




## Flourish Aquaponic Farms™

Designed by Farmers for Farmers

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 Efficient Design

 Production Driven

 Resilient Systems



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## Why Aquaponics?

Aquaponics is the most efficient and resilient way to grow a wide variety of produce and fish together in a single system. Aquaponic farming is quickly becoming a critical part of the local food production equation. We simply have to grow more food with less water and grow the food closer to the consumer if we want to create a more sustainable future. We need more local farmers and gardeners producing the healthiest food possible for our families and communities.

Aquaponics allows us to...

- 🌱 **Reduce** food transportation miles by growing locally
- 🌱 **Grow** highly nutritious fruits and vegetables year round
- 🌱 **Preserve** our wild fish populations by raising healthy fish in a controlled farm
- 🌱 **Conserve** water. Aquaponics uses a tenth of the water compared to soil based agriculture
- 🌱 **Replenish** soils with aquaponic water
- 🌱 **Scale** from home production to community and commercial scale farms
- 🌱 **Feed** people and communities who lack access to healthy affordable food

### Food Miles – A Typical Meal

The Food	Common Place of Origin	WASD*
Tilapia	China, Ecuador, Indonesia	7,626 miles
Salad greens	US, Mexico, Canada	2,055 miles
Tomato	US, Mexico, Canada	1,369 miles
Herbs	US, Mexico, Turkey	3,456 miles
Strawberries	US, Mexico, Chile	1,944 miles

**16,450 Food Miles**

\*Weighted Average Source Distance – A single distance figure that combines information on the distances from production to point of sale and the amount of food product transported. – Leopold Center's Food, Fuel and Freeways report, data for Chicago.

## Why Us?



Since 2009 we have been researching, developing and operating aquaponic gardens and farms. We built and operated Flourish Farms, a 3,000 sq ft aquaponic farm, managing every aspect of food production, distribution, marketing, food safety and many other aspects related to the business of farming. Many people in the industry have claimed that aquaponics can't be profitable particularly at a small scale. We proved that aquaponics can be profitable with the right system, a good business plan, and with a resolve to overcome any obstacle.

*Our mission is to continuously improve our farms, training and support programs so that we can provide aquaponic farms that are productive, efficient and resilient for generations to come.*

## What Differentiates Our Farms?

Most of the aquaponic farms on the market today do not use space very efficiently. The farm equipment and layout does not best fit the customers space and there is significant space wasted to large inefficient filter tanks and plumbing. We've met many aquaponic farmers with DIY or turnkey systems and they often say the same thing; "We paid too much money and we are not getting the production and financial returns we had hoped for" Why is that? Well there's a lot of reasons but one of them is because the system simply didn't fit their space well and that space is costing money.

Our farms are designed with the farmer in mind. We want to make sure that your farm best fits your goals, space and budget. If your intention is to sell for profit then we will make sure your system provides the maximum production for your space. If your intention is to use the space for other functions, we can design a system that is appropriate for your needs. Most importantly, our farms are engineered to be highly productive, efficient to operate, resilient and beautiful.

## Our Process

Whether you are choosing a standard farm model or looking for a customized solution, our goal is to make sure that we get the project right from the initial planning stages to your first harvest and beyond. Our team will work with you to determine the right size aquaponic system to align with your goals and objectives.





## Flourish Aquaponic Farms™ Features

Flourish Aquaponic Farms™ are designed to raise fish and plants together in a practical, productive and ecologically balanced system. The high volume production of leafy greens, herbs, fruiting crops, microgreens and fish takes place in a fully recirculating system. The farms use a fraction of the water compared to soil based gardening and can grow food continuously year round. Our farms are based upon years of experience, sound scientific principles and industry best practices.

We offer three standard farm models designed to fit common greenhouse dimensions. However, our farm systems are extremely modular and can be configured to best fit your goals, space, and budget. Visit our services page at the [aquaponicsource.com](http://aquaponicsource.com) to learn more about custom farm design and business planning services.

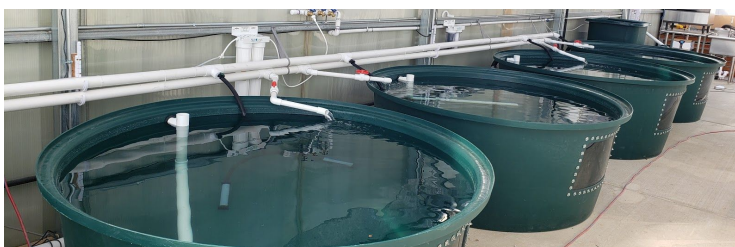
## How the Farms Work

Water from the fish tanks feeds by gravity through the filtration system. Fish solid waste is captured in the filter and bacteria on the surface of the biofilter media convert toxic ammonia to nitrates. An aerobic digester tank allows solids that are removed from the filter to be further “mineralized” to maximize nutrient availability. These additional nutrients can be reintroduced to the system or used for other crops. Following the filter, water flows into the dual sump system. The dual sumps can be connected or disconnected (discussed further in decoupling). Water is pumped back to the fish tank and also simultaneously to the plant systems. Water pumped to the plant systems returns back to the sumps. Low noise linear air pumps provide aeration to the fish and plant systems.

The recirculating nature of the farm allows for reuse of water and absorption of nutrients which are continuously being produced by the fish. No water needs to be discharged from the farm. Water will need to be topped off periodically due to natural losses from evapotranspiration which are detailed in the energy and water section of this document.

