**Project Summaries for Coconut Rhinoceros Beetle Control and Management in O‘ahu Communities**

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| # | *Proposal,* Organization,  (Principal Investigator) |
| 1 | *“Coconut Rhinoceros Beetle Koʻolau”,* Waihapakai,  (Dane Kanaloa Bishop)    Project “Coconut Rhinoceros Beetle Koʻolau” will help control and manage CRB in the Koʻolau community. The objectives are: 1) to increase the awareness of CRB, and 2) to decrease the CRB population, for the Koʻolau community. The project will create awareness in the Koʻolau community by hosting workshops for school groups and for the public. Workshops will focus on creating a proactive mindset to managing the pest. We want the community to notice if CRB are eating the palms in their neighborhoods so that we address the situation proactively and effectively. The project will educate the community to understand the CRB lifecycle so that the community can take action to decrease the potential for new breeding sites in their areas. The project will include the development of a simple Palm Tree Assessment Tool to be used by the community to help inform us of potential breeding locations. Once breeding sites are identified, Waihapakai will work with the landowner and/or caretaker to dismantle the breeding site and kill any larvae or adult beetles found. When nests are large, heavy equipment will be brought in to do a thorough dismantling of the nest. Where applicable, traps will be constructed near new and old breeding sites to capture any adult beetle still in the area. Insecticides injections of palm trees will be used in areas where there are groves of coconut trees. Data will be collected on control methods and workshop participants so that we can measure the outcomes for the main objectives. |
| 2 | *“Three-Pronged Coconut Rhinoceros Beetle Management Model o Kahaluʻu”,* Hui Aloha ʻĀina Momona, (Daniel Anthony)  Hui Aloha ʻĀina Momona (HAAM) is a grassroots organization located in Kahaluʻu, focused on Native Hawaiian promotion of food and culture. HAAM designed the “Three-Pronged Coconut Rhinoceros Beetle (CRB) Management Model o Kahaluʻu,” which proposes a holistic, ahupuaʻa-focused approach to managing the invasive pest through defensive and offensive methods. Their rigorous management model is designed to simultaneously mitigate CRB impacts and empower the community to be active members in the process. The objective of the project is to establish a membership-driven coalition within Kahaluʻu to equip their community with the knowledge and resources to strategically coordinate effective CRB management actions. These management actions are summarized within the three-pronged approach: mulch management, niu armoring, and emergency biocontrol response. These measures rely on circular economy methods, including Korean Natural Farming solutions, trained CRB-detecting pigs, niu planting, and a decentralized green waste mulch management system. The project would be evaluated based on the Ecological Model of Native Hawaiian Well-Being, developed by McGregor et al. (2003), to offer socioecological benefits that result in a lasting increase of communal capacity to manage invasive threats of any kind. HAAM is well-equipped with years of expertise, access to the necessary resources, a humbling level of community support, a kuleana to mālama ʻāina, and keen judgment to cause transformative action. Tangible outputs of this project include a rapid data map to monitor niu health and CRB activity in Kahaluʻu and a potentially scalable ahupuaʻa management model that can be adopted by other ahupuaʻa across Hawaiʻi. |
| 3 | *“Outreach and Education to Promote Community-Level Actions Toward Reducing CRB Populations in West Oʻahu,”* Mālama Learning Center, (Pauline Sato)  This project will build on Mālama Learning Center’s years of experience in Coconut Rhinoceros Beetle (CRB) education and outreach by providing hands-on opportunities to promote community-level actions to reduce CRB populations in West Oʻahu communities. We will provide the Awawalei food forest in Kunia at the Hawaiʻi Agriculture Research Center as a demonstration site that is carefully maintained to minimize CRB presence in an otherwise heavily infested region. We will demonstrate through at least two community workshops and two local school visits proper green waste management and physical procedures to prevent CRB from damaging young palms. We will also produce a five-minute video on the project featuring methods taught in the workshops. This video will be aired on our television show, Outside Hawaiʻi on Spectrum OC16, which has a broad statewide reach. The video will also be shared on the internet and short clips will be put on our popular social media accounts. |
