mechanical properties, high stiffness, excellent low temperature impact strength, and outstanding environmental stress crack resistance, they stand up well in tough environments.

55 TO 250 GALLON TANKS

CAPACITY (GAL)	SHAPE	INSIDE DIA.	HEIGHT	WALL THICKNESS	SHIP WT (LBS)	TANK ONLY MODEL	TANK ONLY EACH
55	ROUND	21"	38"	3/16"	17*	**TP55***	**$139.00**
90	ROUND	39"	20"	3/16"	23**	**TP90****	**219.00**
210	ROUND	48"	30"	3/16"	49**	**TP210****	**289.00**
250	ROUND	60"	22"	3/16"	68**	**TP250****	**399.00**
110	RECTANGULAR	55" X 31" X 18"		1/8"	44**	**TP110****	**249.00**
130	MORTAR BOX	72" X 36" X 12"		1/8"	39**	**TP130****	**259.00**

*Ships ground. **Ships motor freight.

410 TO 1000 GALLON TANKS (WITH & WITHOUT 2' X 2' WINDOW INSTALLED)

These tanks have a flat depression molded into the side near the bottom for a bulkhead fitting. Models ending in -W2 have a 2' x 2' polycarbonate viewing window installed (actual viewing area is 21¾" x 21¾"). Ships motor freight.

CAPACITY (GAL)	SHAPE	INSIDE DIA.	HEIGHT	WALL THICKNESS	SHIP WT (LBS)	TANK ONLY MODEL	TANK ONLY EACH	TANK WITH WINDOW MODEL		TANK WITH WINDOW EACH
410	ROUND	60"	34"	3/16"	74	**TP440A**	**$499.00**	**TP440A-W2**	NEW	**$649.00**
460	ROUND	70"	30"	3/16"	78	**TP400F**	**529.00**	**TP400F-W2**	NEW	**679.00**
650	ROUND	77"	34"	1/4"	105	**TP655**	**629.00**	**TP655-W2**	NEW	**779.00**
800	ROUND	88"	38"	1/4"	120	**TP800**	**779.00**	—		—
830	ROUND	92"	30"	1/4"	134	**TP830**	**809.00**	**TP830-W2**	NEW	**959.00**
1000	ROUND	90"	44"	1/4"	148	**TP1000**	**899.00**	**TP1000-W2**	NEW	**1,049.00**


TP800

FIBERGLASS TROUGHS

Rectangular troughs are used for hatching fish eggs, coral propagation, baitfish, larval rearing (use with McDonald-type hatching jars), invertebrate holding and many other culture applications. Although not as thick as our reinforced fiberglass tanks, they are still quite durable. Light blue gel coat interior. Troughs are stackable and ship via motor freight, Crating charges not included in prices when applicable. FOB Orlando.

MODEL	CAPACITY (GAL)	L X W X H	EACH	4+
FT120L2	120	96" X 24" X 12"	**$282.72**	**$262.93**
FT180L2	180	96" X 36" X 12"	**489.30**	**455.05**
FT240L2	240	96" X 48" X 12"	**661.50**	**615.20**
FT320L2	320	96" X 48" X 16"	**917.70**	**—**

THE MINI FISH FARM™ ✓ DESIGNED HERE

#1 in the classroom

The Mini Fish Farm™ is a complete fish raising system. It includes a quiet, oilless air pump, a state-of-the-art clarifier, a biological filter employing moving bed technology, a 5'4" Dia. x 35" H polyethylene tank that can be ordered with or without a viewing window, an operational manual and a video that gives step-by-step set-up instructions and maintenance procedures. The entire system contains only 400 gallons of water, making heating, water changes and overall size and weight minimal. All electrical components are UL-approved and power consumption is a mere 60 watts. That's under $4 per month!

Maintenance takes less than ten minutes per day and only two 5-gallon pails of water need to be emptied and replaced. The entire system fits in a 6' x 8' area and can fit through a 36" door. Extremely safe, there is no electricity in the water, and the system is virtually leakproof. Ships Motor Freight. One-year warranty. Made in USA.

OPTIONAL STAND-ALONE AQUAPONICS KIT

Use this aquaponics kit with the Mini Fish Farm™ to utilize fish effluent as fertilizer, all while supplementing biofiltration with plant uptake. Eighteen lettuce, herb or other leafy plants are partially suspended in the recirculated water, providing optimal nutrient uptake and aeration of roots without the use of gravel or perlite. This unit is modeled after a commercial aquaponics unit that produces 45,000 heads of lettuce per day. It requires no additional power. Kit includes black ABS tray with removable top for root inspection and harvesting (measures 4' long x 2' wide x 6" deep), aluminum stand, 18 net pots (2") with growing cubes and all plumbing/fittings for hookup to the Mini Fish Farm™, plus a comprehensive hydroponics manual. Ships Ground. The Aquaponics Refill Kit (CK50R) includes net pots, growing cubes and cable ties.

