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PRESIDENT'S LETTER

BY CHRIS McCULLOUGH



NATIVE INTELLIGENCE

Native: *A plant of indigenous origin and growth*

When I first attended a 'native' plant conference at Ho'omaluhia Botanical Garden in the early 90's the state of native plants was frankly in distress. There was concern in our Green Industry that loss of native plants could be possible if we as horticulturists did not take action to cultivate and preserve them. The preeminent Hawaiian ethnobotanist Dr. Isabella Aiona Abbott had just published her seminal work *Lā'au Hawai'i: Traditional Hawaiian Uses of Plants*, and the beginnings of our return to the use of native plants in our landscapes came as a result of pioneers like Heidi Bornhorst, Rick Barboza, and Barry Moss and Ken Bouche, writing about and sharing their mana'o regarding the cultivation of and growing of natives for local landscape use. The National Tropical Botanical Garden had been established in the mid 60's and had grown considerably in its size and scale, and many of our native Hawaiian plant enthusiasts like Heidi and Erin Lee had founded their knowledge of natives there. The Endangered Species Acts 73 and 236, our Federal Law (which was then adopted and adapted by the State of Hawai'i), requiring the use of native Hawaiian plants in State funded projects, was created in the 70's to protect rare and common native plants and increase the populations and public awareness of these plants.

By this time Hawaii had lost significant numbers of native flora and fauna resulting from introduced grazing animals, invasive flora, fire and a loss of habitat due to urbanization and agricultural use. Scientists were telling us that protecting these plants could be achieved by eliminating or reducing threats to native ecosystems, generating and maintaining genetic back-up of these plants and by of course by planting them. Hawaiian culture had depended on their plants for centuries (and still depends on them today). Ancient Hawaiians relied upon their natural resources to provide food, clothing, shelter and all necessities of life. The ancient Polynesians brought with them utilitarian plants during their numerous voyages to Hawaii and also found plants unique throughout the world here in Hawai'i Nei upon their arrival. Ancient Hawaiians had a sense of land stewardship, and their resource management in Hawaiian culture included appreciation for intrinsic natural values, reverence for life, a concept of land stewardship and a strong sense of place. We as plant lovers jumped in with enthusiasm in our endeavor to return natives to our landscapes and follow in our ancestors footsteps. By planting natives we were doing our part to preserve the unique culture of these plants. Yet our Landscape Architects were understandably hesitant to specify native Hawaiian plants in their palettes at first, due to limited or unavailable plant material, unestablished maintenance requirements and difficulty selecting plants for a site due to lack of experience in their cultivation and use. Landscape architects were just not yet comfortable using plants that they were not familiar with in regard to the plant's maintenance and care, the areas to which the plants are acclimatized and adapted, and all the other important factors that would determine the success of the native plant's survival.

Fast forward to today! Heidi is the renowned author of *Growing Native Hawaiian Plants: A How-to Guide for the Gardener*. Rick is (in my opinion) the world's foremost authority on growing native plants and utilizing them in the landscape through his work with his groundbreaking company *Hui Ku Maoli Ola*. You can even find Rick's plants at City Mill and Home Depot! The native plant palette has expanded from just ti, hala, kou, milo, taro, wiliwili, kukui, naupaka kahahai, akia, and hapu'u to many unusual and critical types. We are expanding the native plant gene pool on a daily basis through out-planting in both natural and controlled environments in our work. In almost all resort hotels and residential landscapes you will find the use of natives. Landscape Architects are comfortable in their knowledge of natives to specify entire landscapes of exclusively natives. We even have U.H. Researcher and Professor Orville Baldos developing native plants for specimen ornamental and interior use! As native plant aficionados we have come a long way, and I am proud to say that I was a part of the 'movement' to bring them back to our Hawaiian landscapes, as they are so culturally important and near and dear to my heart! Ho'oulu Hawai'i meakanu!

Please also note my friends and colleagues that we (LICH) have tentative plans (to be confirmed shortly!) for an upcoming Web based conference to take place in November 3-4 for those of you needing both Pesticide, Arborist and LICT CEUs! We also are considering partnering again with the Agriculture Leadership Foundation of Hawai'i for a live conference at the Hawai'i Convention Center in April of 2022, so be looking for more information about these exciting upcoming events!

Mahalo nui, malama pono, Aloha ke Akua!



BIAN's 10th Annual Labor Day Autumn Plant Sale

Due to increasing risks associated with the Covid Delta variant, this event has been postponed until further notice

Great News!

The Big Island Association of Nurserymen (BIAN) will hold our **10th annual Labor Day Autumn Plant Sale September 3rd & 4th** at the Edith Kanakaole Stadium in Hilo. These plant sales enable our members to display their locally grown plants and flowers to the residents and visitors of Hawaii County in a structured setting. They will also promote a greater use of nursery products grown on the Big Island to retard the importation of plant materials from the mainland that have the potential to bring in invasive pests or diseases.

In light of the COVID-19 pandemic, mitigation protocols will be in place. Everyone will be required to wear masks, hand sanitizer will be provided for those entering the stadium, social distancing will be mandated and there will be limited entry into the stadium.

Due to Hawaii County regulations, a maximum of 100 persons will be allowed in during the new hours:

Friday, September 3rd from 2:00 – 6:00 p.m.

Saturday, September 4th from 9:00 a.m. – 2:00 p.m.

Entry is always free and for this sale we will not be able to provide you with boxes to take your plants home.

For more information contact Sean Spellicy at 808-966-7169 or email to bianjudy@gmail.com

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Hawaii Floriculture & Nursery Association (HFNA)

P.O. Box 5640 – Hilo, Hawaii 96720

The Hawaii Floriculture & Nursery Association (HFNA) will be holding their annual Growers' Import Replacement Educational Research Webinar on Wednesday, September 29th in collaboration with the UH-CTAHR Ornamental Extension Agents' Field day which will be held at Waiakea Experimental Station on Thursday, September 30th, 2021.

The webinar will include the most current updates by researchers from USDA Daniel K. Inouye Pacific Basin Agricultural Research Center (PBARC) and UH-Manoa College of Tropical Agriculture & Human Resources along with UH-CTAHR's Cooperative Extension Service. The event will be hosted at the Komohana Research & Extension Service. Please save the dates! Registration information will be forthcoming and available at HFNA's membership website: www.hawaiiFloriculture.org. You may also send questions to Judy at hfnajudy@gmail.com or Dr. Joanna Bloese, bloese@hawaii.edu.

This program is sponsored by the Hawaii Department of Agriculture, the Hawaii County Department of Research & Development, USDA DK1 ARS PBARC, UH-Mānoa CTAHR and CES.

