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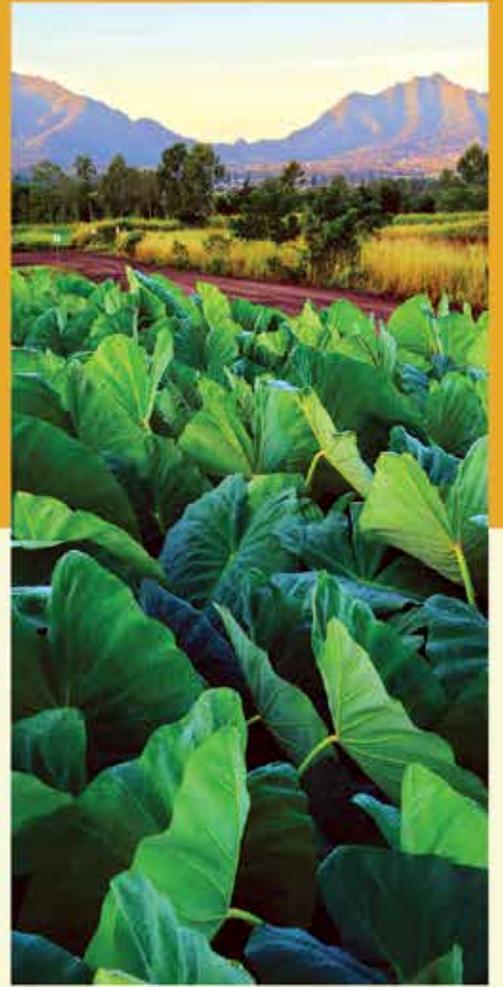
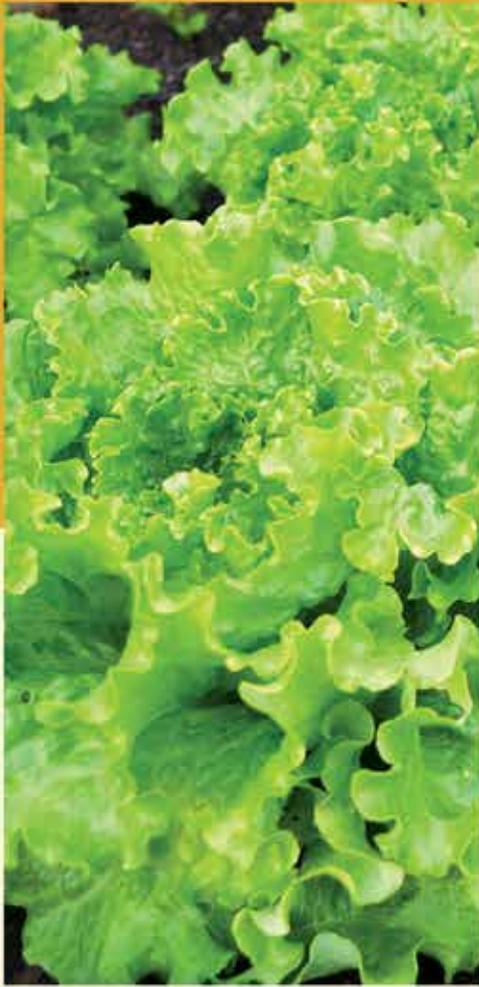
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Hawaii Landscape May/June No. 60 is published bi-monthly by Landscape Industry Council-Foundation, 73-1110 Ahikawa Street, Kailua-Kona, HI 96740

Editors

Russell Galanti
Hannah Lutgen
Chris McCullough

Advertising Sales

Michael Roth
rothcomm@gmail.com

Executive Director

Garrett Webb
palmsinkona@yahoo.com

Designer

Roann Gatdula

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Chris McCullough President	Timothy "Lanky" Morill Vice President
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contents

DEPARTMENTS

- 4 PRESIDENT'S LETTER
- 6 CERTIFICATION CORNER
- 28 PEST COLUMN

FEATURES

- 18 NURSERY INDUSTRY INVOLVEMENT WITH CONSERVATION
- 30 TOOL TIPS

COVER

- 10 ACHIEVING SUSTAINABILITY AND PROFITABLE AGRICULTURE THROUGH NATURAL FARMING
- 14 CONTROLLED ENVIRONMENT AGRICULTURE AND ARTIFICIAL LIGHTING TO GROW PLANTS
- 24 WEED STEAMING: A SUSTAINABLE WEED CONTROL ALTERNATIVE





PRESIDENT'S LETTER

BY CHRIS McCULLOUGH



SUSTAINABILITY: ETHICAL IS OUR NEW NORMAL

Robert Swan, the British polar explorer turned environmentalist and author is famously quoted as saying “The greatest threat to our planet is the belief that someone else will save it.” Please let that sink in for a moment. As the focus topic of this issue is sustainability please consider Swan’s words carefully. It is all of our kuleana, our responsibility, to be good stewards and do our best to avoid the depletion of our natural resources in order to maintain an ecological balance. Too often in our Green Industry and in our modern world in general we go to the easiest and often cheapest route to accomplish our objectives. But do we truly consider the true costs of our methodology, the negative impacts to our ‘Aina, the stress we inflict on our environment. To me it’s always been worth it to utilize the most Earth honoring methodology, because if the method negatively impacts our fragile environment then to me it is then too costly.

As a child I loved the books of Dr. Seuss, but none more than *The Lorax*, which chronicles the plight of the environment and the Lorax who speaks for the trees. I resonated with this fable of danger of human destruction of the natural environment as a young child as my parents had connected me with the wonder and value of nature and the need to respect and protect it.