## The Fish System

Flourish Farms are designed to ensure that the fish, bacteria and plants are well balanced to provide the nutrients the plants need and the biological filtration necessary for healthy fish. All organisms in the system need to be working together and thriving for maximum productivity.



Our farm systems incorporate multiple fish tanks using a staggered stocking method. Each tank contains a specific age cohort of fish which allows them to receive the proper feed and nutrition they need. The staggered stocking method allows for continuous production of fish for sale. Fish will grow up in the same tank their entire life without having to be moved which reduces stress on the fish. As we say in class... Don't stress out the fish!



## The Filtration System

Flourish Aquaponic Farms use AST Polygeyser series filters designed for long-lasting, hands-off operation. The filter provides mechanical and biological filtration in a single unit occupying only a few sq ft. No media cleaning or replacement is necessary. The auto-pneumatic backwash limits the water loss to the removal of concentrated sludge. Sludge can then be manually or automatically removed and added to the aerobic mineralization tank for additional nutrient production. Filters are sized for each farm based upon the anticipated daily feed rate among other factors.

## Aerobic Mineralization Tank

Adjacent to the AutoBackwashing filtration system is a fully aerated mineralization tank. The tank is sized based upon the expected discharge of waste from the filter and the expected mineralization time for the solids to fully break down. When fish waste and water is added to this tank and aerated it goes through a process of aerobic mineralization which allows the sludge removed from the filter to be naturally broken down into soluble nutrients that can be taken up by plants. Periodically you can turn the air off for an hour which allows the suspended solids to settle to the bottom of the tank. The resulting compost tea like solution that separates is called the supernatant. The supernatant is a concentrated microbial and nitrogen rich solution that is an ideal natural fertilizer for all types of plants, grasses, shrubs and trees.

Each mineralization tank is plumbed with a supernatant discharge connection directly to your plant sump. Simply open the valve and super boost your crops. Through our experience and the research of others, we've found that the reintroduction of mineralized solids allows you to get maximum value out of your fish feed while reducing reliance on supplemental nutrients.

## Growasis™ Modular Raft Systems

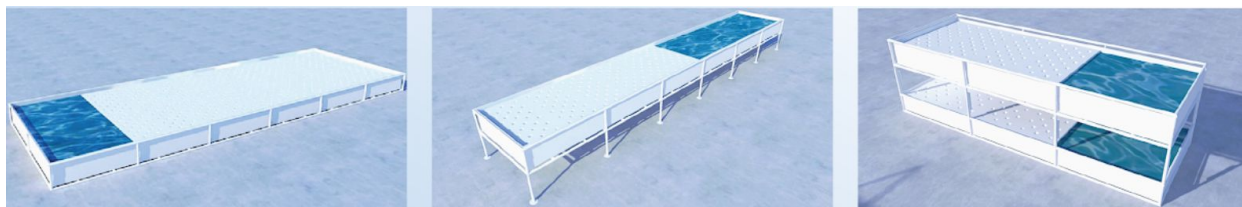
The primary method for plant production in our farm designs is floating raft or deep water culture (DWC). DWC has been proven for over 30 years in research and production farms as the most reliable and consistent way to grow a wide variety of crops at a commercial scale. Roots take up water, oxygen and nutrients below the raft while the plants grow above getting the greatest benefit of sunlight, proper spacing and airflow.

Our Growasis Modular Raft Systems include fully constructed metal framed troughs, liner, aeration, insulation paneling and Beaver Plastics 28 hole food grade raft boards. Seedlings in the nursery are started in compostable plugs that fit perfectly in the raft boards.

We offer three different styles of Growasis DWC systems: Our base farm systems utilize the ground level DWC troughs. Growasis troughs can also be elevated for convenient and “back friendly” transplanting and harvesting. Growasis double decker troughs can also be utilized if you want to double your production in the same space. Double decker systems include high efficiency LED lighting to provide ideal lighting levels for crops on the lower deck. All of our systems are extremely scalable and can be designed to best fit your growing space and production goals.



*Growasis Modular Raft Systems: Ground Level, Elevated and Double Decker Illustrations*



With Growasis Modular Raft Systems you know exactly how many plants per square foot you are growing in your system. This allows for very predictable and organized crop rotations, allowing you to maximize plant production.



*< Growasis Double Decker 4 x 40'*

*Growasis 8 x 72' Elevated >*





## Growasis™ Vertical Nursery and Microgreen Systems

One of our favorite features of our Flourish Farm systems is the combination of our Growasis Elevated transplanting trough and the Growasis Vertical Nursery and Microgreen System. Much of the work on the farm involves seeding, transplanting and harvesting. Doing this work at waist height between the nursery system and elevated transplanting troughs makes farm life so much easier! Each 4 tier vertical nursery system allows for up to (16) 128 hole seedling trays (2,048 plants) in only 8 total square feet (pictured top right). This is ideal when space is at a premium.



We also offer our nursery system in a two deck raceway style format (pictured lower right). The nursery can span from 6 to 30 feet long holding over 90 plug trays and microgreen flats.



The size of the nursery and elevated transplanting trough is correlated to the size and anticipated production of your DWC system. Additional space on the nursery decks not being used for your seedling rotation can be used for production of microgreens or other early stage plant starts.

## AquaBundance Modular Media Bed System

Our farm designs also incorporate media beds to provide space for other crop varieties such as tomatoes, peppers, squash or even dwarf fruit trees. The media beds contribute to the overall bacterial surface area and thermal mass in the system.

