

FINAL REPORT

to

Hawai`i Invasive Species Council

from

UNIVERSITY OF HAWAII

Office of Research Services
2440 Campus Road, Box 368
Honolulu, HI 96822

**Pacific Cooperative Studies Unit
University of Hawai`i at Mānoa**

Hawai`i Ant Lab Core funding 2017

Jan 1 2017 to Dec 31 2018

Summary

The Hawai`i Ant Lab (HAL) is a project of the Pacific Cooperative Studies Unit (PCSU), University of Hawai`i. Core activities are jointly funded by the Hawai`i Department of Agriculture, and the Hawai`i Invasive Species Council (HISC) and the Hawai`i Department of Agriculture (HDOA). This agreement relates to the provision of core funds that will allow the Hawai`i Ant Lab to provide ongoing support to the HISC and island Invasive Species Committees and maintains a “critical mass” needed to provide these support services.

The HAL is a point-of-contact for conservation agencies, industry and members of the public on any matter involving identification and control of invasive ants. The HAL is developing a regional and global reputation as a center of excellence and cutting-edge research on biosecurity, pest ant management and ant taxonomy. Daily services provided by the Hawai`i Ant Lab include the following:

- Operates and maintains a 24/7 telephone contact service for members of the public.
- Provides a diagnostic service to members of the public and other conservation agencies.
- Develop, update and promote the www.littlefireants.com website
- Manages the HAL web-based discussion group.
- Produces “fact sheets” providing practical advice to residents and industry.
- Provides ongoing advice, expertise and assistance to island invasive species committees as needed.
- Regular speaking engagements to associations and societies, public displays.
- Conduct monthly training days for residents and industry groups.
- Provides training in identification, awareness and control practices to other agencies such as island ISCs, Hawai`i Department of Agriculture and DLNR.
- Manages new detections of LFA on neighbor islands, develops and implements eradication plans for these.
- Prevent and mitigate infestations that threaten public safety or act as vectors for inter- and intra- island spread of invasive ants.

General metrics

A total of 10,425 persons interacted in some way with staff from Hawai'i Ant Lab in 2017 (Table 1). Attendance at ant management clinics was lower than expected and this may be due to cooler weather and heavier rain than normally experienced.

Table 1. General metrics for Hawai'i Ant Lab in 2017.

	2017 target	1 Jan to 30 June 2017	1 July to 31 Dec 2017	Total
public calls and emails	700 walk-ins, emails	394	427	821
public walk-ins	and phone calls	180	208	388
total		574	635	1,109
public ant samples	300	612	726	1,338
website visits	5,000	2,877	2,187	5,064
interaction at presentations	1,500	1,570	499	2,069
Ant management clinic participants	11 clinics & 200 participants	6 65	4 45	10 110
total		5,698	4,727	10,425

Prevention activities

The risk of inter-island spread has become a front-line issue in recent times with the discovery of new LFA incursions on Oahu and new detections on Maui. HAL addressed these threats by:

- Increasing the frequency of point-of-entry surveys at airports and seaports on the Big Island.
- Applied bait treatments at infested seaports and airports. This particularly applies to Hilo passenger terminal where a large portion of the car parking area is infested.
- Continue to engage with the nursery industry, pesticide retailers, small-scale plant vendors and consumers.

The intra-island spread of LFA on Hawai'i Island is also a major concern. While this spread can not be prevented, HAL will work to reduce the rate of spread. Strategies to achieve this include:

- Developing risk minimization procedures for county of Hawai'i green waste facilities and monthly monitoring of pest status at the facilities.
- Monitor, and where necessary, treat infested areas where these pose an increased risk of further spread.

Achievements in 2017

Point of entry surveys and bait treatments

Frequency of point of entry surveys is determined by risk and previous survey results. Sites with known LFA populations are surveyed every 3 months and those without are surveyed every 6 months. When LFA are detected, the site is treated on a regular basis. Table 2 below outlines the number of surveys and treatments applied at points of entry for Hawai'i island.