The Lorax, published just as global environmental awareness was beginning in the early 1970s, is among Seuss’ most famous works and perhaps his most controversial because of its environmental messaging wrapped in the guise of whimsical rhymes and Seussian charisma. The fable pits capitalism against biodiversity. It’s a sobering tale of the growing consequences of human intervention on global biodiversity. As the forests and wildlife crumble and disappear, the Lorax, who “speaks for the trees,” pleads for the preservation of his ecosystem. Ultimately, the Lorax’s admonitions fall on deaf ears, and the book ends with the ecosystem on the brink of extinction. But hope glimmers faintly in the book’s final passage:

Unless someone like you
Cares a whole awful lot,
Nothing is going to get better.
It’s not.

Please consider this deeply and take this to your minds and hearts. We must all do our part and move forward in a positive way in the path of sustainability, in both our work and in everything we do. For as Robert Swan and the Lorax reminds us, we must show our care a whole awful lot. The well-being of our planet and future generations are depending on us to do so. For in the sobering but true words of Niall Fitzgerald we are reminded, “Sustainability is here to stay or we may not be.”

Chris McCullough, LICH President

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CERTIFICATION CORNER

BY GARRETT WEBB, LIC-MANAGER, LICT-EXTERIOR ORNAMENTAL MAINTENANCE & IRRIGATION

LANDSCAPE INDUSTRY CERTIFICATION COMMITTEE ANNOUNCEMENTS

The Landscape Industry Certification Committee has been formed. The members are Brandon Au, Chris Dacus, Erin Lee, Lanky Morrill, Garrett Webb, Larry Borgatti and Ty McDonald.

The new Computer-Only Landscape Industry Certification Technician Test has had very few people show interest in taking the new test. If you are already LICT certified and have paid your dues to NALP (National Association of Landscape Professionals) for your re-certification, you can add a Specialty Component, which used to be called a Module. Christopher Albores LICT, added Irrigation this April 2021 BUT, if you are NOT currently re-certified with NALP, there are two computer tests you need to take; Common Core and then the Specialty Component test, either Irrigation, Ornamental Maintenance, Turf Maintenance, Softscape Installation, or Hardscape Installation. That is the case with me. I have been a LIC Manager for a number of years, but I wanted to see what the test was like and how people would need to prepare for the computer-only technician test. I am now a Landscape Industry Certified Technician in Irrigation and Ornamental Maintenance. Want to know how I did and what my experience was like? Give me a call any time at 808 960-3650. For registration information, go to www.hawaiiscape.com



You might be interested to know that Chris Dacus will be working with the LIC Committee this year on forming a new Hawai'i-only local landscape certification test as well as hands-on classes for test preparation. It will be known as the **TLC Tropical Landscape Certification**. Stay Tuned!

Garrett Webb
LICT State Administrator

LANDSCAPE INDUSTRY COUNCIL OF HAWAII

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To become a 2021 Member, we encourage you to join online at: www.hawaiiscape.com. You will immediately receive an Invoice and a Welcome Notice that you have become a member. This will help as proof of membership when signing up for HMMA Insurance. It will also help LICH build an Industry Survey which has not been done since 1986.



Landscaper practices operating a turf aerator under the tutelage of Ken Sugai (orange vest). Photo credit: Christian Renz

BACK IN THE SADDLE AGAIN...AGAIN

By Ty McDonald

HILA re-convenes new Continuing Education classes

Last fall I reported on the attempted deployment of the Hawaii Island Landscape Association's and University of Hawaii Kona Cooperative Extension's new continuing education series of face-to-face workshops despite the disruptions and uncertainty caused by you-know-what.

As it turned out, after successfully completing two of the four workshops we decided to postpone the remaining events until 2021 - with the expectation (glass half full) that the "situation" would improve significantly by then. So, here we are already, well into 2021 with a reboot of the series of four hands-on classes underway.

With restrictions for outdoor gatherings recently relaxed somewhat, we set a limit of 24 attendees - a significant increase from the 10-person limit required at our last workshop held in 2020. Of course, now-standard six-foot physical distancing and face coverings are required by all participants.

We conducted the first workshop, Equipment Operation and Maintenance, on a glorious Saturday morning in early April at the Mauna Kea Beach Hotel's luau grounds and North Pointe lawn area

fronting the South Kohala coastline. The two lead instructors and collaborators for this class were Tony Savarese from All Tool Kona and Clifford Vianzos from Golden Eagle Distributing. These gentlemen, along with Gary Ramos (Mauna Kea Resort) and Ken Sugai (Keauhou Nursery) provided instruction on proper equipment fluid mixing and storage, as well as safe operation and maintenance practices for a wide variety of landscape equipment, including both gas-powered and commercial-grade battery operated.

Stations were set up for weedeater, lawn mower, blower, and hedge trimmer, as well as turf aerator and verticutter. With an emphasis on hands-on learning, all participants had an opportunity to operate each piece of equipment. Interactive discussions included topics such as buying tips, common equipment failures, and examples of poorly maintained power equipment.

This new HILA workforce development program is geared toward both entry level technicians as well as providing opportunities to earn recertification CEUs for existing certified landscape professionals.

The second workshop, *Basic Botany and Horticultural Principles*, is scheduled for



Cliff Vianzos (second from right) discusses battery operated equipment with a small group of landscapers. Photo Credit: Ty McDonald

Saturday morning, June 4 at the Four Seasons Hualalai Resort. Following the classroom portion, resort Landscape Director, Erin Lee, will lead the attendees through the resort's ornamental plant gardens for a hands-on show-and-tell to demonstrate best horticultural practices in tropical landscapes. Online registration is available at: www.hilahawaii.com.

Irrigation Hydraulics, Design and Troubleshooting (date to be determined) will be instructed again by Lynnett Tohara, from Diamond Sprinkler and Farm Supply. Topics include hydraulics and design; water pressure and elevation changes, elements of an irrigation plan, point of connection, backflow prevention devices, mainline/ laterals, valve types, flow rates, friction loss, precipitation rates, selection of sprinkler heads and spacing.