OPTIONAL FLOATING AQUAPONICS KIT ✓ DESIGNED HERE

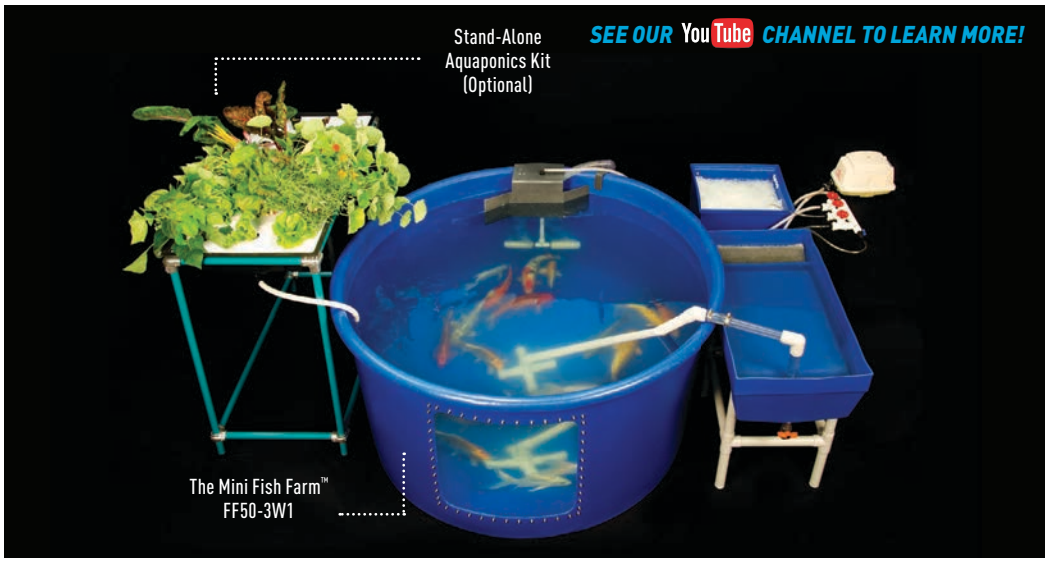
Use this aquaponics kit with the Mini Fish Farm™. It consists of a unique aquaponics tray that allows the growth of lettuce, herbs, flowers and other crops in the same tank as the fish. This interaction between animals and plants provides the opportunity to study and observe a more natural eco-system. The tray is designed to float within the tank, covering one half of the water's surface. It is capable of growing up to 24" plants. Special screening protects plant roots from foraging fish and the design provides proper tray height above the water. Kit includes two heavy-duty ABS plastic trays, screening, twenty-four 2" net pots, twenty-four 3¼" net pots, zip ties, twenty-four Rockwool cubes and complete instructions. Ships Oversize. Made in the USA. The Aquaponics Refill Kit (CK50R) includes net pots, growing cubes and cable ties.

OPTIONAL TANK WINDOW KITS

The **FF50W-KIT** is 1' x 2' polycarbonate window kit with an actual viewing area of 9¾" x 21¾", and the **FW22-KIT** is 2' x 2' with a viewing area of 21¾" x 21¾". Order extra windows and we will automatically install them in your Mini Fish Farm™.

MODEL		SHIP WT (LBS)	EACH
THE MINI FISH FARM			
FF50-3	MINI FISH FARM (NO VIEWING WINDOW)	230	**$2772.43**
FF50-3W1	MINI FISH FARM W/1' X 2' VIEWING WINDOW	230	**2929.25**
FF50-3W2	MINI FISH FARM W/2' X 2' VIEWING WINDOW	230	**2977.70**
OPTIONAL AQUAPONICS KITS			
FF50HT	STAND ALONE AQUAPONICS KIT	60	**698.58**
CK50	FLOATING AQUAPONICS KIT	30	**181.32**
CK50R	AQUAPONICS REFILL KIT	0.5	**23.46**
OPTIONAL TANK WINDOW KITS			
FF50W-KIT	1' X 2' WINDOW KIT	2.5	**109.00**
FW22-KIT	2' X 2' WINDOW KIT	2.5	**149.00**
REPLACEMENT COMPONENTS			
SL88	115V 60HZ LINEAR PISTON AIR PUMP	23.5	**498.00**
ALR15	6" MEDIUM PORE DIFFUSER	1	**13.50**
ZPF2	FILTER PAD (4½" X 18")	0.35	**8.09**

Optional Floating Aquaponics Kit



Mini Fish Farm with Optional Stand-Alone Aquaponics Kit

BACKYARD AQUAPONICS SYSTEM

The perfect aquaponics system for everyone from the advancing hobbyist to the beginning commercial grower. We have successfully grown over one hundred varieties of produce in this system throughout our initial testing period and it has proven itself to be robust and problem-free.