Table 2. summary of surveys and treatment of points of entry on Hawai`i island.

Location	target	1 Jan to 30 June 2017	1 July to 31 Dec 2017	Total for 2017
Surveys				
Hilo airport (ITO)	4	2	2	4
Hilo seaport (HSP)	4	1	1	2
Kawaihae seaport (KSP)	2	1	4	5
Kona airport (KOA)	2	2	0	2
	12	6	-	13
Treatments				
Kawaihae sea port	As needed		3	3
Hilo Seaport (HSP)	As needed	1	-	1
Hilo airport (ITO)	As needed	1	-	1

Industry engagement

Funds from this contract have been levered against USDA Farm Bill funds to implement a program of vendor education across the Big Island (USDA APHIS agreement #63000000876). Often, sales associates at garden centers and hardware stores have insufficient knowledge to advise customers on LFA control products. HAL will provide training and advice to these sales associates which will greatly assist consumer knowledge and serve to increase the efficacy of control operations while reducing pesticide use by residents.

County of Hawai`i green-waste processing

HAL has worked with the County of Hawai`i to modify the processing of green waste at the Hilo and Kona facilities. The new process includes partial composting of waste which raises temperatures to over 130 F. over three days. This destroys invasive species including ants, Coconut Rhinoceros Beetles, vectors for Rapid Ohia Death, and possibly Rat Lungworm Disease. HAL monitors both facilities on a 1-2 month basis for LFA and reports these surveys on the website (Table 3). Together, the new practices and monitoring activities have substantially reduced the contamination risks associated with county mulch.

Table 3. summary of survey activities at green waste processing locations on the Big Island.

Location	target	1 Jan to 30 June 2017	1 July to 31 Dec 2017	Total for 2017
Surveys				
Hilo Green-waste	8	4	4	8
Waikoloa Green-waste	8	3	5	8

Response activities

LFA Oahu

Over the past two years, HAL has managed the eradication program for infested sites at Waimanalo and Mililani Mauka. The treatment phase has been completed and no ants can be detected at either site. Ongoing monitoring is necessary for a minimum period of three years to ensure no colonies remain. New LFA outbreaks continue to be discovered (Figure 1), mostly in the Waimanalo area where many larger nurseries operate. As new infestations are detected, treatment and follow-up monitoring are implemented until no LFA are detected. These sites are also flagged for additional survey activities.