The final class of this series, *Proper Pruning Techniques*, instructed by Diana Duff will be held at a later date this year. All classes are about three hours and approved for 3.0 CEU by NALP. For more information about the classes and to register online visit www.hilahawaii.com or contact me at tym@hawaii.edu.

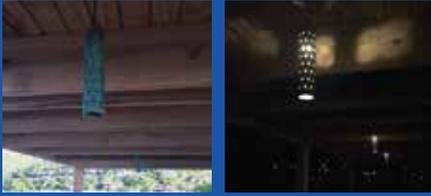
Ty McDonald is the Kona Cooperative Extension for the University of Hawai'i at Manoa.

More HILA News

Our biennial Landscape Management Conference will be conducted (in person) on the Big Island on **Friday, October 22** at the **Hapuna Beach Hotel in South Kohala**. More information and online registration is available at the HILA website: www.hilahawaii.com

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Millennial Rising

by Matt Lyum and Russell Galanti

Millennial Rising is back with an interview by Matt Lyum with Christopher Albores. Thank you to Chris for taking the interview and letting us get to know you!

Q: Where were you raised and how did that affect your path in life?

A: I was raised in Houston, Texas. I believe that being in an environment like Texas gave me a good appreciation for the outdoors which makes working in the green industry that much more fun. Also, Houston is very competitive in high school sports which I think made me competitive by nature and to always strive to be the best in whatever I'm working for or towards.

Q: Hawaii high school? College?

A: I went to The Woodlands College Park High School

Q: When did you graduate and what was your major?

A: I graduated from Texas Tech in 2017 with a Major in Economics and a Minor in Construction Engineering

Q: What is your favorite green industry resource website?

A: NALP

Q: Favorite restaurant?

A: I'm a loyal Texan, so Whataburger is my favorite place to eat

Q: What is your favorite plant?

A: My favorite plant would have to be a bromeliad. So many different colors, and flowers and fruits that you can find.

Q: The trend is that landscape and agriculture are aging community, you're bucking the trend - why?

A: Opportunity and Growth. I don't think people my age or many others for that matter truly know how big and profitable this industry really is until they work in it. Plants never stop growing and customers keep calling, which means our job never stops. With the technology and research going into this industry as well, I think there is a very bright future for people who choose this career path.

Q: Who and/or what was the inspiration to start this business?

A: I did not start this company but I am learning from the owner and I believe he is one of, if not the best mentor I could ask for in this industry.

Q: What you trying to accomplish?

A: In terms of what I want to accomplish. I'm always learning and always consider myself as a student of the industry, so I just want to keep expanding my knowledge, keep helping my boss grow the company in size and revenue, and to be a positive impact on whatever project or job is in front of me.

Q: What is your best accomplishment so far?

A: My best accomplishment in this industry so far has probably been winning Contractor of the Quarter from our military contractor.

Q: What has the current generation done well? What do you think could be improved by your generation?

A: I believe my generation has done a good job at helping older generations adapt to the technological advances made in all industries. We are finding newer and better ways to increase business and expand the market no matter what line of work it is.

Q: What will the landscape industry look like in 30 years?

A: In 30 years the landscape industry will be electric. Literally. Battery power is a growing market for so many power tools and equipment used by all workers in the green industry.

Q: What advice would you give high school students consider a career in the green industry?

A: Advice for high school kids considering this career would be to have an open mind and patience. There are so many different career paths within the green industry that you could choose

and sometimes kids rush into decisions. Be patient, find what drives and motivates you then don't let anything stop you from achieving your goal.

Q: Do you work with the Hawaii extension office?

A: I do not work with Hawaii extension office

Q: Tell me about what you're working on now.

A: Currently I'm helping my company oversee the residential contracts for some military bases and it's a never ending job but I love what I do and love making the customers happy.

Q: Who are your biggest influences?

A: Influences would be my father first and foremost he was my best friend and biggest mentor, but also my two bosses Matt and Benny who have really helped me grow not just in this industry but as a young man too. I was fresh out of college when I moved out to Hawaii not knowing what to expect or how long I would be here, but those two have really helped me personally answer the many questions every young adult may have as they make their way through life.

Q: What advice would you give someone thinking of choosing a career in the green industry?

A: Advice to someone thinking about this as a career path would be to be ready to get down in the dirt and have fun. It's such a fun industry to be in and there is always someone to meet or something to learn.

CONTACT INFORMATION

Christopher D. Albores
Performance Landscapes
808-561-7167
www.performancel.com
Instagram: Altorez_5



A bench of healthy kentia palm – these plants are 22 months old in three-gallon pots. This is usually the age and size of the plants when we would see chlorotic symptoms and overall plant decline due to various root rot pathogens. However, since implementing the new cultivation practices plants remain healthy.

Achieving Sustainable and Profitable Agriculture through Natural Farming

By Joanna Bloese, Ph.D.

Most growers strive for sustainable agriculture operations, but at the end of the day they must remain profitable. The concept of sustainable agriculture encompasses a wide range of strategies and practices, however the common thread among them is that all these various methods strive to mimic natural ecological processes. When we hear “Organic Agriculture” naturally, questions are raised, such as, is it more costly? How will it affect yield? Is it more laborious?

Marc Kinoshita has been the farm manager for the past year and a half at Kohala Kentia, the largest Kentia Nursery in the nation. If, when at home tonight, you indulge in *The Bachelor* or another reality show, peppered in the background you are likely to see Kentia palm. Big rental companies in California use them to decorate offices and they are in many popular Hollywood tv shows; these plants likely came from Hawai'i.

However proud we are to boast about the production of Kentia palms in Hawaii, we hope to share a more interesting story

with you today. I had the opportunity to sit down with Marc and learn from Kohala Kentia's experience.