| 4 | *“Community CRB Coalition,”* HFUU North Shore Chapter, (Thanh Bidwell)  Our community outreach plan aims to control the Coconut Rhinoceros Beetle (CRB) through workshops, a beetle-collection competition, and educational materials distributed at public venues. We will provide netting and traps to protect palm trees and capture CRB. A dedicated website will offer resources and a forum, while volunteer groups will help sort mulch piles for larvae. An online map will track coconut tree conditions and mulch piles to focus control efforts.  These initiatives will engage the community in CRB control, improving pest management and protecting our coconut palms.  1) community outreach a) workshops to capture adult CRB; b) weigh station competition for CRB collection with prizes for who can collect the most in one month; and c) flyers, infographics, pamphlets as give aways at all farmer markets, stores and public places.  2) netting to give away to farms and homeowners with palm trees.  3) traps (bucket traps and larger container traps for trapping flying lecture CRB);  4) website a) organize volunteer groups to visit different farms or homes to hand sort through mulch piles and find beetle larva and grubs; b) map out Oʻahu so community members can upload and map where coconut trees are and record details of its conditions and what actions are needed for the tree; and c) map out mulch piles that haven’t been touched for a long time.  Community outreach, volunteering, education! |
| 5 | *“Managing Green Waste and the Spread of CRB in the North Shore Community Through an In-Vessel Composting System”,* Kōkua Hawaiʻi Foundation, (Janice Staab)  The Kōkua Hawaiʻi Foundation (KHF) is installing an in-vessel composting system at the Kōkua Learning Farm that will manage food and green waste from the Kōkua Learning Farm and Oʻahu’s North Shore community. This thermophilic, aerobic composting machine will provide a system to safely process Coconut Rhinoceros Beetle (CRB)-infected green waste into usable compost, while collecting data on mortality rates of larvae that have been exposed to temperatures above 130 °F., for 3 consecutive days, according to CTAHR and HI Dept. of Health pest and pathogen destruction standards. This composting operation will utilize specially designed, CRB-proof mulch and compost storage bays, which can provide data, in parallel, on their effectiveness in preventing CRB mulch infestation, and replicability. The composting machine processes materials on an accelerated timeline of 3 to 4 weeks, allowing it to have an increased throughput of infected green waste. This small-scale project can provide insight into the scalability and practicality of composting as a low-tech, toxin-free mitigation method for CRB, as well as CRB-proof infrastructure. This project is particularly relevant in the North Shore Oʻahu area where infections are rapidly spreading, and replicable solutions are urgently needed. |
| 6 | *“E Ho`ola Ulu Niu a Maunalua”,* Maunalua Fishpond Heritage Center, (Chris Cramer)  Maunalua and East Honolulu communities are home to ancient ulu niu (niu groves). This heritage of kūpuna niu spans Maunalua Bay’s shoreline. The communities of Niu and Kuliʻouʻou as well as the Hāwea Heiau are named for niu drums. Areas planted in niu (the tree of life) were marks of a good chief that cared for their people. Some niu are a century old and direct descendant of the Hawaiian food system that interplanted coconut with freshwater springs and fishponds. Historic groves of towering coconut trees surround Kānewai Fishpond in Kuli‘ou‘ou, Kalauhaʻihaʻi Fishpond in Niu and the Hāwea Heiau complex and Keawāwa wetland in Maunalua.  These ulu niu (groves) contain significant varieties of niu. Hāwea yielded the Hawai‘i Grand Champion title in 2013 for “Coco” which led to a 2014 national acclaim through American Forests annual contest vote of all the big trees in the nation. She was also the tallest recorded niu in the state at that time. We regularly hold workshops on the importance of niu in Hawaiian practice and custom as well as share the nuts, fronds and trees with our community. One of the first drawings of Niu Valley to Maunalua in 1845 shows the coconut groves from that period.  This project promotes community engagement and on the land demonstration by educating residents to prevent this highly invasive pest from multiplying or establishing in new areas by reducing, controlling, or managing CRB and/or lessening the damage caused by CRB to our community. |
| 7 | *“Protect Our Palms: Hawaiʻi’s Fight Against the Coconut Rhinoceros Beetle,”* Kinai ʻEha-Diversion, (Melissa Waiters)  The project aims to empower the windward side local communities with the knowledge and tools needed to combat the CRB infestation. Through education, outreach, and collaboration with all that are involved currently, we can protect Hawaiʻi, safeguard our environment, and ensure the well-being of future generations.  We currently have two attack teams that go out Monday-Friday and search and collect CRB. While the teams drive to and from locations, they look for current signs of CRB activity. We also give classes at our school on CRB using the states’ training videos available online.  What we would like to do with this grant is create community Easter larvae egg hunts and CRB gold mining days to engage more of the community and connect state community outreach groups on fun mornings at various mulch pile sites on the windward side. We also would like to create a reward-based larvae and CRB buy back to get more engagement. We need more community to get activated and we would like to be that go to organization for the windward side that connects state and private partnerships.  We can do this if we all unite. We want to connect all the organizations involved, currently private and public, with the greater community. |

