Aquaponics Update

Ted Radovich & Kai Fox
(and a lot of other folks too)

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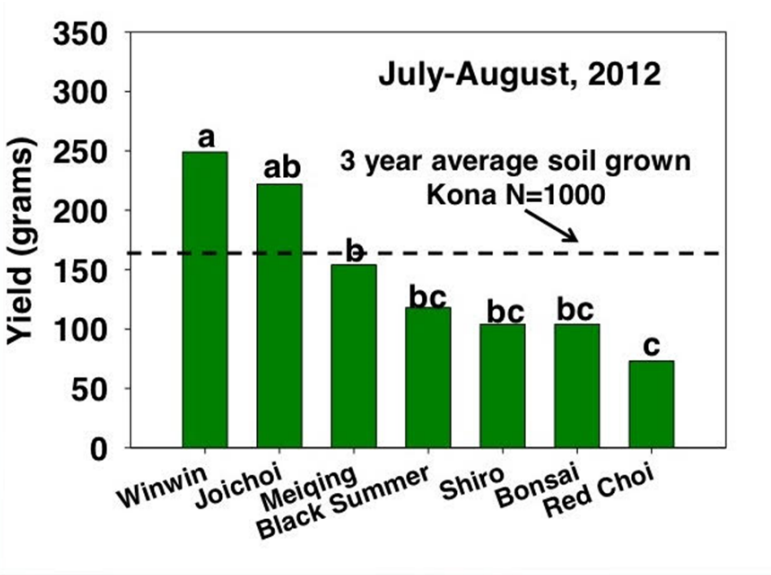
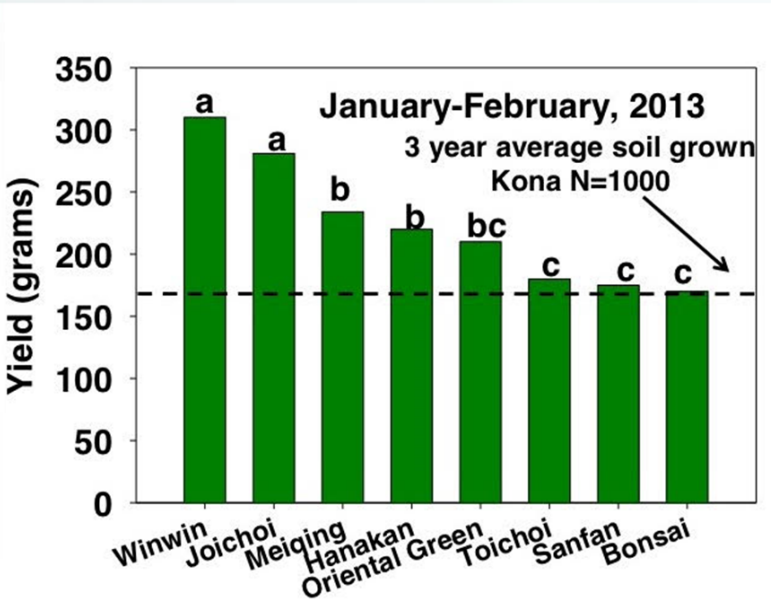
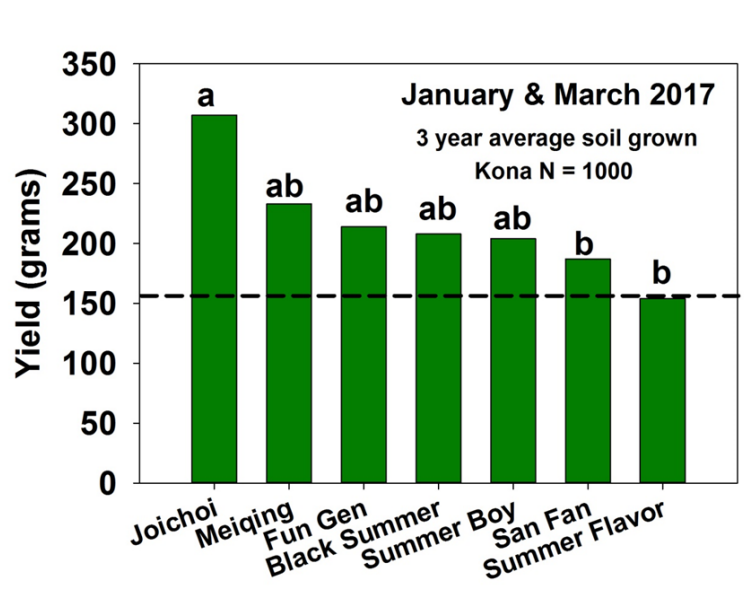
Clyde Tamaru stands behind a WCC modified "barrel-ponics" system growing taro.