HFNA will hold their Wedding Celebration 2021 Webinar November 19th, 20th and 21st, 2021 to educate wedding industry professionals on the benefits of using Hawaii grown flowers and foliage in wedding floral designs. New to this year's webinar is a Breeders' & Growers' Forum on Friday, November 19th which will include UH-CTAHR researchers and breeders who will have roundtable discussions with the audience in order to ascertain which traits (i.e., color, scent, size, longevity, etc.) the industry is seeking. Hawaii growers of floriculture products will also participate in order to talk with the audience and breeders to discover which varieties of flowers and foliage are widely sought after, as well as upcoming trends in floral design. This will provide the growers with an opportunity to make alterations to their crops and production to stay current with the marketplace.

Information on the webinar and upcoming registration availability will be available on HFNA's marketing website www.hawaiineotropica.com.



Westin Hapuna Beach Hotel, site of the 9th Landscape Management Conference. Photo by Marriott Hotel



9th Landscape Management Conference & Tradeshow 2021: Back to the Basics

by Ty McDonald

Due to increasing risks associated with the Covid Delta variant, this event has been postponed until further notice

The Hawai'i Island Landscape Association and University of Hawai'i - Kona Cooperative Extension are excited to conduct our biennial Landscape Management Conference on-schedule and in-person next month. The conference and tradeshow is slated for Friday, October 22 at the Westin Hapuna Beach Hotel in South Kohala from 8am to 4pm.

In addition to providing diverse topics of interest, as well as an opportunity for networking with other folks in the Green Industry, a primary focus of this event is to provide practical management tools for landscape professionals.

Kicking off the conference is Plenary Speaker, Katy Deshotels-Moore, director of island operations for Pulama Lāna'i - a land and resource management company, cultural steward, and community builder. Katy's topic is *Lāna'i: Growing toward the Vision, with Each Sustainable Step*.

When going *back to the basics* in the design, installation and management of built landscapes, the consideration of plant health from the ground up is a good place to start. Hannah Lutgen, a University of Hawaii Extension Agent based on Maui, will establish this foundation with a talk about *Soil and Plant Health*.

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Likewise, knowing your plant material is a basic requirement in the appropriate design and care of tropical landscapes. Matt Ritter and Jenn Yost, botany professors at California Polytechnic University, San Luis Obispo will discuss *Hawai'i's Most Commonly Grown Trees and How to Identify Them*. Other topics include *Mushrooms in the Hawai'i Landscape* with Don Hemmes, Professor Emeritus of Biology from the University of Hawai'i at Hilo. And the future is now with commercial-grade, cordless power equipment. Clifford Vianzos from Golden Eagle Distributing will discuss the *Basics of Battery Powered Landscape Equipment*.

Trade show exhibitors will feature their latest products and services, as well as up-to-date information on invasive pests and diseases. Continuing Education Units (CEU) are available for certified landscape technicians (LICT), tree workers and arborists (ISA).

Post conference Tour

An optional tour will take place the day after the conference (October 23) and visit two sites in north Kona. The first stop is the Kona Cloud Forest Sanctuary in Kaloko Mauka, a tropical cloud forest situated on

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70 acres at the 3,000 foot elevation on the slopes of Hualalai. The second stop is a tour of Hawaiian Gardens, an 8-acre plant nursery with a wide variety of ornamental trees, fruit trees, palms and shrubs located at the Keahole Agricultural Park near Kona airport.

More HILA News

Irrigation Hydraulics, Design and Troubleshooting workshop - date to be determined. Instructor - Lynnett Tohara from Diamond Sprinkler and Farm Supply.

For more conference information and on-line registration visit www.hilahawaii.com or contact me at tym@hawaii.edu.

Due to the rising COVID-19 statewide executive order limits on indoor gathering, the Management Conference and Tradeshow will be canceled until a later date. Hope to see you then when we are all safer.

.....
Ty McDonald is a University of Hawai'i Extension Agent and advisor to the HILA board of directors.



Jacquemontia sandwicensis
'Puhala Bay', a unique selection
of pāūohi'iaka from Maui for
hanging baskets and landscapes.

by Orville C. Baldos

Typical form of pāūohi'iaka growing on the beach.



Jacquemontia sandwicensis 'Puhala Bay' in a hanging basket.



Wild-collected and cultivated pā'ūohi'iaka grown under the same conditions show varying degrees of hairiness, growth and flower color



Pā'ūohi'iaka or oval-leaved cluster-vine is a common groundcover growing along the coasts of the main Hawaiian islands. It is a vine that grows up to 10 feet long with oval leaves. In the wild, plants can vary in terms of stem and leaf hairiness (e.g. very hairy to no hairs), stem color (e.g. green or purple) and flower color (e.g. white or blue) [1].

In ancient times, pā'ūohi'iaka has been used by the native Hawaiians as tea, as food, as a laxative and as a treatment for thrushes in babies, cuts and other aches and pains [2]. In recent decades, pā'ūohi'iaka has been promoted as a landscape groundcover or container plant that is tolerant to wind, salt spray and saline soils. Despite the existence of varying forms in the wild, identifying island specific plant selections suited for landscaping and container plantings has been limited. To increase the variety of pā'ūohi'iaka for the landscape and nursery industries, our lab initiated research to collect, select and evaluate plants from the different islands. In 2017, we collected and characterized six plants from three islands (Oahu, Maui and Hawaii) and identified two selections for hanging baskets or as a landscape groundcover. Here we describe 'Puhala Bay', a

unique selection of pā'ūohi'iaka from the island of Maui [3].

'Puhala Bay' was originally collected as seeds from a wild population in north Maui. Plants were germinated and grown at the Maui Nui Botanical Gardens (MNBG) in Kahului. In 2017, we collected stem cuttings from MNBG to propagate and increase for further testing and evaluation. After characterizing the plants in pots and hanging baskets, we identified 'Puhala Bay' as a promising selection.

'Puhala Bay' is a unique selection of pā'ūohi'iaka due to its very hairy stems and leaves. This characteristic makes it look grayish-green or silver green when viewed from afar. Its leaves are oval (1.42 inches long by 1.18 inches wide, on average when flattened) and thick (0.02 inches, on average) and it possesses a unique, wavy edge that adds ornamental value. Flowers are 0.44 inches (on average) in diameter and violet blue in color (RHS 91B, Royal Horticultural Society, 2007). Because of its short stem lengths between leaves (0.47 inches, on average), 'Puhala Bay' exhibits a compact growth habit. It also produces numerous side branches with pruning or pinching.

Due to these characteristics, it can be used as a hanging basket plant or as a landscape groundcover.

