



Aquaponics Basics

What Is Aquaponics?

Aquaponics is a closed-loop system where fish, plants, and beneficial bacteria work together.

- Fish produce waste
- Bacteria convert waste into plant nutrients
- Plants clean the water
- Clean water returns to the fish
- Uses 90% less water than soil gardening

No soil. No synthetic fertilizers.

1. Choose which system:

Small-scale DWC (Deep Water Culture)

- Convert already established fish tank by adding a [Hydroponic Grow Tower](#)
- Easiest to install and maintain
- Perfect for indoor spaces
- Filter would no longer be needed on fish tank:
 - Beneficial bacteria → convert ammonia → nitrites → nitrates
 - Plants (lettuce & herbs) → uptake nitrates
 - Shared water loop → water circulates between fish tank and grow tower

Other Aquaponics systems:

Chop-and-Flip IBC System (Grow bed on top, fish tank on bottom)

- Low cost, compact, beginner friendly
- Vertical stacking maximizes space
- Excellent biofiltration
- Simple plumbing & gravity fed system
- Conserves water
- Scalable & modular

Media Bed - Flood & drain with substrate (lava rock)

- Very forgiving system
- Handles feeding mistakes
- Grows the widest range of plants
- Acts as its own filter

2. Choose & Prepare Location

- Place system outdoors or in a greenhouse
- Ensure:
 - Level surface
 - Partial sun (4–6 hrs ideal) Must be shaded in afternoon
 - Access to power and water
- Concrete blocks or a sturdy stand help raise the fish tank slightly
- Taller grow beds = better root zone & biofiltration

3. Add a pump and aeration

- Install a sump pump to draw water from the tank to the grow bed, and back again
- Install air pump outside tank, then run airline tubing to air stone
- Place air stone at bottom of fish tank
- Continuous aeration is critical for fish health
- Pulls oxygen to plant roots and bacteria
- Direct water back into fish tank
- Splashing return helps oxygenation

4. Best beginner fish:

- Koi (easy, not edible, a lot of waste)
- Goldfish (not edible, easy to care for)
- Tilapia (edible, easy, heat tolerant)

5. Cycling the tank takes 3–6 weeks and is critical!

- Use dechlorinated water if possible
- Establish beneficial bacteria
- Test water regularly during this phase (checking ammonia, nitrites, nitrates, temp, and pH)

6. Water Goals

- pH: 6.8–7.2
- Ammonia: 0
- Nitrites: 0
- Nitrates: present = plant food

7. Common Beginner Mistakes

1. Too many fish
2. Not enough oxygen
3. Planting tomatoes too soon
4. Changing things too fast

8. Tips for Success:

1. Start small, add plants gradually
2. Test water frequently
3. Avoid over stocking fish
4. Clean filters, pumps and siphons regularly
5. Observe fish and plants daily for stress or nutrient deficiencies

9. Installation Recommendation:

- Contact John Healy with [Southwest Aquaponics](#) 602-618-1771
- Pre-order a Chop-and-Flip system with the AZ Worm Farm for DIY at home installation (azwormmedia@gmail.com)

Aquaponics isn't about control — it's about balance.