

# Friendly Aquaponic's 2019 5-Day Commercial Aquaponics And Solar Greenhouse Training

**First, you should know this is YOUR training;** and we encourage questions from the participants. We have structured 10-minute Q&A periods at the end of each discrete presentation, and an optional 30-minute Q&A at the end of each day at 5:00.

Did you know that you get ALL the slideshows, videos, and technical papers we use to present the course with, in digital form; AND are allowed to use our copyrighted photos out of them as long as you attribute them to us?

## 3-Day Commercial Aquaponics Training

### Day 1, Aquaponics Technology:

#### Introduction to Aquaponics:

- What aquaculture is; what hydroponics is, and what aquaponics is: we explain the HUGE differences between them.
- We discuss the water conservation feature of aquaponics; how little water does it actually use?
- Why you can grow vegetables at incredibly close spacings in an aquaponic system, and CAN'T do that in the soil.
- Why aquaponic vegetables have the best flavor you've ever tasted, and shelf life that is three to ten times as long as soil-grown or hydroponic vegetables, and why this is a benefit to you.
- Why aquaponics only requires 1/10 of the space of a regular farm, doesn't require fertile soil, and why the ideal aquaponic farm might be a 3-acre abandoned gravel parking lot on the outskirts of a city.
- What aquaponics gets or does for you.
- Basic definition of "Organic": a quick explanation of why our systems and growing methods, including pesticides and additives, are all organically approved.
- The benefits of organic certification to the small aquaponic grower (don't worry, we do an entire 1-hour presentation on organic certification, finding an organically certifiable farm, and how to get certified, later on Day 5).
- The 4 basic types of aquaponic systems that ALL aquaponics systems derive from, including their benefits and drawbacks.
- The nitrifying bacterial cycle in the ground and in the aquaponic water.
- Where DO the solids go?
- Why do the fish lose money for you? This seems like heresy, until you understand that the ONLY people who do recommend growing lots of fish either make their money from consulting or selling fish tanks.
- Prawns! Everyone loves shrimp, and everyone wants to grow prawns. We did, we'll tell you how, and we'll tell you why they can't possibly be a profitable item on your aquaponic farm unless you have a prawn hatchery nearby.
- Examples of aquaponic systems from 3 square feet up to 7,500.
- The incredible variety of things you can grow in aquaponics, from bananas to taro to bok choy.
- How aquaponic systems eradicate mosquitoes over a huge nearby area.

## **Day 2, Aquaponics Technology:**

### **Advanced Information About Aquaponics:**

- What vegetable species and varieties grew well, what didn't, and what you can make money on fast right after you get started (154 specific varieties tested).
- We show you how to grow 4-pound tender and sweet turnips, 5-pound chard plants, heirloom tomatoes, cucumbers, all kinds of melons, bulbing onions, green onions, leeks, edible flowers, tobacco, watercress, wheat, bananas, taro, basil for leaves and seed, Ong Choy (Vietnamese water spinach), pineapple, and of course lettuce!
- We cover how we went from the "standard" University 1-1/2 holes per square foot of raft area to 4 per square foot through careful experimentation. On Day 3 we show you how we increased that from 4 per square foot to nearly 7, with an easy-to-use special technique.
- "Fish selection: what's legal, what's available in your area, what's profitable on your market; how to find and procure fingerlings. We cover tilapia, catfish, large and smallmouth bass, hybrid striped bass, yellow perch, all kinds of trout, and even koi and PetCo goldfish!
- Basic sprouting and planting systems; how the sprouting tables we invented allow you to water 60,000 sprouts in 3 minutes a day.
- We show you how to combine aquaponics in outdoor troughs, hooked up to the fish tank and pump in your nearby greenhouse, and increase vegetable production during normal growing season at low cost.
- We show you how to get huge yields of organically-certified soil-grown crops in half the time by growing in the ground next to your aquaponic system, using aquaponic water for drip irrigation (we're the only ones who teach this). Think lemongrass, grape vines, and peach or cherry orchards, because none of these things can be grown in the rafts.
- "Slant" trough layout for outdoors troughs saves grading costs.
- Preliminary market research to figure out what your Test Grow candidates are.
- Why and how to do your Test Grow and record the results; we also explain why you want to continue doing Test Grows indefinitely.
- Vegetable varieties that "cuddle" well, and those that attenuate when you ask them to "cuddle". (This technique optimizes production)
- How to do raft hole spacing tests (after the Test Grow has established basic information for how the different varieties and species grow in your area) to optimize raft hole spacing for optimized production.