'Puhala Bay' can be easily propagated from stem cuttings or simple layering. If propagating from stem cuttings, we suggest using stem sections with at least 4 to 6 leaves and with preformed root initials (i.e. bumps at the bottom of the stem). Remove flowers and flower buds before propagating. Since root initials are already formed, the application of rooting hormone is not required. Root cuttings under full shade. Cuttings can be rooted in water or in containers with calcined clay filled halfway with water, and then transplanted after 3 weeks into a well-draining potting medium. Cuttings can also be directly planted into the final potting medium provided that the medium is constantly moist but not saturated. Avoid propagating the cuttings under mist conditions since the dense pubescence on its leaves can hold too much water and leads to rotting.

Cuttings of 'Puhala Bay' can be made available to interested nurseries in the state. Contact Orville Baldos (obaldos@hawaii.edu) or Maui Nui Botanical Gardens for inquiries.



Jacquemontia sandwicensis 'Puhala Bay' tip cuttings being rooted in subirrigated trays filled with calcined clay.

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Orville Baldos is the Assistant Researcher in Sustainable Ornamental Production Department of Tropical Plant and Soil Sciences University of Hawai'i at Mānoa

missing photos as well - Puhala Bay as a groundcover.jpg

Close-up photos of the flowers and foliage of *Jacquemontia sandwicensis* 'Puhala Bay'.



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PEPP staff searching for additional plants
of *Cyanea heluensis* on West Maui.
Photo by Hank Oppenheimer.



PEPP Botanist Steve Perlman with *Cyanea heluensis* in flower.
Photo by Hank Oppenheimer.

Hawai'i's Plant Extinction Prevention Program:

**Saving native species
with teamwork!**

by Matt Keir



Hawai'i's Plant Extinction Prevention Program saves rare native plants through teamwork. When the last remaining individuals of a rare plant species are discovered, they can be protected, propagated, and planted back out into secure areas to reclaim their role in native ecosystems. Without this intervention, more native plants would have gone extinct. The Hawaiian Islands are the most isolated land masses on Earth. This isolation has created a biological hotspot where approximately 90% of the native flora is endemic (found nowhere else in the world). Hawai'i's unique flora is at risk of extinction, primarily due to the ongoing impacts of invasive alien species. Now, Hawai'i has the regrettable distinction of being "the endangered species capital of the world," home to 40% of all endangered plants in the United States. Although Hawai'i has less than 1% of the landmass in the United States, there are 425 Threatened or Endangered plants. Most of these plant species are critically endangered, having fewer than fifty individual plants remaining in the wild. In these cases, a single animal, landslide, storm, or new disease can wipe out an entire species. So far, over one-hundred plants only found in the Hawaiian Islands have gone extinct. The Plant Extinction Prevention Program (PEPP, <http://www.pepphi.org/>), is a project of the Pacific Cooperative Studies Unit (<https://pcsuhawaii.org/>), of the University of Hawai'i at Mānoa and is supported by partners at the State of Hawai'i Division of Forestry and Wildlife (<https://dlnr.hawaii.gov/ecosystems/rare-plants/>), and the Pacific Islands Fish and Wildlife Office (<https://www.fws.gov/Pacificislands/promo.cfm?id=177175799>), and with grants and donations from public and private institutions.

With staff located on Kaua'i, Oahu, Maui, Moloka'i, and Hawai'i Island, PEPP works wherever the plants live. Field surveys are done to search for rare species along roadsides and in remote locations. New locations of rare plants are discovered every year, but most often these populations are in decline. Whenever possible, threats are immediately controlled, and long-term protection is planned for the area. Fences are built to exclude feral animals such as pigs, goats, cattle and deer which trample and eat vulnerable native species. Rats and mice devour seeds and damage small plants. Sometimes this is so

severe that there are no seedlings or younger plants of rare species. Aggressive invasive plants can smother native plants and alter soil and microclimate conditions to favor their own survival, killing off native species. Many of these weeds are adapted to establish quickly after wildfire, blocking native species from regenerating. As the frequency of these fires increase in Hawai'i, so does the spread of invasive plants. New pathogens to our islands, like Myrtle Rust (*Austropuccinia psidii*) and those causing Rapid Ohia Death (*Ceratocystis spp.*), are causing further disruption of native forests allowing invasive plants to take hold. Many native plants rely on other organisms for pollination and dispersing seeds. When birds, moths, and other native animals go extinct, so do the plants that rely on them.

In 2020, a new species of native plant was described from the only known individual discovered in a remote location in West Maui. While exploring the steep slopes of Helu above Lahaina, PEPP botanist Hank Oppenheimer and colleague Jennifer Higashino found a single large plant in the deep shade of healthy 'ōhi'a forest. The new plant, named *Cyanea heluensis*, is related to other native plants known as hāhā, but has unique leaves and gently curved long white flowers. The flowers of this and other related species are pollinated by birds and the orange fruits are attractive to fruit-eating native birds that would disperse the seeds. Since first discovering years ago, Mr. Oppenheimer has managed a team of specialists to prevent its extinction. From

the highly skilled helicopter pilots at Windward Aviation who being him to the site, to the horticulturists at Lyon Arboretum and the Olinda Rare Plant Facility who developed methods to clone and grow the new species, each has played an important role in saving this species. With it now secured at State nurseries, *Cyanea heluensis* can now be multiplied and planted back into its home on West Maui.

Since PEPP started over twenty years ago, an average of one species has gone extinct in the wild every year; but not before being saved in cultivation. Direct intervention to collect seeds, cuttings, or other propagative material has been successful. There are now at least twenty-four species that have been saved before their last plants died in the wild. Salvaging the last plants to rescue a species can only be done with teamwork. Talented propagators at botanical gardens, seed banks, and specialized plant nurseries across the state maintain these plants until they can be returned to the wild. Protecting and restoring habitat provides new homes for rare species to recover.

Stenogyne bifida is an endangered species known only from the island of Moloka'i. It was first described in the 1870's and was listed as a State and Federal Endangered species in 1992. By 1995, there were just 12 plants known and it was collected and secured in tissue-culture at Lyon Arboretum. Despite being fenced and protected, the population continued to decline.



Photo by Hank Oppenheimer.

A single plant remained at the site until 2013, when it was observed to have died. Plants held at Lyon Arboretum were withdrawn and sent to the Olinda Rare Plant Facility on Maui where it was grown out, pollinated, and successfully propagated. In 2019, seedlings were returned to Moloka'i and planted in a protected preserve. Since then the plants have flourished and the next generation is expected to survive.

Each year, PEPP works with nearly 200 plant species in Hawai'i. By focusing on teamwork, cost efficiency, and innovation, we have been successful! But we cannot do it alone. To join the team, please visit us here: PEPPHI.org.

Matt Keir is a botanist working for the State of Hawai'i, Division of Forestry and Wildlife and helps to manage PEPP.



