

## FIRST YEAR TARO IPM PROJECT REPORT

PROJECT FUNDING: Statewide Integrated Pest Management (IPM)  
IPM PROJECT COORDINATOR: Dr. Ronald F.L. Mau, Extension Specialist, Entomology

PROJECT TITLE: Leaf Blight Tolerant Taro Varieties: Promoting Growers Adoption and Food Processor Acceptance

PARTICIPATING PROJECT PERSONNEL (Project Leader First)

Personnel	FTE		FTE
Randall Hamasaki	.10	Alton Arakaki	.10
H. Dale Sato	.10	Robin Shimabuku	.05
Rhoda Yoshino	.10	Steve Fukuda	.15
Naomi Kanehiro	.05	Dwight Sato	<u>.05</u>
			.70%

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### Problem, Goal, Objective

Phytophthora leaf blight is a major production bottleneck for commercial luau (taro leaf) and corm producers. In luau production, the disease cause direct damage to the leaf surface, making it unmarketable. In corm production, the continuous disease pressure on the plant has caused yield reduction and in some cases farmers have reported total crop losses to the disease.

Integrated pest management program has stressed the need to develop and introduce production practices that will achieve greater harmony between production activities and the environment, the project's GPRA goal. Thus introducing cultural methods that lessen the requirements to use chemical alternatives to manage the disease will contribute towards achieving the IPM goal. Dr. Eduardo Trujillo has identified disease tolerant Palauan taro cultivars in his work in the Hamakua area.

The objective of this project is to demonstrate, transfer and promote adoption of non-chemical practices to effectively manage diseases such as phytophthora leaf blight statewide.

### Current Status of Activities

Agricultural extension faculties on all major taro producing islands are conducting field demonstrations for taro farmers on the new blight tolerant cultivars introduced by Dr Trujillo. The cultivars will be evaluated for their blight tolerance capability under local conditions. Depending on important local uses for the taro, faculty are working with industry collaborators to determine the value of the cultivars for leaf production, table taro qualities, poi production and suitability for taro chip production.

### Activity Status

Island/ Personnel	Date Planted /Projected Harvest Date/ Design	Cooperator/ Site	Planting Conditions	Current Status
Molokai/ Alton Arakaki	Sept. 27, 1997/ August 1998/ 3 replication, 15 plants/plot, spacing btwn plts 1', betwn row 5', bun long control	CES Demo Farm/ Hoolehua	Dry land with drip irrigation	16 varieties show signs of maturity/ nematode pressure/ no sign of leaf blight/ dry winter/field day, corm yield-quality evaluation in August 1998.
Oahu/ Steve Fukuda	Jan. 15, 1998/ on going 1/99/ 3 replication, 15 plants/plot, spacing btwn plts 3', betwn row 5', Bun Long control	Shiraki Farm/ Wahiawa	Dry land	Commenced weekly leaf yield data collection starting 6/9/98 / target 8 months of yield data, no blight observed yet/ varieties Bun Long, P1,5,10 & 20
Oahu/ Randy Hamasaki	Previously conducted blight resistant evaluation			Coordinating quality evaluation planned for August
Oahu/ Rhoda Yoshino				Will be conducting quality evaluation planned for August
Oahu/ Naomi Kahehiro				Will be conducting quality evaluation planned for August
#1 Hawaii/ Dwight Sato	May 22, 1998/ Feb-Mar. 1999/ 3 replications, 8 plants/plot, spacing btwn plts 1.5', betwn row 5'	/Pepeekeo	Dry land/ rainfed	2 months old/ incidence of leaf blight will be evaluated later on older plants/ varieties P 1, 8, 10, 13, and 20
#2 Hawaii/ Dwight Sato	July 9, 1998/ 2 replication, 10 plants/plot, spacing btwn plts 1', betwn row 3'	Waiakea Experiment Station	Dry land/ rainfed	plants couple days old/ leaf production data collection start at 4 month old for a period of 1 year, varieties P 8, 10, 13
Maui/ Robin Shimabuku	Nov. 1997/ replicated trial	/Keanae	Wet land	

