

AQUAPONICS BUN LONG TARO CULTIVATION

Windward Community College
Aquaponic Research Lab
October 2011 – May 2012



TEAM MAHALO

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Data Collection

Grow media:

Black Cinder, Red Cinder, Clay Balls (Hydroton)

pH Remediation:

Plant Growth/Media comparisons

Commercial Outcomes:

Commercial Farmer
Consumer Application



Taro, *Colocasia esculenta*

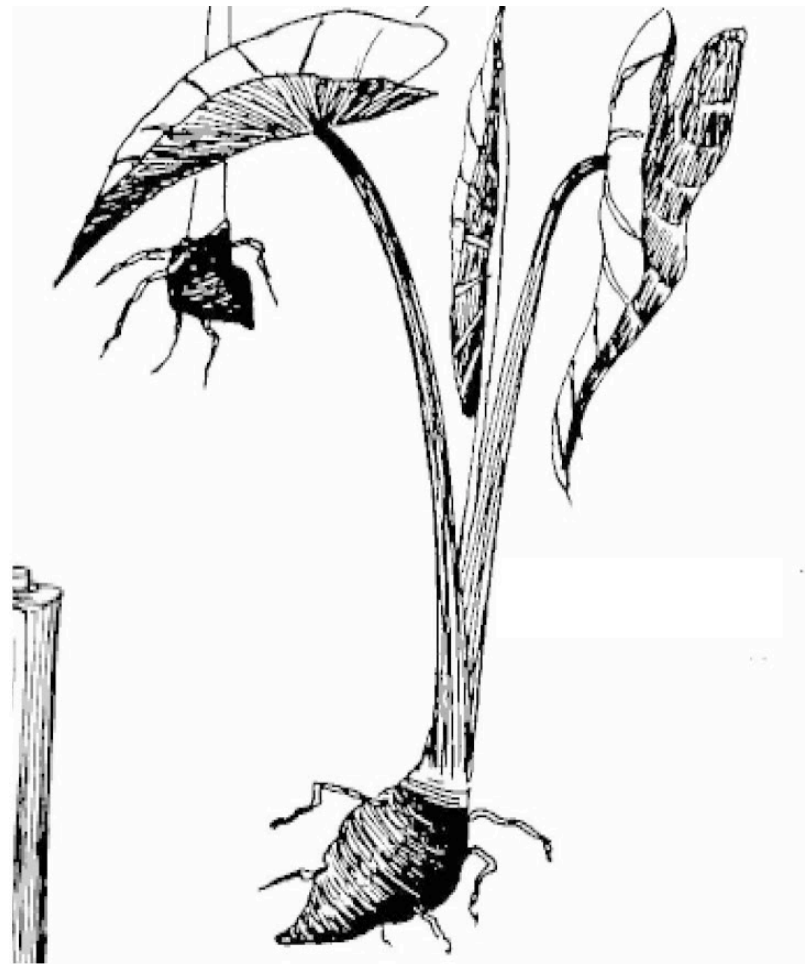
Family: *Araceae*

Genus: *Colocasia*

Species: *Esculenta*

Taro variety known locally as Bun Long, or Chinese Taro.

Used for both leaf and corm, in dishes like squid luau, laulau, palasami, lupulu.



Trial 1 Approach

Grow Media comparison

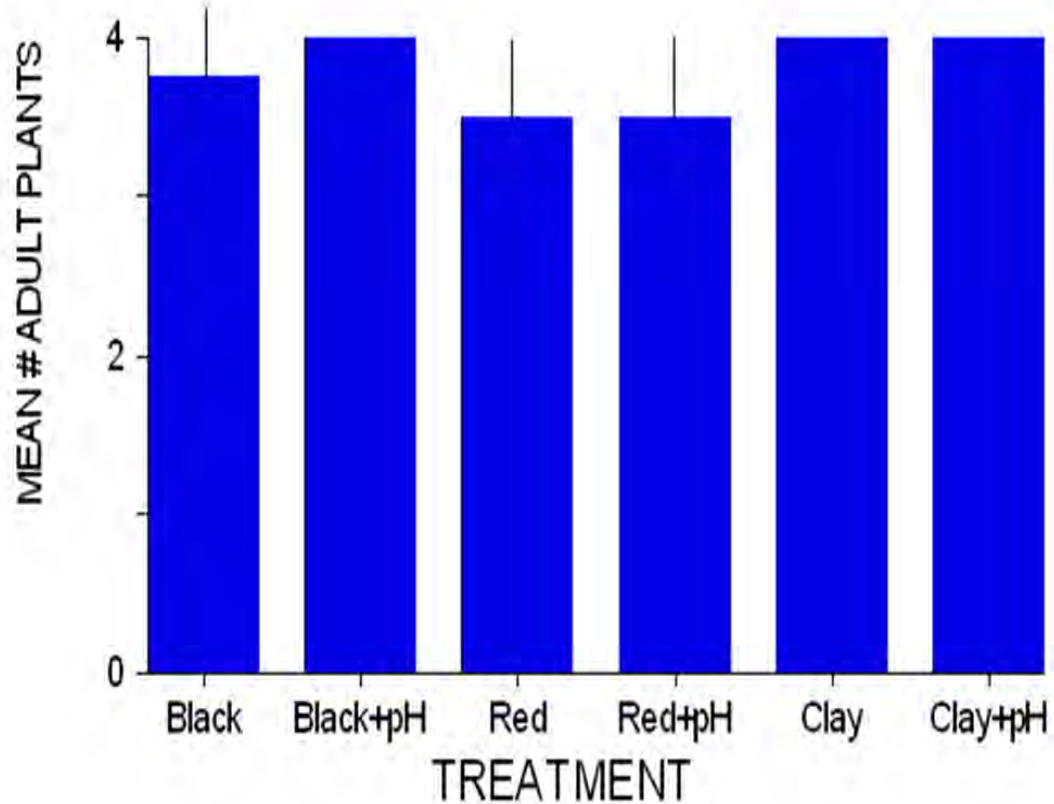
- Water Quality monitoring (weekly) DO, TDS, Temp. Ammonia, Nitrite, Nitrate
- pH remediation (weekly) alternating KOH, $\text{Ca}(\text{OH})_2$
- Leaf Harvest - frequency once every 10 days
- Media Leaching Analysis

Leaf Quality/Farm Yield/Commercial

- Leaf Harvest
- Taste/comparison trials utilizing traditional luau leaf recipes
- Corm harvest – Taro Chip taste/comparison trials
- Keiki (sucker shoot) production.