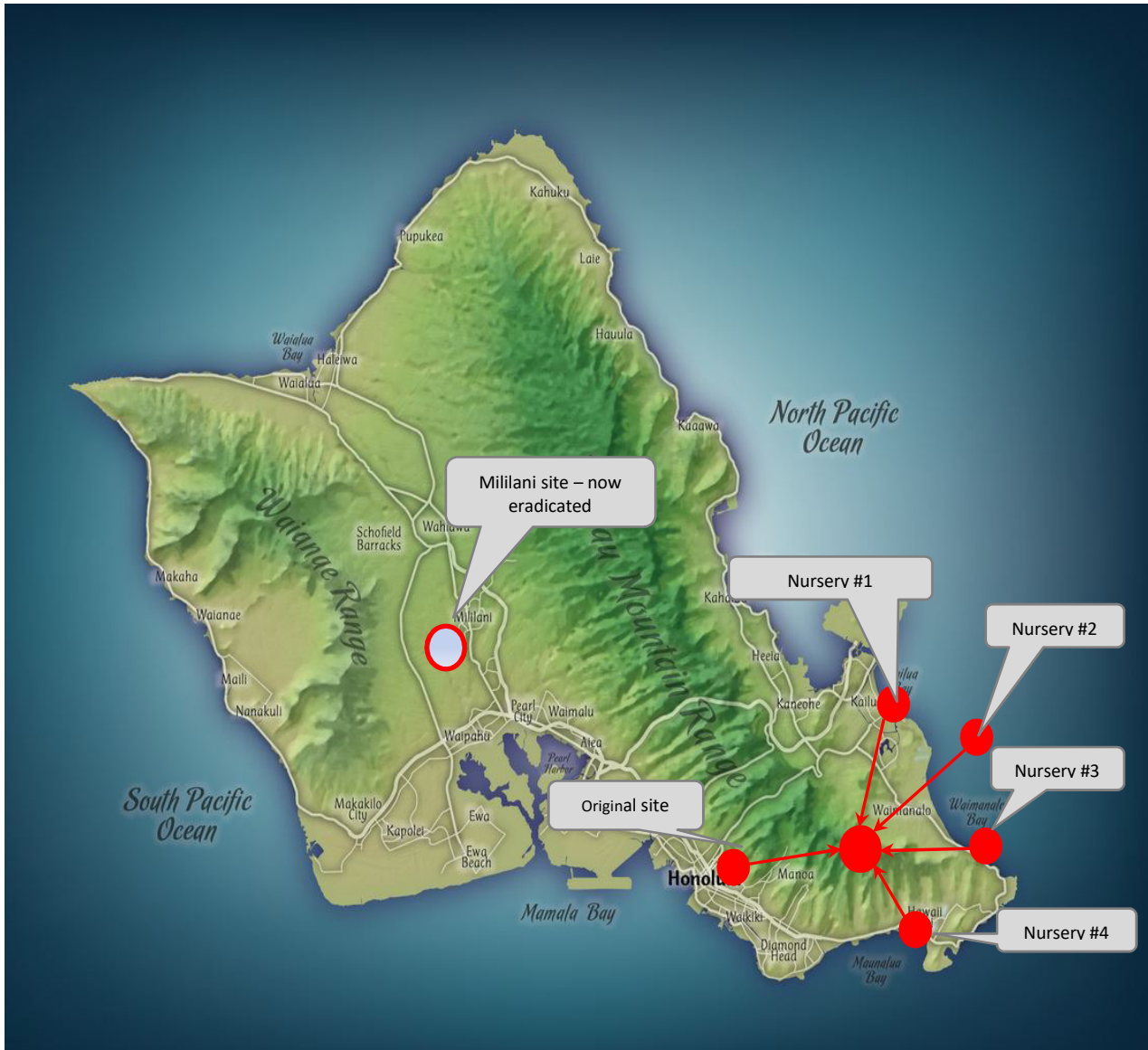


Figure1. Location of current infested locations on Oahu (2017).

LFA Maui

There are several established LFA populations on Maui (Figure 2). One site, located at Waihe`e is a small remnant outbreak of an infestation treated in 2009-2010. Follow-up monitoring revealed a small infested area beyond the original treatment boundary. This may have been an undetected colony or more likely, a result of within-property movement of risk materials such as green waste.

A second infestation, located at Huelo spans approximately six acres. This site has been treated throughout 2015 and 2016. However, one resident actively resisted the treatment program which delayed treatment activities. This delay resulted in a rebound of LFA population density at this site which required the treatment program to be

extended, including not allowing access to the property. These actions have severely compromised progress at this site. Treatment of adjoining properties will continue where possible.

Containment activities at a large >20 acre infestation at Nahiku have continued. This site is bisected by several streams and some parts of this site are not accessible on foot. Efforts to delimit this infestation are needed to identify infestation boundaries. A Special Local Need permit (HI-SLN180001) has been sought and granted to allow this site to be treated by aerial means. This permit will allow treatment of previously inaccessible parts of this infestation with Altosid (a methoprene concentrate).

A new infestation was recently discovered at Kapalua. Spanning approximately ten acres, this site has been treated 8 times and LFA are now restricted to two small “hotspots” where treatments continue. These hotspots, are invariably associated with larger trees where bait can not be applied effectively into the crowns. This results in canopy colonies not receiving adequate bait amounts and necessitates additional treatment and monitoring activities.

