Kia'i Moku

guarding the island

WHAT'S INSIDE?

Volume 6 Issue 1 2013

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"It's what you learn after you know it all that counts."

Harry S. Truman

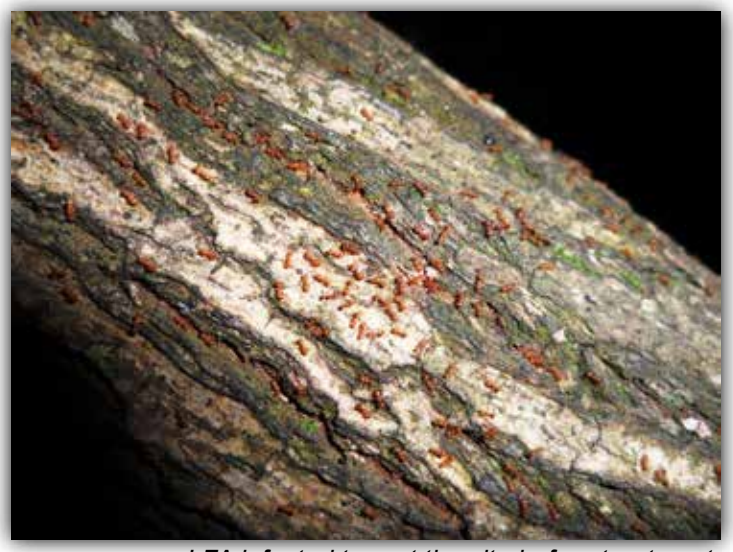
Little Fire Ants on Kaua'i:

Not Pau, But Getting There!

Cas Vanderwoude, Ph.D.
Hawai`i Ant Lab

Bigger than Ben Hur, with a cast of thousands, and years in the making, our Little Fire Ant eradication project is finally underway. Little Fire Ants were first detected on a property in Kalihiwai in 1999 and they probably arrived in a shipment of mature palm trees from the Big Island. At the time, Hawai'i Department of Agriculture treated the trees and surrounding area and as far as anyone could tell, they were quickly eradicated. But, one little nest must have somehow survived and continued to spread because a site survey in 2002 revealed a very healthy super-colony spanning several acres. Ongoing efforts by both Hawai'i Department of Agriculture (HDOA) and Kaua'i Invasive Species Committee (KISC) since that time managed to contain the infestation until an effective treatment method could be developed.

Well, after many hurdles including regulatory hiccups, a federal law change, and resolving some access issues, we have finally managed to make a start. Hawai'i Ant Lab (HAL), HDOA and KISC developed an eradication plan, and with the approval of the landholders involved, treatment began in September 2012.



LFA infested tree at the site before treatment

The treatment plan calls for eight treatments over a 12 month period. A newly developed gel bait will be applied to all vegetation with a simultaneous attack of the ground nests with granular baits. So far, seven of these planned treatments have been completed, leaving one more to complete phase one of the mission. After that, three years of careful monitoring will take place to make sure no LFA survive.

Continued on pg 5

KISC funders and partners

A & B Properties
County of Kaua'i
DLNR - Division of Aquatic Resources
DLNR - Division of Forestry and Wildlife
DLNR - State Parks
Garden Island Resource Conservation and Development
Grove Farm
Hawai'i Department of Agriculture
Hawai'i Invasive Species Council
Hui o Laka/Kōke'e Museum
Invasive Species Committees
Kaua'i Albatross Network
Kaua'i Conservation Alliance
Kaua'i Department of Water
Kaua'i Farm Bureau
Kaua'i Master Gardeners
Kaua'i Native Plant Society
Kaua'i Westside Watershed Council
Kōke'e Resource Conservation Program
Kukuiula Development, Inc.
National Tropical Botanical Garden
Pacific Cooperative Studies Unit
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Private citizens
Research Corporation of the University of Hawai'i
UH Rural Development Project
Sea Grant
The Kaua'i Group Sierra Club
The Nature Conservancy Hawai'i
University of Hawai'i College of Tropical Agriculture and Human Resources
US Fish and Wildlife Service
US Geological Survey PBIN
USDA Forest Service
USDA Natural Resource Conservation Service
USDA-APHIS-PPQ
USDA-APHIS-WS

Ho'omanawanui

(be patient and work with what you have)

Keren Gundersen
Project Manager

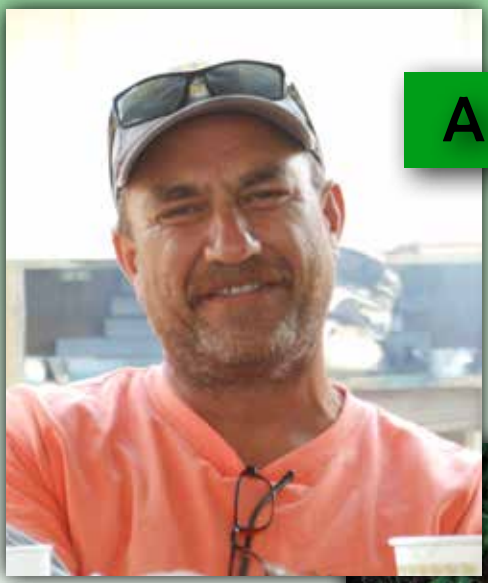
"Intelligence is the ability to adapt to change." - Stephen Hawking

As we started out this year, we realized that many changes and challenges were taking place recently for KISC staff; Tiffani had a baby girl, two staff members left us to pursue career opportunities, Cleve was working on developing his GIS expertise, the crew was still struggling to find an effective way to treat Seasonvine, Joe was charged with building a 5-sided display that proved to be a geometry lesson for all of us, as well as other challenges that were popping up daily.