The kit includes all major components needed to construct the aquaponics system as shown*. System uses 747 total watts ($53.78/mo @ $0.10/kWh). Provides 1,176 planting sites on 6" centers, and 864 planting sites on 8" centers. System size can be even be doubled to better suit your needs.

System includes:

- 4 x 830-gal fish culture tanks.
- Complete filtration system.
- All major plumbing.
- Aeration equipment.
- Energy-efficient centrifugal water pump.
- Enough liner to build four 24' x 4' x 12" growing troughs.

Visit YouTube.com/AquaticEcoTV and see the system in action.

*Excluding wood boards and brackets used to build the plant troughs and polystyrene rafts (found at your local hardware store). Net cup and media choices will depend on the customer and are also not included.

CALL FOR MORE INFORMATION AND PRICING.

SEE OUR YouTube CHANNEL TO LEARN MORE!

You can grow a variety of produce at one time in the grow beds.

Water is filtered before being delivered to grow beds.

Nutrients for the system are provided by fish in these tanks.

VISIT OUR YOUTUBE CHANNEL

- Pentair Product Showcases
- Customer Testimonials
- Event Highlights
- Industry Spotlights
- Behind-the-Scenes Farm Tours
- Insights into New Technology
- Company Overview
- Tutorials

Subscribe for Our Latest Videos

YouTube™ /AquaticEcoTV

IMMERSE YOURSELF AT PENTAIRAES.COM

PENTAIRAES.COM FEATURES

- SHOP COMPLETE PRODUCT OFFERING
- ADVANCED PRODUCT SEARCH
- LEARN ABOUT AQUACULTURE BLOG
- AQUACULTURE CALCULATORS
- LIVE CHAT WITH REPRESENTATIVE
- ONLINE ACCOUNT MANAGEMENT
- PRODUCT INSTRUCTION MANUALS
- NEW PRODUCT ANNOUNCEMENTS
- MOBILE FRIENDLY DESIGN
- CUSTOMER SPOTLIGHTS
- TECH TALKS
- SEARCH BY PART NUMBER

GET THE LATEST NEWS & OFFERS

10% OFF

YOUR FIRST WEB ORDER*

To recieve our e-mails please visit:
PentairAES.com/signup

*Restrictions apply. Please visit pentairaes.com/signup for more information

CONNECT WITH US

PENTAIR AT A GLANCE

EMPLOYEES

x300 = 30,000 Pentair employees

60% of employees are outside the US

Product availability on all **7 continents**

SALES ACROSS THE GLOBE

2014 SALES BY REGION

50% US & Canada

19% Western Europe

31% Fast growth and other developed countries

ROBUST GROWTH

63 The percentage sales grew from **2012 to 2014**

PRODUCTION

5 SECONDS
The number of seconds it takes to fill an Olympic size swimming pool with water by one of Pentair's custom-made flood protection pumps

250 MILLION
The number of liters of freshwater per day Pentair provides the residents of Sydney, Australia

350,000
The number of people in Colon, Honduras who receive clean water each day through Pentair's Project Safewater initiative

100+ Pentair manufacturing facilities

200,000+ Following Pentair AES on Social Media

INSPIRED SOLUTIONS. IMPROVING LIVES.

75% of our solutions relate to food, water and energy

PENTAIR AES 5 PILLARS

SOLE PARTNER

SINGLE-SOURCE PARTNER

A single-source provider of equipment, expertise and accountability for virtually all water-related applications

VALUE

A TEAM WITH DEEP, REAL-WORLD EXPERTISE

Former curators/operators bringing valuable expertise and experience

INNOVATION

PRODUCT AND SOLUTION INNOVATION

An innovator that consistently brings value to the industry and its business via new ideas, equipment and solutions for every challenge

PERFORMANCE

COMMITMENT ACROSS THE ENTIRE SYSTEM LIFE CYCLE

From system commissioning and start-up through maintenance and troubleshooting

WIN RIGHT

A COMPANY THAT WINS RIGHT

We are committed to absolute integrity, respect and performance excellence in everything we do