1. *Stenogyne bifida* in flower on Moloka'i. Photo by Ane Bakutis
2. Plants established in tissue culture at Lyon Arboretum. Photo by Nellie Sugii
3. Seedlings of *Stenogyne bifida* being grown out for planting. Photo by Ane Bakutis
4. *Stenogyne bifida* plants a few weeks after planting into protected habitat. Photo by Ane Bakutis

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Native *Pritchardia* Palms

by Garrett Webb, Landscape Industry Council of Hawaii, Executive Director, and Cycad Nurseryman

I arrived in Hawaii in 1977. I was born and raised on the east coast of the mainland and never settled down in one place for long until I made my home on the Big Island of Hawaii. I began landscaping in 1979; and collecting and growing palms has been my passion ever since. I soon found out that the only palms that came to Hawaii on their own were species in the genus *Pritchardia*. As well as collecting palms, I have also enjoyed collecting books. To consolidate the study of Native *Pritchardia* to one magazine article is a challenge, but I will give you some background information on the political and legal issues to do with native *Pritchardia* palms, and a very brief introduction to the book all palm growers should own, *The Biology and Management of Landscape Palms*, by Donald Hodel.

Pritchardia and Politics

In 2015, the State Legislature amended HRS § 103D-408 to set clear mandates for the use of Hawaiian (native and Polynesian-introduced) plants in public landscap-

ing, in furtherance of the preservation of Hawai'i's cultural and ecological heritage, among other purposes. HRS § 103D-408 defines Hawaiian plants as endemic or indigenous plant species as well as those brought to Hawai'i by Polynesians before European contact, such as kukui, kalo, wauke, niu, noni, and kamani. The law intends to set clear mandates for the use of Hawaiian plants in public landscaping. If you look carefully, you may find that many public landscapes attempting to follow this mandate by using many non-native palms, such as *P. thurstonii* and *P. pacifica*, from elsewhere in the south pacific.

In 2016, as the Legislative Chair with the Kona Farm Bureau I called our local legislator in Hilo and asked him to enter an Administrative Rule with the Hawaii State Legislature. It took two years, but in 2017 a rule was adopted permitting the sale of Endangered plant species. Up to that point, owning or buying a T&E (Threatened and Endangered) plants was illegal.

Matt Keir is presently the State Botanist Hawai'i Rare Plant Program, Department

of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) and the author of an article in this issue of this magazine, titled *Hawai'i's Plant Extinction Prevention Program: Saving native species with teamwork!* on page 12. If you are growing or selling endangered palm species commercial use tags are required to do that. Here are some interesting historical facts. DOFAW has issued a total of 121,844 commercial-use tags permitting the sale of Endangered plant species since 1998. There were 4,070 tags issued in 2020 and 11,645 so far in 2021. To date, **we have records of 6,815 tags being issued for Endangered species of Pritchardia.** These are the six species we have issued tags for are: *P. kaa-lae*, *P. maideniana*, *P. napaliensis*, *P. remota*, *P. schattaueri*, *P. viscosa*, with most tags for *P. remota* (4,467).

There are ten Endangered species of *Pritchardia* in Hawaii, one on Niihau and Nihoa, three on Kauai, two on Oahu, one on Maui and Molokai, and three on Hawaii Island. Half of these Endangered *Pritchardia*, along with *P. gordonii* which is

not listed, are priority species for the Plant Extinction Prevention Program (*PEPPHI.org*). *Pritchardia* are experiencing an ongoing decline in numbers due to impacts of invasive alien species, especially ungulates and rodents that eat live plants and fruits. Conservation actions to fence the remaining wild populations are ongoing at some locations, but more work is needed to control threats around rare species. Research on holding the seeds in storage is ongoing and beginning to show promise. Living collections of many species are maintained at botanical gardens around the state and these could be carefully managed in a breeding program to produce seeds from controlled crosses that are appropriate for use in restoration. Here is a link to the Permit: <https://dlnr.hawaii.gov/ecosystems/rare-plants/permits/>

Can you Identify your Native Palms?

When native palms are discussed, they are most often referred to as loulou palms. A loulou palm is defined in the Hawaiian Dictionary as 'all species of native fan palms (*Pritchardia*). Unfortunately, many fan palms are assumed to be loulou when they are not one of the 24 species of native Hawaiian palms. To see the full list, read *Loulou, The Hawaiian Palm* by (again) *Donald Hodel* (2012 *University of Hawai'i Press*). The two of the most common palms seen in landscapes on all the islands erroneously referred to as loulou are *P. thurstonii* and *P. pacifica* which are located elsewhere in the south pacific.

To help you ID your native palms, study the glossary in Hodel's *The Biology and Management of Landscape palms* so that you can describe your palm to a professional from a live specimen, or from a photo that a client has sent you needing advice because something is wrong, or an ID to find another palm of the same kind.

Here are a few important terms to be able to use:
Armed: possessing spines, teeth or similar appendages.

Bipinnate: a condition where pinnae are divided again into subpinnae, a condition found only in the genus *Caryota*.

Costapalmate: a condition of a palmate leaf where the petiole extends into the leaf blade.

Crownshaft: a structure formed by overlapping, tubular leaf bases that are little or not split opposite the petiole.

Inflorescence: flower stalk, typically with various levels of branching, holding the flowers and later the fruits.

Palmate leaf: a type of leaf with the divisions (segments) all originating at more or less the same point.

Root initiation zone: area of the trunk, typically at the base or proximally, where roots initiate.



Pritchardia maideniana at the King Kamehameha's Kona Beach Hotel
Photo by Donald Hodel



Pritchardia schattauri, a species of palm tree in the genus *Pritchardia* that is endemic to mixed mesic forests on the southwestern part of island of Hawaii, near Kona
Photo by Donald Hodel

Care and Management of Native Palms

Problems: Nutritional and Fungal

The two most common nutritional problems I have encountered in Kona are Boron and Potassium deficiency. I am going to address just these two nutritional issues in managing *P. maideniana* and *P. hillebrandtii*.

Boron

'Boron (B) deficiency is one of the most common and wide spread of all nutrient deficiencies in palms. It occurs in palms growing in high rainfall areas of the tropics, but it is also found in palms growing in desert climates (Elliott et. al. 2004).'

'Recent work has increased our understanding and appreciation of Boron deficiency in palms, especially its transient nature both in the palm and in the soil; and B deficiency may be much more common in palms than was previously recognized.'

An insufficient amount of Boron in the soil is the primary cause for B deficiency and B can easily leach from the soil. Even a single heavy rain or irrigation event can lead to B deficiency (Broschat 2005d, 2007a). After the leaching has occurred, B can return to a satisfactory level. It is possible for this B deficiency pattern to occur as often as three times during the development of single leaf (Broschat 2005d, 2007a).