Instead of feeling overwhelmed by these daunting changes, we collectively decided that we would dub this year as "The Year of Learning". We would dedicate ourselves to adapt to new schedules and demands, acquire new skills and know-how, and generally, be willing to think "outside the box". So far this is proving to be effective and KISC continues to be efficient and successful. And, we are doing it with an attitude of creativeness and ingenuity.

This newsletter shares both the challenges and successes we have encountered over the past year. We are especially grateful for the article contributions from several of our partners.

Look around. Take a deep breath and practice patience. Learn every day.



A hui hou Ray!

We wish you both great luck on your next adventure!

A hui hou John!

Small Hive Beetle

found on Kaua'i

By Craig Kaneshige, HDOA

The small hive beetle (SHB), a serious pest of honeybees, has been found on Kaua'i. On May 21, 2012, a beekeeper in Līhu'e noticed beetles on some beekeeping equipment near his hives. The Plant Pest Control Branch of the Hawai'i Department of Agriculture (HDOA) was contacted. Samples were taken and sent to HDOA entomologists in Honolulu who confirmed the identification of SHB. Today, the SHB seem to be widespread on Kaua'i.

The adult beetles (*see top right photo*) are about four to five millimeters in length, and yellowish brown-to-black at maturity. The adult beetle and its larvae feed on almost anything inside a beehive such as honey, pollen, wax, as well as honeybee eggs and bee larvae. As the beetle larvae (or maggots) feed, they tunnel through the hive damaging or destroying the honeycomb and contaminating the honey (*see bottom right photo*).

The SHB infestation of the hive causes discoloration of the honey, creates an odor like decaying oranges, and causes fermentation and frothiness in the honey. Heavy infestations may cause honeybee colonies to abandon hives.

The SHB doesn't need a ride to find other hives. They can zero-in on clean hives about ten to fifteen miles away. Hawai'i depends on bees to pollinate about 70% of all food crops grown. Beekeepers should be on the lookout for this pest and try to keep their hives healthy to aid in combating infestations of the small hive beetle.

Top Right: Adult Small hive beetle

Bottom Right: Beetle larvae feeding on honey comb.

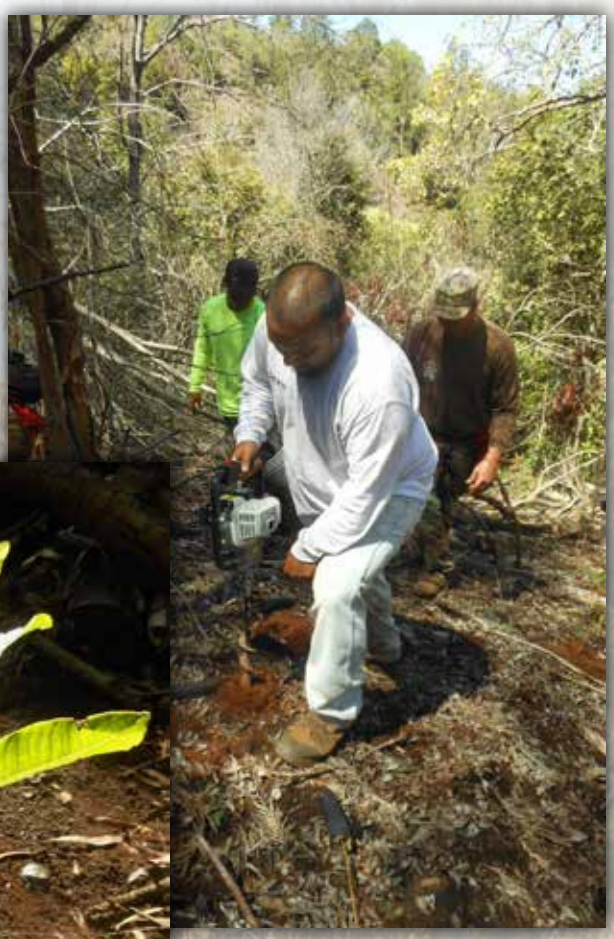
Coqui Update

As dusks approaches, the sounds of the island fade into the silent night. In the recent past, about once a month, this silence was broken by the piercing "ko-kee" call of a newly arrived lone male coqui frog. The KISC crew, while assisting HDOA, would diligently follow the call and capture the calling coqui. This pattern of introductions decreased during the last year with only three calling coqui captured. HDOA and KISC received 17 reports of suspected coqui in 2012 and only one report in 2013. Most of the reports were misidentified greenhouse frogs or wild birds, with only 3 confirmed coqui in 2012. The KISC crew still persistently listens in the night for that piercing call at high-risk sites such as nurseries and big box stores where plants arrive on a continual basis. Other surveys are routinely conducted across the island at places where coqui were captured previously . Thankfully, no calling frogs have been detected at the eradicated Lāwa'i infestation site. Although outreach efforts to solicit reports continue, hitchhiking coqui seem to be decreasing to Kaua'i; hopefully this will emerge as the new pattern.