Island/Personnel	Focus of Evaluation	Future Plans	Huli Distribution
Molokai/ Arakaki	Blight resistance, yield, product quality	Repeat trial to evaluate disease resistance with overhead irrigation	250 -300 hulis from nursery field distributed to growers/ more available in Aug.
Oahu/ Fukuda	Leaf yield, blight resistance		Varieties with production and/or blight resistance qualities
Oahu/ Randy Hamasaki	product quality		
Oahu/ Rhoda Yoshino	product quality		
Oahu/ Naomi Kahehiro	product quality		
#1 Hawaii/ Dwight Sato	Blight resistance, corm yield		Previously distributed to 8 cooperators throughout Big Island/ initial response from growers is positive in resistance and growth
#2 Hawaii/ Dwight Sato	Leaf yield, product quality		
Maui/ Robin Shimabuku	Blight resistance, corm yield		Previously distributed from nursery field

“Work In Progress” (data still being collected)

#### Steve Fukuda Leaf Production Data

Variety	Date Taro Leaf Harvested (lb./45 plants)							
	6/9	6/16	6/23	6/30	7/6	7/14	7/21	Total
Bunlong	17.75	9.75	12.0	9.75	10.50	11.25	12.50	83.50
P1	17.25	9.25	12.25	10.0	9.25	11.0	10.50	79.50
P5	18.25	11.0	11.25	7.75	9.25	12.0	7.50	77.00
P10	8.25	9.00	11.25	10.25	16.50	8.50	11.00	74.75

#### “Point of Interest”

Taste Test of Chicken Lau Lau Wrapped with Palauan Taro Leaves

by Dwight Sato, 5/20/98

n=12, rating 1 to 5, 5 being bad

Palauan Variety	Flavor	Texture	Comments
P-8	1.36	1.45	no acridity
P-10	2.20	2.10	some acridity
P-13	2.27	2.09	some acridity
P-20	2.24	2.55	high acridity
P-1	3.40	3.10	high acridity

initial cooking 1hr 15min, additional cooking eliminate “plenty bite” characteristics

## Assessment of Project Activities/Accomplishments By Island

### **Maui**

**Luuau production trial:** Five Palauan varieties (P1, P5, P7, P8, and P10) are being evaluated for luau production under wetland conditions in Keanae. Interestingly, the grower noted relatively little disease in the plants of the susceptible variety in trial plot as compared to that growing in nearby commercial fields with a solid stand of the susceptible variety. The cooperating grower is already marketing product from the Palauan varieties and is satisfied with their suitability for luau.

**Poi production trial:** In Waihee, three Palauan varieties (P1, P10, and P20) are being evaluated for poi production when grown under wetland conditions. The cooperating grower/commercial poi processor (Aloha Poi Co.) should be able to provide a good evaluation on the suitability of the new varieties for poi production. This crop will be harvested sometime during January-April 1999.

**Distribution of new varieties to growers:** 50 plants each of selected Palauan varieties (P1, P5, P7, P8, and P20) have been established at the Maui Low Elevation Demonstration Farm for use as mother plants. The planting materials will be distributed to growers after completion of the field trials.

Overall, the Investigator feels that the Palauan taro varieties are very promising for luau production. Suitability of these varieties for poi production still needs to be investigated further before an assessment can be made.

### **Molokai**

**Upland taro planting for blight resistance/corm evaluation/planting material distribution:** The plants were not evaluated for disease resistance due to dry weather conditions. The yield and quality evaluation data is currently be processed. A field day and planting material distribution was conducted. 250-300 huli from a nursery field were distributed to growers. Corms were sent to Oahu for a poi taste test on August 14, 1998. The investigator observed that the Palauan taro varieties are subject to rootknot nematode damage like other taro varieties grown under upland conditions. More information on yield and quality will be available after processing the data for the field trial.

