



College of Tropical Agriculture and Human Resources  
University of Hawai'i at Mānoa

# Aquaponics in the Classroom

October 13, 2012

Windward Community College



# MAHALALO

- Joan Ako
- Lynn Fujioka
- Amy Isono Weintraub
- Kathleen McGovern-Hopkins
- RuthEllen Klinger-Bowen
- Leina'ala Sharon Bright



UNIVERSITY of HAWAII\*  
**WINDWARD**  
COMMUNITY COLLEGE



# Today's AGENDA

- Welcome and Introductions (Clyde Tamaru, Maria Gallo)
- Design Thinking (Bernice Bowers, Jeff Garvey)
- Design Thinking Interactive Session (All Attendees)
- LUNCH
- Presentations (Student, Teacher, Educator)
- Presentations (CTAHR Faculty)
- Break
- Presentations (Students, Teachers)
- Presentations (CTAHR Faculty and Intern)
- EVALUATION





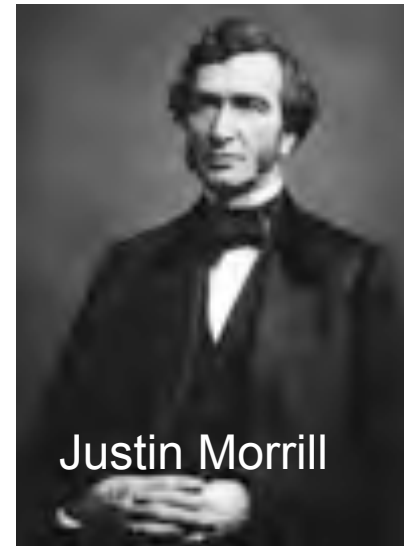
# Who is Clyde Tamaru and Why is He Here?

- Royal Elementary School
- Central Intermediate
- McKinley High School
- B.S. Biology, @ UH Mānoa
- M.S. Zoology, @ UH Mānoa
- Ph.D. Faculty of Agriculture, Dept. of Fisheries, University of Tokyo

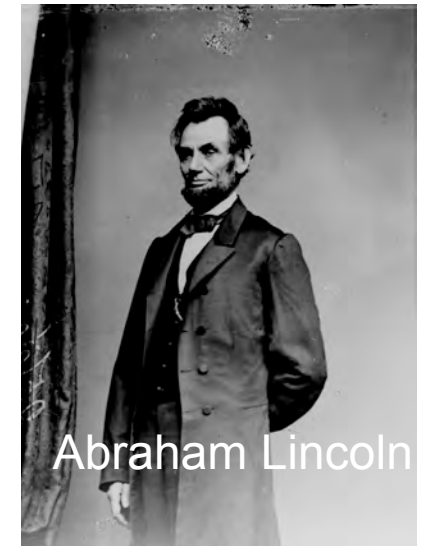


# Land Grant College System

- Universities or colleges that receives the benefits of the Morrill Acts of 1862 and 1890  
(Education)
- Hatch Act of 1887 allows for creation of agricultural research stations (Research)
- Smith-Lever Act of 1914 results in the cooperative extension services for technology transfer (Extension)



Justin Morrill



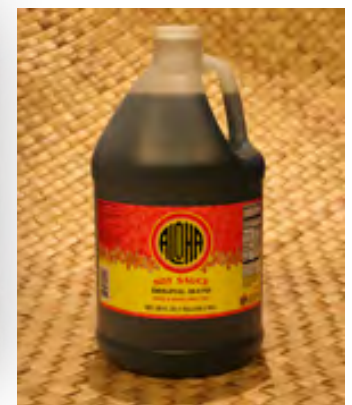
Abraham Lincoln

## Smithsonian Folklife Festival



# Definition of BIOENGINEERING: bio·en·gi·neer·ing

The design, manufacture, and maintenance of **ENGINEERING** equipment used in biosynthetic processes, such as fermentation, composting, digestion, pasteurization, biofuel production.



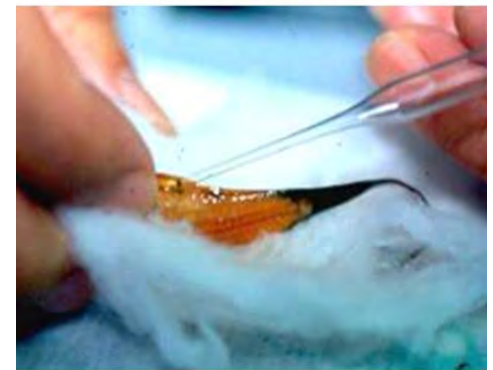
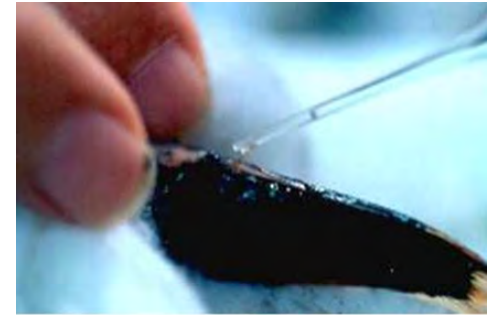


# Definition of BIOENGINEERING: bio·en·gi·neer·ing

The application of biological techniques to create modified versions of organisms: Classical method is known as breeding.



Induced spawning



Homogzygous Genotype



# Definition of BIOENGINEERING: bio·en·gi·neer·ing

The application of biological techniques to create modified versions of organisms- also called *genetic engineering*

*Transgenic* mouse passing on jellyfish green fluorescent protein (GFP) to her young



## Scientists decipher papaya's genome

Research could pave way for transgenic fruit exports to Japan





# Aquaculture + Hydroponics = Aquaponics





For over a thousand years ancient Hawaiians were completely isolated from the rest of the world.



Hawaii

Currently, over 80% of our food and 90% of our energy is imported

Image IBCAO  
Image © 2010 TerraMetrics

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# STEM Week Hawaii

Celebrating Science, Technology, Engineering & Math


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## STEM Week Awards Recognize Hawaii School Excellence

### High School State Champions

1. Mililani High School
2. 'Iolani School
3. Waipahu High School

### Middle School State Champions

- 
1. Highlands Intermediate School
  2. 'Iolani School
  3. Punahou School



Principal: Ms, Amy Martinson, Lynn Fujioka,  
ISIS Hawaii, Hapa Farms





## **Maria Gallo, PhD, Dean Of CTAHR**

- BS Cornell University
- MS and PhD North Carolina State
- Chair of Agronomy Department, University of Florida in Gainesville
- Founder of the world's pioneering programs for sugarcane biotechnology
- Past president of Crop Science Society of America
- American Peant Research and Education Society