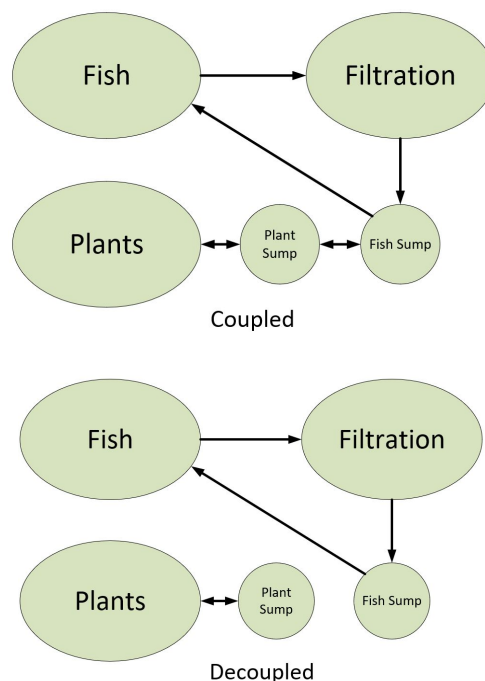


Media beds also allow you to grow root crops such as carrots, potatoes, onions and yams using our Aquapouch cloth growing bags. This is a great way to increase the diversity of plants in your farm.

Our AquaBundance media beds come complete with heavy duty powder coated metal frames, grow beds, growing media, all plumbing components and an optional light rack (also used for trellising vining crops).

## Fish and Plant Decoupling

We design all of our farm scale systems with the capability to “decouple” the fish system from the plant system. In coupled mode, the fish water flows through the filtration system and to the dual sump where it is simultaneously pumped to the fish tanks and plant systems. In this configuration the two sump tanks are connected together and exchanging water. However, there are times, such as during startup, when fish loads are low or plants need to be off the fish system for pest issues. In decoupled mode, a valve simply disconnects the two sumps. You can then run the plant system independently with its own pump using an organic nutrient solution. The fish system uses its own dedicated sump and pump to return filtered water back to the fish. Both the fish and plant systems can operate independently in decoupled mode.



***Having the ability to easily decouple allows you to keep your plant production and business running even if your fish population is not able to provide the full amount of nutrients.***

## System Plumbing

We have taken great care in our farm designs to ensure that the layout of all pipes and plumbing elements in the system are tightly consolidated and are not obstructing walkways or creating an unsightly mess. We have seen a lot of farms with “turnkey systems” where there are huge PVC pipes all over the place making it extremely difficult and unsafe to work.

The Growasis Modular Raft Systems have supply and return inputs on the same end of the trough. Each trough is also independently plumbed so there are no pipes interconnecting between the troughs. By establishing the supply and return on the same end of the troughs all of the plumbing is consolidated towards one end of the farm and out of the way of high traffic areas where much of the day to day activity takes place.



We use a combination of both rigid PVC pipe and flexible vinyl tubing for all of the water and aeration plumbing in the farm. For smaller farm systems using pipe diameters of 2” or less, we run the pipes above the floor. Supply and return tubing that crosses a walkway is covered by an industrial ramp (pictured above). For larger diameter pipes we can provide a trench plan with removable fiberglass grate covers to keep pipes below walkways.

## Optional Equipment

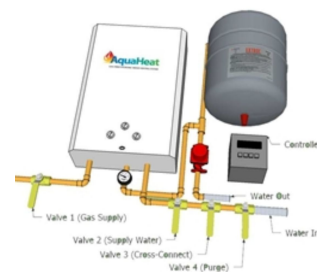
**System alerting** - An optional monitoring and alerting system is recommended for 24/7 monitoring and alerting for power outages, floods, temperature, high/low water levels. There are several additional monitoring options available to choose from.

**Fish Quarantine and Purge System** - The system allows for the observation and development of incoming fingerlings to help prevent the introduction of potential diseases to your main fish population. The system comes with (1 or 2) fish tanks, an Endurance 2000 auto-backwashing filter, UV Filter, aeration system, heater, pump and all plumbing components.

**Artificial Grow Lighting** - Depending on your location, your farm may require artificial grow lighting to stay operational year-round. Our design team uses real location-based data to determine how much light your greenhouse will naturally receive, and tailors custom grow lighting solutions to provide the exact amount of light that your plants require. Using this method, we can ensure ideal growth rates without wasting extra money or electricity operating unnecessary lighting fixtures. We utilize the most advanced technology available today, using highly efficient, high-output LED fixtures, robotic moving systems, controllers, and light monitoring systems. Our team also works with a variety of lighting technologies, including LEDs, Ceramic Metal Halides, Fluorescents, and more to accommodate virtually any lighting application and budget. Electrical requirements, operating costs, and lighting schedules are all calculated by our team and provided with each grow lighting system.



**Heating Solutions** - Depending on your location, environmental controls, fish species and other factors, you may need to heat your water. Providing a consistent and stable temperature for your fish and plants is important for the success of your farm. When the water temperature fluctuates rapidly or is too cold for the selected species, then your fish will be stressed and not eat productively. When fish are not actively eating at their recommended daily feed rate then plants will not get the nutrients they need. Our Aquaheat natural gas and propane heating solutions will provide you energy efficient and reliable heat to your system using a 12VDC pump which can run on a battery backup.