A Day in the Forest

By Mugs Kaneholani, KISC Crew Supervisor

In the summer of 2012 there was an outbreak of fires that devastated hundreds of acres on west Kaua'i. Where majestic trees once stood, a charred "toothpick" was all that remained. Having no remorse or animosity the fire destroyed native and invasive plants alike, leaving only a blackened scar across the forest of Kōke'e. However, despite this fiery devastation, a sense of hope emerged within. For Kaua'i's conservationists it is now a race against invasive species.



Above: Joseph Aguon-Kona drilling the holes

Left: A'ali'i finds a new home.

On April 4, 2013, KISC crewmembers assisted the DLNR DOFAW Natural Area Reserve System (NARS) staff, headed by Chris Mottley, with the out-planting of 493 native a'ali'i plants in part of the areas that were burned. This out-planting will help stop the erosion of hillsides and curb the regrowth of invasive plants.

NARS, KISC, Kōke'e Resource Conservation Program (KRCP), and US Fish and Wildlife Service's Michelle Clark all pitched in to do out-planting, weed control, and seeding.

The weather was warm and dappled sunlight filtered through the tree canopy as we worked. Joseph set the pace, working the auger to dig the holes as we followed behind planting the seedlings. The seedlings (called slips) had been hand-carried into the area over the sometimes-slippery terrain. While a'ali'i was being re-introduced the area, NARS staff broadcast koa seeds with the hope that this majestic tree will eventually restore the canopy.

All in all, it was a great day; Michelle Clark showed us what a native wasp looks like, we saw the enclosure that has been made to help protect this area from feral pigs, and we got to do something other than work on plant eradication.

We worked hard, had fun, and want to do it again.

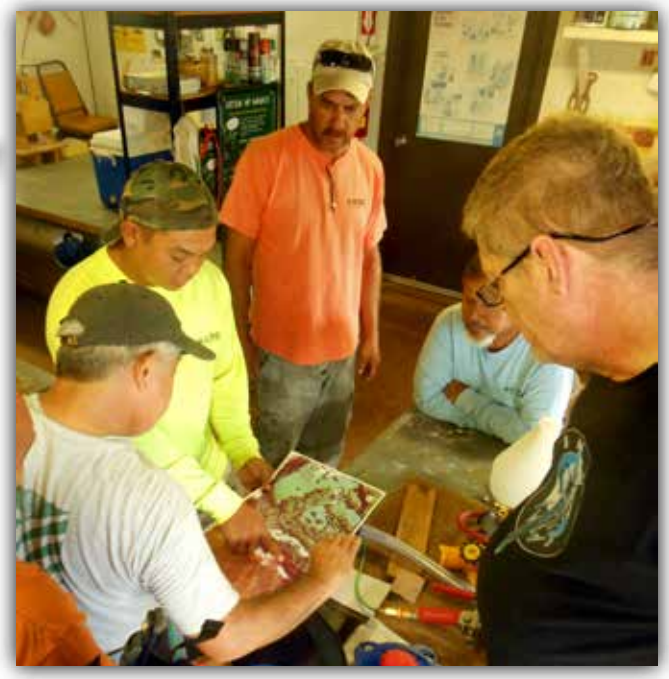
What animal is this Nene disguised as?

Answer on page 11

Little Fire Ants on Kaua'i:

Not Pau, But Getting There!

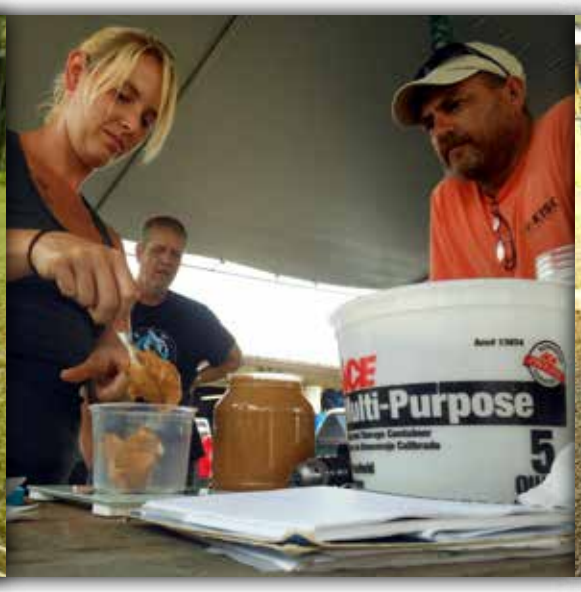
Continued from Page 1

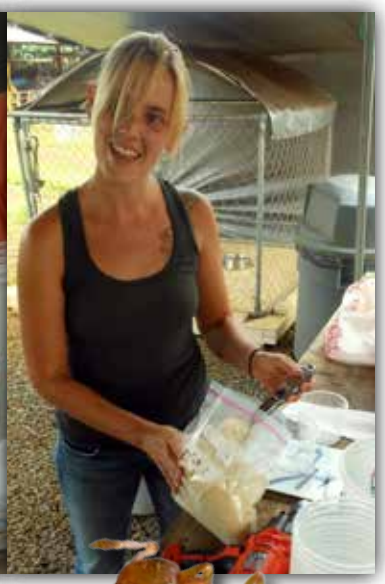


An intensive survey of the infested area was completed in March, 2013, and at that time, not a single Little Fire Ant was found inside the treated area. This is fantastic news and tells us we are on-track for a successful eradication. There are still a few hurdles to overcome though. The biggest one is a narrow strip of land along the Kalihiwai Bay coastline. This area is very steep and we have not yet figured out a way to treat the ants there. Additionally, there are sure to be "hot-spots" of surviving Little Fire Ant nests that will need to be found and treated. The most difficult of these are going to be surviving nests in some of the many mature palm trees scattered over the site. But, we live for challenges! I'm sure we will find solutions to these problems in time.