Number of Adult Plants Harvested per Treatment



BlackCinder



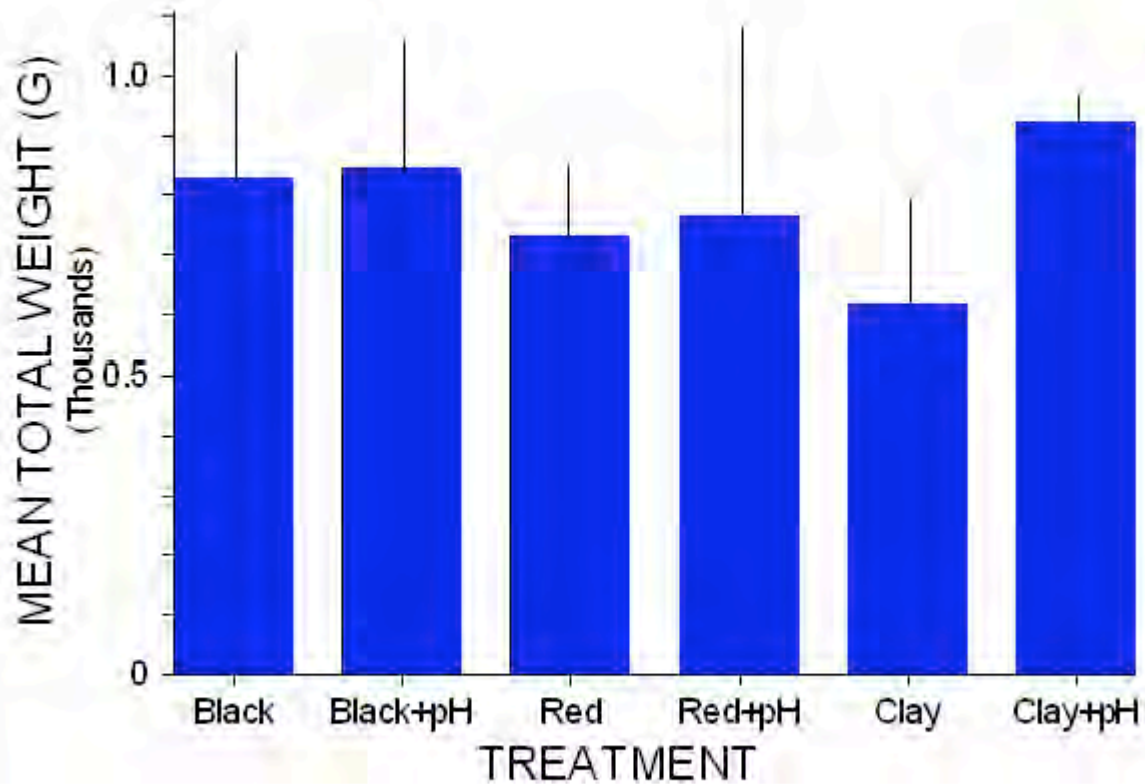
Red Cinder



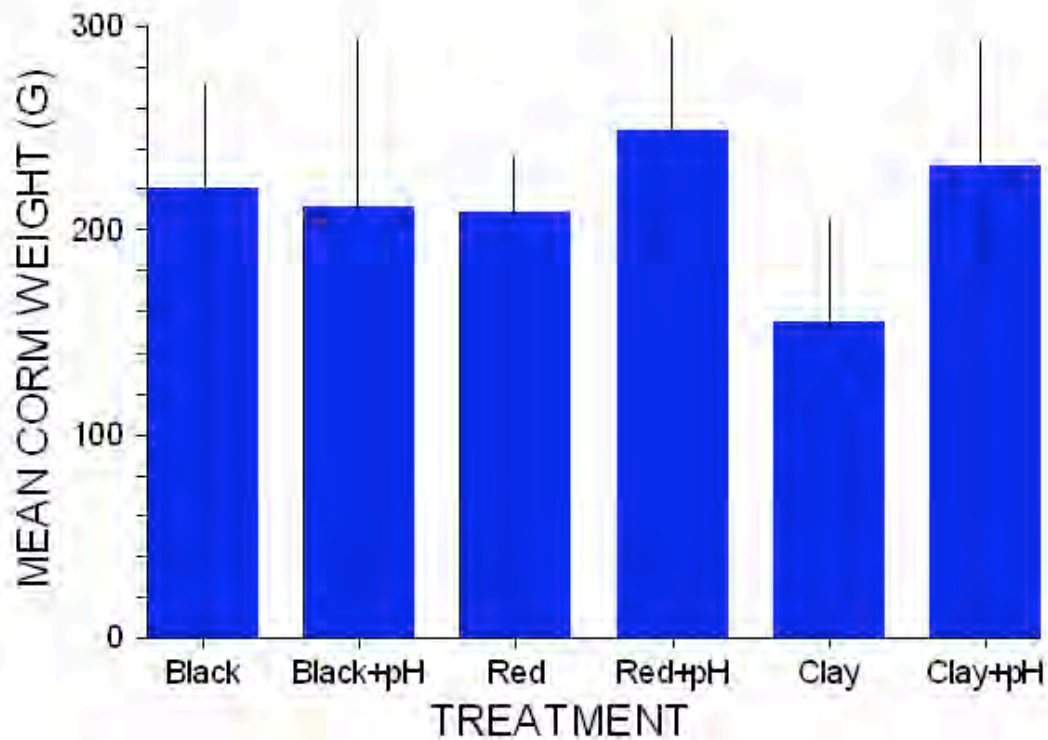
ClayBalls



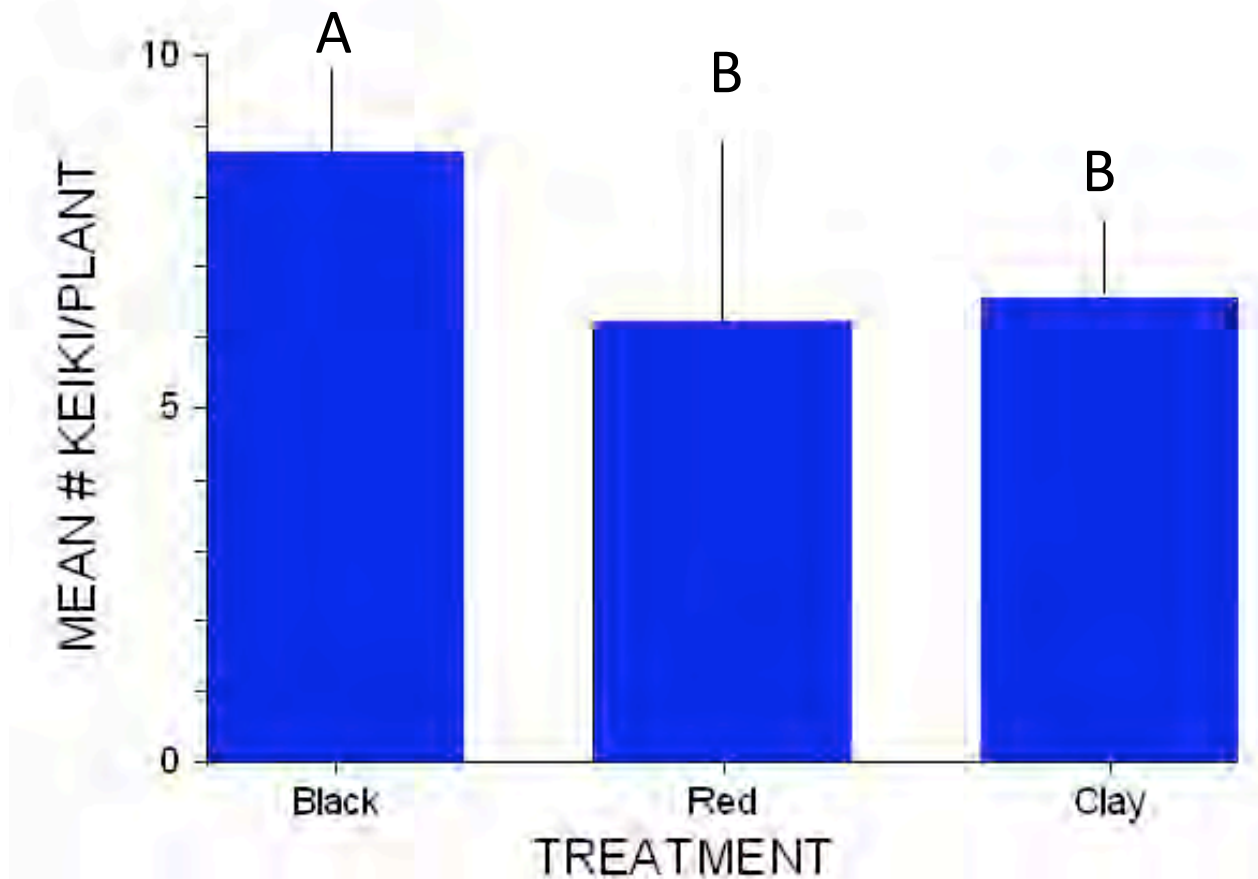
Total Weight of Adult Plants per Treatment