Additional outbreaks have recently been detected by surveys conducted by the Maui Invasive Species Committee. HAL works with MISC in providing guidance and treatment applications as required.

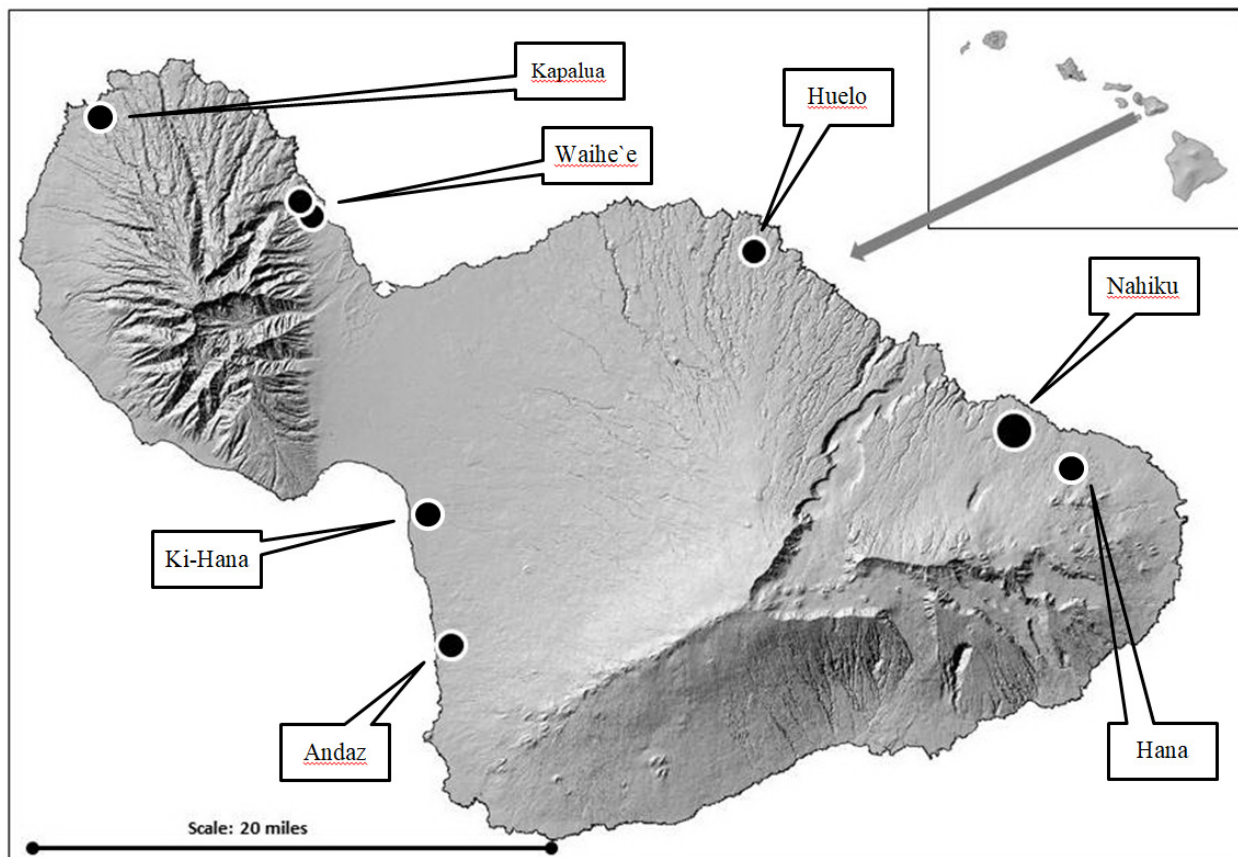


Figure 2. Map of Maui showing the location of infested sites (2017)

Extension activities

Ant management workshops and clinics

The inaugural ant management clinic was delivered to 20 export nursery operators in June 2013. Since that time, similar ant clinics have been delivered to residents and small-scale nursery managers on a monthly basis. The workshop covers every aspect of invasive ant management from ant biology, bait design, practical sessions on pesticide safety, bait mixing and application. These clinics have steadily increased in popularity and it has become apparent that additional workshops need to be scheduled. Feedback from previous clinics has been overwhelmingly positive. In 2017, a total of ten clinics were conducted for a total of 120 participants.