### **Aquaponic System Construction, Materials, And Equipment:**

- Construction of aquaponics systems starting with tabletop-sized systems.
- "Cowboy" techniques work just as well and save you money.
- The importance of an adequate water flow rate, defined. How to measure water flow rate and levels for your aquaponics system.
- Where does the trough liner come from?
- Tank discussion; "toxic" IBC totes, other types of fish tanks.
- Discussion of power supply loss, air supply loss, and water pump breakdown; with what to do in each case.
- Filters. NOT "biofilters", but filters that keep baby fish out of your troughs.
- How to diagnose a clogged water pump and how to fix one.
- How to build a 64-square-foot backyard system in photos.

- Standpipes explained for the plumbing-challenged.
- Uniseals! Boy do we love it when we get to use UniSeals!
- Why you need trough airlines, with “choke valves” explained.
- Weed mat system explained, with Vitamin C and diatomaceous earth.
- How to build a mid-sized 512-square-foot backyard system in photos; with an aside on how to grow Heineken Beer in an aquaponic system.
- Rafts, made and store-bought; what’s organically approved.
- Construction of outdoors troughs tied to fish tank inside greenhouse, and why you’d want to do this.
- “Slant” trough grading; why you’d want to use this, where to use it.

## **Day 3, Aquaponics Technology:**

### **More Advanced Information About Aquaponics:**

- How to startup your aquaponics system. The secret to this? You can’t prevent it from starting up unless you do something really bad!
- How to foul up your startup in spite of that! All the possible things that can go wrong to delay your startup and how to avoid all of them!
- How we doubled the planting density in our systems, and doubled the amount of plants harvested, without spending any additional money or time. Susanne invented this technology in 2010; if you’ve seen it somewhere else, this is where it came from. Don’t build twice as much greenhouse, use this system instead!
- EVIL Duckweed and why you should NEVER put any in your aquaponics systems! We also cover crayfish, which are the Shrimp From Hell.
- What pH is, how to measure it, which pH meters and tests work and which aren’t worth a darn, and how to adjust pH with the organically approved methods we developed in 2008.
- How to identify iron deficiencies, and how to correct them with the organically approved method we developed.
- Dissolved Oxygen (DO); how to use a DO meter, the different levels of DO that are needed in the fish tank and the vegetable troughs.
- Test strips for Nitrites and Nitrates, how to use them, and what the different levels of nitrites and nitrates mean.
- We explain what “good quality” fish food is, and how it makes clean healthy roots; then compare the consequences of using “cheap” fish food, which creates rotten roots on plants growing poorly.
- How ammonia in your aquaponics system works; how higher levels of ammonia can actually depress nitrifying bacterial action and result in lower levels of nitrites and nitrates.
- What an “ammonia disaster” is, how it can stop your system in its tracks; and how to recover from one within a day or two.
- How organic aquaponic systems can run for months, growing vegetables explosively, but with ZERO measurable nitrates. Some people say we’re lying; but they have never operated an organically certified system. We’ll show you how, and why it’s not a concern.
- How to build and operate a tilapia or catfish hatchery to sell fingerlings to other aquaponic and aquaculture operators.
- We discuss the frequent interest in using sensors, electronic regulating equipment, and automatic controls for aquaponic systems, and then we explain why you simply don’t need any of those things. I mean, you’re welcome to buy them if you’ve got a trust fund; but they don’t add to the bottom line in a commercial aquaponics system.

## **Day 4, Our Greenhouse Day:**

### **Where We Integrate Energy-Efficient Greenhouses with Aquaponics:**

- Why conventional greenhouses no longer can be profitable in today's economy.
- We define and explain insulation, thermal mass, heat transfer, solar-based heating, supplemental heating and cooling, geothermal heating and cooling, and sunlight transfer to your plants through your greenhouse covering; so that you understand all of these and can make intelligent decisions about how much greenhouse YOU need in your part of the country.
- We cover passive and active hot-air venting, and make a distinction between removing excess heat and actually cooling your greenhouse.
- We cover all the possible greenhouse coverings in depth: poly film, double-layer poly film, single layer corrugated solid polycarbonate, double and triple layer polycarbonate, Solexx, SolaWrap, and ETFE, as well as the costs, and other pros and cons of each one, AND most importantly, how much sunlight each one of them blocks!
- We demonstrate the difference between a greenhouse that's appropriate for Hawaii, and one that's appropriate for 6,000 feet in the mountains of Colorado. We also show you all the ones in between, including one that works in "tornado alley", if you live there.
- We show you how to find a free greenhouse, and how to take it apart and re-assemble it at your location; as well as explain why this gets you a better greenhouse for much less than just buying a new one.
- We talk about the type of geothermal heating/cooling systems that use a series of large underground pipes, and show why those work best for heating, and then only in select locations that have certain qualities.
- We do a whiteboard exercise where we walk you through operating a greenhouse in the summertime, then the changes in operation that you make as you enter your cold season.
- We do another whiteboard exercise where we demonstrate how to lay out your greenhouse with the proper amount of raft area, fish tank, sprouting table area, work area, and storage area.
- We do yet another whiteboard exercise where we walk you through how to lay out your entire farm, buildings, walkin refrigerators, greenhouses, residence and all. How big a backup area is required for a 24-foot refrigerated box truck? What is that anyway, and why do I need to have one of those come on to my farm?