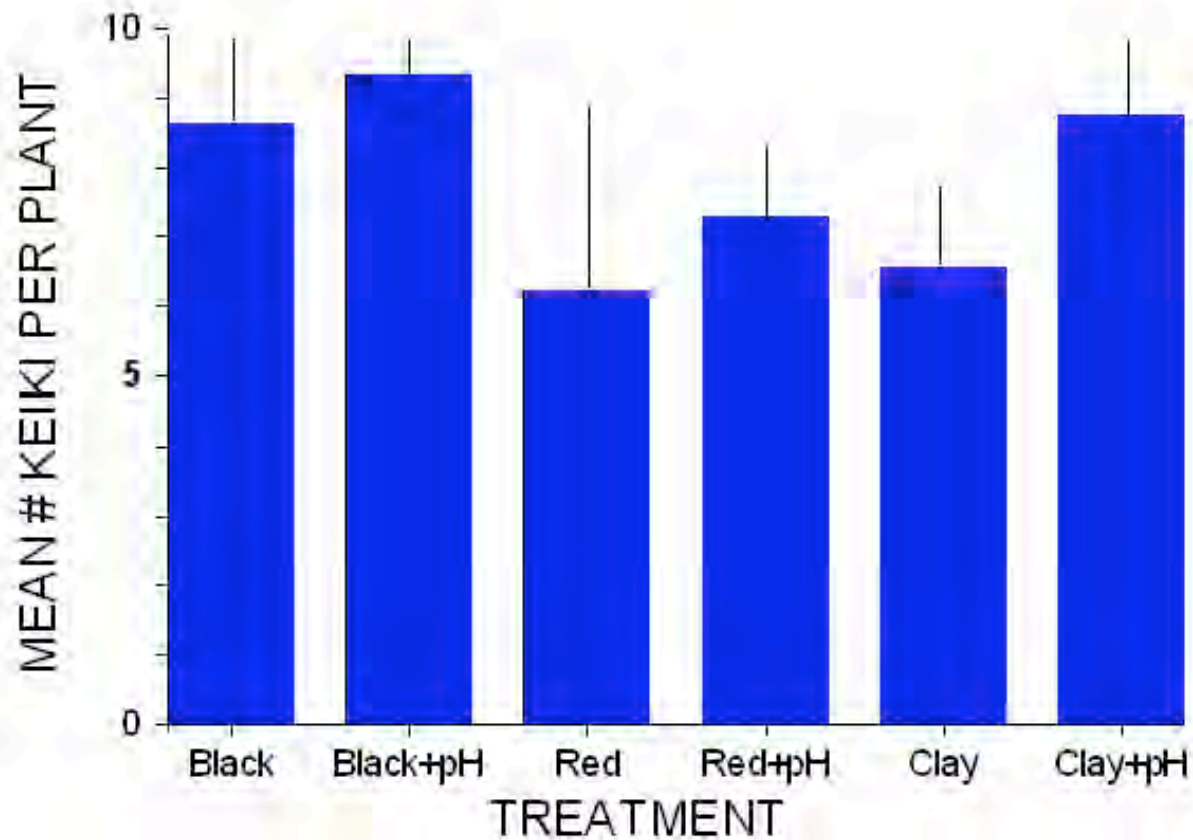
Mean Corm Weight Per Treatment



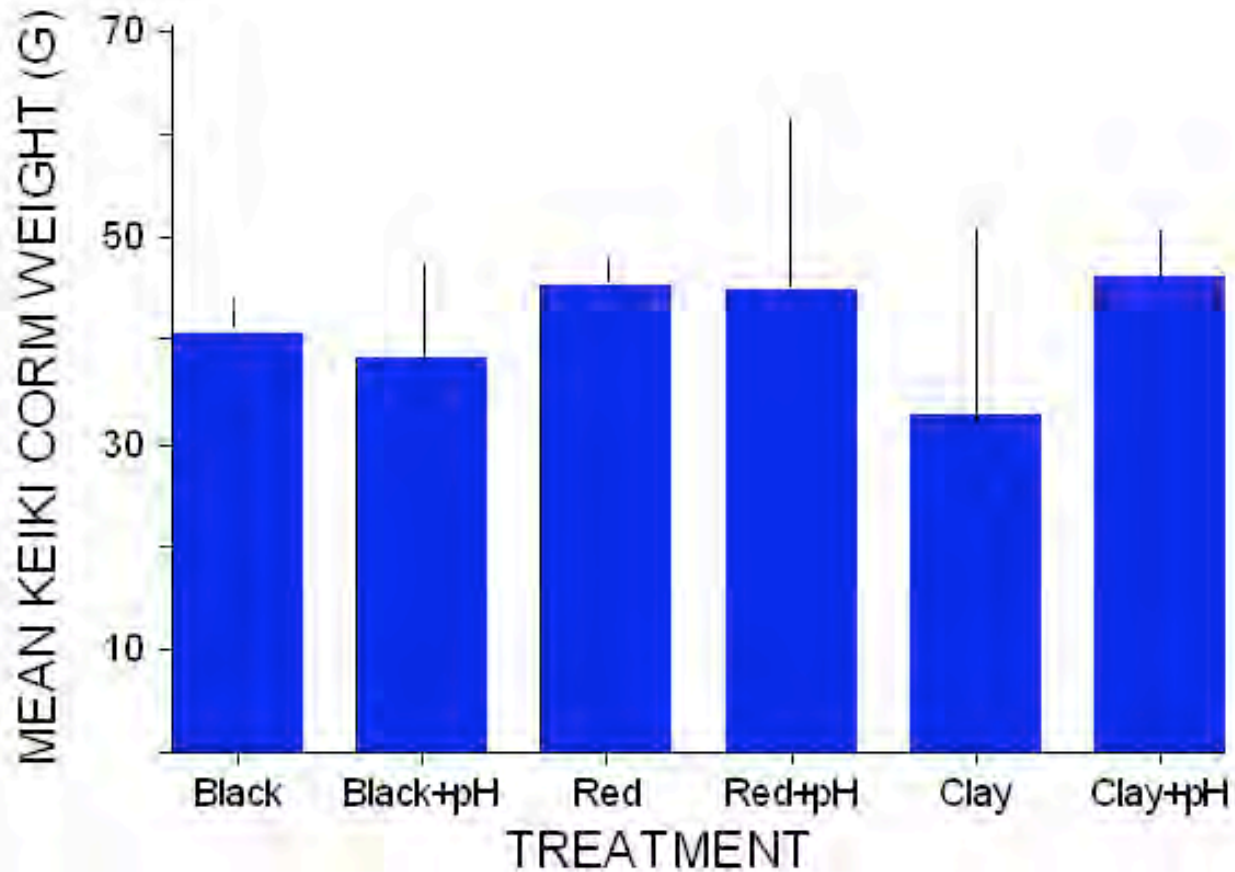
Number of Keiki per Makuia Plant