Symptoms of Boron deficiency:

***Fused leaflets;** 'presence of two or more unopened or unevenly opened spear leaves with stuck together leaflets that do not separate.' This is the most common symptom of B deficiency. This fusion can affect leaflets along the entire length of the rachis or it may be restricted to either basal or distal portions of the leaf.*

***Leaning Crown Syndrome (LCS), epinasty, trunk bending;** 'this symptom occurs where epinastic growth of the apical meristem causes bending, twisting or curving of leaves, and redirection of the apical meristem in a horizontal or even downward manner.'*

Treatment for B deficiency

Apply 2 to 4 ounces of the product Solubor in 5 gallons of water as a drench. Results may not be visible for up to 5 months. Because the tolerances between too little, enough and too much B can be so small, it is important not to over-apply B as toxicity can result.

**Excellent results have been achieved by applying up to four inches of mulch and by avoiding over-watering. Here is a discussion of why this is so important in Kona soils and how these practices can aid a palm in the uptake of Boron.*

Key Points / Cation Exchange

Cation exchange capacity (CEC) is the total capacity of a soil to hold exchangeable cations.

- CEC is an inherent soil characteristic and is difficult to alter significantly.
- It influences the soil's ability to hold onto essential nutrients and provides a buffer against soil acidification.
- Soils with a higher clay fraction tend to have a higher CEC.
- Organic matter has a very high CEC.
- Sandy soils rely heavily on the high CEC of organic matter for the retention of nutrients in the topsoil.

Potassium

*Potassium (K) deficiency is very common in all kinds of palms in Kona, especially *P. maideniana*. Potassium is responsible for cell wall strength. When cell walls collapse due to K deficiency the result is the formation of yellow and brown spots (necrosis) on older leaves.*

Left untreated the deficiency advances to new growth and can be fatal. Potassium deficiency is common in palms growing in high pH soils and soils that are high in salinity, not because the element is absent in the soil but because the high pH and salinity “lock up” the Potassium making it chemically unavailable to the palm.

Fungal Disease effecting Native P. maideniana

Thielaviopsis paradoxa has a worldwide distribution and is most often observed on mature palms with considerable trunk height as well as smaller P. maideniana.. The symptoms include; trunk rot, trunk collapse, and canopy drop. “Due to the disease, the palm trunk either collapses on itself or the canopy suddenly falls off the trunk, often without warning.” (Thielaviopsis Trunk Rot of Palm, Monica L. Elliott, Florida Cooperative Extension Service PP-219). In Hawaii, we often see stem bleeding in Coconuts and P, maideniana, which is also a symptom of *T. paradoxa* (Scot Nelson, CTAHR Plant Disease PD-30). The fungus produces spores that will survive for long periods in the soil and infects palms when there is a fresh wound present. Although, as stated, trunk or canopy collapse can occur without symptoms, one may be able to observe either stem bleeding, or the premature loss of older leaves in palms infected with the fungus. The exact diagnosis of the *T. paradoxa* is based on the fungal pathogen present in the diseased trunk tissue (Elliott). Often this requires taking down the palm in order to recover infected tissue for the lab to culture.

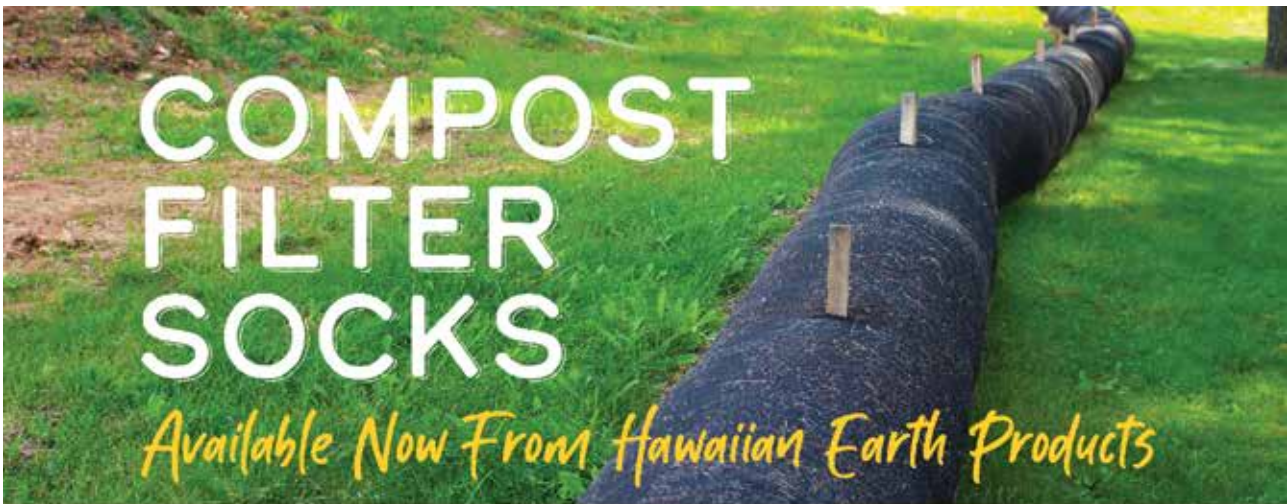
Thielaviopsis paradoxa, like other fungal diseases, most often infects plants that are under stress. Stress reduction and the promotion of plant health are extremely important for the palms at the beach area. Adequate water and a fertilizing program will greatly aid in keeping the palms healthy and resistant to disease

It is important to understand how Thielaviopsis Trunk Rot of Palm can spread. “Only fresh trunk wounds will become infected by the fungus, so disease management includes limiting manmade wounds to the trunk, especially the upper third of the trunk.” (Thielaviopsis Trunk Rot of Palm, Monica L. Elliott, Florida Cooperative Extension Service PP-219). This statement points out the danger that the disease can be spread by pruning cuts, wounds that are made to the petioles (that organ, usually long and slender, that attaches the leaf to the leaf base) at close proximity to the trunk. Sterilizing saws after trimming each tree will be necessary. One effective way to sterilize saws without causing corrosion is the use of flame, like a butane torch, to heat the saw after trimming. Use of chain saws should be avoided, but if needed in the removal of a palm, the chain should be removed so that all the sawdust around the clutch assembly area can be removed.

The fungicide Thiophanate-methyl is very effective as a treatment for Thielaviopsis. However, in the windy conditions it would be very difficult to spray the crowns of the palms. Also, the use of the fungicide as a soil drench could have deleterious effects on the water table or ocean water. There is, however, a third option. The application of a ‘slurry’ of fungicide, either Benlate or Cleary 3336 painted on wounds, has been shown to be effective in arresting the progress of the disease (Garofalo and McMillan Proc. Fla. State Hort Soc. 117:324-325. 2004).

