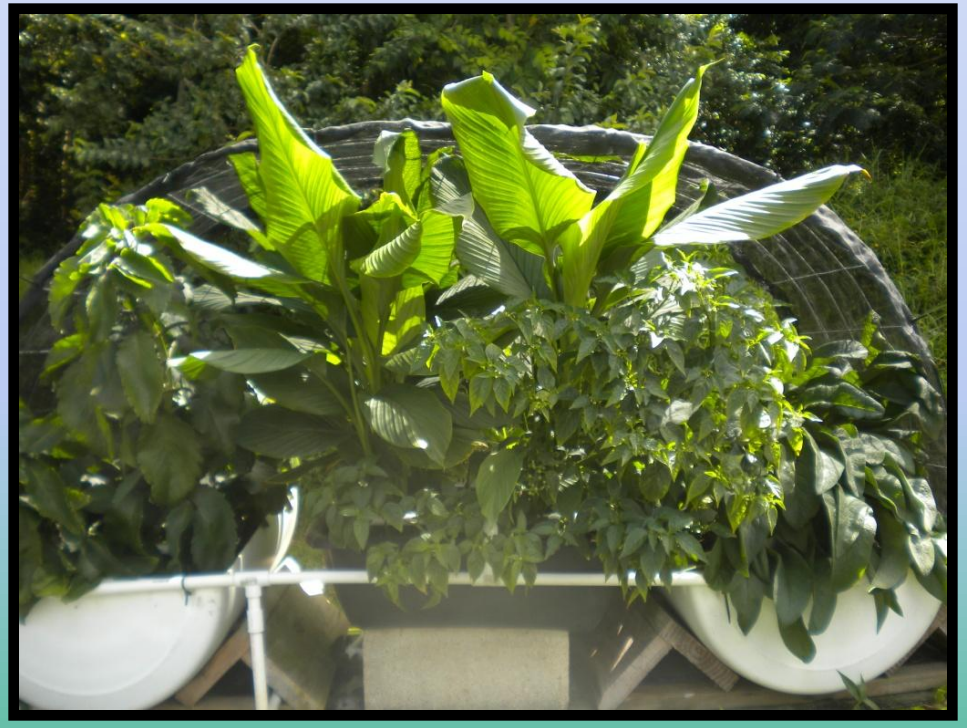
# Waihona Lāʻau Lapaʻau
# “Hawaiian Herbal Medicine Cabinet”



McNair Student Achievement Program

By Leinaʻala Bright

9/24/2011

# Introduction

- Undergraduate Student at UH Mānoa, Kamakakūokalani Center for Hawaiian Studies
- Concentration in Hawaiian Perspectives on Geography and Resource Management
- Student Internship with College of Tropical Agriculture and Human Resources
- Cultural Practitioner in Native Hawaiian Community

# Malāma ʻĀina ~ Caring for our land

## Hoʻomana ~ Empower

Native Hawaiian families and Communities through food and medicinal sovereignty.

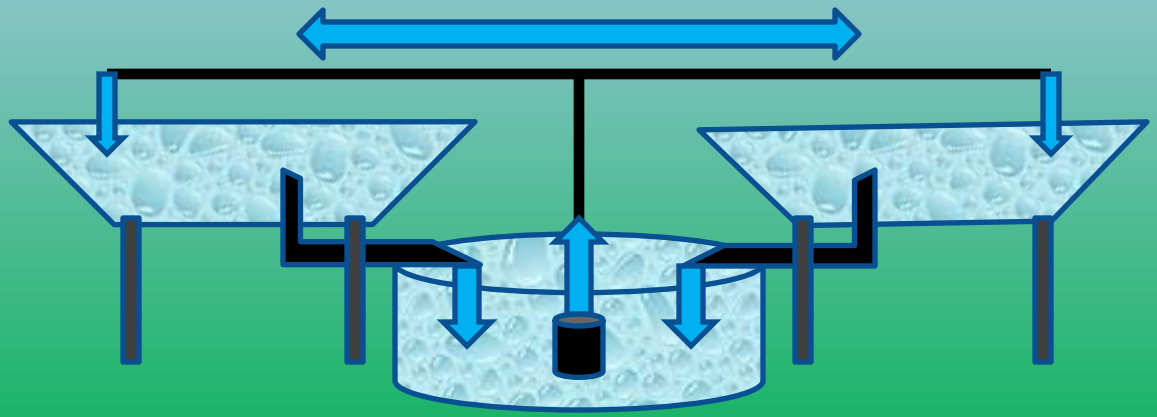
# Why Integrate traditional practices with modern techniques?