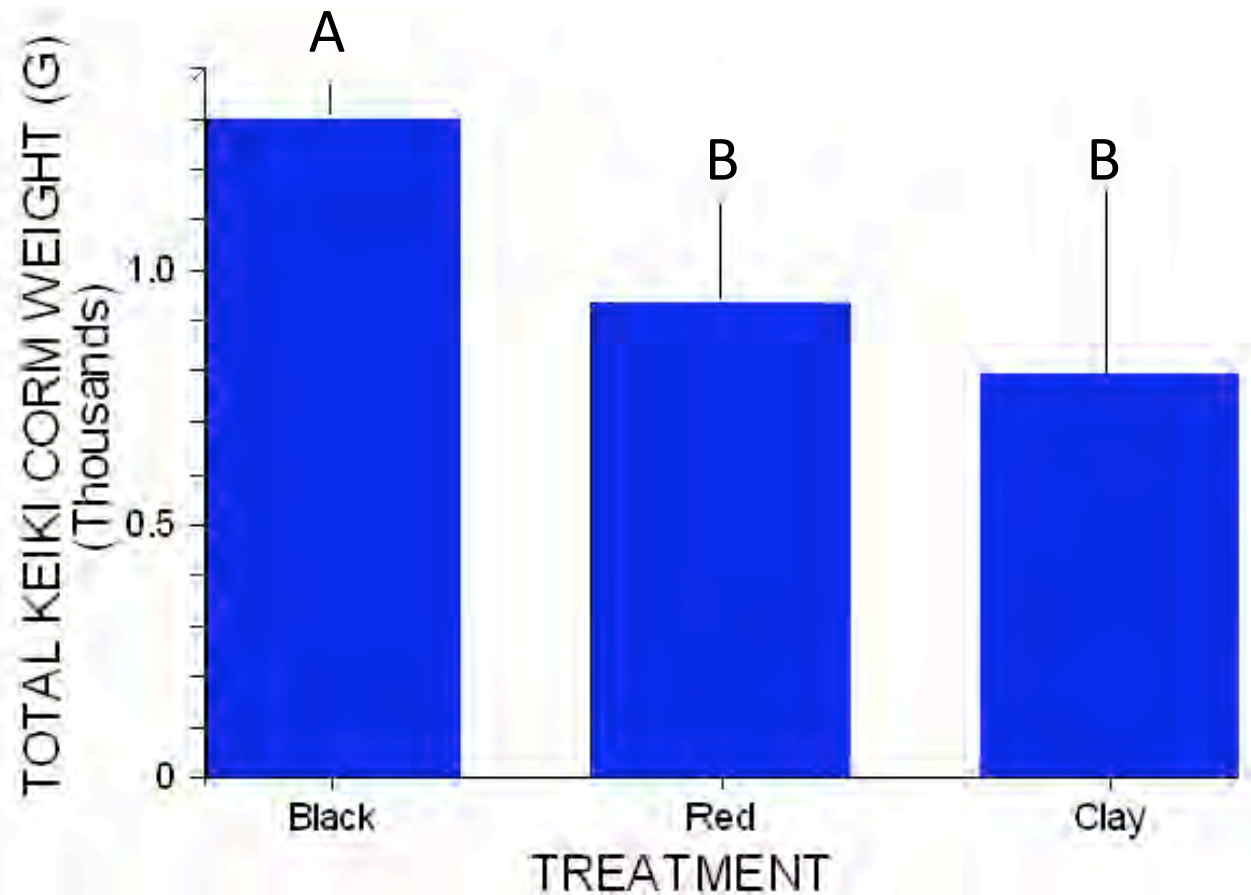
Number of Keiki per Makuia Plant



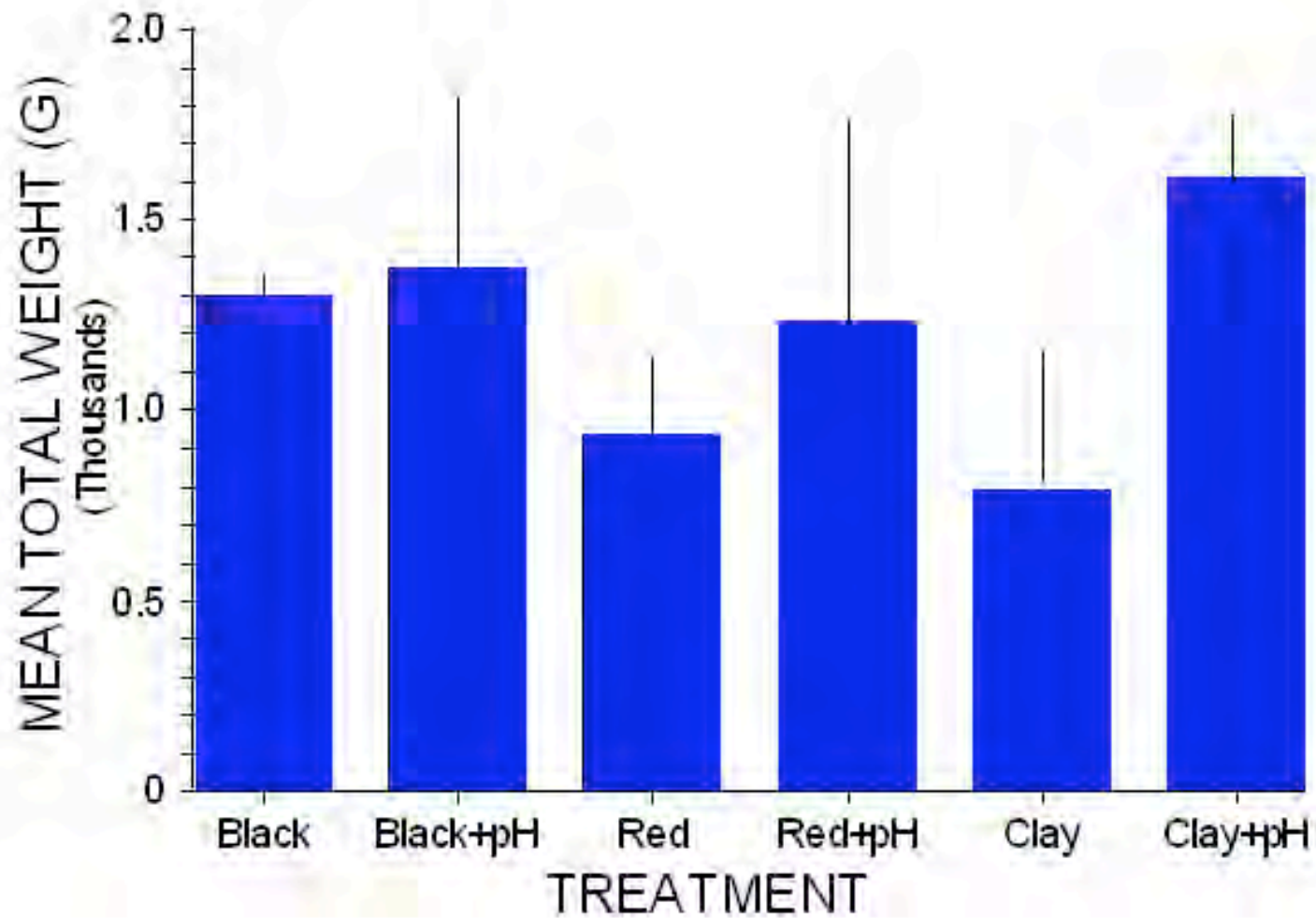
Mean Weight of Keiki Corm per Treatment



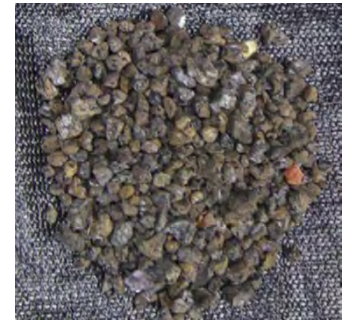