Marc has worked with plants all of his life. He received his degree from the National Tropical Botanical Garden on Kauai. After which he worked at various vegetable farms in Lalamilo. Later on, he worked at Mauna Kea Beach Hotel in the landscaping department before starting his own landscaping business. “I have seen the transition of agriculture from input heavy practices promoted during the Green Revolution of the 70's that pushed synthetic fertilizers, chemical pesticides and higher yielding seed varieties to the ever-expanding organic agriculture market we experience today” he tells me. Now he is seeing another shift from organic farming to natural farming, which has been gradually gaining popularity.

When pressed on why he believed this shift was occurring Marc elaborated on the dramatically increased yields due to the chemical inputs and technology of the Green Revolution. He mentioned “these outcomes were undoubtedly appealing, especially from an economic

standpoint. Certainly, the short-term benefits were great, however, we did not yet know the long-term consequences of these inputs on our health and on the environment. As more information came to light, an organic movement was born.” At a time when many scientists were concerned with world hunger and the perceived inability of available arable land to feed a growing global population, the inputs birthed from the Green Revolution were a little short of miraculous.

Over the years, organic agriculture has become highly commercialized and big chemical companies are the suppliers of many organic inputs. Marc believes the younger generation demands alternative methods of sustainable future for themselves. “Our youth understand the seriousness of climate change and believe there is a way to produce food naturally and sustainably, even if it is not certified organic.”

Kohala Kentia had been struggling with chlorotic plants for the past 8-10 years. They knew they were dealing with pathogens such as *Pythium*, *Phytophthora*, and *Rhizoctonia*, because they had

sent samples to Brian Bushe at Agricultural Diagnostic Service Center (ADSC) lab in Hilo. Marc said “when I began working here, we were losing about 35-40% of our product due to these diseases. Symptoms included severe yellowing of leaves and root rot. We were spending exorbitant amounts of money on fungicides and chemical fertilizers with limited to no success.”

I asked him what changes were made to the cultivation practices since he began. It was clear a “Top-Down” approach that targeted the disease directly was not working and it came with a high price tag. He switched tactics and decided to take a “Bottom-Up” approach, and start from the ground up. They began with healthy, clean media and proper nutrition. Kohala Kentia switched the growing media from red cinder to high porosity black cinder. Which we believe played a large role in increasing overall plant health. Marc then targeted proper plant nutrition from BOTH a bottom-up and top-down approach by incorporating HP Pro-Mix with biofungicide and mycorrhizae into the growing media, and applied weekly foliar nutrition applications of Nutrient Express 4-4I-27, and a natural biostimulant cocktail. Marc could start seeing a change in about three months. Within six months everyone saw dramatic differences.

Hiram Hagio, the previous manager, said “the palms are looking like when they first started 20 years ago with chemical inputs.”

Due to these changes, Kohala Kentia reduced its quantity of non-marketable product from 40% to less than 10%. This is a dramatic transformation given the cultivation changes have only been implemented for a year and a half. It is also an impressive feat considering it takes three and a half years to grow kentia palm from seedlings to seven-gallon pots. They started applying a natural farming seedling spray and the plants no longer exhibited disease symptoms after a half year. This is in contrast to previous years when the plants would become chlorotic and die. Marc has only been working here for a year and a half, so it is still a little early to tell if this change is sustainable, but the renewed optimism and hope from everyone when



Marc Kinoshita shows me around Kohala Kentia nursery. These one and a half year old kentia palms are, dark green, healthy and thriving.

you arrive at the nursery is evident. “Everyone told me Rhapsis and Kentia palm leaves were too thick and would not absorb nutrients through their leaves. I began spraying natural farming inputs in May, without telling anyone what I was doing, I didn’t accept the position until July, 2019, after I saw changes in the plants” says Marc.

Marc explained “We are raising works of art.” Not only must they raise healthy plants, which is an art in and of itself, but the planters must match the right palms together so the pots look balanced. It is no simple feat.

When I asked Marc, what his takeaway has been from this experience, he said his takeaway is that natural farming practices can be both practical, sustainable and profitable. While he can’t share the company’s exact figures, Kohala Kentia has reduced their chemical fertilizer input by 60% and have utilized more plant-based pesticides, such as PureCropI, Regalia, as well as microbial products such as Effective Microorganisms. These products are more costly than many other products

on the market, however we have to apply them less often. Marc explains “there will always be labor costs when it comes to agriculture, and there are labor costs in many natural farming practices.” He applies a foliar nutrition application every week using a Maruyama four-gallon backpack sprayer. However, he can cover two and a half acres in less than two hours and treat the entire property in a day and half by himself. “More is not always better” says Marc, “but consistency matters.” Marc asserts that natural farming is incredibly simple and easy. “By targeting plant health through proper nutrition and quality inputs both natural and synthetic, we see dramatic decreases in fungal and algal pathogens in our nurseries.” So Marc, what is your message for other growers?

“THERE are PRACTICAL ALTERNATIVES out there that can work on a commercial scale.” Marc understands the real risk of making big changes in your cultivation practices. Marc hasn’t divorced himself from chemical control options and conventional farming

Marc holds up two kentia palms removed from three gallon pots for a side by side comparison. The plant on the left is 3 years old and suffers from root rot, as we can see from the lack of root zone and leaf chlorosis. The plant on the right is 2 years old and much healthier. It received foliar nutrition from natural farming and commercial inputs.





Two benches of kentia palms in three-gallon pots. The plants on the left are 3 years old, while the plants on the right are 2 years old.

It is helpful to zoom in on these plants and compare their overall color and quality.

completely. “Right now, I am using Natural Farming as a supplement, and it has been very beneficial to our operation. Most growers work in monocrops, we are already working in an unnatural, highly managed system. Everyone in this industry understands the difficulties of raising a monocrop and the problems that arise from it. I am trying to find more of a balance” Marc explains. He mentions that perhaps in the future natural farming will become a bigger part of their operations, realizing he works with a biological sys-

tem that is constantly evolving and smart insects that get used to a certain method of farming – thus we must always keep them on their toes. We must plug into the system. Natural farming is of great benefit to Kohala Kentia now, but who knows what the future holds, perhaps it will have to evolve with the system. Only time will tell.