- Limited resources- land, water, native plants
- Diminishing integrity of soil
- Food safety and security

# Why Aquaponics?

- Organic, soilless, above ground environment.
- Plants and fish share a life sustaining, recirculating, rich environment.
- Easy access to herbal medicine, vegetables and fish.

# Waimānalo Prototype
# Hawaiian Homestead Families



# Phase I ~ Soil vs Aquaponics

‘Ōlena

Common Name: Turmeric

Scientific Name: Curcuma longa

Questions

1. Which method is the most effective for high ‘ōlena (turmeric) yield and quality?

2. How do the different growing conditions affect the species?

# Null Hypothesis

There is no difference between ʻŌlena (turmeric) grown in soil vs aquaponics

# Methods

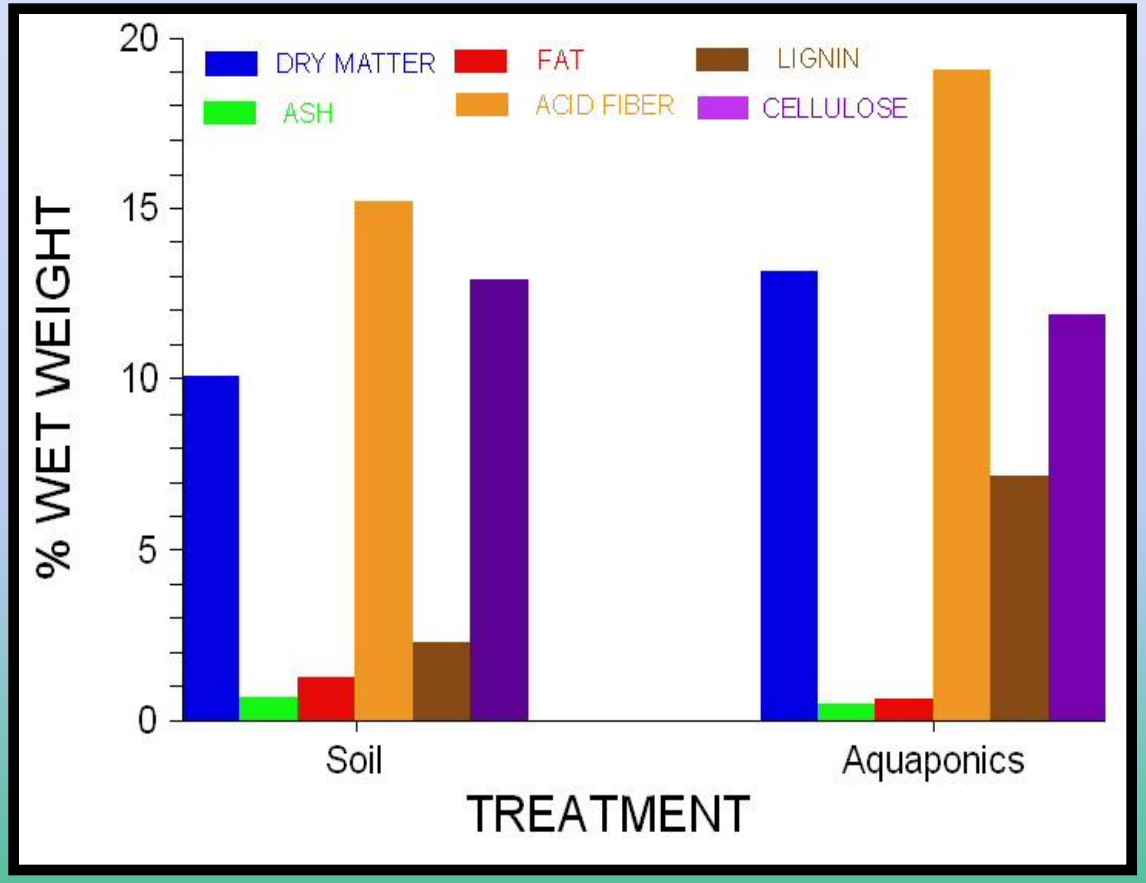
1. Two different growing conditions
2. Identical plants used
3. Soil control group watered daily
4. Chelated iron was the only additive
5. Grown at the same site
6. Harvested on the same day