Enjoy collecting, studying, and maintaining your Native Hawai'i Palms!

.....
Garrett Webb, is the Landscape Industry Council of Hawaii (LICH), Executive Director, and Cycad Nurseryman.



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NATIVE PLANTS THAT KNOW HOW TO DRINK RESPONSIBLY

By Tamara Sherrill, Executive Director, Maui Nui Botanical Gardens



'Ili'e (*Plumbago zeylanica*)



'Ili'e (*Plumbago zeylanica*) Photo by Forest and Kim Starr

Many people who have landscaped with native Hawaiian plants conclude that they have awfully specific needs. The plant you thought would be perfect declines from a nearly invisible scale insect or being planted just outside its comfort zone. Hawai'i's endemic plants evolved in a geography with widely variable soils, moisture regimes, and temperatures, and many less pressures from pests and diseases. Some are generalists adapted to many elevations, and others only like certain conditions.

There is a cohort of native Hawaiian plants that truly thrive in dry landscapes. These drought tolerant superstars evolved on the leeward low to mid elevation areas, or on windward mountaintops above the inversion zone, which excludes orographic rainfall. Repurposing them for landscaping

takes experimentation, but it is absolutely worth the extra effort to create landscapes that preserve Hawaiian cultural heirlooms, conserve fresh water, and reflect the unique beauty of each island's environment. Maui Nui Botanical Gardens (MNBG) is a low elevation former coastal dune system with an average annual rainfall of 18 inches. The soil is a pale sand, a highly alkaline Jaucus series soil that can dissipate hundreds of gallons of water in minutes. We have experimented with hundreds of native species and varieties in the past two decades to see which can create a beautiful landscape on a nonprofit budget. Low maintenance? Not quite; but below are a few examples of our favorites. All are all long lived, relatively pest free in Kahului, Maui, and extremely water conservative.

Succulents and other pot subjects – Because native Hawaiian plants can be

picky as to soil type, we maintain many large planters in our paved areas. These areas are less than ideal for irrigation lines but some plants look good even when we forget to hand water for weeks at a time. 'Ihi (*Portulaca molokiniensis*) is a rare endemic that will bloom and grow beautifully if you keep the soil very dry, grow it in full sun, and fertilize regularly. The flowers draw many different pollinators, and though we don't have much success growing it directly in our sandy soil, it lives many years in pots. Although all native *Portulaca* are drought tolerant, *P. molokiniensis* is relatively pest and disease resistant compared to others we grow.

'Ala 'ala wai nui (*Peperomia leptostachya*) is indigenous (formerly *P. blanda* var. *floribunda*) and can survive severely dry soils as well as shade. This native of the black pepper and 'awa family has dozens of



Pōhuehue (*Ipomoea pes-caprae* ssp. *brasiliensis*)
Photo by Kim and Forest Starr



Pōhuehue (*I. pes caprae*) with kauna'oa (*Cuscuta sandwichiana*)



Pōhuehue growing at Maui Nui Botanical Garden.

native Hawaiian species that live both as ground dwellers and as epiphytes on trees. *P. leptostachya* therefore thrives in filtered light or partial sun, and still looks fresh in a drought. It is a perfect first native plant to give a friend in a small pot, as it does not mind root crowding.

Groundcovers – Commonly used native groundcovers or low shrubs such as ‘ilima (*Sida fallax*), pōhinahina (*Vitex rotundifolia*), and ‘ākia (*Wikstroemia monticola*) are fabulous but there are more species to add to this list with proven drought tolerance.

‘Ilie’e (*Plumbago zeylanica*) is more of a beautiful green background than a flowering plant, but it is fantastic at straddling the line between suppressing weeds and not taking over the world. ‘Ilie’e was used in traditional Hawaiian kākau or tattooing. Probably because the juice from the

roots causes a temporary chemical burn if applied to skin for several minutes, deer and other ungulates do not browse on this plant. It is not picky as to sun or shade and can be sheared regularly if you want to be fancy and keep it a certain shape. It is perfect to sprawl in dry shady areas, and the ‘ilie’e at MNBG that were planted under mature trees in 2001 have never needed pest control or any special attention.

Pōhuehue (*Ipomoea pes-caprae* ssp. *brasiliensis*) is common on sandy beaches on leeward coasts, but it was once found up to 1,380 feet elevation. It does not need extra water after getting established. A single vining plant can cover a huge area with attractive leaves and purple morning-glory flowers, but it is courteous and does not twine or climb. Try wrapping fresh stems of the endemic kauna’oa (*Cuscuta sandwichiana*) around established pōhuehue vines

for an easy lei material source and a beautiful pop of orange each year as it grows and fades; although kauna’oa is parasitic on pōhuehue, it will not hurt it one bit.

Shrubs and Trees – Woody native Hawaiian plants don’t keep their foliage in serious drought, but many mature inhabitants of leeward areas spring back in winter even if stems die back. Some are summer deciduous and need the cycle of losing their leaves in the dry season to be healthy and set flowers, which pairs nicely with summer water restrictions.

Naio (*Myoporum sandwicense* ssp. *sandwicense*) is unusual in that it can thrive at nearly every elevation. The wood, called ‘a’aka, was valued for hale construction and for firewood. It can be sensitive to drought at juvenile stages but very tolerant when a mature small tree or tall shrub. There



Naio (*Myoporum sandwicense* ssp. *sandwicense*)
Photo by Forest & Kim Starr

Naio (*Myoporum sandwicense* ssp. *sandwicense*) Photo by Forest & Kim Starr



Mamane (*Sophora chrysophylla*) Photo by Jupiter Nielsen



Mamane (*Sophora chrysophylla*) Photo by Jupiter Nielsen



Ko'oloa'ula (*Abutilon menziesii*) Photo by Jupiter Nielsen



Ko'oloa'ula (*Abutilon menziesii*) Photo by Jupiter Nielsen



Wiliwili (*Erythrina sandwicensis*) Photo by Kim and Forest Starr



Wiliwili (*Erythrina sandwicensis*) Photo by Kim and Forest Starr



Māmane (*Sophora chrysophylla*) with Amakihi Photo by Jupiter Nielsen

is a Big Island coastal variety with a dwarf habit that is sold as “naio papa” or groundcover naio, which maxes out at several feet tall despite the name and shares all other qualities.

Ko'oloa'ula (*Abutilon menziesii*) is an endangered endemic species in the Hibiscus family that once were common in sugar growing areas. Some know it as “red 'ilima” and the flowers are beloved for lei. Like 'ilima and other species with grey or silvery leaves, it has minute hairs that help it retain water. As water becomes more restricted, leaves tend to get smaller. Not all endangered species are harder to grow. Some, like ko'oloa'ula and our logo plant dwarf naupaka (*Scaevola coriacea*), were pushed out of their habitats by people but do fine in cultivation.