This has been no cakewalk. The site is difficult, quite large, and heavily vegetated. Rain, wind, access, a complicated treatment program all combine to make this very hard work. Only the combined forces of Hawai'i Ant Lab, Kaua'i Invasive Species Committee staff and HDOA involvement could possibly have conquered this challenge. Without great people like Ann Kam, Becky Azama, Cleve Javier, Craig Kaneshige, Darcy Oishi, Jim Roselli, Joseph Aguon-Kona, Keren Gundersen, Leonard McCarthy, Michelle Montgomery, Mugs Kaneholani, Raymond Kahaunaele, and the Sproat family, those pesky LFA would still be happily spreading around Kaua'i. Thanks guys and keep up the great work!

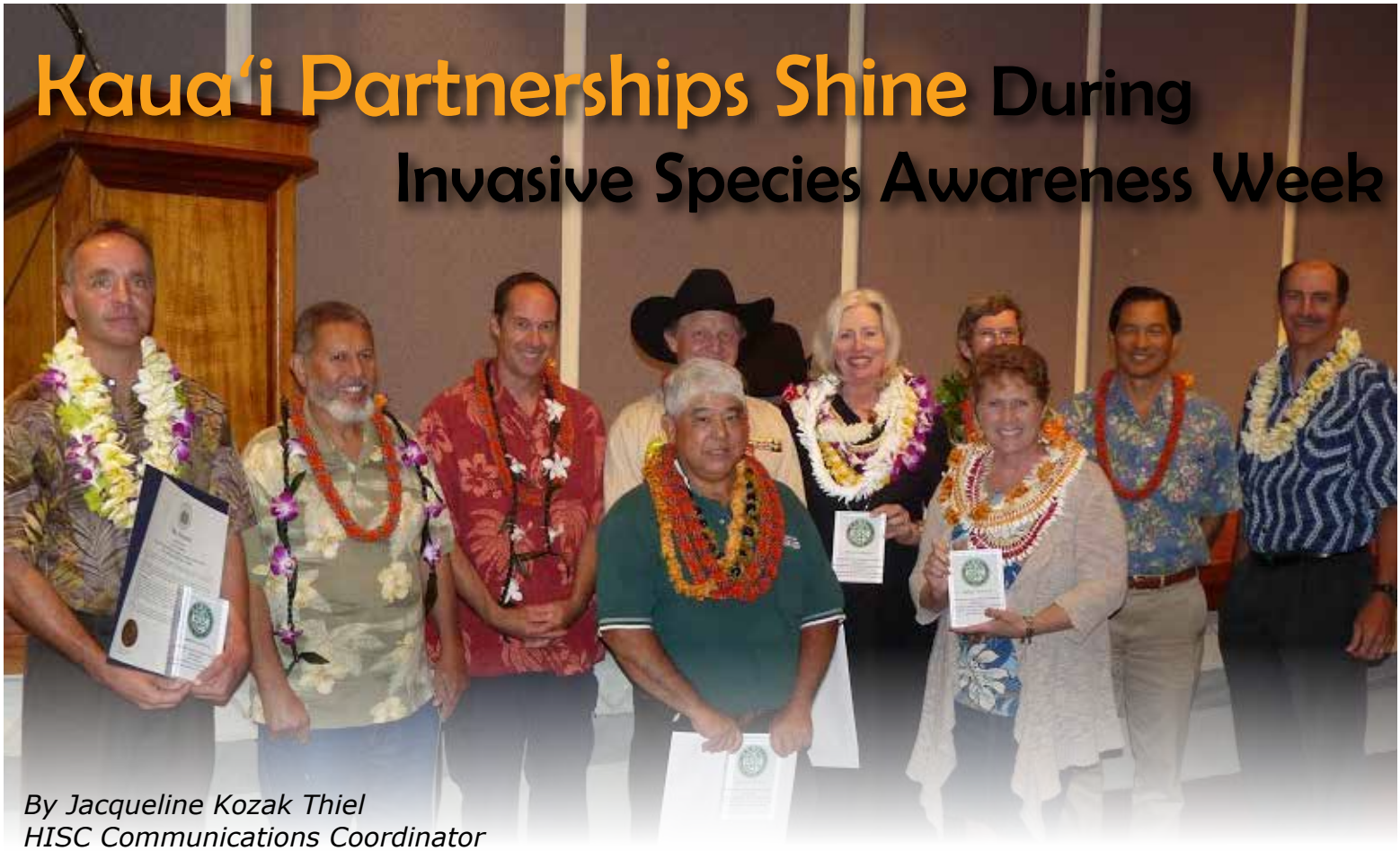
"Only the combined forces of Hawai'i Ant Lab, Kaua'i Invasive Species Committee and HDOA involvement could possibly have conquered this challenge."