# Aquaponics vs Soil Results

Aquaponics

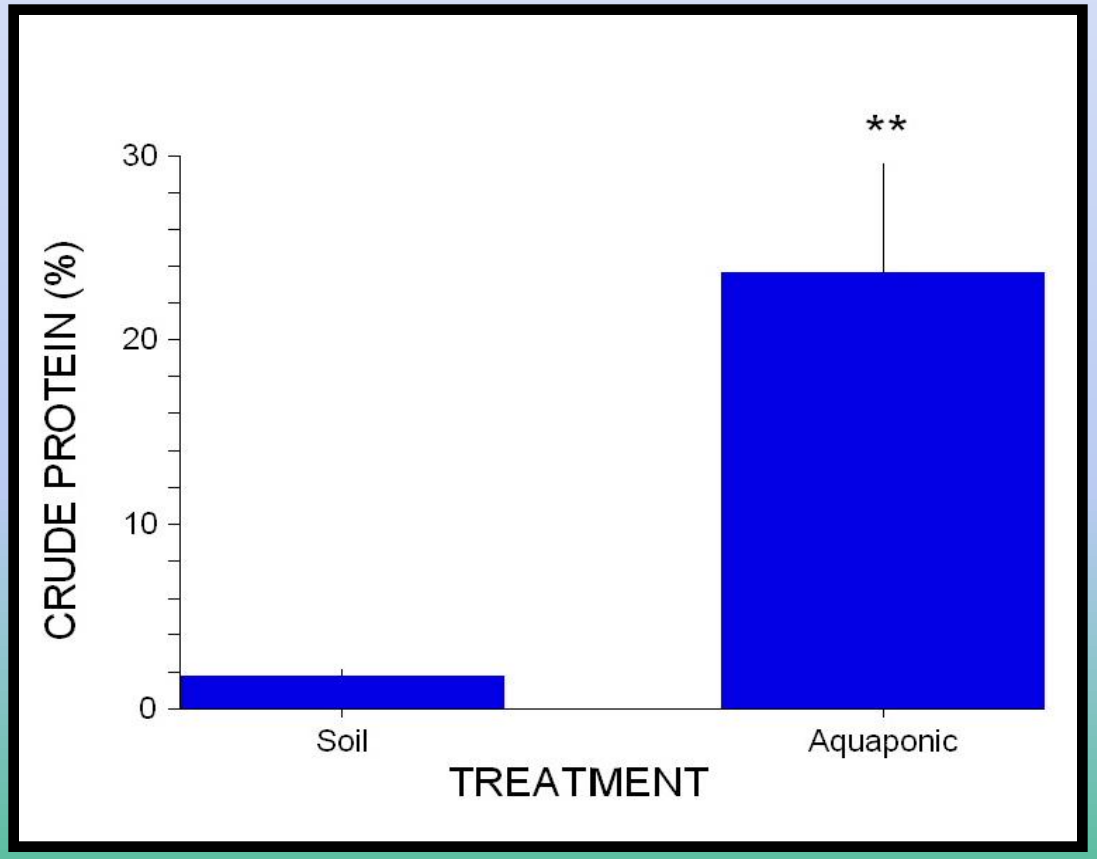
Soil

# Results




Components with  no significant differences detected between soil versus aquaponic grown ‘ōlena.

# Results Continued




Significant (P<0.01) difference in crude protein between soil versus aquaponic grown ‘ōlena.