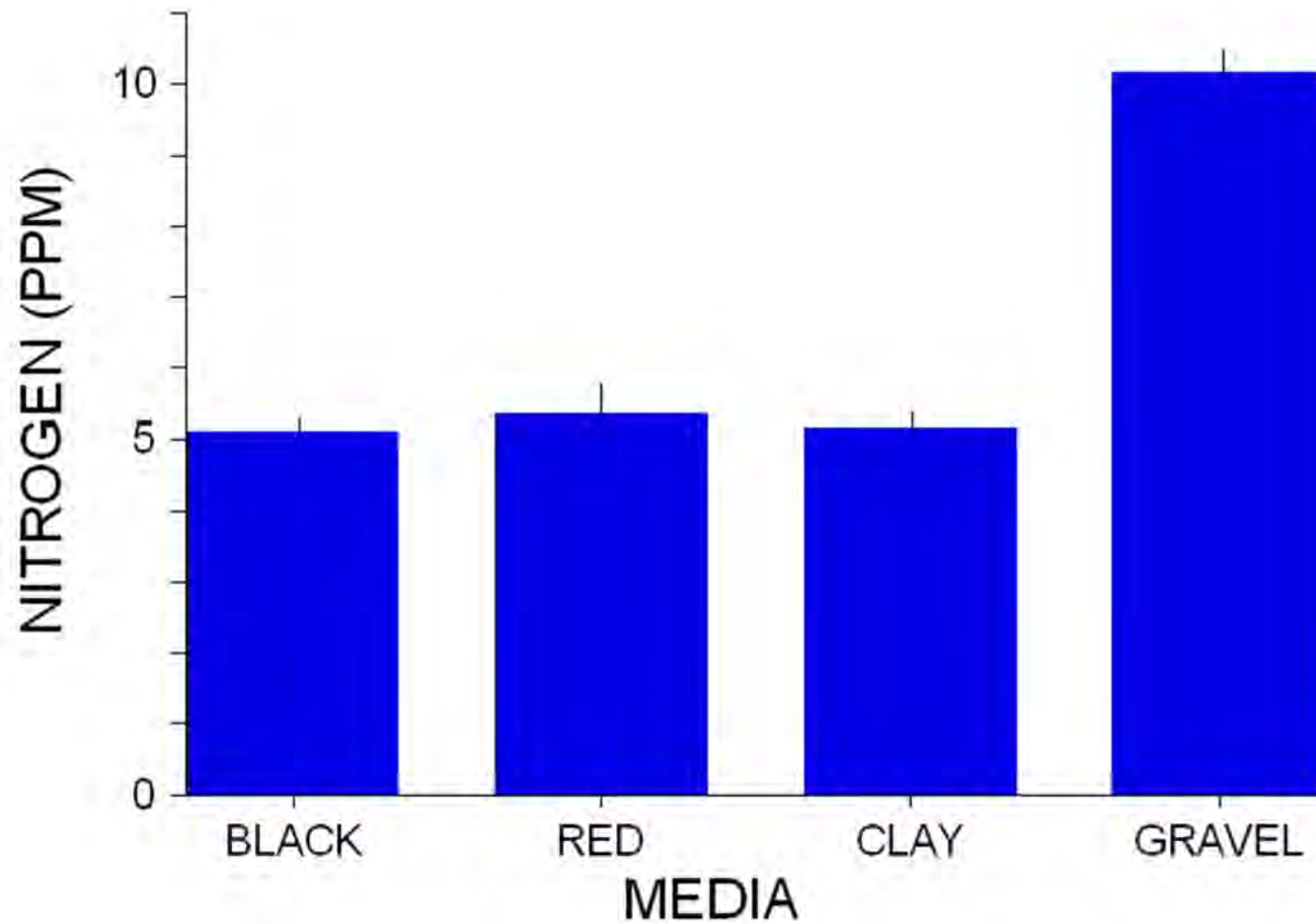
Total Keiki Corm Weight



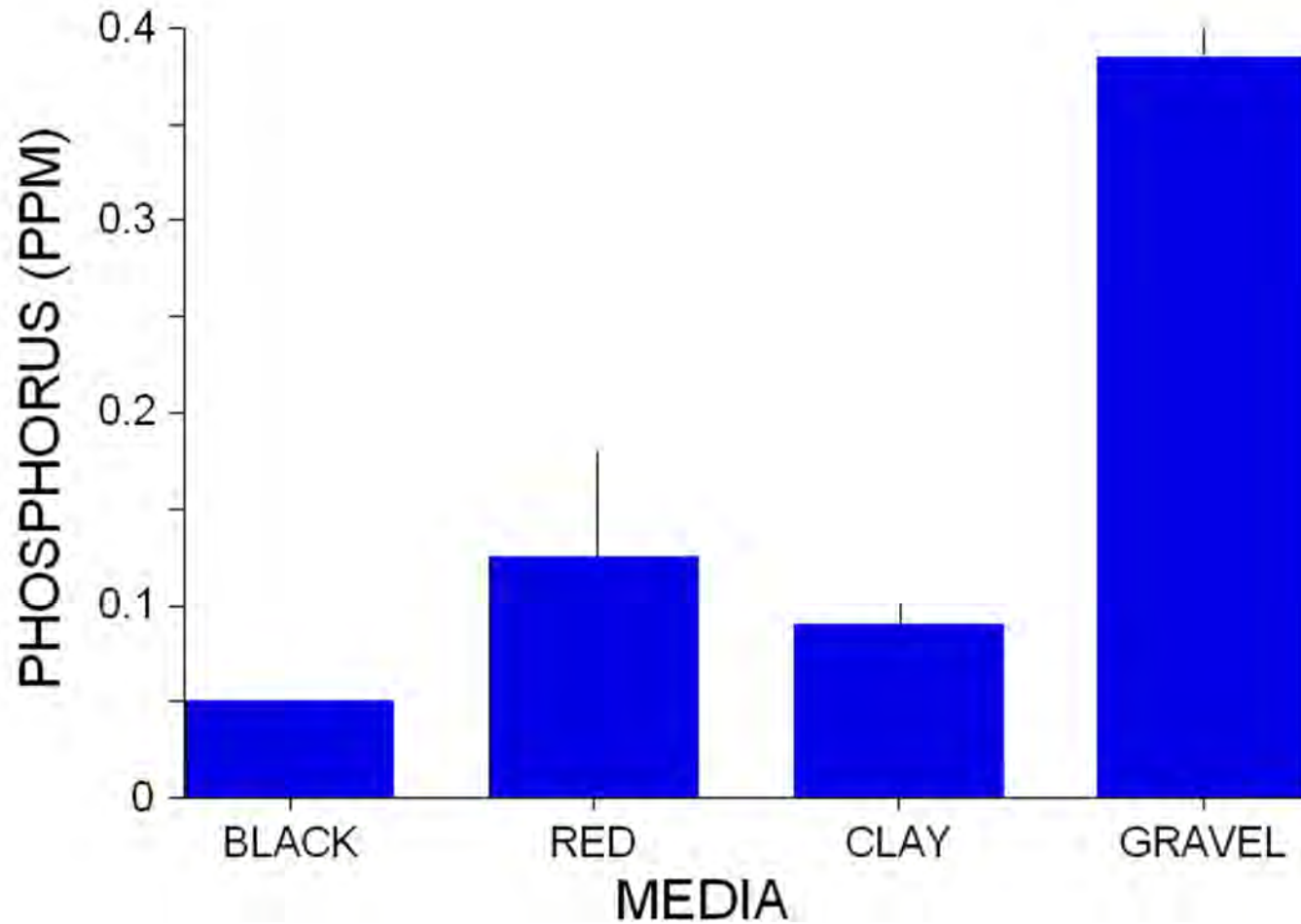
Total Weight of Keiki Plants per Treatment