**Farm Supplies** - Each Flourish Farm includes supplies tailored for the size of your farm.

- **Cycling Supplies** – Establishes proper bacteria levels to begin fish and plant production
- **Fish Supplies** – Stage 1 and 2 fish feed, fish nets
- **Pest Management Products** – We provide three different OMRI approved and aquaponic safe biologicals for use against common pests, fungus and plant diseases
- **Nutrients and Adjusters** – AquaUp pH Buffer formula, Chelated Iron, AquaDown, Espartan organic nutrient solution
- **Growing Supplies** – We provide enough Growtech 128 seedling plug trays for you to achieve approximately two full harvests for your farm
- **Water Quality** – Master API test Kit, Hanna Iron and Alkalinity checkers, Prime Water Conditioner

## Flourish Farm Aquaponic Systems Overview

**Production Estimates** - There are many variables that will influence the levels of production in your Flourish Farm System. Some of the main factors influencing productivity are: Available light, nutrient availability, water and air temperature, humidity, quality of seedlings, plant species, performance of biofilter, fish feeding, and more. Your role as the farmer will be managing these elements with a goal to optimize production and minimize risk.

### Production Assumptions

- The system is being run for production purposes and not for research or education which could affect the consistency of output and quality of products.
- Seeding, transplanting and harvesting rotations are being well maintained.
- All raft boards have been planted in the Growasis Raft systems using five common species of leafy greens; Bibb Lettuce, Romaine, Green Star, Mustard Greens and Basil.
- Production of leafy greens is based upon the total Growasis sq ft, planting density and an average transplant to harvest time of 5 weeks (not including nursery time)
- Media beds include seasonal produce such as Tomatoes, Cucumbers, Peppers and Collards. Production estimates are in total lbs of product
- Microgreen flats represent standard 10" x 20" flats using remaining space in the vertical nursery system that is not being used by the seedlings in the regular planting rotation.
- Total lbs of fish assumes whole live weight fish not processed or eviscerated.

### Annual Production and Energy Comparison

Flourish Farm System	DWC Sq ft	Planting spaces	DWC 4 weeks*	DWC 5 Weeks*	DWC 6 Weeks*	Microgreens (flats)	Fish (lbs)	Energy kWh
Flourish Farm 23 x 40	320	1,064	13,832	11,066	9,221	260	321	885
Flourish Farm 30 x 52	680	2,240	29,393	23,514	19,595	520	614	1378
Flourish Farm 30 x 96	1,320	4,480	57,057	45,646	38,038	624	794	2030

\*represents estimated production in heads based upon different transplant to harvest times

**Financial Performance** - A comprehensive farm production and financial performance report for each farm system is available for purchase on our website. The report provides detailed production estimates, seasonal crop and density variations, a 4 year financial pro-forma, 2 year operating cash flow, sensitivity analysis and startup capital estimates and much more. This information can be a valuable resource for developing your business plan, obtaining grants or seeking financing from banks and investors.

**Energy** - The farm utilizes a single main pump in normal operating mode running continuously. When running in decoupled mode, the farm utilizes two pumps, one running the plant system and the other running the fish system. Energy estimates also include the artificial lighting

required to run the vertical nursery systems. Estimates do not include optional electric water heat, greenhouse or building HVAC systems.

**Total Growasis Planting Spaces** - Represents the number of holes available for growout in the raft boards. This does not include the 2x2 100ct transplanting rafts or the vertical nursery.

**Estimated Farm Management Time** - The estimated amount of hours required to manage the farm each week. Some days will be busier than others such as harvest and seeding days. Other days you may spend very little time in the farm except to feed the fish of course.

**Annual Harvests to Price Analysis** - For the purposes of illustrating the wide range of revenue a farm can achieve, for each farm model we have provided a range of hypothetical production levels from the Growasis Modular Raft System followed by a range of potential product prices. Cells in green highlight the wide range of gross revenue a farm can theoretically achieve based upon price vs. production. In other words, two identical farms can perform much differently depending on a variety of factors noted below.

*Annual Harvests - Growasis Raft Systems      Product Price per head*

Annual Harvests	Avg. culture time (weeks)*	Annual Heads	Weekly Heads	\$1.25	\$1.75	\$2.25	\$3.00
13.0	4.0	13,832	266	\$17,290	\$24,206	\$31,122	\$41,496
11.6	4.5	12,295	236	\$15,369	\$21,516	\$27,664	\$36,885
10.4	5.0	11,066	213	\$13,832	\$19,365	\$24,898	\$33,197
8.7	6.0	9,221	177	\$11,527	\$16,137	\$20,748	\$27,664

\*Average culture time represents the time from which the seedling was transplanted into the troughs to when it was harvested. Annual heads may vary from the stated production estimates in the farm since no loss rate or crop specific planting density information has been factored in. Revenue estimates also do not include sales of produce from media beds or microgreens.

*Number of Annual Harvests depends on factors such as:*

Operator motivation	Seasonality/Light	Food safety controls	Backup systems
Quality of nutrients	Quality of starts	Plant rotation management	Species of plants
Environmental controls	Pest management	Risk Management	Monitoring and control systems