Presentations to industry and interest groups

Hawai'i Ant Lab staff continue to deliver presentations to industry groups, clubs, associations, teachers and other interested groups. Extension activities during the reporting period included 12 staffed static displays, 20 presentations to groups and 30 training sessions which reached 2,126 members of the public at 62 separate events. The table below summarizes extension activities for 2017.

Table 4: list of HAL presentations, training events and static displays for the reporting period.

Date	Group	Type of outreach	# people
1/4/2017	Kona Voucher	Training	35
1/14/2017	Hilo Voucher	Training	60
1/14/2017	University Group	Presentation	30
1/24/2017	Hilo Voucher	Training	30
1/27/2017	AMC	Training	8
1/28/2017	Kona Library	Presentation	30
2/1/2017	Kona Voucher	Training	15
2/7/2017	Waieka Lions Club	Presentation	35
2/11/2017	Hilo Voucher	Training	15
2/15/2017	Hilo Voucher	Training	35
2/24/2017	AMC	Training	16
2/25/2017	Puna Covenant	Presentation	25
2/26/2017	Tutu and Me	Presentation	20
3/1/2017	Kona Voucher	Training	15
3/3 and 3/4/2017	BIAN	Booth	80
3/5/2017	Hamakua FM	Training	20
3/7 and 3/8/2017	KS	Presentation	120
3/11/2017	Hilo Voucher	Training	35
3/15/2017	Hilo Voucher	Training	63
3/24/2017	AMC	Training	16
4/6/2017	Master Gardeners	Presentation	10
4/8/2017	Tropical Living Fest	Booth	30
4/13/2017	NARS	Training	15
4/18/2017	CTAHR/Master Gardeners	Training	5
4/20/2017	APHIS	Presentation	8
4/21/2017	Earth Day	Booth	300
4/28/2017	AMC	Training	8
5/6/2017	Hawi FM	Booth	50
5/10/2017	Hawi HUB	Presentation	200
5/12 and 5/13/2017	Kona Orchid Show	Booth and Presentation	60
5/26/2017	AMC	Training	7
6/1/2017	Hawi True Value	Presentation	8
6/2 to 6/4/2017	Hilo Orchid Show	Booth	120
6/13/2017	BI Housing Foundation	Presentation	10
6/15/2017	Resort Maintainance	Training	33
6/23/2017	Ant ID	Training	7
6/24/2017	Puna Palacades	Training	16
6/24/2017	Farm Supply Coop	Presentation	25

6/28/2017	Mookini Library	Presentation	10
7/10/2017	HVNP	Presentation	27
7/11/2017	Ant ID	Training	5
7/21/2017	AMC	Training	15
7/23/2017	Alohele Subdivision	Presentation	26
8/4/2017	MIDPAC	Booth	30
8/25/2017	AMC	Training	9
9/1 and 9/2/2017	BIAN	Booth	75
9/7/2017	PCO	Training	32
9/12/2017	Coffee Farmers	Presentation	6
9/15/2017	Master Gardeners	Training	25
9/24/2017	Hispanic Community Fest	Booth	25
9/29/2017	AMC	Training	13
10/5/2017	Kona MG	Presentation	17
10/6/2017	CPS Seminar	Booth	25
10/20/2017	HDOA Taxonomy	Workshop	5
10/21/2017	Kona ID Event	Booth	12
10/27/2017	AMC	Training	8
10/31 and 11/1/2017	Lanai	Training	60
11/3/2017	BEI Staff	Training	7
11/10/2017	HILA	Booth and Presentation	80
11/11/2017	Kona Coffee Fest	Booth	20
11/17/2017	HCC	Training	22
total			2,126

