



Determining the Effects of Saltwater Infiltration on Taro (*Colocasia esculenta*) Production in American Samoa

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Introduction

Tutuila

Aunu'u



Objectives

- Identify the salt tolerance threshold (maximum salt level a crop tolerates without losing productivity) for the most common locally grown taro cultivar (“Lalelei o Samoa”)
- Evaluate a relatively quick, simple method to assess the salt tolerance of 3 different taro cultivars:
 1. Lalelei o Samoa
 2. ASCC-ACNR-2
 3. ASCC-ACNR-3B

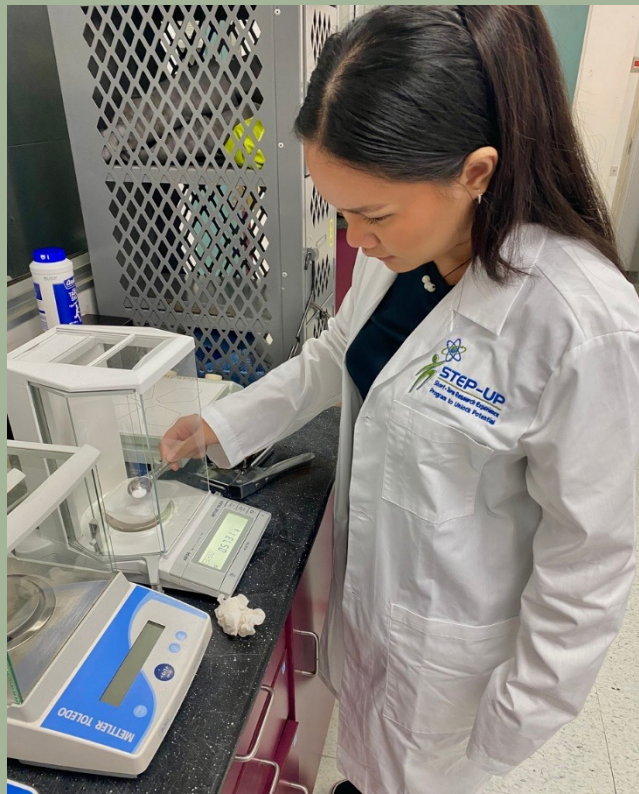
Hypothesis

We anticipate the salt tolerance threshold for “Lalelei o Samoa” taro cultivar to be approximately 20 mM NaCL solution (equivalent to electrical conductivity of 2.3 dS/m).

1. Lalelei o Samoa
2. ASCC-ACNR-2
3. ASCC-ACNR-3B

Methods

NaCl (mM)	0	10	20	30	40	50	100	150
dS/m	0	1.1	2.3	3.4	4.5	5.5	10	16



Step 1: Measure Sodium Chloride in mM for salt concentrations.



Step 2: Cut and weigh taro shoots.



Step 3: Planted taros in pots.



Step 4: Measuring the height of each taro.

Methods

Three taro cultivars were grown at NaCl concentrations of 40 mM and 0 mM, equivalent to 4.5 dS/m and 0 dS/m.

NaCl (mM)	0	40
dS/m	0	4.5

$$\frac{\textit{shoot dry wt.at 4.5 EC}}{\textit{shoot dry wt.at 0 EC}} \times 100$$



Step 1: Preparing buckets for NaCl solution



Step 2: Cut and weigh taros



Step 3: Plant taros in pots



Step 4: Measure the height of taros

Results

The salt tolerance threshold for “Lalelei o Samoa” was found to be at 7.9 mM NaCl, equal to an EC value of 0.79 dS/m.



Results

ASCC-ACNR-2 was the most salt tolerant of the 3 cultivars.

Cultivar Name	Percent Reduction in Dry wt.
Lalelei o Samoa	26.5%
ASCC-ACNR-2	21.2%
ASCC-ACNR-3B	49.3%

Conclusions

- Identifying the salt tolerance threshold for taro will be necessary as sea level rise affects taro production in low-lying areas.
- The method used in this project for rating salt tolerance of new cultivars is simple and quick and should be implemented as a screening method for identifying cultivars suited to areas such as the Aunu'u wetlands affected by increasing salinity.

Future Research

- Allow more time for the taros to grow to see the full effects of salt on taro production.
- We propose to conduct more trials with more cultivars to compare their relative salt tolerance.

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STEP-UP

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Thank You!

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