It is easy to talk to Marc, he is incredibly kind, remarkably easy going and very bright. The hours we spent talking flew by. I finally asked him one last question.

What is your hope for the future?

“It’s all about education for me, it’s essential to disseminate what we learn and new information to the industry and provide new models of operating and thinking about sustainable agriculture” says Marc. “We need to understand the science behind precision nutrient management, plant immune defense and the various pathways by which biostimulants and nutrients are metabolized by plants. How can we mimic a natural environment versus creating a completely sterile environment that we then try to control. Can we ever truly control nature? We spend a lot of money trying to” explains Marc.

Marc reminds us of a Japanese sang “the bigger the front the bigger the back”. George Ohsawa – The Art of Peace Did the promises from the green revolution have a hidden long term environmental cost? May we keep this phrase in mind as we strive for a more sustainable future.

Perhaps, one more thing we can take from Marc’s story is that we can start to examine the preconceived ideas, and misconceptions about alternative farming techniques. Does it truly result in lower yields, does it require more land use? Is it less profitable and can we make such sweeping generalizations across assorted cropping systems? I believe today’s youth are already asking these questions as they try to seek creative sustainable solutions to growing food, flowers, and foliage in a quickly changing environment.

Acknowledgements:

We would like to acknowledge Master Han-Kyu Cho and the entire Kohala Kentia crew, for without whom none of this would be possible. It takes creative problem solving and open minds to try new ways of farming. Thanks to everyone’s continued efforts we are able to grow healthy plants again.

Controlled Environment Agriculture and Artificial Lighting to Grow Plants

By Kent Kobayashi, Associate Professor, Fellow, American Society for Horticultural Science. PhD, Horticulture, Oregon State University. Research on photobiology; controlled environment agriculture; and space farming (astrobotany).

Ideally, we would like to grow plants and crops under conditions that are appropriate or optimal for the plants. That is, these conditions meet the requirements of the plants regarding weather (light, temperature, water, humidity, and CO₂), soil characteristics and fertility, and the absence of pest pressure. Under these favorable conditions, field production of plants can be successful. However, “perfect” conditions are not always present so what can be done? A grower can use controlled environment agriculture (CEA), including the use of artificial lighting, to provide optimal conditions to grow plants. Using CEA, we can mitigate environmental factors that may be unfavorable or lacking. The amount and costs of various inputs for plant production can be reduced.



Controlled environment agriculture (CEA)

In contrast to field agriculture, controlled environment agriculture (CEA) is the growing of plants in structures to help better control plant growth and development by controlling the effects of external weather and climate factors. The microenvironment within the structure can also be precisely controlled through monitoring both above ground and below ground factors. Conditions within the structure can be corrected or brought to more optimal levels including light, air temperature, soil moisture, soil temperature, soil fertility, relative humidity, and CO₂ level.

The ultimate aim for controlled environment agriculture is an autonomous structure, a “smart” structure that is capable of running itself with little human intervention and monitoring conditions outside and inside the structure. With this information, the CEA structure can make adjustments such as providing shading, artificial lighting, misting, ventilation, CO₂ enrichment, and irrigation.

CEA and agricultural sustainability

A grower using CEA can better monitor and modify the environment for their plants and thus provide optimal conditions for production. Less inputs and precision agriculture enable more efficient use of inputs for the desired outcomes. The grower has better control of environmental factors and is not always at the mercy of the environment.

Benefits of CEA

- Better monitoring and control of the environment leading to better control of plant growth and development
- With protected cultivation, there are less pest problems.
- Reduce the amount of inputs needed through precision agriculture.
- Precise control so only specific inputs at specific times and locations are implemented.
- More uniform plant growth and development.

Artificial lighting

Field production of plants has the advantage of using natural sunlight. However, when conditions are not ideal, such as day length and light intensity, artificial lighting can be used to supplement sunlight or substitute for sunlight. In addition, artificial lighting enables more precise control and alteration of day length, light intensity, light direction, and light spectrum (wavelength).

Kinds of artificial lighting

Over the years, there have been many kinds of artificial lighting. We have seen incandescent lighting, metal halide, high-pressure sodium, fluorescent, compact fluorescent, plasma light, and light-emitting diodes (LEDs). Nowadays, the most popular lighting are high-pressure sodium, LEDs, and high output (HO) fluorescent lighting.

I first saw HO fluorescent lighting at Kennedy Space Center that was being used for their plant growth studies. These are T5 HO fluorescent lighting, which are smaller in diameter and are super bright compared to the typical T12 fluorescent lighting. These fixtures come with two, four, or eight bulbs in various lengths from two feet and longer. As with other fluorescent lighting, the bulbs decrease in light intensity over time and blacken near the terminals. They require replacement when broken or too dim. Fluorescent lighting also has the disadvantages of high heat production and lower light efficiency.

LEDs, light-emitting diode lighting, have become quite popular recently with the proliferation of manufacturers, different kinds of LEDs, and the reduction in cost. Initially, LEDs were quite expensive. The early LEDs were light bulbs that could be screwed into fixtures that were used for incandescent lighting. There were primarily red LED and blue LED bulbs. A shortcoming was the narrow focus of light meaning they were bright under the LED bulb and quickly less intense at wider distances.

LED arrays (fixtures) with different kinds of LED light bulbs began to appear.



LED light fixture with interchangeable LED light tubes.



Light-emitting diode (LED) red bulbs, blue bulbs, and T5 high output (HO) fluorescent lighting.

These early arrays were typically square or rectangular in shape. Some problems included that the ratio of different color LED bulbs was fixed (for example, 2:1 ratio of red to blue LED bulbs) and again the light was concentrated under the fixture.

