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

HapaFarms
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
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
Common Problem 2

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