



**THE OHIO STATE UNIVERSITY**

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COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

# ABC-2 Project Overview

## Options and Expectations



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OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER



# Projects

- Hands on design
- Groups or individually
- Monitored throughout the year
- Record the process and data collected
- Your choice of aquaculture/aquaponics





# Aquaponics Components

- Fish Tank
- Place to Grow Plants
- Water Pump(s)
- Air Pump
- Irrigation Tubing
- Water Heater (Optional)
- Filtration (Optional)
- Grow light (Optional)
- Fish and Plants





# Small Fish Tanks

- Aquarium
- Stock Tank
- Half Barrel
- Rubber-made Tub





# Medium Fish Tank

- IBC – totes (make sure you know what was in them before)
- Bath tubs
- Plastic, Steel or Fiberglass Stock Tanks
- Build your own





# Large Fish Tanks

- Open Ponds
- Large Stock Tanks
- Swimming Pools
- Fiberglass Tanks





# Safe Materials

- Make sure all your system components are fish and human safe
- Polypropylene - labeled PP
- High Density Polyethylene - labeled HDPE
- High Impact ABS (Hydroponic Grow Trays)
- Stainless Steel barrels
- EPDM or PVC (poly vinyl chloride) pond liner (make sure its UV resistant and avoid fire retardant material)
- Fiberglass tanks and grow beds
- Rigid white PVC pipe and fittings, black flexible PVC tubing
- **DO NOT use Copper – Its toxic to the fish**





# Aquaponic System Designs

- Media-Based Growbed
- Aquarium Systems
- Raft System
- NFT (Nutrient Film Technique)





# Media Based Growbed

- Gravel
- Hydroton
- Lava Rock
- Packing Foam
- Sponges
- Perlite
- Vermiculite





## Pros

- Work great for most hobby aquaponics
- Easy to find components, easy to build
- You can grow lots of different plants in one system
- Make as big or small as you want



## Cons

- Can build-up anaerobic zones
- May need to be cleaned out occasionally (or use worms)





# Aquarium Systems





# IBC Containers

- Intermediate Bulk Container
- 275 Gallons full
- 175 with top cut
- 12" grow bed
- Inexpensive
- Plumbed for 2" PVC





# Raft Method

- Method researched and developed at University of Virgin Islands
- Research and commercialized by Nelson and Pade, Montello, WI





## Pros

- Great for commercial setups
- Very high yield of both fish and plant crops
- Small system – 100 lbs of fish, 925 heads of lettuce
- Big system – 7,500 lbs of fish, 194,400 heads of lettuce
- Typically installed inside a greenhouse (Outside in warmer climates)

## Cons

- Requires more extensive filtration methods
- Usually grows a specific crop like lettuce or basil





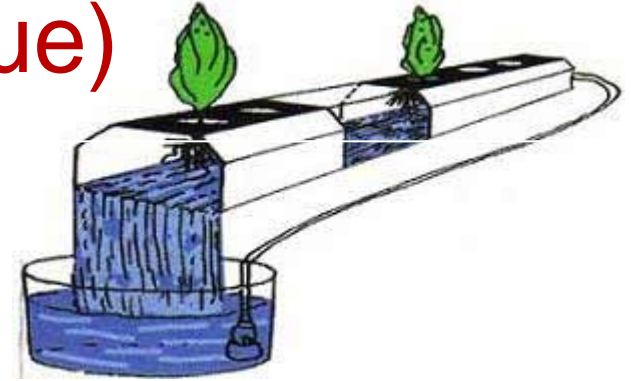
# NFT (Nutrient Film Technique)

## Pros

- Materials readily available
- More precise growing conditions
- No concerns for pH changes related to media