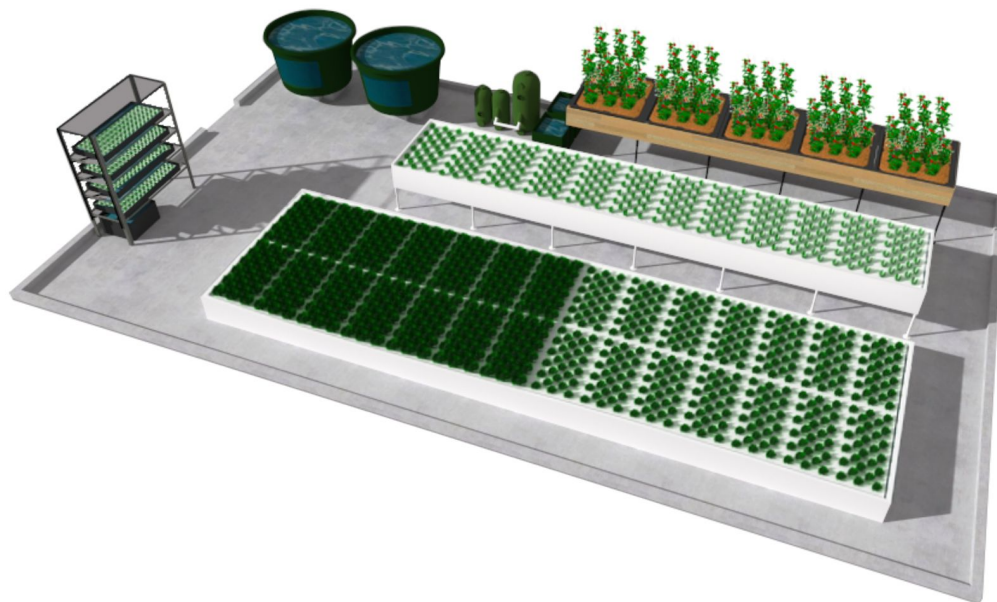
*Product Price Depends on factors such as:*

Market strategy	Market pricing	Customer acceptance	Location	Distribution plan
Competition	Quality of product	Cost to produce	Labor and time	Seasonality



## The Flourish 23 x 40' Aquaponic Farm

This is the perfect farm for people considering growing food for their family while also running a small farmers market or establishing a CSA program in their community.



### System Components

- Two 300 Gallon Fish Tanks (54"w x 33"h) - Forest Green with optional window kits
- AST Endurance 4000 Auto-backwashing filtration system
- Nutrient Recovery and Mineralization Tank - 30 Gallon
- Aquabundance Modular™ Five Media Bed System 45 sq ft total - 31"h x 40"w x 16'l
- Growasis™ Elevated Modular Raft System 4'w x 24'l x 30"h
- Growasis™ Ground Level Modular Raft System 8' x 28' - Main Plant Production Trough.
- Growasis™ Vertical Nursery and Microgreen System with LED lighting (replaces single deck nursery in illustration) - Up to 2,048 seedlings can be housed in each system.
- Danner submersible mag drive pumps for fish and plant recirculation.
- Alita ultra quiet high capacity linear air pumps for aeration of fish tanks and plant troughs
- Farms include all PVC piping and fittings
- pH, EC, Temp Monitor with active carbon auto top off filter

## Flourish Farm 23 x 40' Summary Data

*Total Growasis Raft System Planting Spaces - 1,064*

*Estimated Farm Management Time - 20 hours a week*

### *Production Estimates*

Growing Environment	Annual	Monthly	Weekly
Growasis DWC (# of plants)	11,066	922	213
Media Beds (lbs of product)	445	37	9
Microgreens (# of flats)	260	22	5
Fish live weight (lbs)	321	27	6

### *Electrical Equipment and Energy*

Units	Equipment Usage	watts per unit	total watts	Op Hrs	Op Days	Op Mths	Daily kWh	Monthly kWh
1	Air pump for Endurance Filter	3	3	24	7	12	0.1	2
1	Aeration for Fish Tanks	46	46	24	7	12	1.1	33
1	Primary pump for Farm	175	175	24	7	12	4.2	126
1	Fish pump (decoupled only)	110	110	0	0	0	0.0	0
1	Aeration for DWC troughs	126	126	24	7	12	3.0	91
1	Pump for nursery (on timer)	33	33	1	7	12	0.0	0
1	Aeration for nursery reservoir	3	3	24	7	12	0.1	2
1	pH, Temp, EC Monitor	5	5	24	7	12	0.1	4
8	LED Lighting for Vertical Nursery	48	384	14	7	12	5.4	161
	Totals		885				14.0	420

### *Annual Harvests to Price Variability Table*

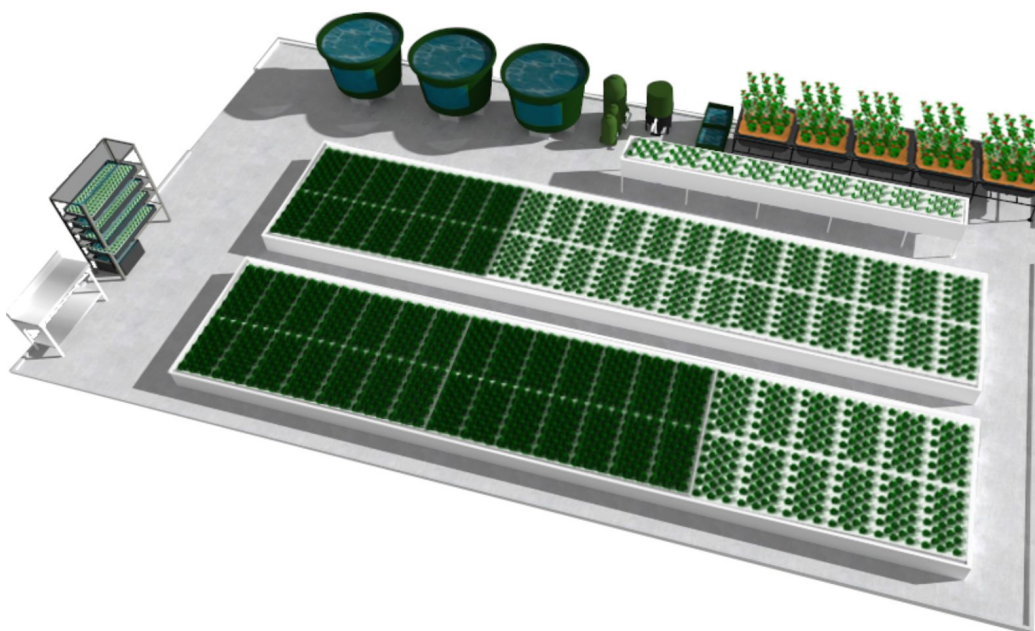
#### Annual Harvests - Growasis Raft Systems