Soon, LED light bars (fixtures) resembling fluorescent light fixtures appeared. These came in various lengths such as 2 feet or 4 feet. They offered the advantage of covering a larger area with more even lighting. On fixtures that had replaceable light bulbs, you could change LED light tubes that were dim or broken. In addition, you could interchange different types of LED light tubes according to your spectral needs, e.g., one red LED light tube and one blue LED light tube.

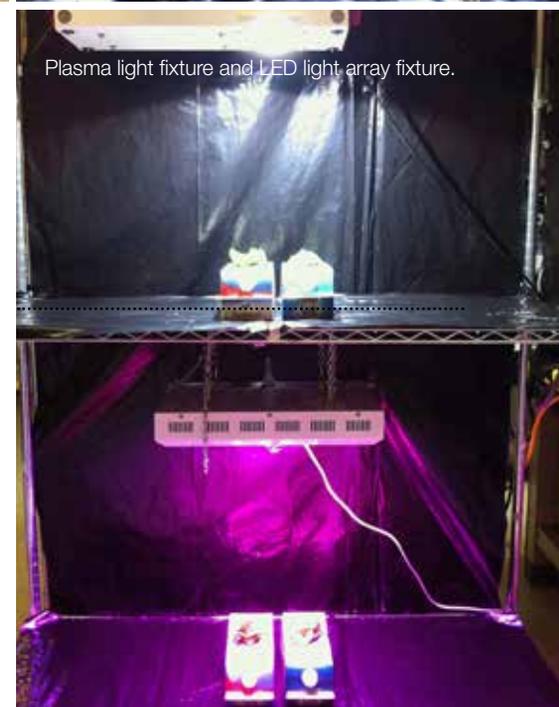
Some of today's LED fixtures are fully adjustable and 'smart', i.e., you can adjust the amount of red, blue, and white light intensity. They have manual switches that let you adjust the amount of the various colors (wavelengths) of light. More sophisticated LED fixtures are programmable and allow you to adjust different colors, day length, and light intensity. These can be programmed and adjusted with a smart table such as an iPad.

Artificial lighting and agricultural sustainability

Artificial lighting can be sustainable depending on the efficiency of the lighting. For example, LEDs are very efficient, providing light with less energy usage and little or no heat. LEDs provide high light intensity for the amount of electricity that is used. LEDs last a long time and thus do not require frequent replacement of bulbs. Because you can customize the light spectrum, it allows you to use specific wavelengths for the desired effect you are looking for, e.g., plant height, foliage color, and flower color.

Benefits of artificial lighting

- LEDs are light efficient and use less electricity.
- Extend day length.
- Can specify the light spectrum, in particular, with LEDs.
- Cost of LEDs has come down compared to a few years ago.
- Control direction the light comes from including intracavity lighting.
- Can specify the color (cool or warm) and light spectrum.



Plasma light fixture and LED light array fixture.

Conclusion

When considering agricultural sustainability, controlled environment agriculture and the use of artificial lighting provide growers with the capability and option of better controlling the growth and development of their plants.

.....
Kent Kobayashi is the Associate Professor, Fellow, American Society for Horticultural Science. He has a PhD in Horticulture from Oregon State University.



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Nursery Industry Involvement with Conservation

By: Molly Murphy

Mark Hanson

Driving along the road high up on the slopes of Mauna Kea, Mark Hanson suddenly stops the truck, exclaiming, "Look at that sandalwood tree!! The Sierra Club volunteers planted this four years ago. It's so healthy! How did I miss it until now?" The gorgeous sandalwood, or 'iliahi, hiding inside a clump of māmane (*Sophora chrysophylla*), had finally grown big enough to top the canopy and be visible.

Hanson, known as the Sandalwood Man, has been seed collecting, growing, and planting sandalwood (*Santalum sp.*) since the 1990s. His nonprofit Hawaiian Reforestation Program estimates 250,000 trees have been sown since inception. His current focus, reforesting Mauna Kea, began once portions were fenced in 2013. After an extensive survey, he collected sandalwood seeds, then germinated them to outplant in the same area.

It may seem that with a quarter of a million trees planted, his excitement over the single tree we've stumbled upon is excessive, but his efforts weren't always successful. Of the first 600 seedlings he planted, only five survived! Frustrated, Mark built a nursery at his Big Island home to ensure a strong beginning for each tree. Although his home in Mountain View is not within the usual habitat of 'iliahi, the rainy area turned out to be perfect for germination. These days, thousands of beautiful keiki trees come to



Mark Hansen grows sandalwood for outplanting in dry forests on Hawai'i Island. Twice a month, he leads volunteers to maintain and monitor their growth.

life under the shade cloth in his backyard, all neatly lined up in accelerator pots and dibble tubes.

Over the years, with more experience, he also learned what worked best to ensure his outplanted seedlings' survival. As we carry our dibble tubes and digging tools under a beautiful blue December sky, Mark instructs me to plant my seedlings close to the māmane clumps, which can provide moisture and protection from harsh conditions. He will return later to weed and fertilize these new growths, ensuring they get enough of an edge to survive the aggressive grasses surrounding us.

The most critical ingredient for the success of Mark's program isn't water or nutrients, though: it's volunteers. Mark relies on charitable donations and volunteer effort to bring the forest back to this part of Mauna Kea. He gets help from many groups like the Sierra Club, including students from the Forest TEAM program at Hawai'i Community College and even young kids: his first volunteer sandalwood outplanting was in 2014 with a local Girl Scout troop. He points out those outplantings to me, now strong, healthy trees topping six feet.

