

Aquaponics Overview

Charlie Shultz
Lethbridge College

KSU/OSU Aquaponics Workshop

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Recirculating Aquaculture



University of the Virgin Islands



Kentucky Aquaponics



Kentucky State University

Lethbridge College



What is Aquaponics?

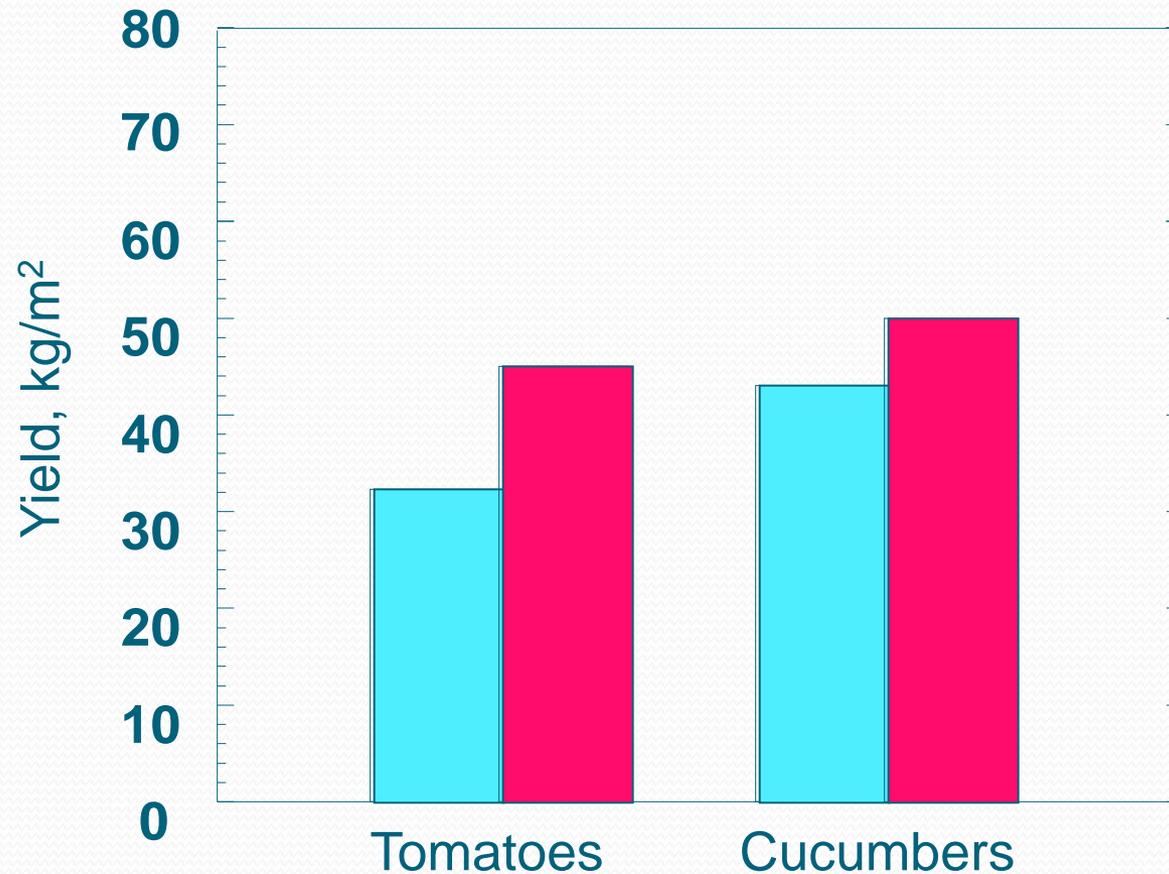
- Not Just Hydroponics plus Aquaculture
- Balanced or De-Coupled
- Commercial or Smaller
- Don't ask the Regulators or Inspectors! Educate them.
- Associations
- Certification
- Is it Organic?