#### Product Price per head

Annual Harvests	Avg. culture time (weeks)	Annual Heads	Weekly Heads	\$1.25	\$1.75	\$2.25	\$3.00
13.0	4.0	13,832	266	\$17,290	\$24,206	\$31,122	\$41,496
11.6	4.5	12,295	236	\$15,369	\$21,516	\$27,664	\$36,885
10.4	5.0	11,066	213	\$13,832	\$19,365	\$24,898	\$33,197
8.7	6.0	9,221	177	\$11,527	\$16,137	\$20,748	\$27,664

## The Flourish 30 x 52' Aquaponic Farm

Our mid-sized farm system that looks small but produces big results. A great farm for supporting a niche market, boutique restaurants, CSAs or farmers markets.



### System Components

- Three 300 Gallon Fish Tanks (54" w x 33" h) - Forest Green with optional window kits
- AST PG-6000 Auto-backwashing filtration system
- Nutrient Recovery and Mineralization Tank - 55 Gallon
- Aquabundance Modular™ Five Media Bed System 45 sq ft total - 31" h x 40" w x 16" l
- Growasis™ Elevated Modular Raft System 2' w x 20' l x 30" h
- Growasis™ Ground Level Modular Raft System (2) 8' x 40' - Plant Production Troughs.
- Growasis™ Vertical Nursery and Microgreen System with LED lighting (replaces single deck nursery in illustration) - Up to 2,048 seedlings can be housed in each system.
- Danner submersible mag drive pumps for fish and plant recirculation.
- Alita ultra quiet high capacity linear air pumps for aeration of fish tanks and plant troughs
- Farms include all PVC piping and fittings
- pH, EC, Temp Monitor with active carbon auto top off filter



## Flourish Farm 30 x 52' Summary Data

*Total Growasis Raft System Planting Spaces - 2,234*

*Estimated Farm Management Time - 30 hours a week*

### *Production Estimates*

Growing Environment	Annual	Monthly	Weekly
Growasis DWC (# of plants)	23,514	1,960	452
Media Beds (lbs of product)	445	37	9
Microgreens (# of flats)	520	43	10
Fish live weight (lbs)	614	51	12

### *Electrical Equipment and Energy*

Units	Equipment Usage	watts per unit	total watts	Op Hrs	Op Days	Op Mths	Daily kWh	Monthly kWh
1	Air pump for Endurance Filter	3	3	24	7	12	0.1	2
1	Aeration for Fish Tanks	60	60	24	7	12	1.4	43
1	Primary pump for Farm	200	200	24	7	12	4.8	144
1	Fish pump (decoupled only)	150	150	0	0	0	0.0	0
2	Aeration for DWC troughs	60	120	24	7	12	2.9	86
2	Pump for nursery (on timer)	33	66	1	7	12	0.0	1
2	Aeration for nursery reservoir	3	6	24	7	12	0.1	4
1	pH, Temp, EC Monitor	5	5	24	7	12	0.1	4
16	LED Lighting for Vertical Nursery	48	768	14	7	5	10.8	323
	Totals		1378				20.2	607

### *Annual Harvests to Price Variability Table*

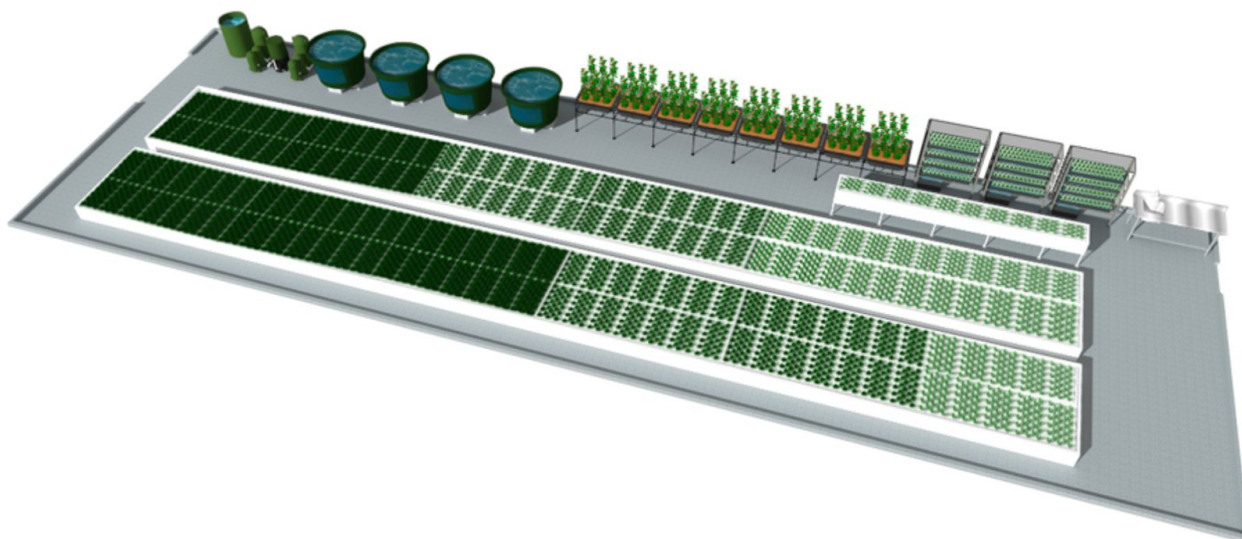
#### Annual Harvests - Growasis Raft Systems