Mark's passion for the native forest, flute playing, and deep sandalwood knowledge have created something of a legendary character. People are drawn from all over the state to work alongside the Sandalwood Man, and his field trips do not disappoint. He might take you to the 'hugging tree,' a 40-foot tall old-growth remnant sandalwood that survived decades of unfettered grazing and massive harvesting of native sandalwood. He is a storyteller, entertaining companions with tales of his planting adventures and sharing the vision that led him here. He tells of how early in his sandalwood journey, intending to plant on the slopes of Haleakalā; he was granted permission to collect seeds from Polipoli State Forest on Maui. Sadly, only two seeds were found. But Mark's son encouraged his Dad not to give up, so they made their way to the first sandalwood Mark had

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Mark 'The Sandalwood Man' at his Plant Pono endorsed nursery proudly holding a sandalwood he grew from seed.

ever seen. Seeds were falling off the tree like rain! Mark took this as a sign that he should pursue his vision, and since then, his program has developed to grow sandalwood on a massive scale in a way that had not been attempted before.

Mark diversified his native plant growing over the years, in part to support his 'iliahi. Sandalwoods are semi-parasitic. Drawing nutrients from neighboring plants, sandalwood thrives best in a synergetic relationship with other native trees. Koa, a nitrogen fixer, is the best tree to partner with sandalwood. 'Akoko (*Euphorbia sp.*), 'a'ali'i (*Dodonaea viscosa*), ko'oko'olau (*Bidens sp.*) are other good partner plants. Surprisingly, Mark's favorite native species is not iliahi, but the less flashy 'ohe makai (*Polyscias sandwicensis*). Mark fondly describes it as a rock buster. He gushes, "the roots of 'ohe makai grow on bare rock, slowly they penetrate and break up the rock in search of nutrients and moisture. This species survives where other plants per-

ish. 'Ohe makai is so rare and beautiful!"

Most mornings at his Mountain View home, Mark dines on roasted sandalwood nuts and coffee. He hopes that one day, Hawai'i will have a value-added, sustainable industry from pressed sandalwood nuts. The oil, used for all kinds of skin ailments, fetches a high price. There is potential...if enough trees are planted. But after more than a decade of work, Mark Hanson has lost none of his passion for the project. The Sandalwood Man plans to be out there, gently placing new saplings into the ground for years to come.

For dryland native plants and forestry projects, contact him at 808-769-0683 or sandalwoodman@gmail.com.

Jill Wagner

Jill Wagner, owner of Future Forest Nursery and seed-banking expert, has spent a lifetime immersed in a love and study of plants, and now she is using her



Jill Wagner, owner of Future Forests Nursery, LLC, is a well-respected consultant for landscape design and practical restoration.

passion and expertise to combat Earth's biggest challenge: climate change.

Growing up, her family regularly visited botanical gardens, and she was drawn to move to Hawai'i in the early 1990s with Terence Mckenna, the American ethnobotanist, writer, and philosopher. Jill absorbed much of his botanical knowledge and decided to pursue her ethnobotany degree at the University of Hawai'i at Hilo. Together, while propagating a vast array of plants, she and Terence dove deep into taxonomy and plant origins. "Knowing where a plant is from helps to understand its uses, its place on Earth," Jill says. "A sophisticated plant lover learns about the natives in that region. Almost anything in the world can be grown in Hawai'i. But people seem to favor certain plant groups, bamboo, bromeliads...it limits plant exposure and interest."

For over eight years, Jill volunteered at Amy Greenwell gardens in Kealahou, giving tours and working in the nursery. Her restoration work is grounded in the formative experience of growing native plants there and on her property. Over the years, she built a reputation as a restoration expert in Hawai'i, bringing degraded landscapes back to life as diverse, flourishing forests.

"My favorite project right now is one in Kohala," she says. "It's a blank slate, just an abandoned pasture. Historically it was a koai'a forest. Our goal is to return the land to its original state. Last year we planted 'a'ali'i (*Dodonaea viscosa*), wiliwili (*Erythrina sandwicensis*), and of course, koai'a (*Acacia koaia*); all were small plants. Now they are several feet tall. The champion koai'a is 3 feet tall! Restoration is happening right before our eyes."

Now, her hard-earned knowledge is expanding to a global community: as head forester for the innovative start-up Terraformation, Jill is part of a new effort to combat climate change through forest restoration around the world. Terraformation is different from traditional forest restoration in that a key goal is economic development. Therefore, each management plan includes an economically viable agroforestry effort. "When people practice agroforestry, they often use the same ten plants: cacao, coffee, etc. We take a regional approach to our global project. What are the native overstory trees? What can be grown in the understory to create regional economic opportunities? It is a marriage of economics and native biodiversity." Jill's botanical expertise is critical in developing regional management plans, identifying and evaluating the native plant communities.

The funding comes from angel investors committed to supporting innovative ideas to address the world's most pressing challenges. Silicon Valley-based Terraformation partners used their engineering skills to create a free pre-planting app, launching in February 2021. The app will allow users to store and retrieve data about individual plants used in seed collection and outplanting and enable site managers to create a map with a detailed history of a restoration site.

Terraformation has sought to use technology to improve one of the biggest hurdles to successful restoration: seed-banking. For both agriculture and forestry, seed banking is a crucial endeavor in today's world of fires, floods, invasive pests, and climate change. However, it takes a dry, climate-controlled environment and adequate space to store seeds properly. But as any grower who has tried to raise new plants from seed can tell you, the seeds themselves aren't always cooperative. Consider the beloved 'ōhi'a (*Metrosideros polymorpha*), now facing an existential threat in the form of rapid 'ōhi'a death (ROD): the seeds have only a 20% germi-

nation rate! Terraformation has developed a new technology, using x-rays to measure a seed's viability, so that time and space are not wasted storing seeds that will never produce. Sowing only viable seeds saves the nursery industry soil, pots, table space, water, and manual labor - and the whole thing fits into a 40-foot container!

In the works are plans for a video series, apps, management plan, and new technology, all with a commitment to being carbon-neutral and resource-conservative. Thanks to affordable solar power, water filters with desalination capabilities will be included not only for irrigation but also for the people of that region to use. The hoped-for outcomes are carbon sequestration, clean water, and economic opportunity in that region.