Wiliwili (*Erythrina sandwicensis*) and other low elevation summer deciduous trees such as native *Polyscias sp.* are drought tolerant even at juvenile stages. Though they do lose leaves in summer, wiliwili have a gorgeous bloom along the bare branches. The wood was sought after for surfboards.

These plants grow easily at low elevations, but don't forget there are also high elevation superstars. Māmane (*Sophora chrysophylla*) is an essential food source for native birds and maintains its leaves even in drought. This native shrub must grow at 1,500 feet or above. Michelle Smith of Maui Native Nursery says that even the seedlings don't wilt when they dry out in small pots.

As the global human population grows, fresh water becomes increasingly scarce. Global warming means we need plants in urban areas now more than ever to reduce heat, manage pollution, and create a healthy environment for people. Hawai'i is no exception, and in addition Hawai'i has a unique cultural and natural heritage to protect. Our landscapes can include natives while being low maintenance and water conservative if we are willing to experiment and learn.

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Tamara Sherrill is the Executive Director of Maui Nui Botanical Gardens.

'ILI KUPONO NURSERY OPENS AT FORMER KALAOA GARDENS SITE IN KONA

By Diana Duff



Caz and Feather were delighted to have Kumu Kealoha deliver the blessing at the opening of Ili Kupono Gardens nursery and Farmer's Market. Photo by Rhonda Barker

Garret Webb is well known in landscaping circles in Hawaii. He has served as president of the Hawaii Island Landscaping Association and continues as an advisor to their board. He is currently the Executive Director of the Landscape Industry Council of Hawaii and has worked tirelessly for years on a variety of landscape certification programs. All this, while being a very knowledgeable palm nurseryman running Kalaoa Gardens in one of the Ag lots at the bottom of Kaiminani Drive in Kona.

We all get to a point when we want to simplify our lives. Garret got there about two years ago and was ready to reassign the Ag Lot lease that housed his palm nursery at 72-4261 Lau'i Street near the Kona Airport. He decided to move Kalaoa Gardens LLC closer to his home on Ahikawa Street and will soon be opening a cycad nursery on the site.

Garrett is happy to report, "Today my backyard is a forest of interesting palms that I attend and enjoy every day".

Garrett's friend Caz DiMarco was ready to add a nursery to his Hawaii Lawn & Landscape business to serve his clients. The timing was perfect and the lease reassignment began. A year and a half later, the paperwork is complete and 'Ili Kuponu Gardens is open for business.

Caz involves all of his family members in the business and he considers his workers and associates part of the family as well. They all participated in the grand opening of the new nursery on Saturday, April 3, 2021 that included a blessing by Kumu Kealoha as well as a community-based market. The Market featured fresh local produce and locally prepared food along with booths featuring community artisans and some local musical accompaniment. The market will occur on the first Saturday of every month and include great local participants like Muzzy's Instagrindz, Personius Maximus Coffee Farm, Bopper's Hot Sauce, Kona Engraving and Aina & Co.

Opening the nursery to a monthly marketplace is evidence of Caz's strong interest in serving the community. He reported that many attendees pulled him aside at the opening telling him that they had reconnected there with

community members they had not seen in years. For Caz that reinforced his attachment to community service.

He said, "I like that our market is bringing people back together. I often try putting community interests ahead of company interests. I know that community building is good for everyone and for all of our businesses". He plans to make the Palisades Farmers Market at 'Ili Kuponu Gardens at 73-4261 Lau'i Street a regular event, occurring from 8 a.m. to 2 p.m. on the first Saturday of every month. Anyone interested in having a booth at the market should call the company to place a request at 989- 0323.

Tours of the nursery and plant sales continue Monday through Friday

from 8 a.m. to 2 p.m. On a visit to the nursery, you'll see lots of healthy palms and thousands of beautiful ornamental plants that are ready for direct sale or installation through Hawaii Lawn & Landscape.

It was delightful to see so many healthy plants on my last visit to the nursery. I found several species particularly interesting. The 'Joey' palm (*Johannesteijsmannia altifrons*) with stiff upright closed fronds and a variegated manila palm (*Adonidia Merrillii*) definitely caught my eye. It was also a treat to see two of my favorite ti varieties, the multi colored 'Hawaiian flag' and the rust colored 'Peter Buck'. Those are just a few of the interesting species in their collection.

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Feather DiMarco served as the official greeter at the opening of 'Ili Kupono Gardens Farmer's Market. Photo by Caz DiMarco



Kelley and Caz happily show off their Plant Pono swag after 'Ili Kupono nursery was accepted as a Plant Pono business. Photo by Naomi DiMarco



Kelley propagates lots of the Hawaiian flag ti plants to keep up with demand for this colorful variety. Photo by Diana Duff



The unusual 'Joey' palm is one of the interesting species you'll find at 'Ili Kupono. Photo by Diana Duff



Caz is very proud of their recent Best of Kailua-Kona Landscape 2021 award. Photo by Kelley O'Brien



Variegated Manila palms are one of the specialty palms that 'Ili Kupono nursery carries. Photo by Diana Duff



'Ili Kupono has lots of interesting ti plants including the popular 'Peter Buck' variety. Photo by Kelley O'Brien



Caz and Feather DeMarco are happy to include nursery manager Kelley O'Brien and operations manager Josiah Olival in their business family. Photo by Diana Duff

Caz certainly knows what he's doing. He has been a successful, certified landscaping professional in Kona for nearly fifteen years. He prides himself on running a faith-based business with high standards and strong ethical principles. His belief that customer satisfaction is the key to building lasting relationships means that he strives for perfection in each job he takes on.

His professionalism was rewarded this spring when the Kailua Kona Award Program selected Hawaii Lawn & Landscape for the 2021 Best of Kailua Kona Award in the Landscaping category.

Caz comes to this job with a deep respect and understanding of our 'aina. Though he was born on Oahu and spent some of his youth on the mainland, he definitely considers Kona his home.

He and his wife live not far from the new nursery and all of their four children live and work in Kona. His wife Feather serves as a partner in the business working with her daughter Naomi to maintain the company's outreach through Facebook and other social media sites. Their son Michael runs the landscaping crew and Zion, whose photo inspired their logo, became the mascot when he was only two. At sixteen, he now works with the crew and cares for plants and trees differently today. Josiah Olival who has

served for several years as the company's operations manager has definitely become part of the family.

Caz's wife Feather has a long history in Kona. She grew up on a coffee farm on Captain Cook Road and was quick to define herself.

She declared, proudly, "I'm a Kona farm girl. I fell in love with plants as a child and enjoyed the freedom I had to roam the farm and learn about all the plants." Today, her family's 100% Kona coffee is gathering new dedicated customers as they are featured at one of the farmer's market booths at the nursery.