***Top Right**: Craig Kaneshige, Cleve Javier, Ray Kahaunaele, Joe Kona, and Cas Vanderwoude debriefing on the treatment application.*
***Bottom: Left**: Joseph Aguon-Kona and Craig assisting fitting of the "Anterminator"*
***Middle**: Michelle Montgomery and Ray preparing bait. **Right**: Michelle preparing bait.*

Kaua'i Partnerships Shine During Invasive Species Awareness Week



By Jacqueline Kozak Thiel
HISC Communications Coordinator

For those of you who missed it, Kaua'i stole the show during the statewide kickoff of Hawai'i Invasive Species Awareness Week (HISAW) at the Capitol on March 4. With Governor Abercrombie, legislators, cabinet members, the media, and many colleagues in the audience, this event felt like the Academy Awards for invasive species. Several superstars from Kaua'i strutted down the red carpet to accept honors for their amazing performances of 2012.

Before interviews with screaming fans and the Honolulu paparazzi (local TV stations), Hawai'i Department of Agriculture's Craig Kaneshige accepted the Kaua'i MVP award for his tireless work to protect Kaua'i's agriculture and environment from pests like little fire ants, varroa mites, and miconia. Katie Cassel, weed warrior wahine of Kōke'e Resource Conservation Program (KRCP), received honorable mention for the Community Hero category. And (drum roll please), the overall Greatest Hits of 2012 award was presented to KISC for capturing the first two live mongooses on Kaua'i AND declaring Kaua'i coqui free all in one year!

Despite a busy day in the middle of session, Kaua'i leaders also made time to join the festivities. All three of Kaua'i's state representatives were in attendance to present the awards to their constituents. Representative Kawakami referred to Kaua'i's winners as "unsung heroes." In response to Kaua'i's incredible showing at HISAW, Mayor Carvalho declared March "Kaua'i Invasive Species Leadership Month" to continue the celebration.

"...we are all in this together. Just as it takes a village to raise a keiki, it takes a village to malama our aina..."

Kaua'i also participated in other parts of HISAW. KISC's Tiffani Keanini helped to plan *Hawaii Bioblitz 2013: What's in your backyard?*, which provided an online interactive and educational opportunity for the public. KRCP organized a weed pull in the Alaka'i to give people a hands-on experience with protecting Hawai'i from invasive species. For more information on HISAW, visit: http://hisaw2013.blogspot.com/

I started my work in this field with KISC in 2005. Eight years later, I was beaming with pride to see dear friends and mentors receive such well-deserved recognition for their hard work and accomplishments. I am incredibly grateful for all that I learned from KISC staff like Keren and Joe, partners like Craig and Katie, as well as so many

others in the Kauaʻi community. I continue to carry those lessons with me in my efforts with the Hawaiʻi Invasive Species Council.

One of the greatest lessons that I learned from living and working on Kauaʻi is that we are all in this together. Just as it takes a village to raise a keiki, it takes a village to malama our aina. We will need creative and lasting partnerships to overcome the immense challenges facing our sustainability and resiliency. The Kauaʻi award winners, each one of them, are a testament to this community-based and collaborative approach that is a key to their success. So much of the time, it is the high-profile pests that steal the attention, but on this day, the spotlight was on people who truly make a difference.

"Creative and lasting partnerships"

Right: Representative Morikawa presents the Kauaʻi MVP 2013 award to Craig Kaneshige, HDOA

Left: Representatives Tokioka and Kawakami present the Greatest Hits of 2012 Award to the Kauaʻi Invasive Species Committee (Keren Gundersen and Joseph Kona accepting)

Photos: Joshua Atwood, HISC

Jackson's chameleon CAUGHT on KAUAʻI

Species of Concern

On May 8, 2013, the Hawaiʻi Early Detection Network received an online report of a Jackson's chameleon in a quiet residential area of Līhue. The observer, out walking his dog, snapped a picture and reported the sighting (to www.reportapest.org) knowing that this invader didn't belong on Kauaʻi. Laura Ishii, HDOA PQ, quickly followed up on the report to determine its credibility, and coordinated with KISC to help capture this animal. This network of responders to invasive species reports on Kauaʻi works really well. Kauaʻi is lucky to have such a close relationship with all of the agencies who deal with invasive species, as well as cooperating property owners, so that quick captures such as this one can rapidly happen. Please reports Jackson's chameleons on Kauaʻi to 643-PEST.

Learning the Hard Way

By Cleve Javier, KISC Data Tech

Seasonvine happily growing on the tree-tops

Seasonvine's multiple sprouts after treatment

Molucca raspberry treated vs. untreated

Over the last year, KISC has been trying to take on a few new targets, one of which is *Cissus verticillata* (Seasonvine). At first glance, this vine seemed overwhelming; covering and smothering everything it climbed on. Seasonvine covers a couple of acres in Lāwa'i and Poipu but, fortunately, it does not seem to be spreading too rapidly. Our first thoughts were, "this looks like a mess, but with some time and work we could control it before it covers everything else."