**Plans for future work:** The upland planting will be repeated using overhead irrigation to increase blight incidence. The cultivars will again be evaluated for yield and quality in addition to disease tolerance.

### **Oahu**

**Luuau production trial:** Three Palauan taro varieties (P1, P5, and P10) are being evaluated for luau production under upland conditions in Poamoho with a commercial grower (R. Shiraki). Disease incidence was very low even in the susceptible variety due to dry winter conditions. The investigator has begun to collect weekly yield data and plans to do so for one year. Trials for luau suitability is expected to begin around October 1998. The investigator plans to work cooperatively on the luau suitability trials with a commercial processor (Hawaii Food Products). The Oahu team will also investigate possible objective assessment methods (instrumentation) for leaf texture, acridity, etc.

**Poi production trial:** Two Palauan taro varieties (P1 and P20) are being grown under wetland conditions in Haleiwa (HPC Foods, Ltd.). The crop is expected to be harvested sometime during March-April 1999. A poi taste test for wetland grown taro is being planned for Oahu when the crop is harvested.

**Poi taste test of upland grown Palauan taro:** Six Palauan taro varieties (P1, P2, P7, P12, P13, and P20) were evaluated by a taste test panel for suitability for poi. The taro was grown in

Molokai and processed into poi by a commercial processor (HPC, Inc.). The poi samples made from the Palauan taro varieties received lower ratings for flavor, texture, and color as compared to the commercial poi used as a standard (Taro Brand Poi-HPC, Inc.). It is the investigator's opinion that the color of the poi has a tremendous influence on the perception of the consumer. A dark purple poi would probably be most favorable. The upland grown Palauan taro varieties produced a lighter colored poi than the commercial standard. It is thought that the color characteristic could be improved when certain varieties are grown under wetland conditions. The planned poi taste test with wetland grown taro in March-April 1999 will confirm/refute this supposition. The team strongly suggests that plant breeding be conducted to obtain cultivars with blight tolerance and desirable poi color/textural/flavor characteristics.

Distribution of planting material to growers: 30-60 plants each of selected Palauan taro varieties (P1, P5, P10, P20) were established at the Urban Garden Center for use as mother plants in the Oahu planting material distribution program. It is estimated that the planting material will be ready for distribution sometime during January-February 1999. An educational session on the disease resistant taro varieties will be held at the time of distribution. A taste test may also be held at the same time depending on availability of product.

Expected Impacts: A small amount of Palauan taro is currently being marketed for luau on Oahu. It is expected that the Palauan taro varieties will be marketed more extensively for luau in the future as growers obtain more planting material. It is expected that more growers will use the Palauan varieties after the planting material is released as planned sometime in January-February 1999. Industry acceptance of the Palauan varieties for making poi will be more challenging. We hope to obtain more information on suitability for poi after the taste test of wetland grown Palauan taro varieties (planned for sometime in March-April 1999).

## Hawaii

Luau production trial: The investigator feels that P8 appears promising for luau production because of its low acridity factor (determined through taste testing), production of numerous side-shoots, and the light green color of the petiole and leaf veins.

Poi production: The investigator feels that the Palauan varieties P1, P20, and P10 appears promising for poi production.

Table taro production trial: The investigator feels that P13 is promising for use as a table taro (small scale trial was completed).

Distribution of planting material to growers: Blight tolerant taro varieties were released to 8 commercial growers on the Island of Hawaii.

Plans for future work: The investigator plans to estimate per acre yield of the Palauan taro varieties. Disease resistance evaluation will be conducted in conjunction with a corm evaluation trial (larger trial being planned).

Expected project impacts: The investigator feels that the CTAHR should consider the release of the promising varieties as CTAHR selections (naming selected cultivars). Also, the team should develop an informational leaflet discussing the performance (yield, disease tolerance, suitability for various taro uses) of the cultivars based on the Statewide trials. This informational leaflet should be made available when the planting materials are distributed or sold.