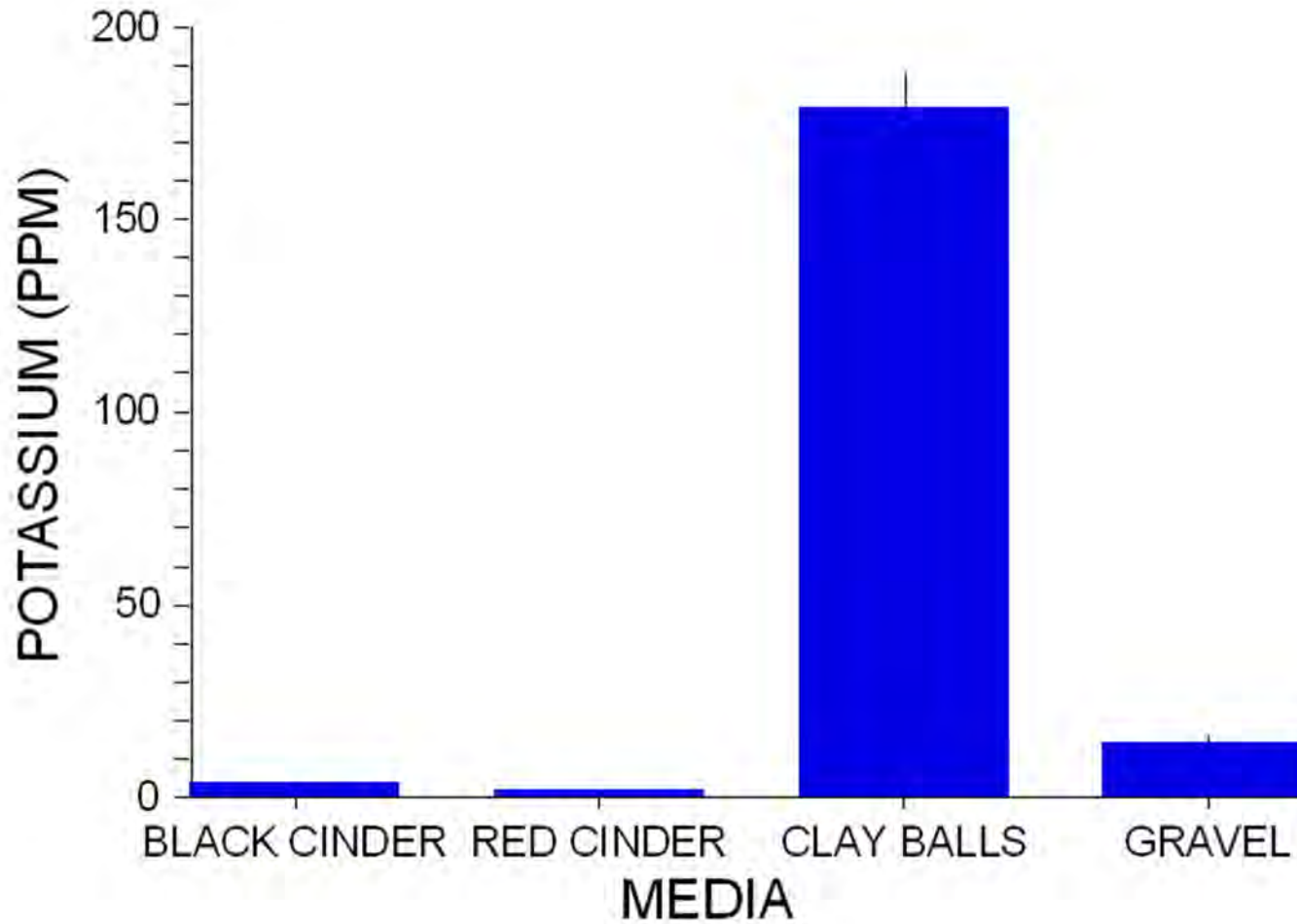
Media Leaching Results



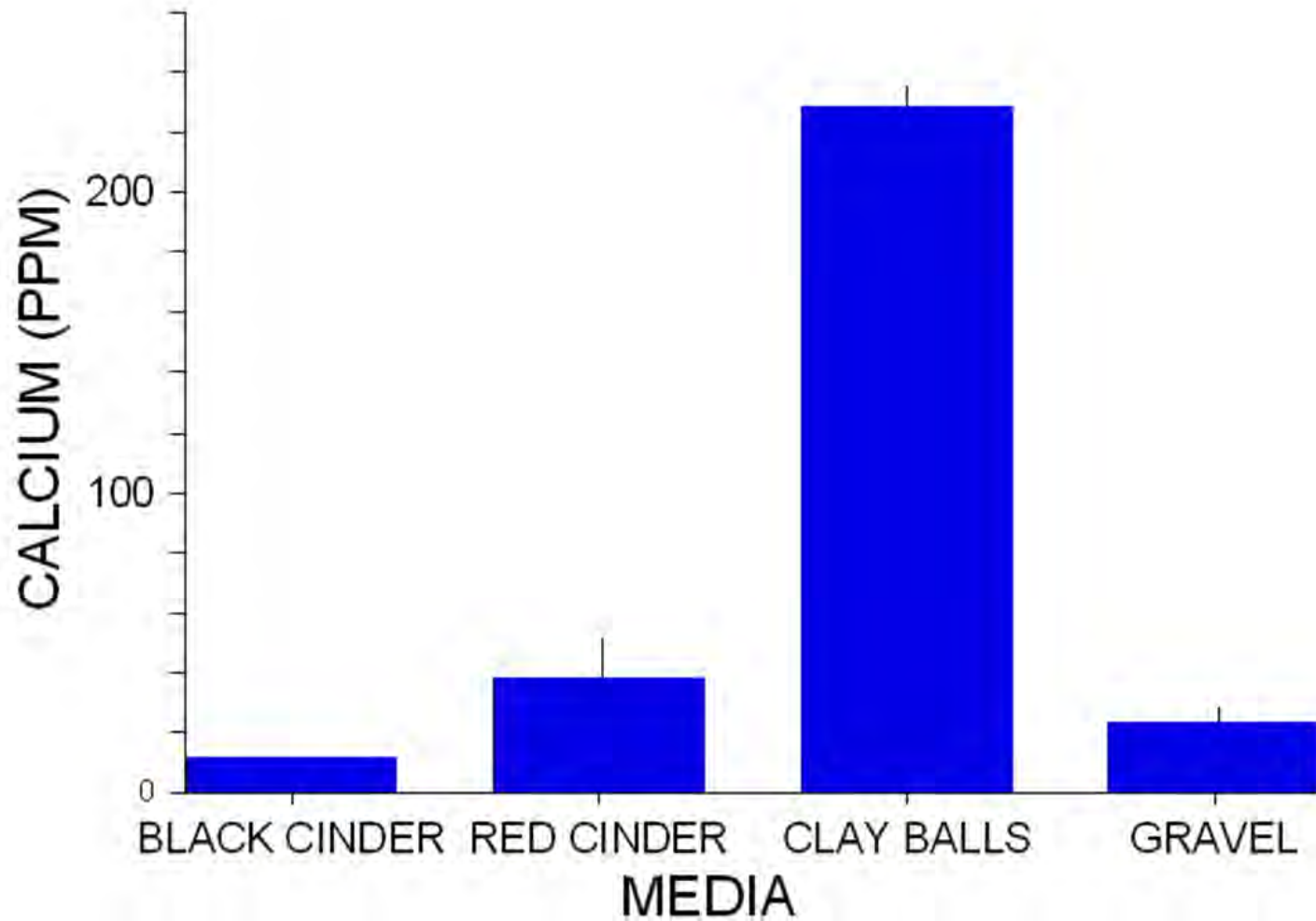
Media Leaching Results



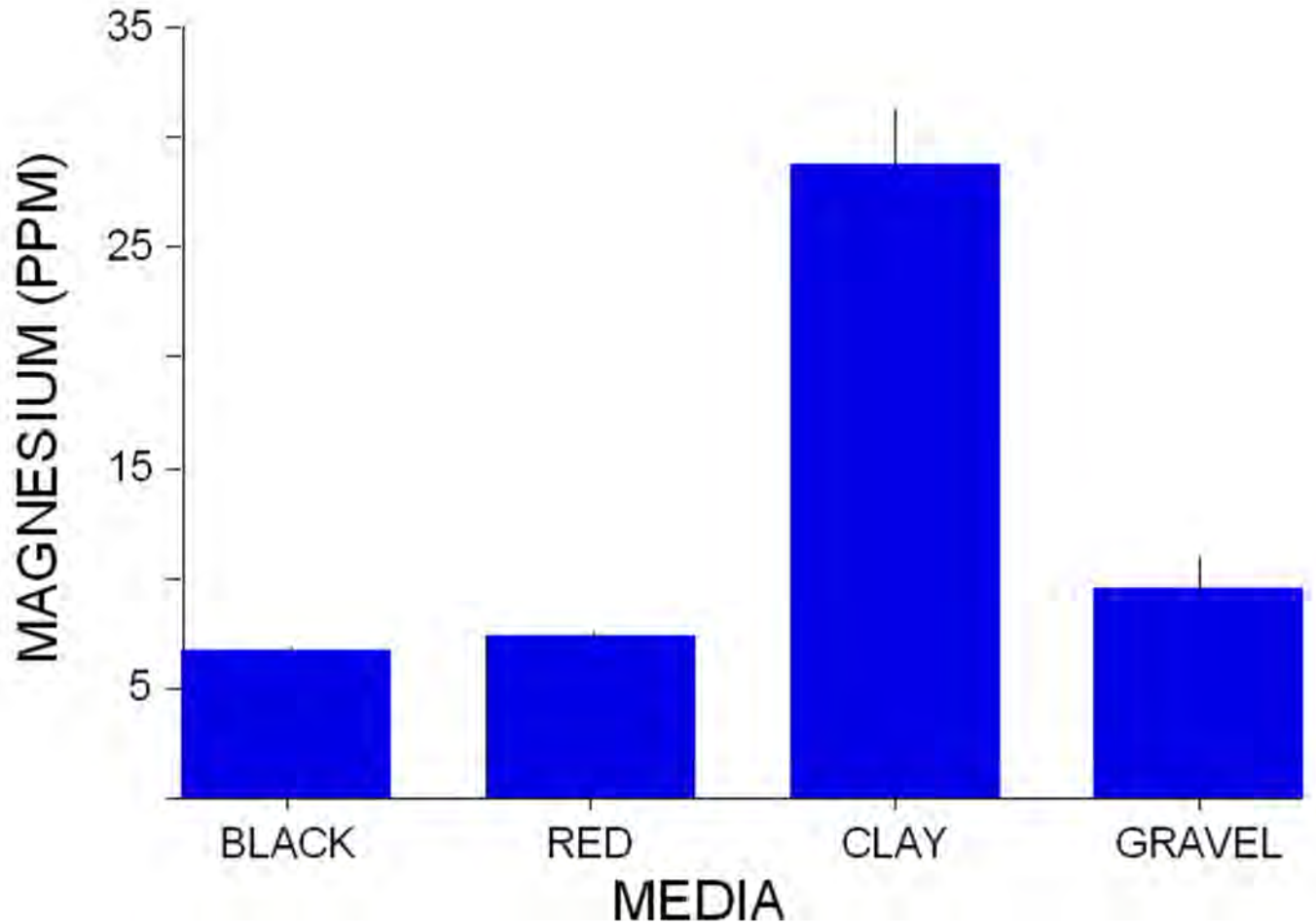
Media Leaching Results



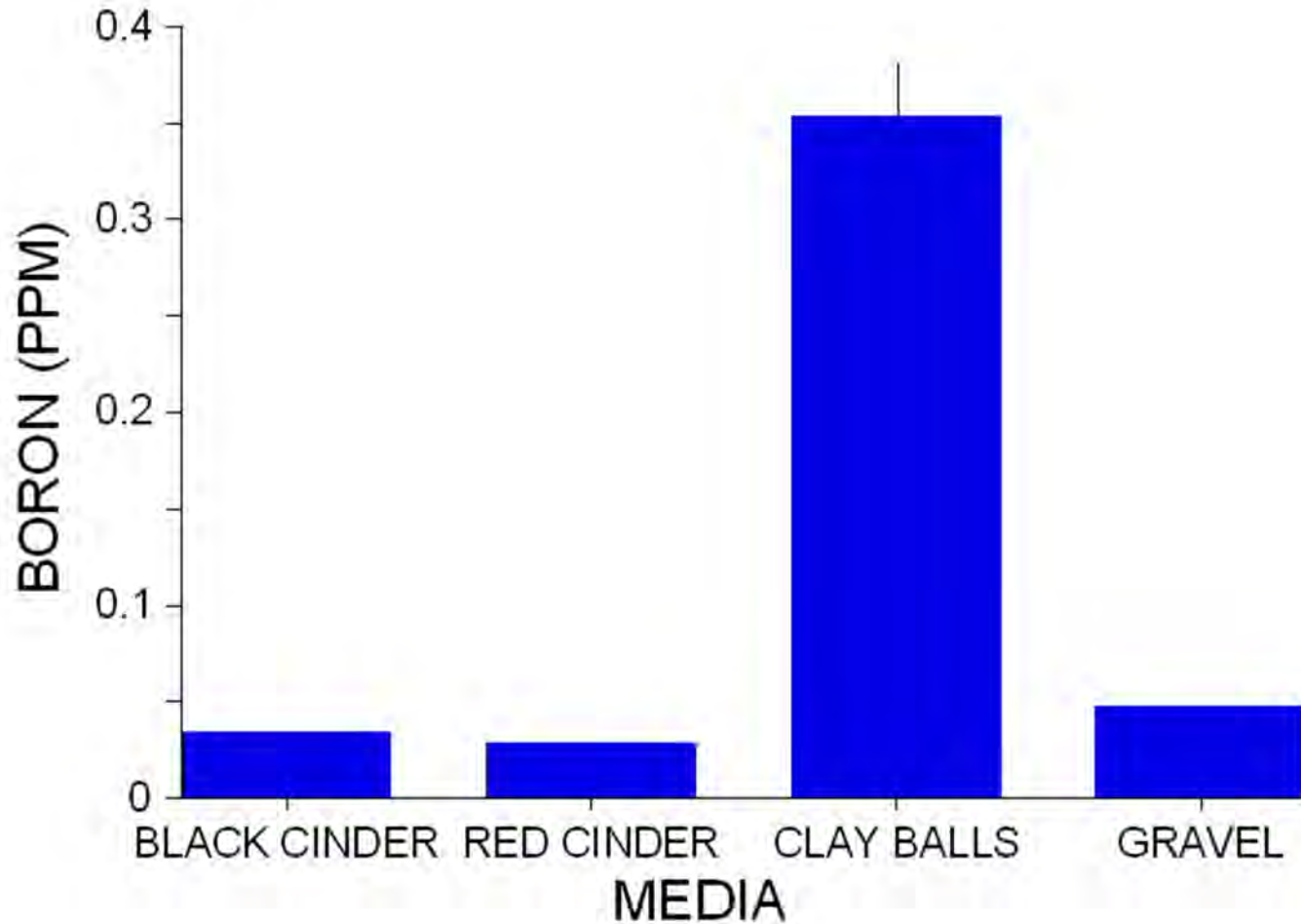
Media Leaching Results



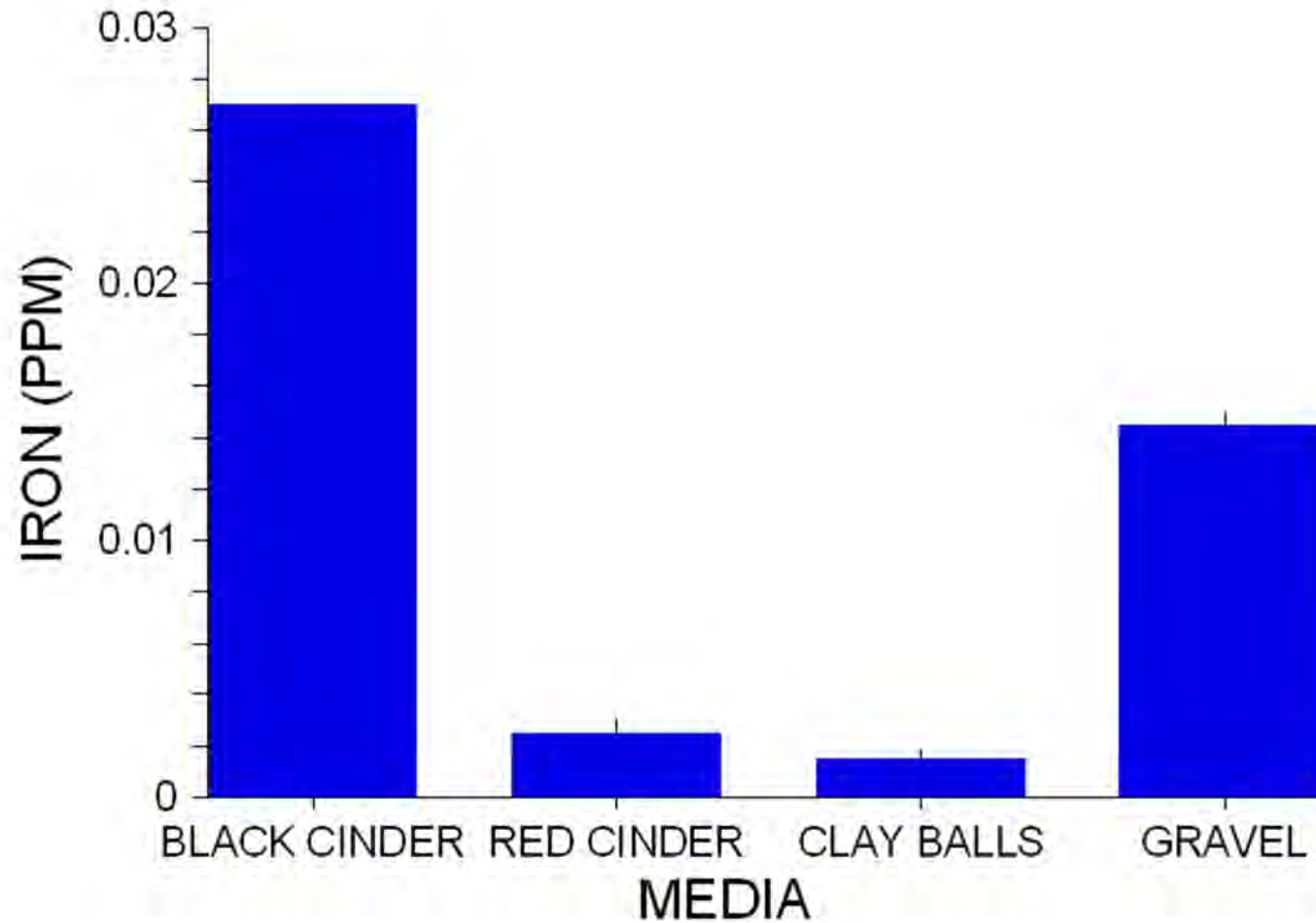
Media Leaching Results



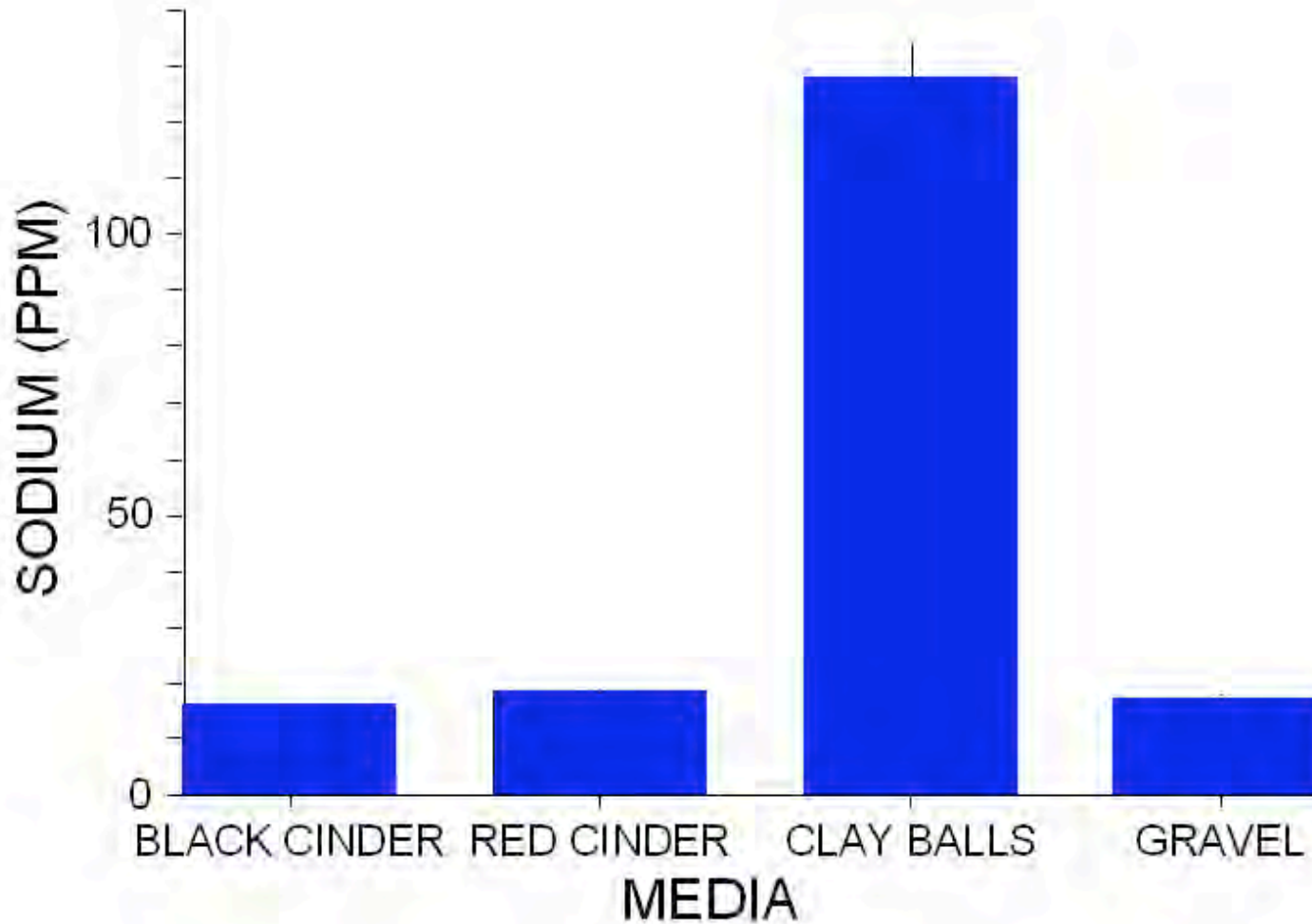
Media Leaching Results



Media Leaching Results



Media Leaching Results



Summary

- Data Collection Analysis (on-going)
- Commercial Farmer/Consumer Considerations
- Trial 2 – investigation of disease pathogen – possible *Phytophthora* & *Pythium* outbreak
- One media – possible use of calcium carbonate for pH remediation.



Nutrient Profiles of Fish Food, Effluent and Static Hydroponic Recipes



WCC Testing Unit



WCC Static Hydroponic Control

Macro and Micro Nutrients	Fish Food (ppm)	WCC Aquaponic System (ppm)	**Static Hydroponic (ppm)
Nitrogen	686,000,000	38.42	158.00
Phosphorus	124,000,000	2.34	40.00
Potassium	75,000,000	9.26	200.00
Calcium	195,000,000	17.88	200.00
Magnesium	18,000,000	8.97	50.00
Iron (Fe)	282	0.04	3.38
Manganese	38	0.12	0.70
Zinc	124	0.08	0.22
Copper	11	0.03	0.40
Boron	9	0.04	0.62

**Hydroponic recipes from: Jones, Resh, Steiner, Wilcox and Snyder

Aknowledgements

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