

# Local Fertilizers: Tankage

Amjad A. Ahmad, PhD  
University of Hawaii at Manoa  
alobady@hawaii.edu



# Hānai'Ai Extension Bulletins Website



**Sustainable and Organic Agriculture Program**  
College of Tropical Agriculture and Human Resources

HOME | TPSS | NREM | PEPS | HNFAS | CTAHR | UH

- What's New?
- For Students
- SOFT: Student Organic Farm Training
- For New Farmers
- Farm Income
- Environmental Stewardship
- Sustainable and Organic Production Methods
- Events
- Past Workshops
- Links
- Hānai'Ai Newsletter
- Videos
- Cover Crops & Green Manures for Hawaii

## Hānai'Ai

The Food Provider ~ June | July | August 2015

In This Issue

- [Featured Farmer: Mark Suiso, Makaha Mangoes](#)
- [HOT TIP from Makaha Mangoes](#)
- [Sustainable & Organic Research & Outreach News](#)
- [Publications and Programs](#)
- [CRATE: Center for Rural Agricultural Training and Entrepreneurship](#)
- [From the Agribusiness Incubator](#)
- [Organic Update](#)
- [For New Farmers](#)
- [Citizen Science](#)
- [Workshops | Conferences | Meetings](#)
- [Videos & Webinars](#)
- [FMI / FYI](#)
- [Funding Opportunities](#)
- [Western SARE](#)

**Sign up for our Email Newsletter**

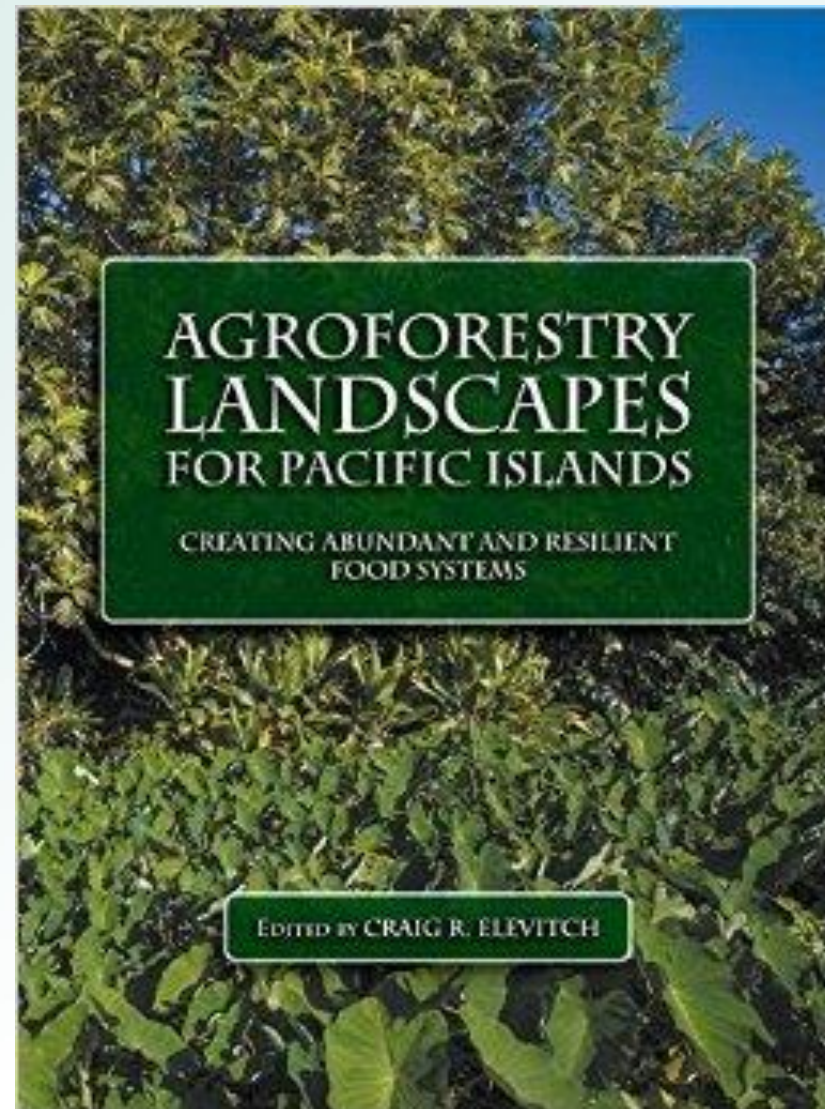
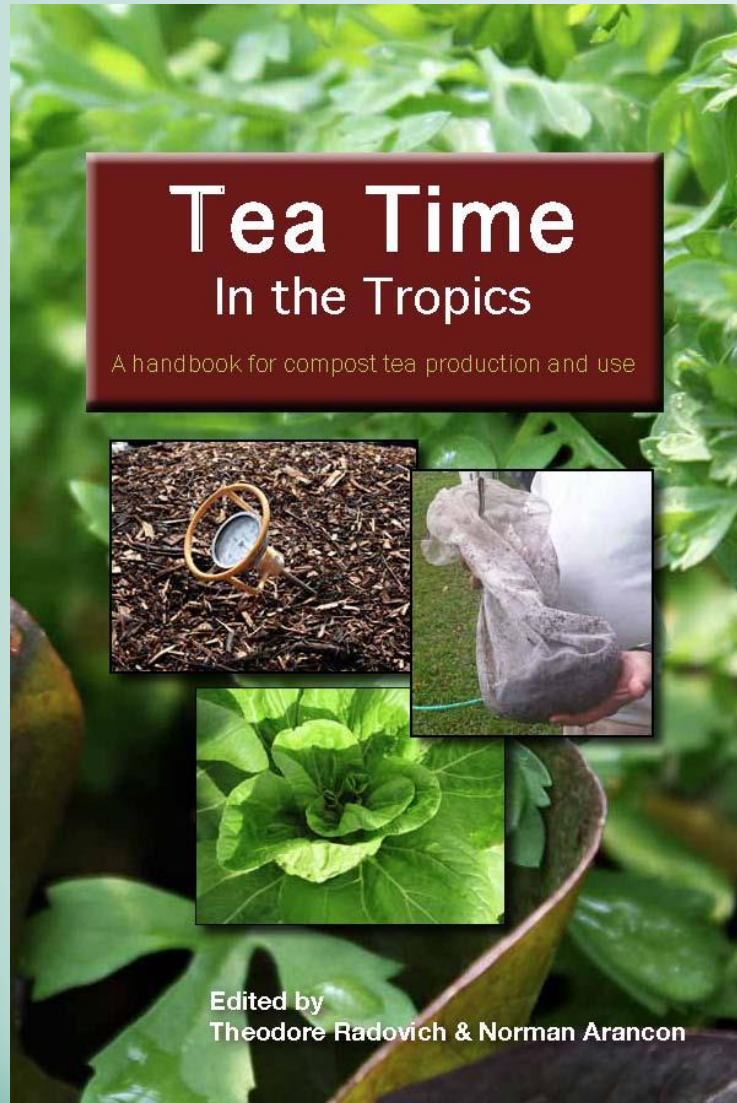
Privacy by  SafeSubscribe<sup>SM</sup>