- 
- Development of a Mature Ecosystem

Aquaponics vs. hydroponics

Yield 2003

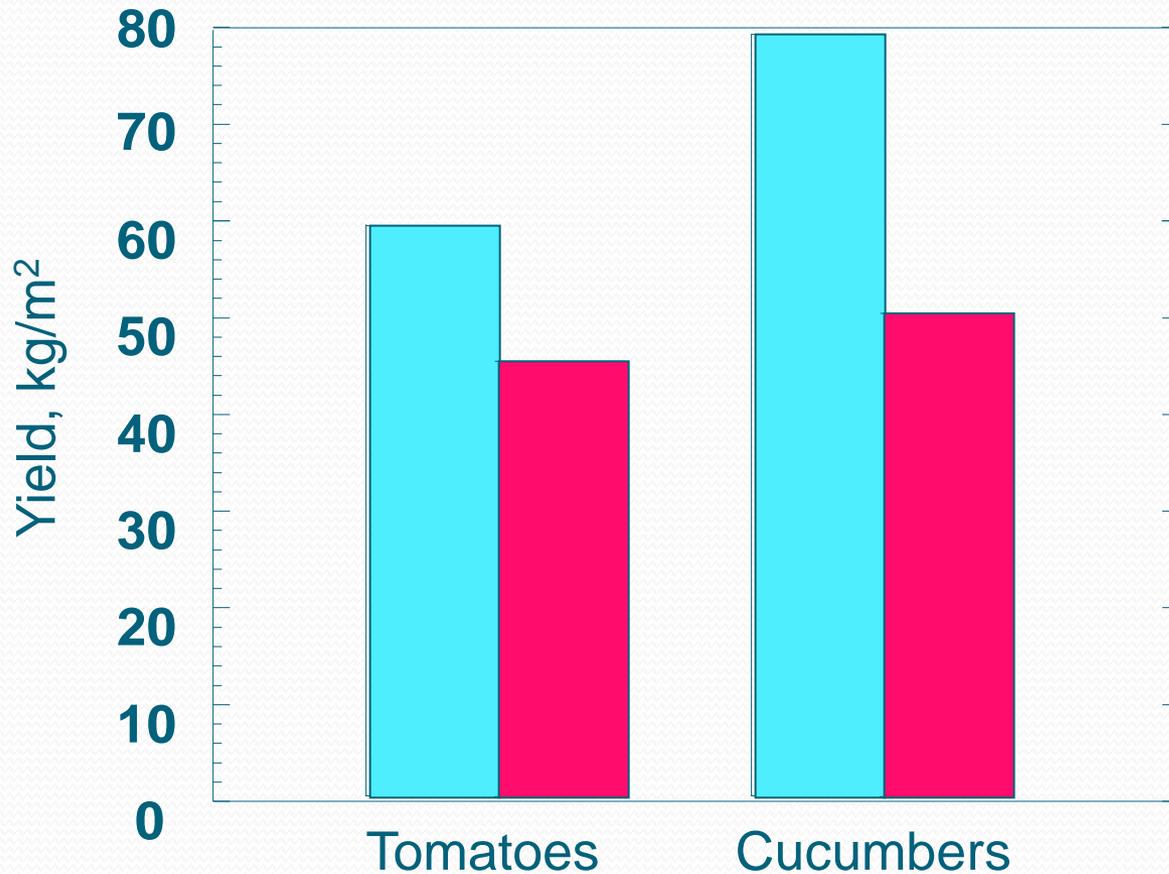
 Aquaponics
 Hydroponics



Aquaponics vs. hydroponics

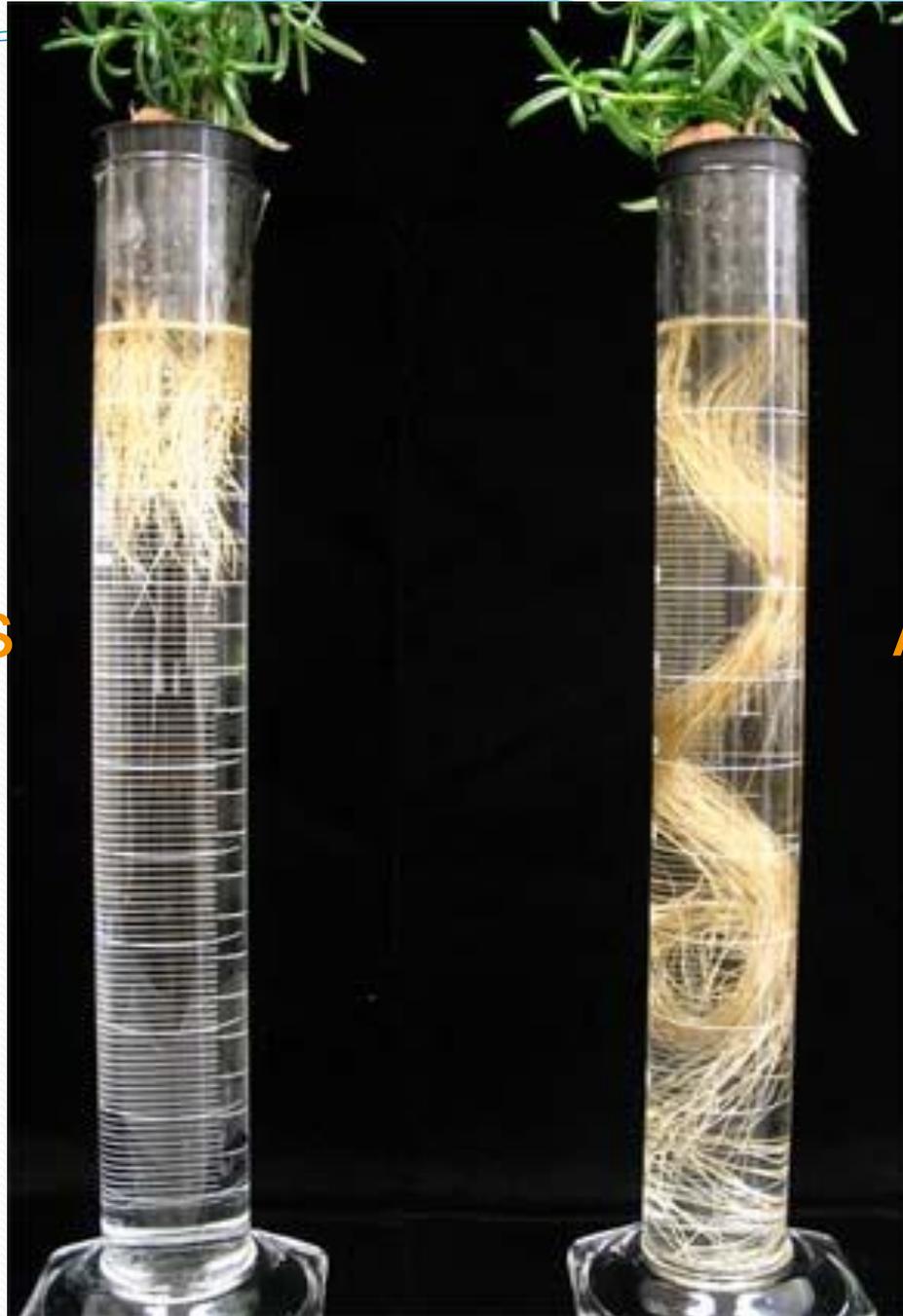
Yield 2004

Aquaponics
Hydroponics



Rosemary roots

Hydroponics

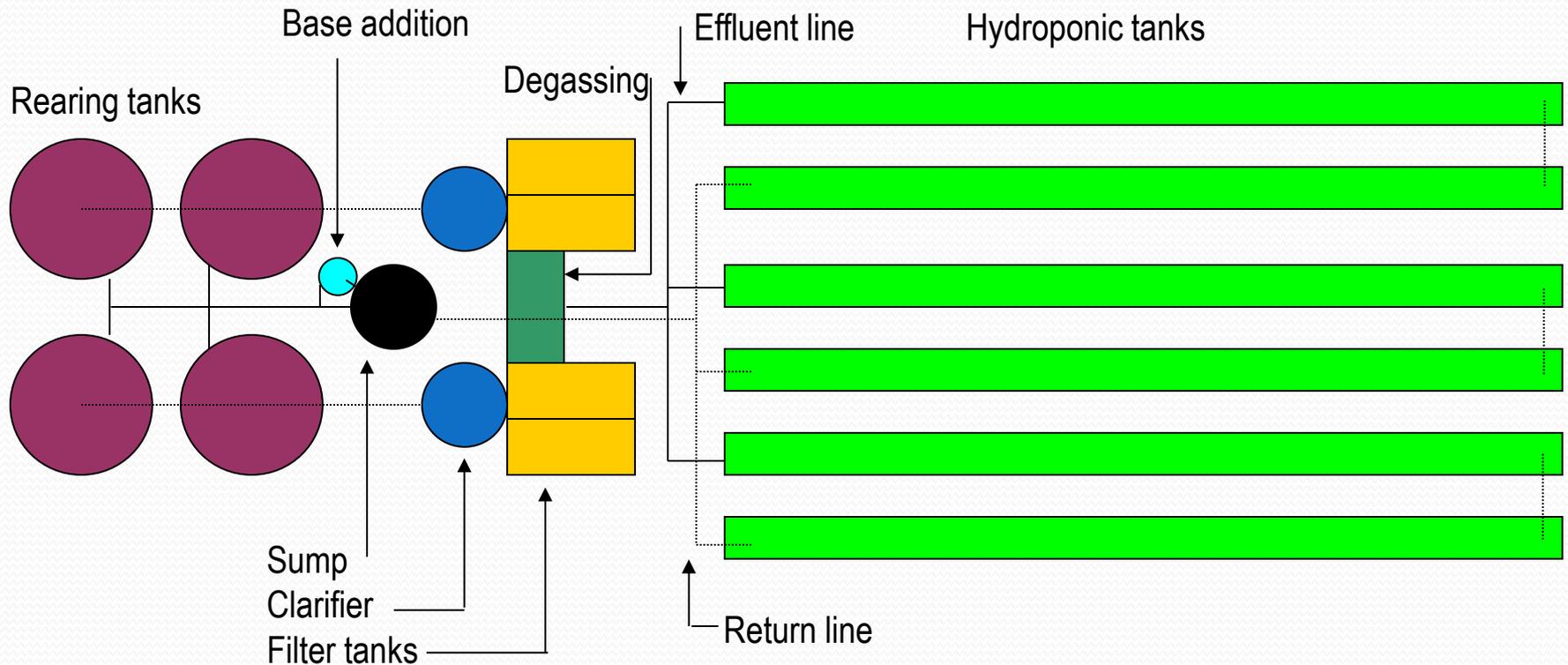


Aquaponics



- **Balanced Aquaponic
Systems**

UVI System Layout



Total water volume - 29,000 gallons Land area - 1/8 acre

2,300 ft² plant area



Keep Feed Input Relatively Constant

- Provides a constant level of nutrients for plant growth
- **Two** methods:

(1) Multiple rearing tanks and staggered production

Advantages: saves labor, good control of stock

Disadvantages: wasted space, higher capital cost

(2) A single rearing tank with multiple size groups of fish (sequential rearing):

Advantage: conserves space, reduces capital costs

Disadvantage: increases labor costs, increases mortality, disrupts feeding, stunted fish accumulate







De-coupled Aquaponic Systems