Yield

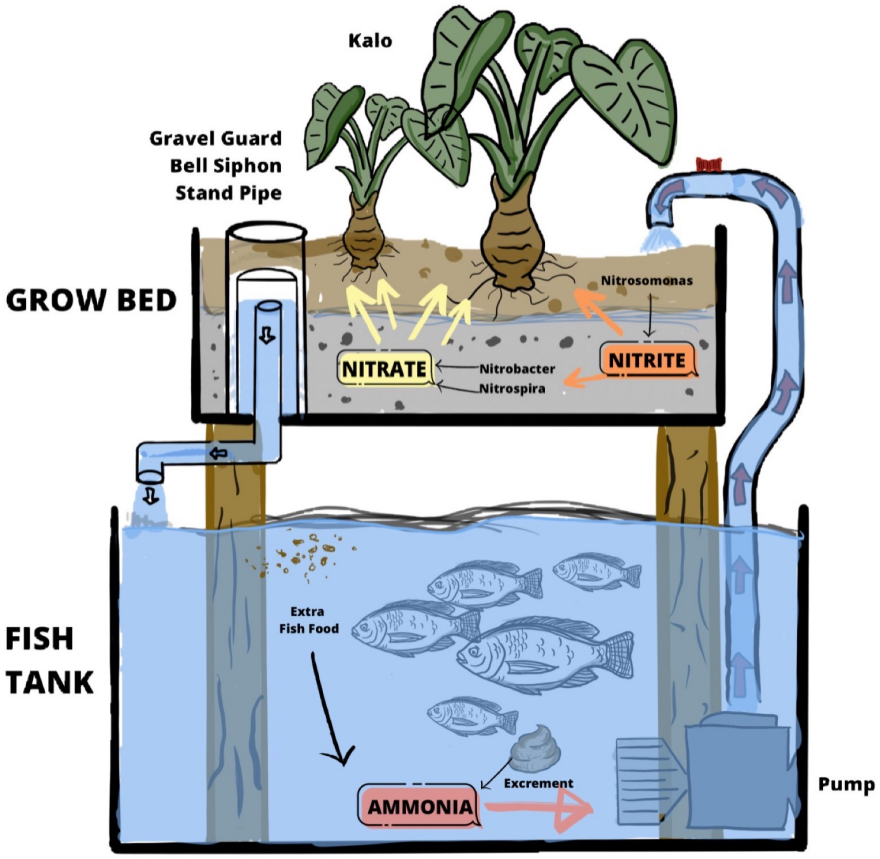

July-August, 2012
3 year average soil grown
Kona N=1000
Yield (grams)
350
300
250
200
150
100
50
0
a
ab
b
bc
bc
bc
c
Winwin
Joichoi
Meiqing
Black Summer
Shiro
Bonsai
Red Choi


Winwin
Jo Choi
Bonsai
Red Choi
Shiro

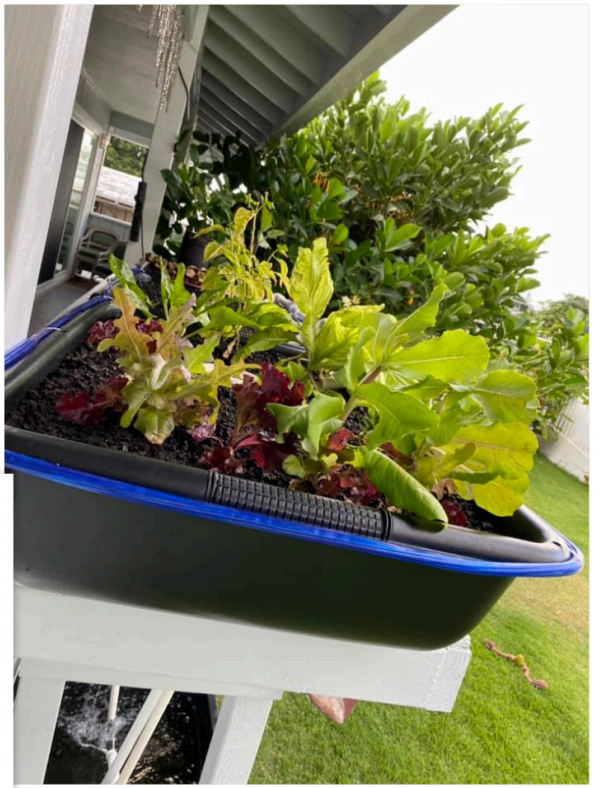

January-February, 2013
3 year average soil grown
Kona N=1000
Yield (grams)
350
300
250
200
150
100
50
0
a
a
b
b
bc
c
c
c
Winwin
Joichoi
Meiqing
Hanakan Oriental Green
Toichoi
Sanfan
Bonsai