**Project Summaries for Green Waste Management in Communities**

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| # | *Proposal,* Organization,  (Principal Investigator) |
| 1 | *“Rapid Response, Prevention and Treatment,”* Food Security Hawai‘i, (Robin Leimomi Proctor)    Food Security Hawai‘i’s proposal includes the following:  1. Promotes community engagement to manage green waste. This project will empower at a minimum, 20 private and public property land managers by equipping them with the necessary knowledge and tools for proficiently managing green waste compost and mulch piles, thereby minimizing or eliminating the risk of Coconut Rhinoceros Beetle (CRB) breeding in these areas.  2. Introduce a product Nemasan, 02-YS and AgriQ, that EPA states is safe for humans, animals and ground water and kills adult beetles and eggs; which will achieve the goal of effectively managing green waste to prevent CRB infestation.  3. Use the introduced product to create a solution that will allow land managers to continue to compost their own green waste because they need compost and mulch for their landscaping health. The provided product will allow them to continue to safely compost and store mulch on their properties. The product will benefit the soil microbes and the composting process.  4. Provide participating land managers that are currently composting green waste or have mulch piles on their properties with complimentary liquid products like NemaSan pesticide and O2-YS, AgriQ non-pesticide treatment sprays for addressing and current or future CRB infestations, the project facilitates a swift and secure response to CRB challenges by addressing both adult beetles and eggs. |
| 2 | *“North and East Kauaʻi CRB eradication strategy through green waste management sites,” ʻĀ*ina Hoʻokupu O Kīlauea, (Yoshito L’Hote)  ʻĀina Hoʻokupu O Kīlauea’s strategy for green waste management consists of a three-pronged approach:  The first priority will consist in educating, promoting, and increasing community awareness of the incredible danger CRB represents and the absolute need to have everyone be concerned about it and be involved in its identification and elimination.  The second priority is to develop a map and the strategy from the existing data compiled by the Kaua‘i Invasive Species Committee and other stakeholders to have a clear and regularly updated understanding of the existing CRB locations and hotspots that exist on these north and east side of the island of Kauaʻi.  The third priority is to understand the creation and location of green waste piles and movements. Traps, sprays and netting will be used to aggressively manage each area with the intention of total eradication, then dogs and traps will be used for getting a count of how many CRB are found. Follow up for a year to two years to ensure there is a complete removal of all signs of CRB. |
| 3 | *“Managing Green Waste and the Spread of CRB in the North Shore Community Through an In-Vessel Composting System,”* KōkuaHawai‘i Foundation, (Janice Staab)  The Kōkua Hawaiʻi Foundation (KHF) is installing an in-vessel composting system at the Kōkua Learning Farm that will manage food and green waste from the Kōkua Learning Farm and Oʻahu’s North Shore community. This thermophilic, aerobic composting machine will provide a system to safely process Coconut Rhinoceros Beetle (CRB)-infected green waste into usable compost, while collecting data on mortality rates of larvae that have been exposed to temperatures above 130 °F., for 3 consecutive days, according to CTAHR and HI Dept. of Health pest and pathogen destruction standards. This composting operation will utilize specially designed, CRB-proof mulch and compost storage bays, which can provide data, in parallel, on their effectiveness in preventing CRB mulch infestation, and replicability. The composting machine processes materials on an accelerated timeline of 3 to 4 weeks, allowing it to have an increased throughput of infected green waste. This small-scale project can provide insight into the scalability and practicality of composting as a low-tech, toxin-free mitigation method for CRB, as well as CRB-proof infrastructure. This project is particularly relevant in the North Shore Oʻahu area where infections are rapidly spreading, and replicable solutions are urgently needed. |