Lethbridge College



Alberta, Canada



Current Prairie Fishermen Corp
Noblesford, AB

Sludge Management

Discharge it



Mineralize it (zero-discharge)



Vendors

- Supplies
- Courses
- Fish
- Plants
- Pest Control
- Greenhouse
- Heat/Cooling
- Lighting
- Processing/Marketing

- Beware of the Aquashyster!

Challenges

- Aquaponics performs well for continuous staggered production of fish and plants, but the logistics of having both fingerlings and seedlings available on a regular basis is challenging for hobbyists
- Marketing two distinct products can be challenging
- For small commercial systems difficulty of obtaining component parts of system from many vendors

Impediments to Commercial Development

- No large-scale commercial models yet
- Lack of capital
- Lack of trained personal
- Organic certification for the plants is an issue
- Food safety is an issue

Problems

- Unqualified or partially trained people jumping on the band wagon as consultants, educators and vendors
- Some courses based on unproven technology
- Unrealistic expectations (e.g., alleviating third world hunger)

Changing Perceptions

- In past aquaponics excited aquaculturists – recover waste nutrients and produce a valuable byproduct
- Hydroponic producers were not interested
- Now hydroponic producers are becoming excited because aquaponics represents an organic source of nutrients (inorganic nutrients in short supply) and aquaponic vegetables are proving to taste better than hydroponic vegetables)

Future Prospects

- Excellent
- The world is running out of nutrients and water, and aquaponics recycles nutrients and reuses and conserves water
- Aquaponic systems are extremely productive (~200,000 lbs/acre of annual production outside in the tropics or in controlled environment agriculture in temperate regions)
- A critical mass of interest and knowledge is increasing to a point where aquaponics will soon take off in the commercial sector and expand at an exponential rate at the hobby level.

Thanks Dr. Rakocy!



Charlie Shultz

aquaponics@hotmail.com