Research activities

Screening tests for certified organic alternatives

Initial screening tests for new bait candidates have focused on identifying viable alternatives for organic producers. To date, the active ingredient Spinosad mixed with HAL gel bait matrix appears to be attractive to LFA (Figure 3). However, mortality of ants treated with spinosad bait is lower than for conventional non-organic mixtures (Figure 4). This project will continue screening other candidates for further testing.

Label extension for Siesta™ ant bait

Commercial fruit growers have few viable alternatives for field control of LFA. Currently Tango™ (a.i. methoprene) is the only option. However, Tango is slow-acting and commercial growers need products that will provide more rapid results. Siesta™ and Altrevin™ are both ant baits that contain metaflumizone, and these products have proven efficacy against LFA. HAL is conducting further efficacy trials in cropping situations in order to allow the registrant of these baits to extend the label use-pattern to include tropical fruits). If efficacy can be determined, these products would offer growers a superior alternative to Tango. To date, preliminary results show good efficacy for Siesta (Figure 5).

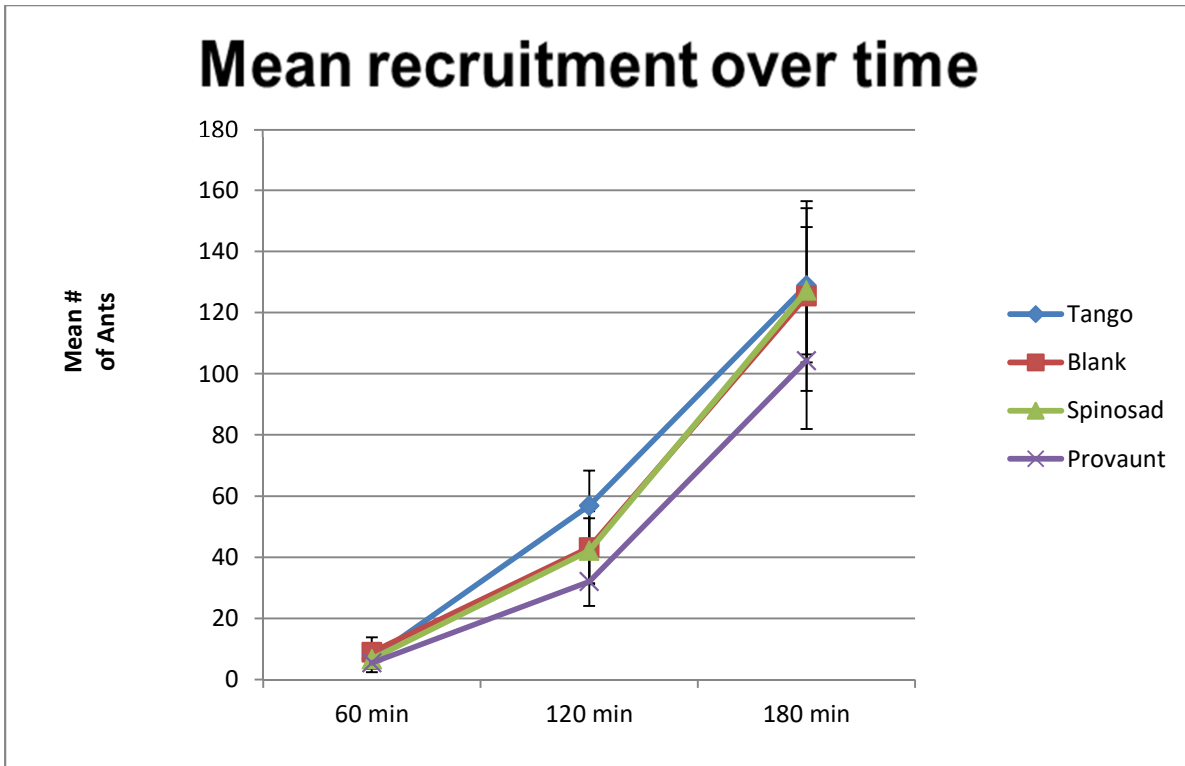


Figure 3. Attractiveness of Spinosad baits was similar to non-organic alternatives.

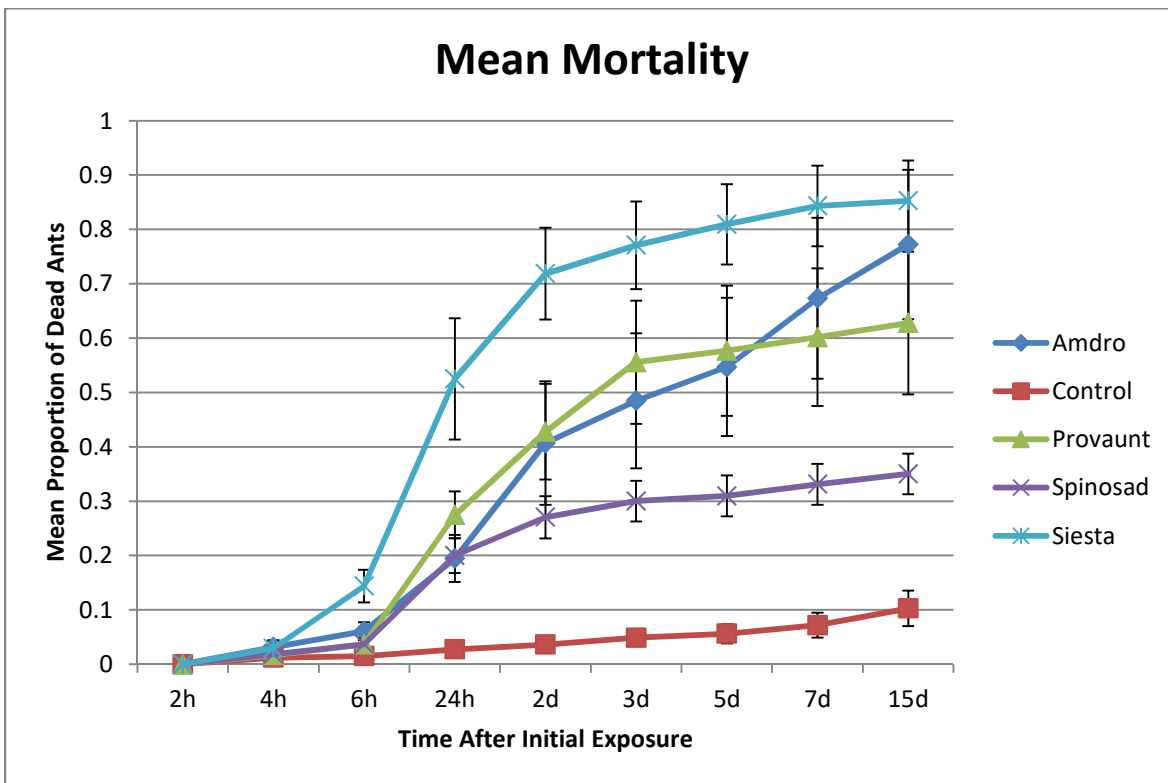


Figure 4. Mortality of Spinosad baits was lower than for non-organic alternatives.