### ARCHIVED ISSUES

---



# Free Publications:



# Social Media & program Website:

The image shows a Twitter profile for 'CTAHR Sustainable Ag' (@SOAPHawaii) and a Facebook post. The Twitter profile includes a bio, location (University of Hawaii at Manoa), website (ctahr.hawaii.edu/sustainag/), and a grid of images. A tweet from the profile features a poster for the '5th Annual Kahumana Farm Festival' with the theme 'Cultivating Change' and the date 'Oct 7, 2017'. The Facebook post shows a tractor in a field with the text 'Across Hawaii, farmers & ranchers are experimenting with different ways of producing agricultural...'. The Facebook interface includes a sign-up button and a login field.



# Research Activities Since 2011:

## Locally Available & Produced Inputs:

### Western SARE R & E Project:

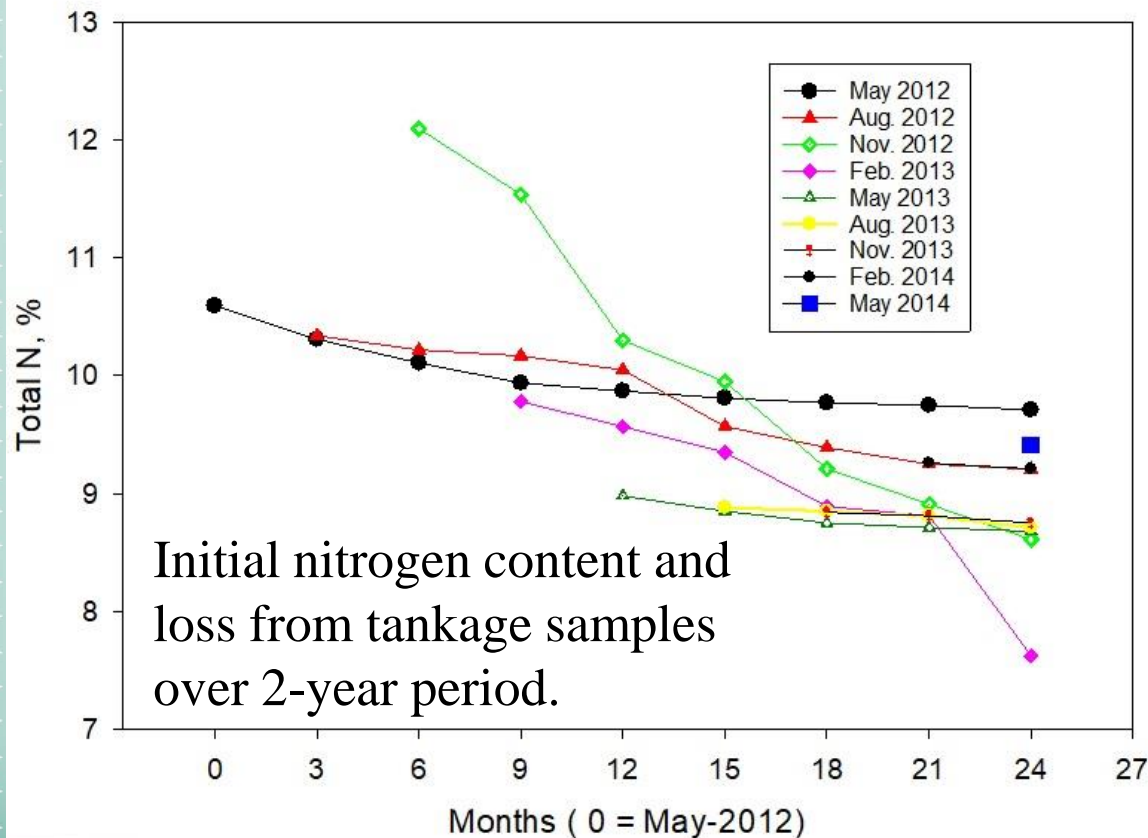


- The project was developed in response to a survey of the highest research & extension priorities in the Pacific region.
- Overarching goal was to reduce the reliance of Hawaii's farmers on imported fertilizers.



