AQUAPONICS

- Aquaponics combines aquaculture and hydroponics
Sustainable Agriculture

- Uses less than 2% of the water of traditional agriculture
- 70-90% less energy than traditional farming
- Plants grow at a rate 2-3 times faster
- Produces 3 times as much produce in less growing space
Types of Systems

DWC (Deep Water Culture): Plants grow in rafts that float in a trough with approximately 12 inch water depth.

NFT (Nutrient Film Technique): Plants grow in long narrow channels in which a thin film of water flows continuously.

Media Beds: Plants grow in beds filled with expanded clay balls, expanded shale or other media where water floods the bed using ebb and flow.
In our DWC system, water flows from the fish tank into a solids barrel. Here excess fish food and waste is caught and the nitrogen cycle begins breaking down the toxic ammonia creating a beneficial bacteria grows nutrients that feed the growing plants.

The flow of water from the fish tank is gravity fed through the system. Each trough is 1 inch lower than the previous.
The Nitrogen Cycle

There are two bacteria in the nitrogen cycle that breaks down the ammonia from fish:

1. Nitrosomonas, which converts ammonia into nitrites.
2. Nitrobacter bacteria then eats the nitrites, converting them to nitrates the plants consume to grow.
• A variety of crops from specialty salad greens to tomatoes can be grown with aquaponics.
Seeds are started in coir, a by-product of coconut shells, a sustainable and pH neutral replacement for peat moss.

As the plants grow, the nutrients are wicked up from the water by the plant roots.
Other factors to consider when growing 100% Chemical Free

Pest Control = Beneficial Insects
Fish in Aquaponics

• Climate and market should be considered in selecting fish.
• Tilapia are typically used for several reasons; they grow fast, are very hardy, are tolerant of crowding, tolerate relative poor water quality conditions, and are resistant to diseases. However they need higher water temperatures.
• Lake or yellow perch, native to Ohio, work well. They require a lower water temperature, however are more sensitive to water quality and disease.
Water Quality

Monitor regularly and adjust as needed

- PH levels 6-7.5
- Nitrites (want them low)
- Nitrates (want them high)
- Calcium
- Iron
- Other trace minerals
Greenhouse or Outside?

• Climate and region will determine
• Greenhouse allows for growing year round
• Southern states and tropical regions can grow outside with caution; low temperatures at night during winter months, weather conditions such as wind, storms with hail
Fresh Harvest Farm
Growing Trough

- Air Line into tank
- Water Line out to next trough

Fish Tank

- Water Line out to media barrel
Seedling table
THANK YOU!

Doug & Jeni Blackburn