After the initial treatment of notching and treating countless vines, we thought we had this battle won early. A month passed by before we returned to see the season vine still there, just a little discolored. Feeling discouraged, we started notching and treating more vines. We thought that would work but it just might take a while before the treatment translocates though the vine.

Our next revisit proved unfavorable; the vines died off at the notch-point without translocating the herbicidal treatment. While surveying the extent of our treatment, Mugs Kaneholani (KISC Field Crew Supervisor), noticed the vines we cut earlier were shooting out multiple sprouts. Seasonvine was also noted growing without touching the ground on a metal sign post. We learned the hard way that this plant pest could not be killed with the notching method and that we had to come up with a new strategy to control this thing.

For months now, the crew has been trying new herbicides, formulas, and dilutions using drizzle spray, foliar spray, or notching method. All of our trials provided the same results: contact kill and no translocation. Higher portions of this vine are still growing happily on the tree-tops out of reach of our sprayers. We are still determined to find the weakness of this pesky vine. Seasonvine will be in our control soon enough.

On the plus side, we are making headway on *Rubus sieboldii* (Molucca Raspberry). After doing trials, we have found a formula to eradicate molucca raspberry. Working with HDOA, we have started treating an area of about 22 acres. The results look really promising; our formula is controlling the pest while not harming the ferns, grasses, or trees in the area (even if most of the trees there are African tulips and strawberry guava). We are also counting on grasses taking over in the areas where the rubus is killed to avoid any possible erosion issues.

The "Year of Learning" is what it is; learning as we go.

Kaua'i Mongoose Update

May marked the one-year anniversary of the first live capture of a mongoose on Kaua'i with the second capture quickly following in June 2012. As the year progressed, KISC had hopes of repeating the success of additional captures. 57 credible reports during 2012 led to 27 different trapping locations around the island.

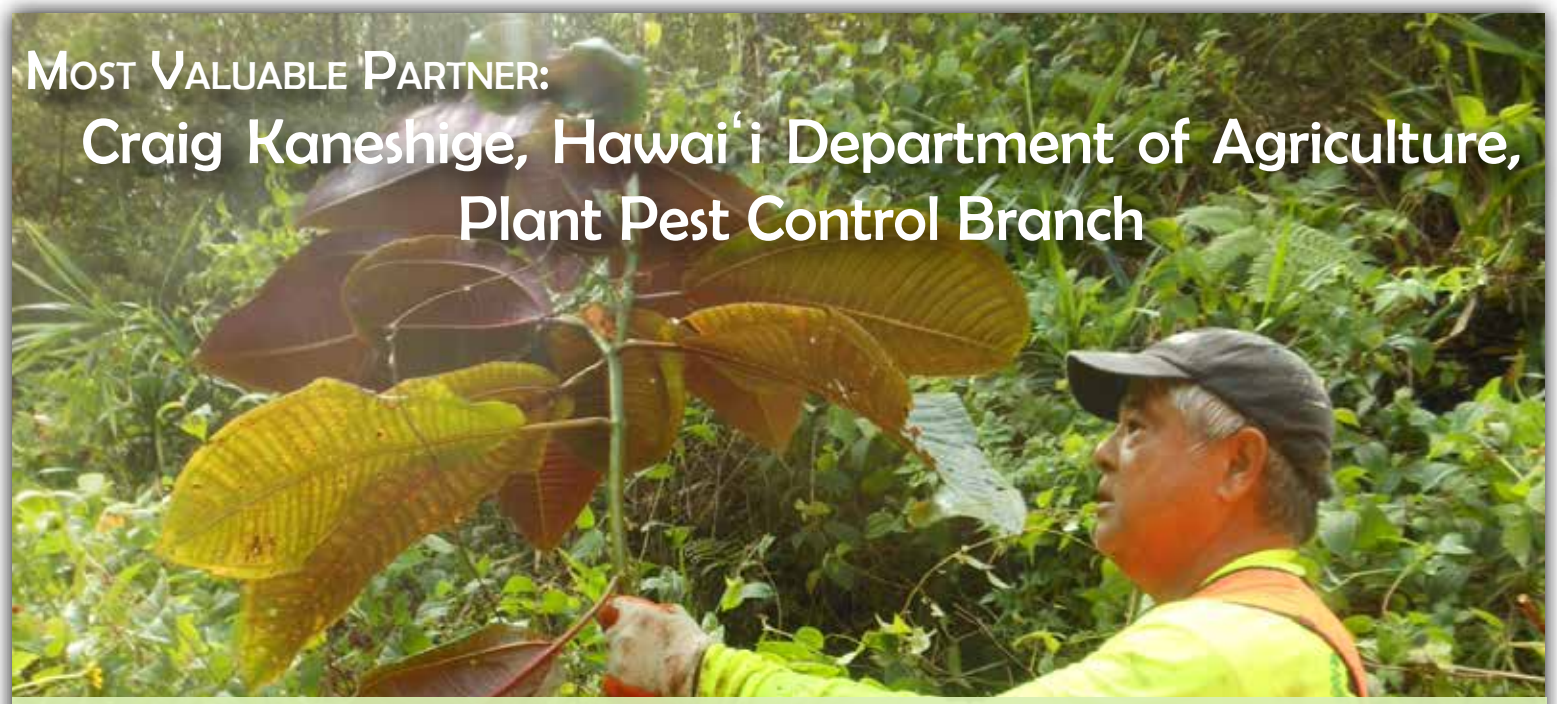
The mongoose response team (Jamie Harris – DLNR DOFAW, and Pat Gmelin - KISC) still has high hopes for a 2013 capture. 24 credible sighting have been reported so far in 2013. They are currently trapping in 8 locations around the island. Every week a new report comes in and the mongoose response team examines the area in hopes of deploying a rapid-response effort with the mongoose-detecting dog. Eventually, the conditions will be perfect with a fresh report in an open area away from roads that will allow KISC to utilize this detection tool. Until that report arrives, the team will persistently bait and check traps for those hungry mongooses.