January & March 2017
3 year average soil grown
Kona N = 1000
Yield (grams)
350
300
250
200
150
100
50
0
a
ab
ab
ab
ab
b
b
Joichoi
Meiqing
Fun Gen
Black Summer
Summer Boy
San Fan
Summer Flavor

M.A.L.A.M.A.



From: MALAMA Aquaponics Manual (2020). Ke Kula Nui o Waimānalo.



Maximizing Taro (Colocasia esculenta L.) Corm Production in Aquaponics through Manipulation of Water Quality Late in the Vegetative Growth Stage.

Bradley "Kai" Fox[1], Theodore J.K. Radovich[1,2], Neil Tsukayama[1], Paul Silva[1], Jane Chung-Do[1,2], Ilima Ho-Lastimosa[1,2], Phoebe Hwang[1], LeShay Keli'iholokai[1,2], Ikaika Rogerson[2], Kirk Deitchman[2], Kenneth K. Ho[2].
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INTRODUCTION

- Aquaponics has been widely adopted in Hawaiian communities as a culturally relevant method of home food production.
- Taro (*Kalo* in Hawaiian) is a traditional Hawaiian staple crop that does well vegetatively in aquaponics, but does not often produce corms of commercially acceptable size.
- As part of a larger community driven project (malamaaquaponics.org), we tested the hypotheses that low kalo corm yields were due to excessive water nitrogen levels late in vegetative development that hinders corm development.

APPROACH

The kalo cultivar 'Maui Lehua' was planted in a randomized complete design with six replications in specially designed dual-tub systems that allowed for the application of two treatments: 1) fish effluent supplied throughout 8 months of plant development (control) and 2) Fish effluent restricted from the system at 4 months and fresh water supplied for the remaining 4 months of development (restricted).

RESULTS

Figure 1. Illustration of taro development cycle

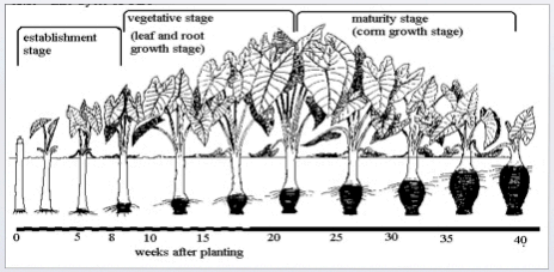
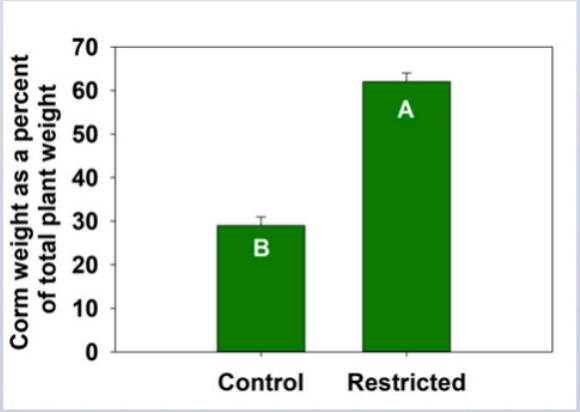


Figure 2. Plant biomass of treatments

Figure 3. Corm weight as a percentage of total biomass



RESULTS

- The ratio of corm to total biomass is a key indicator of plant maturity (Figure 1).
- Control plants produced significantly more biomass than restricted plants (Figure 2).
- Restricted plants had significantly more biomass partitioned to the corm (62% of total biomass) relative to control plants (22% of total biomass) (Figure 3).
- This suggests that we were partially successful in transitioning photosynthate partitioning to the corm.
- However, individual weights of the primary corm were statistically similar between treatments (376-406g·plant^{-1})
- This is still low compared to recorded yields in terrestrial systems (>1kg).
- Modifications to the system are being made to address observed deficiencies in potassium and iron in plants of both treatments, and total time to harvest will be increased.
- For more information on this and other Academic/ Community partnerships, visit:

http://www.kekulanuiowaimanalo.org/

FUNDING

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Giant Gourami