# Meat & Bone Meal (tankage): Batch-to-Batch Variability

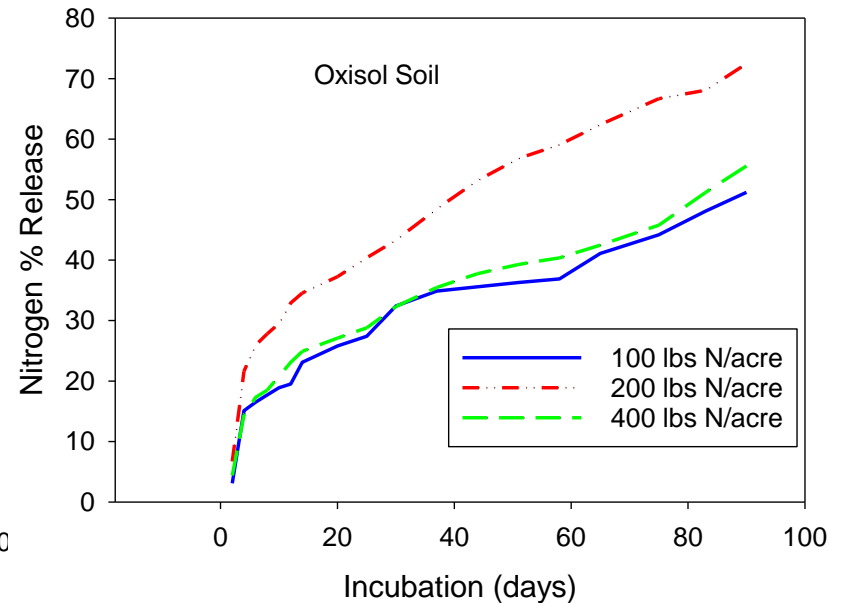
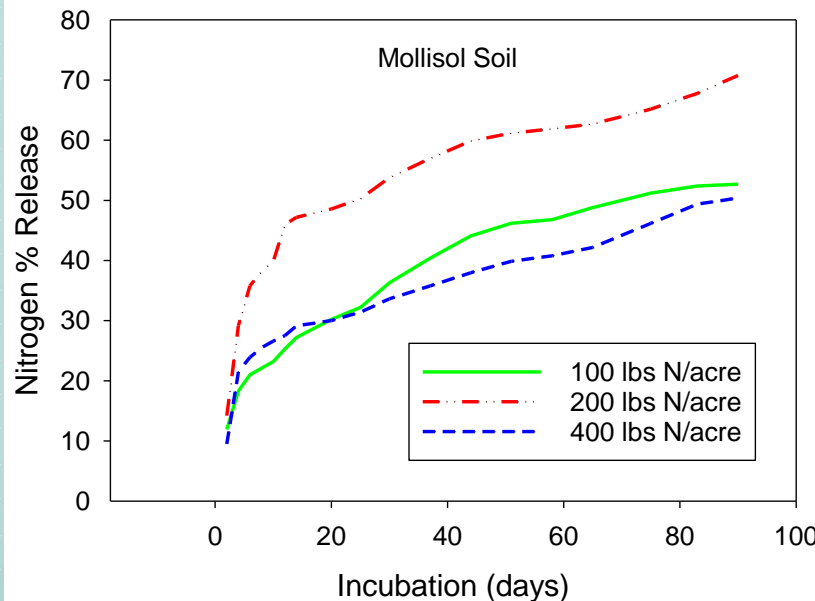
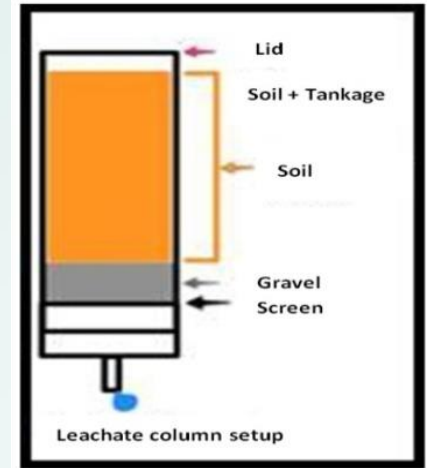
- Approved for Agriculture
- Produced Locally
- N-P-K = 10-3-1 & C:N Ratio: 5:1



Locally produced meat and bone meal by-products (tankage).



# Meat & Bone Meal (tankage) Nitrogen Release Pattern



Nitrogen release (%) from MBM applied at different application rates over 90 days under Mollisols & Oxisols soils