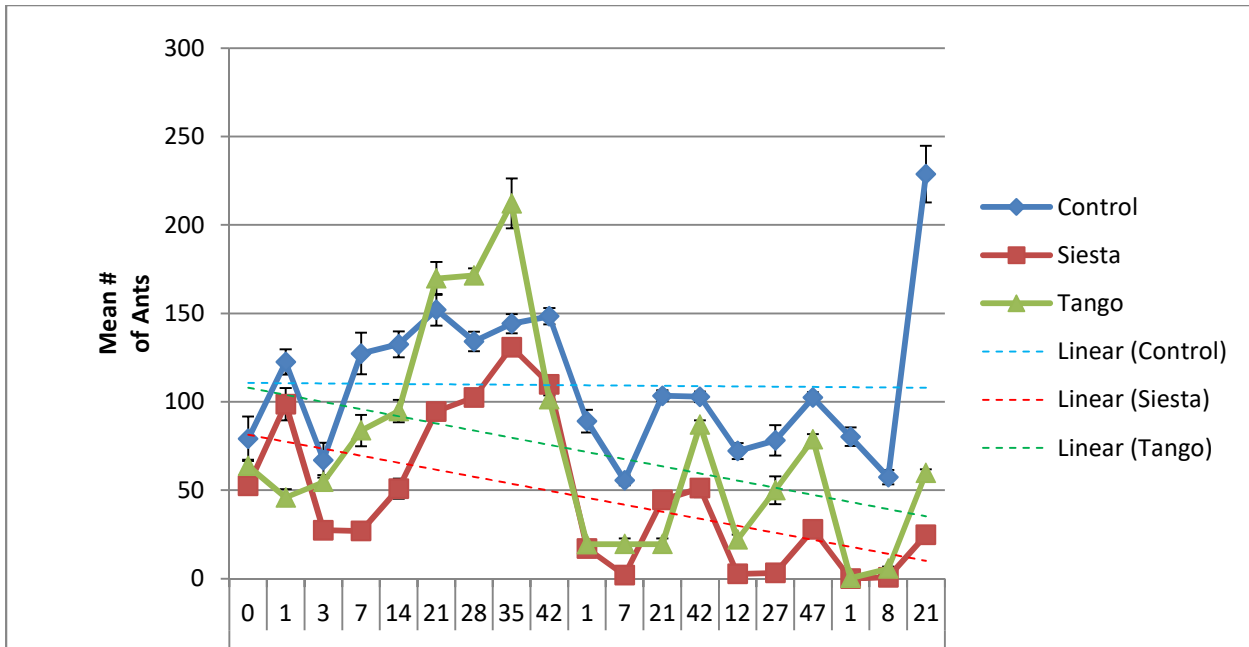


Figure 5. Ant abundance in response to treatment with Siesta™ and Tango™ compared with control in field trial.

Regional involvement

Hawai`i is part of the greater Pacific region and shares many invasive species issues with other Pacific nations. A regional approach to invasive species management is mutually beneficial to all nations. We propose to increase regional involvement and collaboration not only for LFA but other invasive species. Within the Pacific region, Hawai`i Ant Lab is recognized as the regional subject-matter expert for invasive ants and maintains an extensive IAS network, including membership of the Pacific Invasives Partnership (a regional IAS advisory body), and collaboration with IUSSI Invasive Species Specialist Group, Secretariat of the Pacific Regional Environment Programme (SPREP) and other invasive species groups. HAL proposes to maintain and extend involvement in the region in line with governor Ige's commitment at the IUCN World Conservation Congress held in Honolulu, Sept 2016.

Hawai`i Ant Lab hosted the annual meeting of the Pacific Invasives Partnership in June 2017. The meeting was well attended and served to strengthen regional ties between Hawai`i and the Pacific region. Many Hawai`i agencies with involvement in invasive species management show-cased their work and extended their regional networks of colleagues.

Additionally, following an official request from the government of Yap (Federated States of Micronesia). HAL staff traveled to Yap in November 2017 to assist with scoping a new LFA outbreak and providing training and other assistance to staff from Agriculture and Invasive Species agencies there.