### **Where We Give You The REAL Scoop On Indoors Growing:**

While others in this business do their best to sell you expensive, energy-sucking lights and other fancy hardware during their indoors aquaponics trainings, we're the ONLY aquaponics trainers who teach you how to build and operate your own indoors aquaponics systems from standard off-the-shelf equipment and materials.

We don't sell hardware; this leaves us free to be completely objective and honest about what works and what doesn't for indoors growing. We demystify all of the following in your training so you understand everything clearly:

- What is the efficiency of the various kinds of lights you can use in your indoors aquaponic farm, and how light efficiency affects the bottom line of your business,

along with calculations that will help you figure this out yourself without hiring expensive "consultants".

- How to select the most efficient lights.
- Why the most efficient lights are NOT just an option, but absolutely necessary!
- How ALL lights create "waste heat", and how to get rid of it so your farm doesn't overheat.
- How to understand the relationship between your lights and your air conditioning.
- How to figure how much air conditioning you will need, and how much it will cost.
- How to figure out how much electricity your installation will use.
- How to understand utility company billing practices, and select the best time of day to run your lights.
- How to get your indoors farm USDA Organically Certified.
- And many, many more details about the ins and outs of indoors growing.

## **Day 5, Our "Money Day":**

### **Everything You Need To Know To Make A Profit With Aquaponics:**

- A 1 to 2-hour presentation on organic certification, how to find a piece of property that IS certifiable and doesn't have prohibitive boundary exclusions (we explain those, too), how to contact the certification agencies, and how to get certified, including templates and application forms.
- We talk about the possible business structures for your aquaponics business: sole proprietorship, partnership, LLC, S corporation, etc
- We cover how to use business cards, flyers, printed produce bags, etc, with a free "unflattened Photoshop" file of both our business card and lettuce bag for you to use; saves you money on design and printing; also where to get bags.
- Why a website for your aquaponics business is probably a waste of time, plus estimates on cost and time it will take to maintain.
- If a website is a waste of time, how the heck do I advertise and get people to know about my produce and my farm? Farm tours, word of mouth, and free samples explained.
- How to sell your produce: to your friends, CSA's, Farmigo, farmer's markets, restaurants and hotels, to retailers, to wholesalers, to institutions (school districts, prisons, colleges, etc), and to Big Box stores (Costco, Sam's Club, etc). How to get and keep customers.
- How to design and lay out your greenhouse and entire farm, with Building Department requirements, and custom greenhouse design.
- How to apply to NRCS for their "High Tunnel" program and get from \$7,250 to \$50,000 for a brand-new high tunnel greenhouse.
- How to apply to NRCS for other cost-sharing practices such as contour grading of your property (for aquaponic "pads"), fencing, windbreaks, and water conservation features, and get up to 100% of the costs for these reimbursed to you.
- How to apply for the NRCS "new farmer" loan of up to \$100,000.
- We cover the facility and equipment required to do "Value-Added Processing", which simply means doing something to your vegetables so you make more money on them; this can include salad or lettuce mixes, non-cooked salsas, stir-fry vegetable mixes, and dry products such as garden herbs or teas. We also cover what's required by your State Health Department for cooked products.
- We cover both GAP and HACCP Food Safety Certifications under the new FSMA which is in effect now. As of January 2018, unless you sell less than \$25,000 per year of vegetables, you are required by Federal law to meet these standards. If you sell

more than \$250,000 worth of vegetables per year, you are not only required to meet these standards, but also be certified by a licensed agency for these certifications. We also cover how to obtain this certification.

- We show you how to start with a \$3,500 investment and end up with a commercial aquaponics farm that grosses more than \$200,000/year by the end of the third year; all with a minimum of borrowing money (or without borrowing at all!).
- We show you how that looks "on the ground": what you build first, and why; what you build next, and why; and where you put things in relationship to each other.
- We do an exercise with a large piece of land and identify as many "income streams" related to aquaponics as are possible from it. You'd be surprised to see how many we come up with; and how few of them you thought of before the exercise. The purpose is to get you thinking "out of the box", about how an aquaponic business can be many more things than just selling vegetables at your local farmer's market.