

Best Practices & Lessons Learned for Aquaponics in Schools



Aquaponics in Education Conference
October 13, 2012

About Hapa Farms

Innovative Aquaponics

- Sustainable farming
- Minimal resource requirements
- Utilize marginal farm lands



Aquaponics in Schools

- I'm a farmer
- Designed, implemented, and built aquaponic programs for schools
- Partner with isisHawaii and Dr. Clyde Tamaru's lab (CTAHR)



Goal of Aquaponics in Schools

Self-sustaining program:

- Independent maintenance of healthy systems by school faculty, staff, students, parents
- Teachers have a good understanding of science behind aquaponics to develop curriculum

Considering Aquaponics?

- Many dive straight into building an aquaponic system without the proper preparation and understanding of what is involved
 - This can lead to becoming overwhelmed after the system is in place
- These are some things to consider before you get started (or work on now if you already have a system but haven't addressed these points)

Involvement & Investment

- Aquaponic system care is a 7 day/week job – no holidays or weekends!
- The more that are involved with the care & maintenance, the better
 - Science, Social Studies, Economics, English teachers
 - Maintenance staff
 - Administrators
 - Parents
 - Don't limit yourself

Site Preparation

- Ground prep
 - Gravel/cement
- Electrical outlets
- Water/sinks
- Fenced enclosure
 - Security
 - Safety (City Bldg Code §3109)



Materials Selection

- Everything that touches the system should be food safe
- What's safe & what's not is always being debated but a recent study at Goethe University in Frankfurt found that PET leaches hormone-disrupting chemicals into water

System Build

- Build your own system, don't have it built for you
- Everyone that will be involved should help with the system build
 - Starts investment in system(s)
 - Provides deeper understanding of how the system works




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So now you have an aquaponic system...

- Many different possibilities
- With a little bit of creativity you would be amazed with what you could do with your system(s)



Beyond the Basics

- As you get creative & explore what you can do with aquaponics, you will inevitably have questions and run into problems
- There are so many people doing aquaponics now but rigorous scientific research is relatively new and rare
 - This can lead to conflicting information
- Here are a few common myths and problems that I've run into with schools...

Myths

- All poop is the same
- Can't grow some plants because they don't like "wet feet"
- Vegetables from system taste fishy
- Want to get rid of all the poop in my system

Common Problem 1

- *Problem:* Grow space becomes a premium
- *Solution:* Add on low-cost static hydroponics or static aquaponics, or expand in-ground using aquaponic water for fertilizer




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Common Problem 2

- *Problem:* I don't like tilapia
- *Solution:* Try it! Or try to use a different fish (like Pacu)




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Common Problem: (Lack of) Attention to Food Safety

- I've seen a lot of practices at schools which I would deem unsafe from a food safety standpoint
- It will just take one suspected incident of food-related illness traced to an aquaponic system for aquaponics to be eliminated from schools statewide




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Importance of Food Safety

- Salmonella, E. Coli O157:H7, Rat Lungworm Disease
- In June, E. Coli O145 outbreak sickened 14 adults and killed a 21 month old baby

Food Safety

- Can be a relatively inexpensive process
- Does not need to be implemented immediately but should be kept in mind throughout planning, prep, and build

Good Agricultural Practices

- Avoid contamination from feces of warm-blooded animals
 - No overhang over systems
 - No clutter in enclosure
- Avoid contamination from slugs
 - No plants touching ground (i.e. no path for slug between ground and system)
- Water from system shouldn't touch plants
- Two sinks
 - One designated for hand washing only
- Signs of rules
- *Educate everyone in contact with system of food safety rules*

In Conclusion...

- I'm not trying to scare you - aquaponics is safer than ground farming
- Provides hands-on learning experiences for students incorporating STEAM values and active, movement-based learning
- Applications in curriculum are endless




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