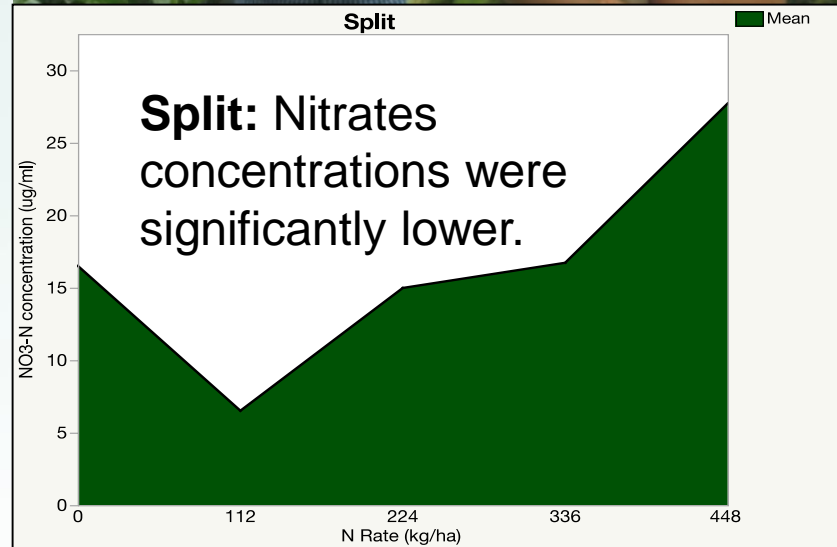
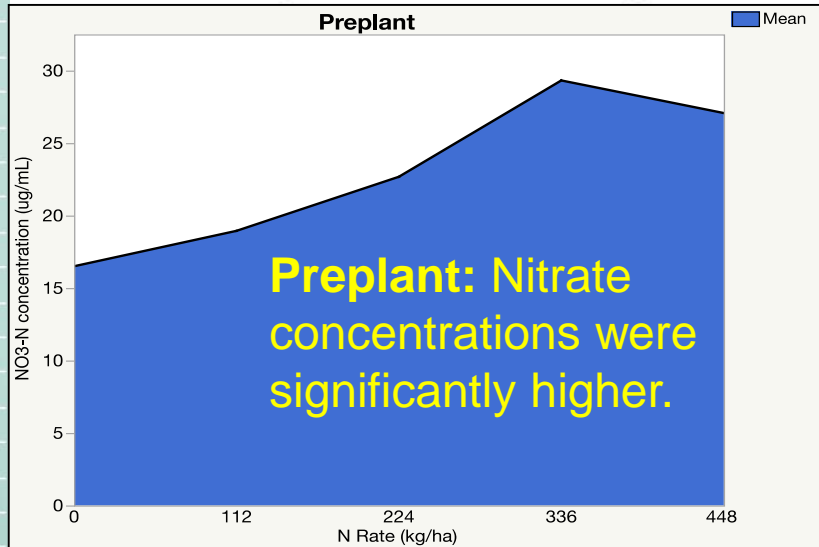
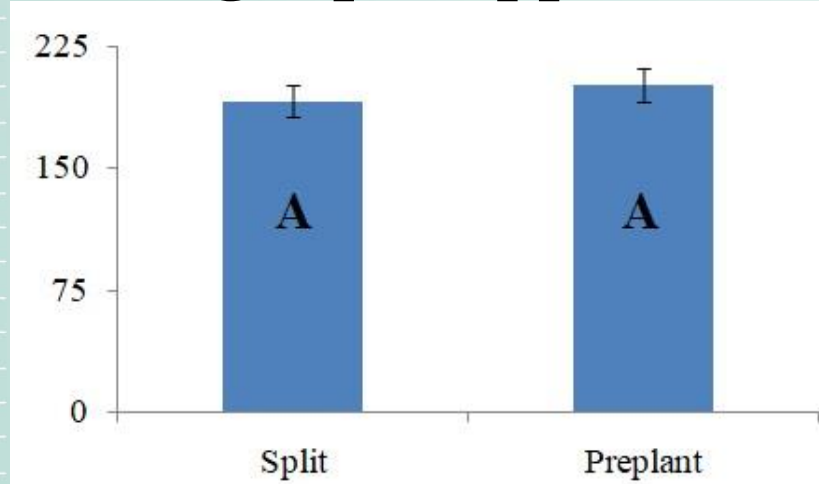
# Tankage-Nitrogen Application Table

Nitrogen (N) (lb/acre)	Tanakage (lb/acre)	Phosphorus (P) (lb/acre)	Potassium (K) (lb/acre)	Applying
50	665	20	6.50	All other macro- & micro- nutrient
100	1,335	40	13.50	
150	2,000	60	20.00	
200	2,665	80	26.50	
250	3,335	100	33.50	
300	4,000	120	40.00	

- Calculations in the table were made based on 75% nitrogen (N) mineralization rate and 10% N in tankage.
- 10% N in tankage is among the highest N content in most available organic fertilizers.



# Tankage split application:



Split application did not affect sweet corn yield significantly. However, NO<sub>3</sub>-N concentrations below the rootzone were ~20% less.



# Importance of Liquid Fertilizer:



- Provide nutrient for immediate uptake.
- Suitable for long-term crops.
- Suitable for mulching.
- Suitable for drip-irrigation.



# Liquid Organic Fertilizer:

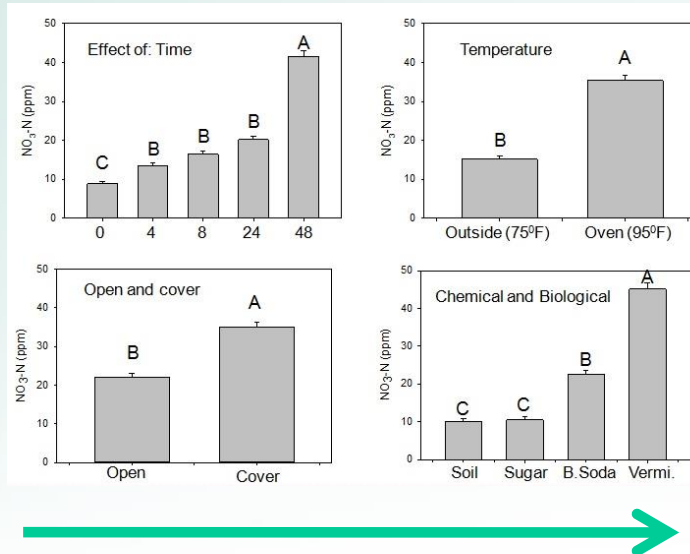
- **Situation:**

There's a need for liquid organic fertilizer, with high nitrogen content, that local growers can make on their own.