# Experimenting With Different Species

| Hawaiian Name<br>Common Name | Medicinal Qualities<br>Different Plant Parts | Aquaponics | Soil |
|---|---|---|---|
| ʻŌlena<br>(Turmeric) | Sinus, immune system<br>Rhizome | Excellent<br>V, R, S, Rt | Excellent<br>V, Rt |
| Koʻokoʻolau<br>(Beggar's tick) | Diabetes<br>Leaf | Excellent<br>V, R, S, Rt | Excellent<br>V, R, S, Rt |
| Laukahi<br>(Plantain) | Pain, stings, bites<br>Leaf and seeds | Excellent<br>V, R,S, Rt | Good<br>Rt |
| Oliwa Kū<br>(Air plant) | Regenerates skin, tissue, bone - Leaf | Excellent<br>V, R, S, Rt | Excellent<br>V, R, S. Rt |
| ʻUhaloa<br>(Waltheria) | Sore throat<br>Inner bark of root | Excellent<br>V, R, S | Fair<br>Rt |
| Pōpolo<br>(Glossy nightshade) | Respiratory system<br>Leaf and berries | Excellent<br>V, R, S, Rt | Fair<br>Rt |
| V =Vegetative growth | R=Reproductive growth | S=Shoot growth | Rt=Root growth |

# Summary

1. There were no significant differences in the dry matter, fat, lignin, ash, acid fiber and cellulose of the ʻōlena rhizome.

2. Aquaponics treatment was 10x greater in crude protein than in the soil treatment.

3. Medicinal plants propagated in aquaponics showed similar to significantly better growth than in soil.

# Conclusion

1. Null Hypothesis was rejected.

2. Positive results warrants further investigation of different species.

3. In optimizing these systems it is key to correlate the different aquaponic growing conditions to the different plant parts used as medicine.

# Benefits
# Waihona Lāʻau Lapaʻau

1. Propagation, conservation and accessibility of native and introduced plants.

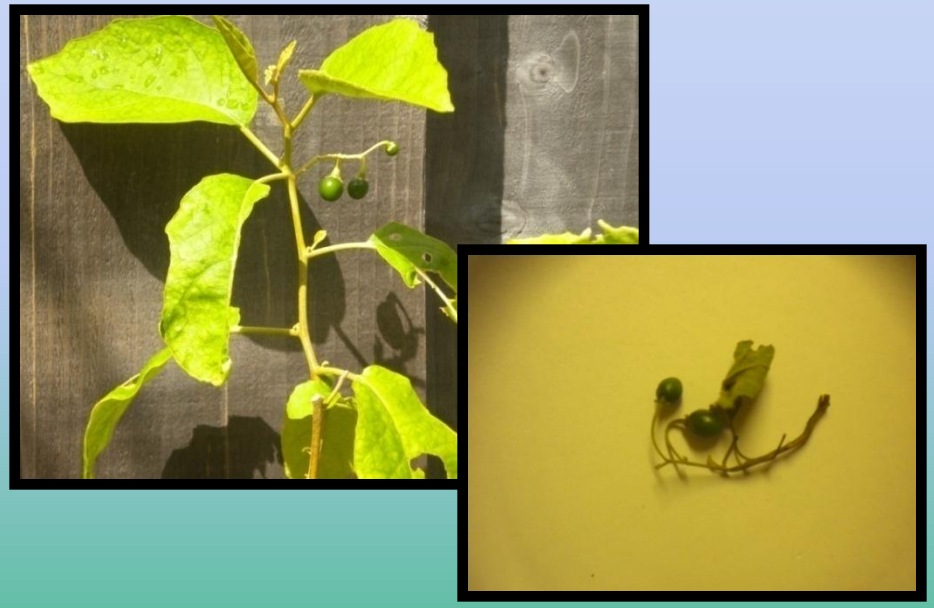
2. Reinforces human/nature connection creating healing opportunities.

3. Promotes self reliance in producing our own food and medicine.

4. Preserves and perpetuates Native Hawaiian's traditional healing practices.

# Phase II ~ Future Investigation

## Develop a set of recommendations for high pōpolo yield and quality in aquaponic systems



Native Pōpolo
Common Name: Glossy Nightshade
Species Not known

Introduced Pōpolo
Glossy Nightshade
Scientific Name: Solanum Americanum

# Mahalo

Ohai Levon, Clyde S. Tamaru and Bradley Fox
College of Tropical Agriculture and Human Resources
Kamakakuokalani School of Hawaiian Knowledge
Ronald E. McNair Program


TRiO
RONALD E. McNAIR
POST-BACCALAUREATE
ACHIEVEMENT PROGRAM

McNair Program Grant Number: P217A090206/02