#### Product Price per head

Annual Harvests	Avg. culture time (weeks)	Annual Heads	Weekly Heads	\$1.25	\$1.75	\$2.25	\$3.00
13.0	4.0	29,393	565	\$36,741	\$51,438	\$66,134	\$88,179
11.6	4.5	26,127	502	\$32,659	\$45,722	\$58,786	\$78,381
10.4	5.0	23,514	452	\$29,393	\$41,150	\$52,907	\$70,543
8.7	6.0	19,595	377	\$24,494	\$34,292	\$44,090	\$58,786

## The Flourish 30 x 96' Aquaponic Farm

Our flagship farm fits perfectly in a common 30 x 96' greenhouse. You can supply cases of leafy greens along with microgreens and fruiting crops to local restaurants and markets each week. This farm means business and lots of it.



### System Components

- Four 500 Gallon Fish Tanks (80" w x 33" h) - Forest Green with optional window kits
- PG-12000 Auto backwashing mechanical and biological filtration system
- Nutrient Recovery and Mineralization Tank - 110 Gallon
- Aquabundance Modular™ Eight Media Bed System 72 sq ft total - 31" h x 40" w x 16' l
- Growasis™ Elevated Modular Raft System 2' w x 20' l x 30" h
- Growasis™ Ground Level Modular Raft System (2) 8' x 80' - Plant Production Troughs
- Three Growasis™ Vertical Nursery and Microgreen Systems with LED lighting - 2,048 seedlings can be housed in each system
- Danner magnetic drive pumps for fish and plant recirculation
- Alita ultra quiet high capacity linear air pumps for aeration of fish and plant systems
- Farms include all PVC piping and fittings
- pH, EC, Temp Monitor with active carbon auto top off filter

## Flourish Farm 30 x 96' Summary Data

*Total Growasis Raft System Planting Spaces - 4,480*

*Estimated Farm Management Time - 40 hours a week*

### *Production Estimates*

Growing Environment	Annual	Monthly	Weekly
Growasis DWC (# of plants)	45,646	3,804	878
Media Beds (lbs of product)	936	78	18
Microgreens (# of flats)	624	52	12
Fish live weight (lbs)	794	66	15

### *Electrical Equipment and Energy*

Units	Equipment Usage	watts per unit	total watts	Op Hrs	Op Days	Op Mths	Daily kWh	Monthly kWh
1	Air pump for Endurance Filter	3	3	24	7	12	0.1	2
1	Aeration for Fish Tanks	85	85	24	7	12	2.0	61
1	Fish pump (decoupled only)	250	250	24	7	12	6.0	180
1	Primary pump for Farm	175	175	0	0	0	0.0	0
2	Aeration for DWC troughs	126	252	24	7	12	6.0	181
3	Pump for nursery (on timer)	33	99	1	7	12	0.0	1
3	Aeration for nursery reservoir	3	9	24	7	12	0.2	6
1	pH, Temp, EC Monitor	5	5	24	7	12	0.1	4
24	LED Lighting for Vertical Nursery	48	1152	14	7	5	16.1	484
	Totals		2030				30.7	920

### *Annual Harvests to Price Variability Table*

#### Annual Harvests - Growasis Raft Systems

#### Product Price per head

Annual Harvests	Avg. culture time (weeks)	Annual Heads	Weekly Heads	\$1.25	\$1.75	\$2.25	\$3.00
13.0	4.0	57,057	1,097	\$71,321	\$99,850	\$128,378	\$171,171
11.6	4.5	50,717	975	\$63,397	\$88,755	\$114,114	\$152,152
10.4	5.0	45,646	878	\$57,057	\$79,880	\$102,703	\$136,937
8.7	6.0	38,038	732	\$47,548	\$66,567	\$85,586	\$114,114

## Applications

**Small Family Farms** - Grow food for your family while having extra produce to take to farmers markets, or sell to neighbors, local markets or restaurants for additional income. This can be a great choice for a startup or supplement career, family activity or enjoyable retirement project.

**Community Development Projects** - An aquaponics farm is a perfect way to create community around food. In addition, there are many underserved neighborhoods that lack access to healthy food. We have witnessed first hand the impact that an aquaponic farm can have in a food desert community and the positive impact achieved when healthy food is available and affordable.



**Retirement Community Greenhouse** - Flourish Farm systems can easily fit into an existing retirement community or be incorporated into a new development. The greenhouse serves as a centerpiece for healthy living and quality engagement among the residents who can care for the fish and plants and grow their own food. The aquaponics greenhouse will be a unique asset providing nutritious food for onsite restaurants or in-home cooking.

**Corporate Campuses** - Health and wellbeing programs are extremely important for corporations. Why not consider growing your own food on site? Employees can visit the greenhouse as a way to take a break. The cafeteria can feature its own farm grown products. Employees can participate in a company food share. Extra produce can be donated to local food banks. The possibilities for sustainable and quality of life improvements are significant.

