

# DOFAW

## Oahu Native Ecosystems Protection and Management

### 2015 Report to the Hawaii Invasive Species Council



#### Oahu Release of Strawberry Guava Biological Control Agent (*Tectococcus ovatus*)

Strawberry guava is one of the most ecologically damaging invasive species in Hawaii. The highly anticipated bio-control agent, *Tectococcus ovatus*, was approved for release in 2014 and promises to have positive effects on slowing the spread of strawberry guava. In order to become successfully established in the wild, the agent needs to be introduced to appropriate sites across the landscape. The release of *T. ovatus* requires significant resources including nursery facilities for the inoculation of *T. ovatus* onto strawberry guava seedlings and ongoing site preparation and monitoring.



Work has already begun on this project. In 2013, efforts at the DOFAW Makiki nursery were initiated to begin propagation of strawberry guava in preparation for the upcoming release. Unfortunately, the lack of a full time nursery manager made it difficult to keep up with sanitation protocols and an infestation of the lobate lac scale (*Paratachardina pseudolobata*) was discovered and the plants were destroyed. Staff searched for an alternative nursery to

propagate strawberry guava and with the help of the additional HISC funding were able to utilize the Nike Rare Plant Facility to support the propagation and inoculation of strawberry guava until a full-time Makiki nursery manager could be hired.

In 2014, a full time nursery manager was hired and the nursery was brought up to sanitation guidelines. In 2015 propagation of strawberry guava was again initiated at the Makiki nursery. Staff trialed propagation by seeds and seedlings transplanted from the wild. It was believed that seedlings would help speed up the propagation timeline but the effort required to clean the seedlings along with the lower survival rate makes transplanting seedlings less desirable over propagation via seeds.

In Fiscal Year 2015 (FY15) staff worked collaboratively with multiple agencies to begin vamping up introduction efforts across the island of Oahu. Table 1 details the prep and introduction work conducted in FY15. Long term monitoring sites were installed at both Pahole Natural Area Reserve and Poamoho Forest Reserve in 2012 prior to inoculations. Inoculations of sites was initiated at the Poamoho monitoring site in March 2014 and at Pahole monitoring site in June 2014. Staff continued implementation of the monitoring protocol developed by U.S. Department of Agriculture to monitor sites where *T. ovatus* was introduced, record fruit and seed collections and enter data into the NEPM database. Sites were checked once per month with the exception of the months of October and November when buckets were checked every 2 weeks during the fruiting season. On July 23, 2014 a transect was installed along Pahole rim management trail per personal communication with Tracy Johnson from US Department of Agriculture. This transect will aid in determining rate of spread. The transect was monitored twice during FY15. No galls were observed along the transect in FY15.

'Keiki paste' is a shoot hormone often used for rare plant propagation. Staff trialed 2 rates of keiki paste (1000 ppm, 1200 ppm) to use at introduction sites to help aid in new shoot development which the *T. ovatus* require for gall production. The paste did not aid in shoot development and use was discontinued.

Table 1 details inoculation work conducted by Koolau Mountains Watershed Partnership (KMWP), Waiane Mountains Watershed Partnership (WMWP) and Oahu NARs and is broken down by Quarter. In FY15 a total of 108 inoculated plants were outplanted at 20 sites. Of those sites, 16 were newly established sites. Figure 1 depicts the total number of inoculation sites installed on the Island of Oahu as of June 31, 2015.



Keiki paste at 1200 ppm

An additional 8 inoculated plants were provided to Ohulehule for introduction at Waikane valley. Staff also worked with Waimea Valley to train and assist Waimea staff in *T. ovatus* introductions. Six plants were provided for introduction and one plant was provided for use in inoculation at their onsite nursery facilities.

Table 1: Site Location and Introduction Timeline

	DATE	Organization	Location	Site ID	# plants introduced	Notes
Q1 July-Sept 2014	7/29/2014	NARS	Pahole	PAH-tecova-03, 04, 05, 06	---	Site check for intros and additional cutting performed (original prep conducted on 4/1/14)
	8/18/2014	NARS	Pahole	PAH-tecova-03, 04, 05, 06	18	Smaller sites spread out along fenceline, additional cutting performed
	8/20/2014	NARS	Pahole	PAH-tecova-01	2	Added more plants to bucket monitoring site and performed additional cutting (original intro on 6/11/14)
	9/4/2014	NARS/WMWP	Makaleha	LEH-tecova-01 & 02	12	Kaala FAA road (site prep on 5/7/2014)
	9/30/2014	NARS	Pahole	PAH-tecova-08	9	Original site prep on 7/29/14
Q2 Oct-Dec	11/25/2014	NARS	Waimea Botanical Garden	WBG-tecova-01	7	Trained and assisted in site preparation and introduction
Q3 January- March 2015	1/14/2015	NARS	Kapuna	KAP-tecova- 02, 03, 04, 05	---	Site prep (introduced on 4/30/2015)
	1/27/2015	KWMP	Halawa	LAW-tecova-01	5	1 site
	2/26/15	WMWP	Kapuna	KAP-tecova-06	---	Site prep conducted by WMWP (large site cleared)
	3/18/2015	NARS	Pahole	PAH-tecova- 05, 06, 07	5	Supplemented additional plants to sites
	3/19/2015	KMWP	Manana	---	--	Site prep, 3 sites (14 plants released on 7/25/2015)
	3/19/2015	NARS	Pahole	PAH-tecova-01	3	Supplemented additional plants to monitoring site
Q4 April-June 2015	4/28/2015	NARS	Kapuna	KAP-tecova-01	2	No prep, site was established from previous fenceline clearing work
	4/30/2015	NARS	Kapuna	KAP-tecova-02, 03, 04, 05	10	4 sites
	6/23/2015	WMWP	Waianae Kai	WAI-tecova-01 & 02	10	2 sites

	6/30/2015	NARS	Kapuna	KAP-tecova-06	6	Large site prepped by WMWP
	7/1/2015	KMWP	Kului	KUI-tecova-01	5	1 site
<b>TOTAL SITES</b>		<b>20</b>	<b>TOTAL INTRODUCED PLANTS</b>		<b>108</b>	

Figure 1: Map of *Tectococcus ovatus* inoculations from June 20, 2015