Above: Jamie Harris checking traps

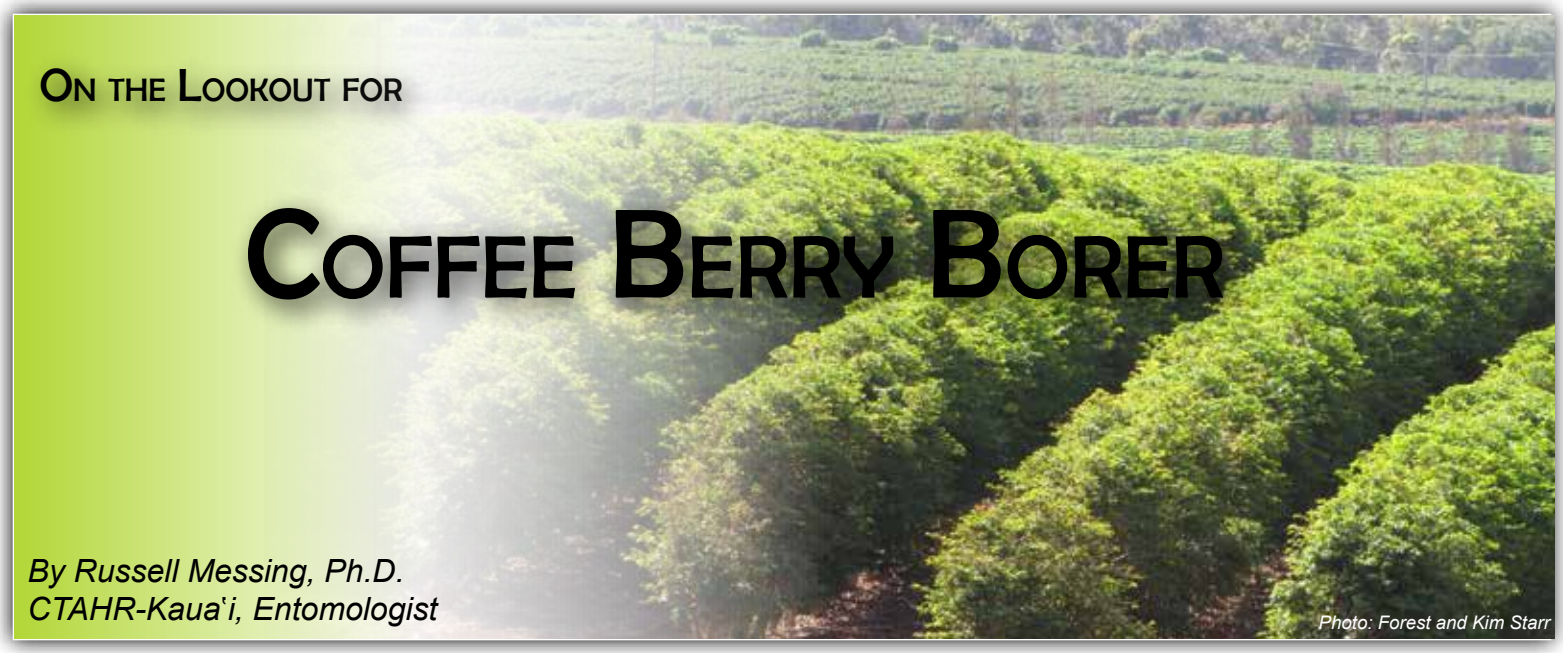
Left: Mongoose trap with new cover

Most Valuable Partner:

Craig Kaneshige, Hawai'i Department of Agriculture, Plant Pest Control Branch



KISC wants to recognize Craig Kaneshige not only as our most valuable partner, but also as the Kaua'i County MVP as recognized at this year's Hawai'i Invasive Species Council award ceremony. KISC works hand-in-hand with Craig on a variety of pest targets including miconia, long thorn kiawe, Molucca raspberry, little fire ants, and coqui frogs. As the only employee on Kaua'i under PPC, Craig works tirelessly on other plant pests as well as small hive beetle and other insect pests. Congratulations, Craig!



On the Lookout for

Coffee Berry Borer

By Russell Messing, Ph.D.
CTAHR-Kauaʻi, Entomologist

Photo: Forest and Kim Starr

The coffee berry borer (CBB), *Hypothenemus hampei*, is the most serious insect pest of coffee worldwide, causing severe economic damage in every region where coffee is grown. For many years, Hawaiʻi growers developed successful horticultural and pest management programs in the absence of this pest. However, the recent invasion of the beetle in the Kona region threatens to seriously impact the entire coffee industry throughout the Islands. The industry comprises 8,000 acres, with farm revenues of 30 million dollars, making it the fourth largest crop in the State.