Tankage produced locally, relatively cheap & high N content

Time, temperature, cover & other agents were tested

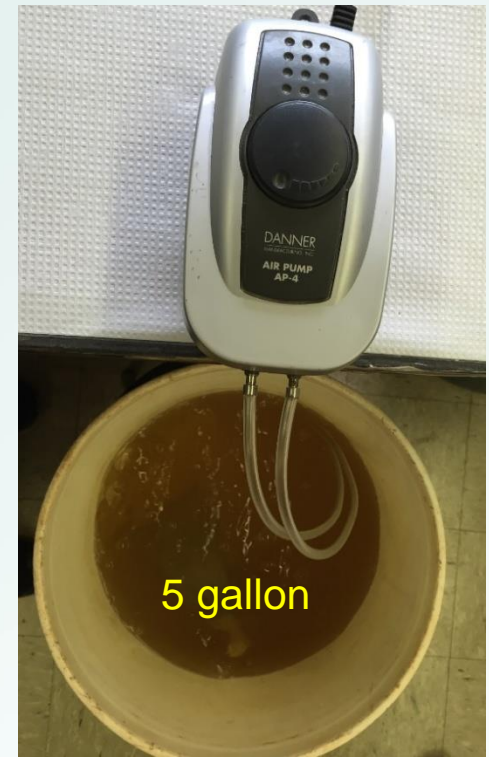
Recipe for high  $\text{NO}_3\text{-N}$  liquid organic fertilizer was achieved



# Liquid Fertilizer from Tankage:

## Liquid organic fertilizer recipe:

- 1.5 lbs of tankage into 10 gallon water.
- Add about 1 ounce vermicompost.
- Air for 12-24 hours.
- Strain & apply with drip irrigation.



# Luquid Fertilizer Application



Please Note:

- Different injectors are available (vary in setup, cost & plan/goal)
- Start with irrigation water till the drip irrigation lines are full.
- Then inject the liquid fertilizer into the drip irrigation lines.
- OR liquid fertilizer will not be distributed uniformly.

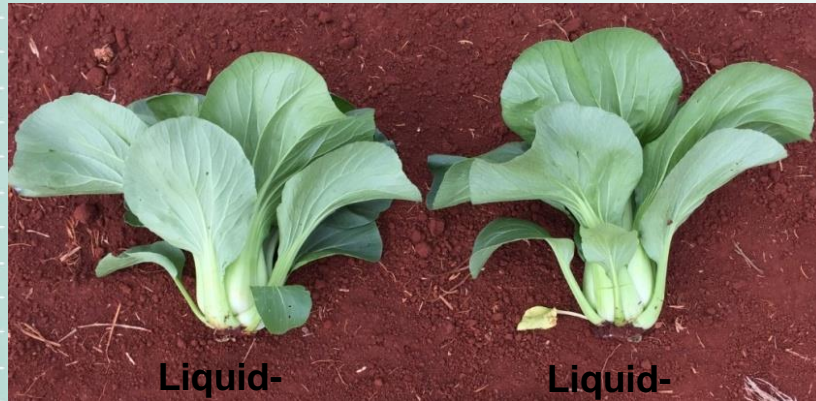


# Results-Lettuce, Pak Choi, and Daikon



**Liquid-Synthetic**

**Liquid-Tankage**



**Liquid-Synthetic**

**Liquid-Tankage**

Lettuce and Pak choi were harvested after 4 and 5 weeks of seedlings transplant, respectively



**Liquid-Synthetic**

**Liquid-Tankage**

Daikon was harvested after 9 weeks of planting



# Watermelon On-Farm Trial on Molokai:



	Fruit Peduncle End	BRIX/Sample Location				Blossom Calyx End	
Melon #	Weight (lbs)	1	2	3	4	5	Average
1	24	10.2	12.0	12.2	12.3	12.1	<b>11.8</b>
2	19	10.8	12.0	12.2	11.8	10.8	<b>11.5</b>
3	18	11.2	13.0	13.0	13.0	12.0	<b>12.4</b>
<b>Average</b>	<b>20.3</b>	<b>10.7</b>	<b>12.3</b>	<b>12.5</b>	<b>12.4</b>	<b>11.6</b>	