Caz's newest employee has also become part of the extended family. Kelley O'Brien manages the new nursery and works onsite daily maintaining the thousands of plants and palms that are ready to sell. Her job includes weed, pest and disease control as well as propagation of new plants. She's good at all of it.

When I met Kelley several years ago, I noticed her enthusiasm and energy and felt she was headed for great things. Several jobs in landscape maintenance prepared her for this challenging position. The responsibilities of this job are an excellent match for her interests and skills.

She recently hosted a nursery visit by folks from the Plant Pono endorsement program. The program grants Plant Pono status to businesses that

agree to offer plants that are not invasive threats to our 'aina. The program is a partnership between the Big Island Invasive Species Committee (BIISC) and green businesses on the Big Island. Several stakeholders including the Hawaii Island Landscape Association participate and offer advice. The visit resulted in 'Ili Kūpono being listed as a participating business in the Plant Pono program.

This and many other achievements by Hawaii Lawn & Landscape and 'Ili Kūpono Nursery are evidence of the DiMarco family's dedication to malama the 'aina every day. When you can, go check out the lovely nursery and thousands of healthy plants and palms they offer to the Kona community. And, try to catch the next Palisades Farmers Market at 'Ili Kūpono Gardens on the first Saturday of the month.

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Diana Duff is a gardening and farming consultant, teacher and writer. She is a partner in the consulting business Farm Works Hawaii (farmworkshawaii.com) working on farms in Kona as well as in gardens on Oahu. She continues to write gardening columns for Kona's West Hawaii Today and teaches classes on zoom through the Osher Lifelong Learning Institute. Their current catalog of classes is available at osher.socialsciences.hawaii.edu



New Pest Alert! Ramie Moth Arrives in Hawai'i



1st instar larva of the ramie moth.

Hawai'i is the most isolated landmass globally, which resulted in an extensive diversification of unique plants and animals on the islands. Sadly, Hawai'i is also the "invasive species capital" of the world. The rise of human transportation worldwide accelerates the movement of species from their native geographical ranges to new regions like Hawai'i. These invasive species can cause dramatic shifts in ecosystems as many of these species become invasive and result in negative ecological and economic consequences.

In November 2018, the Department of Land and Natural Resources, Division of Forestry and Wildlife (DLNR-DOFAW) staff discovered an unknown caterpillar species defoliating mānaki in the upper reaches of Olowalu Valley, in the West Maui Mountains. Within a week, they found the same caterpillars feeding on mānaki plants in the Olinda Rare Plant Facility in East Maui. Mānaki is endemic to Hawai'i with cultural, ecological, and agricultural importance. We have confirmed the identity of the caterpillar as the ramie moth, *Arcte coerulea* (Lepidoptera: Noctuidae).

It is the first report of the ramie moth in Hawai'i and the United States.

The ramie moth is a large brown moth native to Southeast Asia with the potential to inflict substantial damage through its leaf feeding on mānaki and other native nettles. Currently, ramie moths have been spotted feeding in both wild and cultivated populations of mānaki on Maui and Hawai'i Island. The biggest impact of the ramie moth on plant health is during its larval stage. Caterpillars hatch from eggs that are clear-white, circular, and laid singly on the underside of leaves. There are usually one to two eggs per leaf scattered throughout the plant.



Unhatched ramie moth egg. Size: 1 mm in diameter.

Early instar larvae are green and white and are often mistaken for the native Kamehameha butterfly, *Vanessa tameamea*, or the endemic moth *Udea*

stellata because they also use mānaki as a host plant. At early stages, we have observed the ramie moth caterpillars dropping from the plant when disturbed and traveling quickly throughout the plant creating small holes on the leaves as they feed. As they develop, the ramie moth larvae become more conspicuous with vibrant yellow and black patterning and bright orange-red spots on their sides with thin white hairs. In their later stages, the larvae will create sizeable areas of feeding damage in the middle of leaves and completely strip leaves, leaving only the major veins. The ramie moth is also distinct from endemic competitors because of their aggressive defensive behavior. When disturbed or threatened, the larva rears up its head, thrashes around, and regurgitates a green liquid to defend itself. Ramie moth larvae are about 2 mm in length after they hatch and grow to approximately 100 mm before pupating.

Larvae will pupate in the soil or at the base of the plant in the leaf litter. Adults are large moths ranging from 28 mm to 32 mm from head to the tip of the abdomen and 65 mm to 90 mm wingspan.

Ramie moth adult.



5th instar larva of the ramie moth.



Early instar larva of *Udea stellata*.



Late instar larva feeding damage on a mānaki leaf.



Early instar larva of the Kamehameha Butterfly.

They have a dark brown head, and dark brown forewings with black markings, speckles of silvery-blue, and scalloped wing edges. Hindwings have bright silvery-bluish markings. Adults have a short lifespan, living no more than a week and may feed on tree sap or rotting/overripe fruit. Populations of the ramie moth seem to increase during the spring from March to May before decreasing in the winter.



Ramie moth pupa.

The primary concern regarding the ramie moth in Hawai'i is its impact on native mānaki and other related species that are used for both medicinal and ornamental purposes. The caterpillars feed on a range of host plants in the nettle family including the endemic mānaki, 'akolea, olonā, and ōpuhe, with several of these species already threatened with extinction. These plants have cultural importance to Native Hawaiians who traditionally use mānaki leaves as a medicinal tea and its fibers for textiles and rope. There is currently great effort to re-establish these endangered endemic species, such as ōpuhe, through outplanting events by the state and non-profit organizations. The spread of the ramie moth to Hawai'i's forests could wreak havoc on native ecosystems and conservation efforts. Mānaki is the host plant of the endemic Kamehameha butterfly (*Vanessa tameamea*), Hawaiian blue butterfly (*Udara blackburni*), and a crambid moth, *Udea stellata*, a valuable food source for native birds. Competition with the ramie moth for the same resources will threaten these important endemic insects and further disrupt our native ecosystems. As traditional Hawaiian medicines gain popularity, the per-

ceived health benefits of mānaki tea have led to an increase in its commercial production, primarily on Maui and Hawai'i Island. The ramie moth has the potential to devastate the agricultural output of mānaki if populations aren't controlled. Additionally, mānaki is a common ornamental plant in resident's backyards throughout the state. It is important that everyone be on the lookout for this new invasive species. In order to prevent the spread of the ramie moth, do not move host plants such as mānaki and olonā between islands or areas. The Hawai'i Department of Agriculture Plant Quarantine Branch should inspect plants before being moved. If you spot this pest, please report it to me at aumi@hawaii.edu or to the State of Hawai'i's pest hotline at 643pest.org.

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