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 ‘Āina ~ 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

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?

‘Ōlena
Common Name: Turmeric
Scientific Name: Curcuma longa
Null Hypothesis
There is no difference between ‘Ōlena (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 ‘ōlена.
Results Continued

Significant (P<0.01) difference in crude protein between soil versus aquaponic grown ‘ōlена.
<table>
<thead>
<tr>
<th>Hawaiian Name Common Name</th>
<th>Medicinal Qualities Different Plant Parts</th>
<th>Aquaponics</th>
<th>Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Ōlena (Turmeric)</td>
<td>Sinus, immune system Rhizome</td>
<td>Excellent V, R, S, Rt</td>
<td>Excellent V, Rt</td>
</tr>
<tr>
<td>Koʻokoʻolau (Beggar’s tick)</td>
<td>Diabetes Leaf</td>
<td>Excellent V, R, S, Rt</td>
<td>Excellent V, R, S, Rt</td>
</tr>
<tr>
<td>Laukahi (Plantain)</td>
<td>Pain, stings, bites Leaf and seeds</td>
<td>Excellent V, R, S, Rt</td>
<td>Good Rt</td>
</tr>
<tr>
<td>Oliwa Kū (Air plant)</td>
<td>Regenerates skin, tissue, bone - Leaf</td>
<td>Excellent V, R, S, Rt</td>
<td>Excellent V, R, S, Rt</td>
</tr>
<tr>
<td>‘Uhaloa (Waltheria)</td>
<td>Sore throat Inner bark of root</td>
<td>Excellent V, R, S</td>
<td>Fair Rt</td>
</tr>
<tr>
<td>Pōpolo (Glossy nightshade)</td>
<td>Respiratory system Leaf and berries</td>
<td>Excellent V, R, S, Rt</td>
<td>Fair Rt</td>
</tr>
</tbody>
</table>

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 ‘ōlena 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 pōpōlo yield and quality in aquaponic systems

Native Pōpōlo
Common Name: Glossy Nightshade
Species Not known

Introduced Pōpōlo
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

McNair Program Grant Number: P217A090206/02