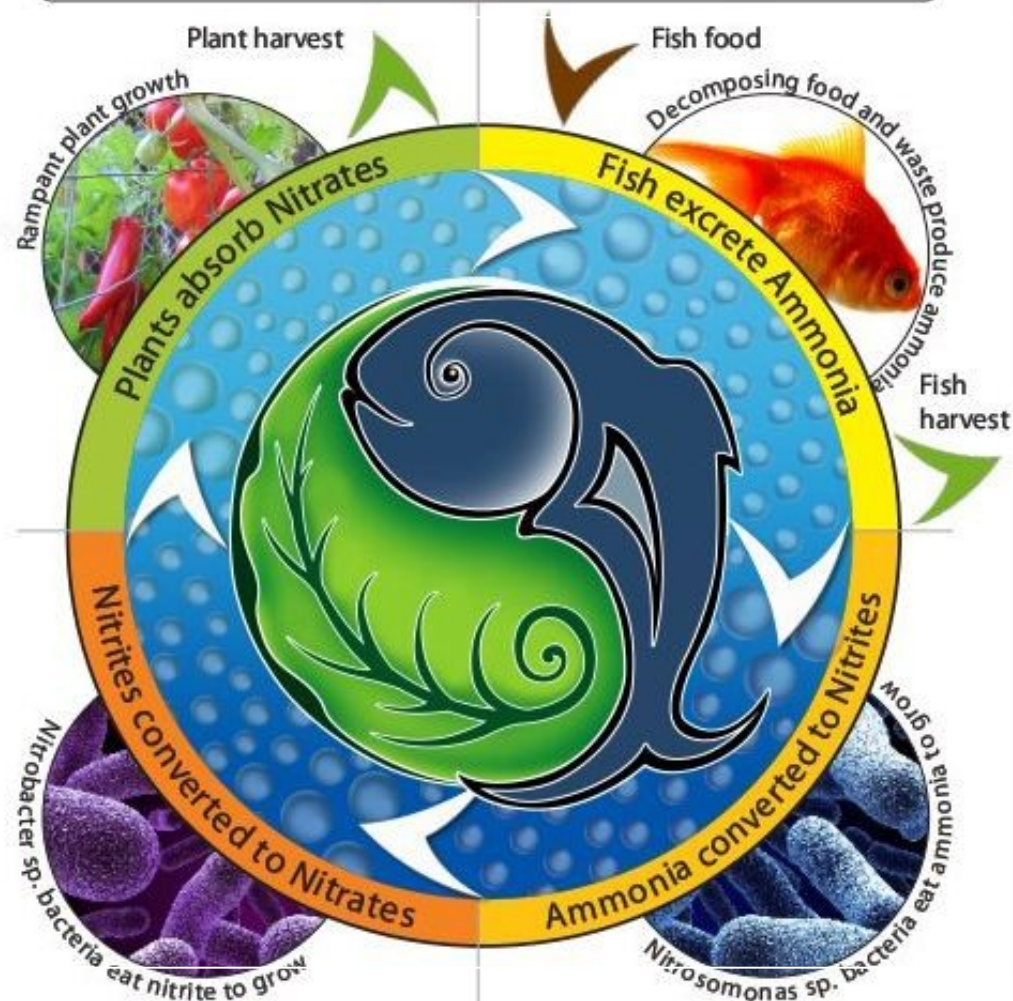
## Cons

- Requires more filtration
- Doesn't allow as many crop options





# The Nitrogen Cycle





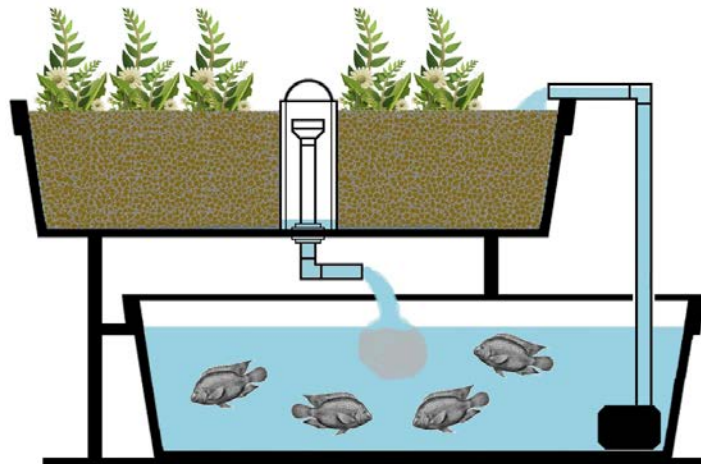
# Project Guidelines

- Write a basic project plan; Email to me by **March 1<sup>st</sup>**
  - Project (aquaculture/aquaponics)
  - System selection
  - Fish or plant species selection
  - What are you monitoring?
  - Goals, risks, expected outcome
  - Input > output; process
  - If planning to acquire land/system later, what are your plans
- Rough draft of written report; Email to me by **July 1<sup>st</sup>**
  - Some data, pictures, progress, questions
  - I will review and return with comments or suggestions
- Final written report; Email me by graduation **December 9<sup>th</sup>**
  - 5 minute oral PP presentation at graduation
  - Will email you oral presentation format



# Project Options

1. Utilize existing system
2. Construct pilot system at home
3. Utilize Piketon aquaponics/ponds





# System Maintenance

- Feed the fish daily, monitor fish health
- Test water quality (every other day for the first month, then about once a week, then as needed)
- As needed clean out filter screens, filter tanks (if using), tubing, water pump, growbed media, etc.
- Check plant health, trim back, harvest or take cuttings
- Check plants for bugs or nutrient deficiencies



# Any Questions on Projects?

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- Please fill out the following form and return it to me
- If you did not fill out a tobacco, picture, or confidentiality form I need it please
- Take a 10 minute break