CBB beetles lay their eggs inside the coffee berry, and the larvae eat the beans. Although the pest has enormous economic impact and has been studied in many regions around the world, few effective and sustainable controls have yet to be devised. Endosulfan (an organo-chlorine insecticide) has been widely used, but is being phased out in the U.S. and elsewhere due to high mammalian toxicity and environmental damage. Classical biological control with parasitoids has had limited success wherever it was used (mostly with African parasitoids transported to Latin America). The fungal pathogen *Beauveria bassiana* has been tried in various locations, with limited or mixed results. Cultural control, comprised first and foremost of effective field sanitation to remove infested berries after the harvest, remains the most effective line of defense against this pest in coffee growing regions throughout the world.

"The [Hawaiʻi coffee] industry comprises 8,000 acres, with farm revenues of 30 million dollars, making it the fourth largest crop in the State."

In Kona orchards, which are predominantly small acreage family farms, sanitation requires crews of workers to carefully glean leftover coffee berries on the trees and on the ground after the main harvest. However, farm labor costs in Hawaiʻi are among the highest in the world. Thus manual sanitation will have a serious impact on overall profitability. In addition, areas around Kona farms contain many abandoned and feral coffee plants which serve as reservoirs for beetles and continuous re-infestation of farms.

On Kauaʻi, coffee growing is dominated by a single large farm in the Kalaheo area, containing about 3,000 acres. To date there has been no evidence that the coffee berry borer has invaded the Garden Island. However, agro-tourism is a significant component of the Kona coffee industry; and with

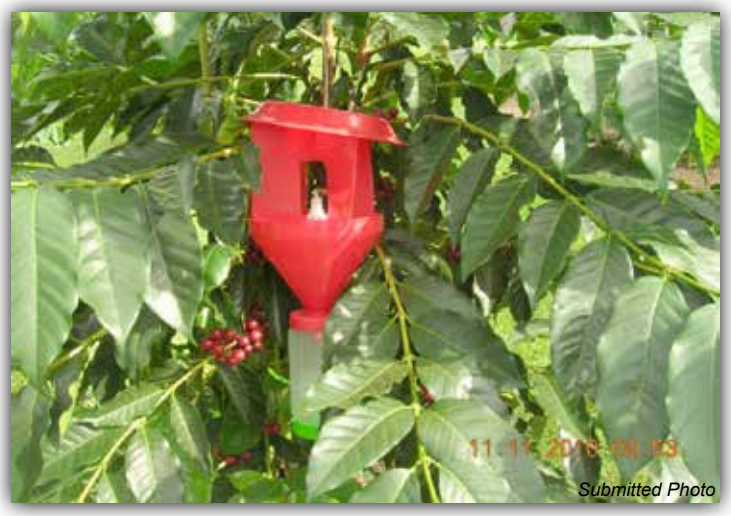
Submitted Photo

Adult female coffee berry borer on a green coffee bean

easy travel between islands most entomologists feel that the beetle will be inadvertently transported to Kaua'i sooner or later.

Kaua'i coffee cultivation differs from Kona in that it is largely mechanized. This means that effective sanitation may possibly be achieved by motorized blowers or sweepers, rather than incurring the high labor costs of manual sanitation. This option would require significant investment and reconfiguration of other cultural practices on the coffee farm.

To monitor for the presence of CBB on Kaua'i, UH researchers in the College of Tropical Agriculture and Human Resources have set up an array of traps using alcohol baits that are serviced weekly to detect incipient beetle infestations. Regular samples and visual inspection of coffee fruits can also detect adult beetles before they tunnel within the seeds. It is a challenge to routinely monitor the entire 3,000 acres with the limited funds available, so researchers are concentrating their efforts on farm areas of most traffic and activity. While the hope is that CBB does not invade Kaua'i anytime soon, we are doing our best to prepare for its arrival and to provide farmers with an early warning system to initiate control measures as soon as possible if the need arises.



Brocap trap for the coffee berry borer

Invasive Brain Teasers

Wake-up your brain with these invasive brain teasers. Each puzzle box "illustrates" a saying or phrase. Can you guess what it is?

1. VASTOPDERS

2. ANT PROBLEM

3. DONT S E E D S

4. Weeds Cont ol r

5. LISTEN LISTEN LISTEN LISTEN COQUI COQUI COQUI COQUI

6. P E T S VOLGETVED

7. PROTECT DICE DICE

1. Stop Invaders 2. Little red ant big problem 3.Don't spread seeds 4. Weeds are out of control 5.Listen around for coqui 6. Step up and get involved 7. Protect paradise.

Page 4 Cartoon Answer: A "Mon-goose"

Kia'i Moku - Guarding the Island

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The Kaua'i Invasive Species Committee (KISC) is a voluntary partnership of government, private and non-profit organizations, and concerned individuals working to prevent, control, or eliminate the most threatening invasive plant and animal species in order to preserve Kaua'i's native biodiversity and minimize adverse ecological, economic and social impacts. KISC is a project of the Pacific Cooperative Studies Unit and Garden Island Resource & Conservation Development, Inc.

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