# Seedlings Improvement:

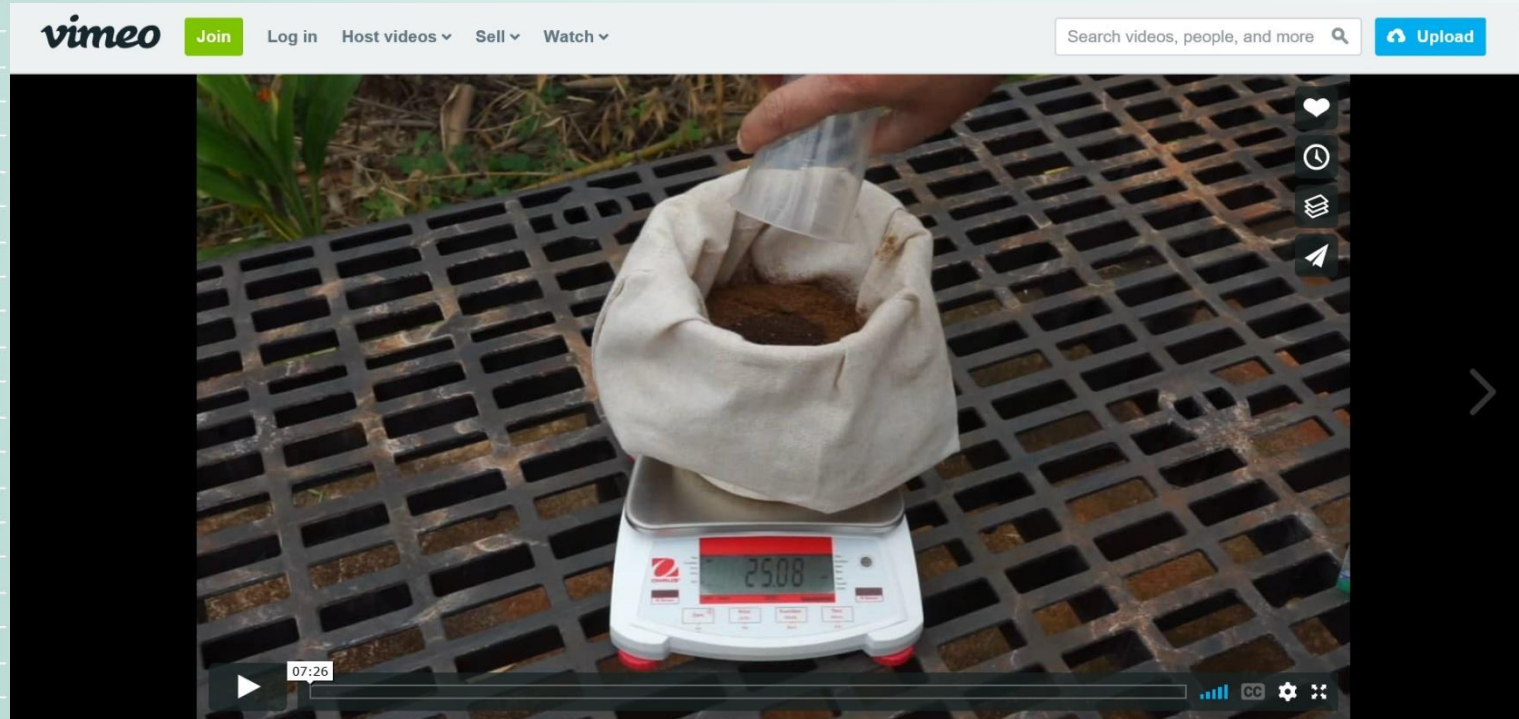


Con = Water only, LS = Liquid Synthetic & LO = Liquid Organic



# Video on how to make your own liquid organic fertilizer:

Vimeo Link: <https://vimeo.com/245473495>



## Please note:

- The liquid organic fertilizer is meant to be as a supplemental application of nutrient and not main source.
- Do not spray the liquid organic fertilizer on plant foliar, since it has high nitrogen content.



# Thanks for listening