**Self Reliance** - There's nothing more important and powerful than controlling your own food especially if the current food distribution system is disrupted. An aquaponics farm in a passive solar greenhouse can be an excellent way to grow year round and ensure your family and surrounding community has access to food at all times. Additional components can be added to run the farms off the grid.



**International installations** - Food and water are scarce for a large percentage of people around the world. Aquaponics can grow more food per square foot with less water and energy than traditional forms of agriculture. Establishing small aquaponic farms can not only provide much needed food and nutrition but can create local jobs and business opportunities.



**Hospitals and other Wellness Centers** - Hospital food is not often described as the most healthy. But medical or wellness setting, it just makes sense to be providing nutritious food.

**Schools and College Campuses** - There's no better learning tool than an aquaponics system. All of the important STEM (Science, Technology, Engineering and Math) subjects and additionally business, economics, nutrition, horticulture, operations, management and more are all part of an aquaponics system. These farms can be learning environments while also producing healthy food for the school.



**Restaurants and Hospitality** - Local sourcing and farm to table are some of the most important trends in food today. Having a greenhouse growing for the needs of a restaurant or hotel is a much added benefit for chefs and customers alike. You can't get any more local or fresh than greens grown right on site.

## Featured Projects

More projects can be viewed here: <https://www.theaquaponicsource.com/our-work/>

### The Mental Health Center - Dahlia Campus Farm - Denver, CO

Believing that food is the first form of medicine, The Dahlia Campus Greenhouse at the Mental Health Center of Denver is a 5,400 sq ft facility that was designed from the ground up. There was a great deal of community input regarding the types of fish and plants they wanted to grow. The farm features two state of the art raceway fish tanks at 2,800 gallons each. The fish tanks have their own integrated filtration system with automatic filter backwashing. The tanks also circulate water via air pumps which simultaneously provide oxygen, thus reducing the overall energy and equipment footprint. The farm is currently raising catfish and tilapia with an expected output of 5,000 lbs annually.

The plant system is all deep water culture comprised of three 8 x 76' long troughs totalling 1,824 sq ft of plant production. The farm is growing several varieties of kale, salad and leaf lettuces, cooking greens, collards, basil and chard, culinary herbs and microgreens. Annual output for greens are expected to be over 25,000 lbs. The farm is run by Colorado Aquaponics, in collaboration with Veterans to Farmers who provides farm support and training to Veterans. The farm was recently featured in a story on PBS Newshour as an innovative community based model for healthy food, wellness and support programs working in the heart of a historic Denver neighborhood.



## ButterCrunch Farms Eagle, CO

ButterCrunch farms was built in the fall of 2016 and is located on private property in Eagle, CO. The owners developed a business plan to serve restaurants and markets in the Vail Valley region with high quality greens, microgreens and herbs along with Tilapia.

The farm has a separate 30 x 30' barn attached on the north of the greenhouse which is where the fish tanks and filtration system is located. This is a great arrangement because it allows the greenhouse to be entirely dedicated to the plant production. The barn also houses a cooler dedicated for product and feed storage and has room for sinks and processing space.

The system is composed of four 500 gallon fish tanks that provide nutrients for the entire 40 x 80 greenhouse. The main DWC system has three 8' x 62' troughs, an elevated transplanting trough, nursery, media beds and containers growing tomatoes, eggplants and peppers.

The owners say that the customer feedback has been terrific and they have tremendous demand for their high quality, year round products at roughly 6,600 ft elevation.



## The GrowHaus - Denver, CO

The GrowHaus is a non profit located in Denver's Elyria Swansea neighborhood. An abandoned greenhouse became the home for the Growhaus in 2010 and serves today as a thriving community center with a focus on providing access to healthy affordable food, education and community events. In addition to the aquaponic farm, the GrowHaus is a unique environment featuring a variety of growing systems including a 5,000 sq ft hydroponics farm, a mushroom cultivation lab, permaculture systems, chickens, rabbits and bees.

We built the aquaponics farm in 2012 and it is one of the longest running urban aquaponics farms in the US. Over four years the farm has grown over 100,000 lbs of produce and fish and is a profitable operation. In addition to serving the community food basket program, products from the farm are sold to local restaurants and markets that are all within 5 miles of the farm.



The farm system has over 1,400 sq ft of DWC in a 3,000 sq ft greenhouse bay. There are three fish tanks totalling 2,000 gallons of water an average of 600 lbs of fish at any one time. Fish are sold live to the local residents at \$5 a fish, bring your own bucket!



## Getting Started

**Attend a Course** - If you are considering aquaponic farming as a business we strongly encourage you or your entire team to attend our **Flourish Farm Aquaponics Business Course**. This is the best way to learn the many aspects of aquaponic farming and get hands on experience in our aquaponic farms. We provide a tremendous amount of resources so you can start planning your farm business. The class is free if you purchase a Flourish 30 x 96 Farm from us at any point in the future.



**Contact us** - Our process starts with listening to your goals and objectives, gathering requirements and then determining a best fit solution. We offer pre-engineered home and farm scale systems along with custom solutions.

Please contact: [Sales@Theaquaponicsource.com](mailto:Sales@Theaquaponicsource.com)



We look forward to helping you get started in aquaponic farming.

*JD & Tawnya Sawyer*

*The Aquaponic Source*  
[www.theaquaponicsource.com](http://www.theaquaponicsource.com)