Jill is excited about her current project with Terraformation in Uganda. "Logging, agriculture, and drilling transformed much of this biodiversity

hotspot into a wasteland. With our help, over 600 acres will be restored to their natural state."

Without collaboration, none of this would be a reality. Angel investors want to make the world a better place, but they don't know about seed banking, plant cultivation, and restoration. The new technology invented by engineers will enable anyone with the desire to store and sow seeds. Add in Jill Wagner, the restoration expert, and it all comes together seamlessly.

For more information about these global projects with a regional approach, go to terraformation.com. Jill Wagner can be reached at 808-325-2377 or trees@forest-nursery.com.

Aileen Yeh

Aileen Yeh, owner of Po'o Wai U nursery on the Big Island, has been a pillar of the nursery industry for many years.

"I grow native plants to make up for all the Eucalyptus I grew early in my career,"

Aileen jokes. For many years at C. Brewer's BioEnergy Development Corp, she grew trees for Hawai'i's burgeoning bio-fuel industry. Her intentions were good: "Locally grown biofuel cuts our energy dependence, helping Hawai'i be independent. It's a win-win with Hawai'i's carbon footprint. Growing trees sequester carbon, and less fuel use importing energy all means less global warming."

However, through her career, she began to develop a deeper understanding of invasive species' problem. After obtaining a degree in Horticulture, Nursery Management, and Research; Aileen was hired by the Hawai'i Agricultural Research Center (HARC) to research the potential for cultivation of various crops here in the islands, in lieu of importing them. Live plant materials have long been vectors of introduction for pests and diseases that negatively impact Hawai'i's forest and farms - in fact, a 2015 report from the USDA found that live plants were the most important source of new damaging invasives. Reducing



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live plant' importation significantly reduces the risk of new invasive pests and pathogens arriving in Hawai'i, a critical part of improving Hawaii's biosecurity, something Aileen is highly committed to.

After the *Austropuccinia* rust became established, likely from imported plants of the Myrtaceae family, HARC saw the need to research the feasibility of locally grown Myrtaceae species, mostly ornamental Eucalyptus. Since 'ōhi'a is a member of the Myrtaceae family and a keystone species for native forests, this research is crucial. Aileen began testing the cultivation of species important to floriculture and horticulture. Her work proved some crops had potential; others were unsuccessful.

One of the crops Aileen has been focused on in the past several years is Christmas trees. Thousands of trees are imported to Hawai'i from the mainland each year, each container bringing with it the risk of wasps, slugs, snakes, and many

other pests. Aileen identified more than a dozen non-invasive tree species that offered the desired characteristics that people like to see in their Christmas tree and tested growing them in different environments and conditions. She was encouraged by the results in several trials: three years in, there are some promising outcomes, including stone pines and a few Cyprus species that grow quickly even in lower elevations. Unfortunately, many of Aileen's test sites failed to produce results as saplings were destroyed by feral pigs: her recommendations to growers now stress the importance of fencing around young trees.

The Christmas tree project is fun, but growing native plants and knowing friends and customers will plant them is most gratifying to Aileen. Her early work with Donovan Goo, restoring parts of Ka'ūpūlehu, piqued her interest in native plants. Today she is an esteemed native plant grower. "I love all native plants, but 'ōhi'a, alani (*Melicope sp.*), and kopiko (*Psychotria hawaiiensis*) are my



'Ōhi'a grown by Aileen Yeh at Po'o Wai U nursery. New research indicates your 'ōhi'a saplings are not prone to Rapid 'ōhi'a Death (ROD).



Koa saplings grown by Aileen Yeh at Po'o Wai U nursery.

favorites," she confides. "Sharing seeds and plants, working with other growers, helping new growers, and hearing from customers and friends how healthy and big the plants I started make it all worth it."

Her nursery, Po'o Wai U, is a highly regarded native plant contract-grower for land managers and landowners. The nursery is a mix of hardwoods, native dryland species, and native wetland species, all in various pot sizes. Proper irrigation is a challenge. As a contract-growing business, the customer isn't always ready to pick up their plants on time. Often the extra inputs like water, pest control, fertilizer, and space can be costly. No business is without challenge and hardship, so Aileen remembers to appreciate the joys in her line of work.

"My biggest joys are seeing a landscape I helped to restore, with seed-producing plants growing happily," Aileen

says. "An example is an area where we fenced off some native Loulu (*Pritchardia beccariana*), which were in decline. After ungulate proof fencing, many new seedlings started popping up through the grass, and seeds could be collected and grown out for outplanting. Before the fence, ungulates and rats were eating the seeds." If you want to incorporate native plants into a landscape, Aileen recommends that you first determine if the species be suited to the area. If you aren't sure, try a few that are from that ecoregion. For larger native plant projects, she advises, "Notify the nurseries far in advance, especially smaller nurseries that don't have a lot of space. Many native species take a long time to grow to a good planting size, while some will grow fairly quickly and become pot bound if not planted out."

For more information on contract-growing, contact Aileen Yeh of Po'o Wai U nursery at akfwyeh@gmail.com.

Much of the conservation in Hawai'i begins in a greenhouse with a single nursery manager. Whether the plants are to reforest Mauna Kea or transform landscapes in Kohala to their original state or rehabilitate loulu forests, none would be possible without Mark Hansen, Jill Wagner, and Aileen Yeh. These humble growers spend their days cultivating essential plants to make Hawai'i and the wider world a better place for all. Not only that, all three teach others their craft to carry on the cycle of conservation.

Molly Murphy is the Plant Pono Specialist for the Big Island Invasive Species Committee. For questions on Plant Pono or invasive plants, contact her at mollym3@hawaii.edu.



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Weed Steaming: A Sustainable Weed Control Alternative

Interview by Hannah Lutgen, CTAHR extension agent

I recently had the pleasure to interview Robin Proctor, founder of Weedsteam Hawai'i, a Native Hawaiian owned, and operated business dedicated to providing innovative weed control. Without further ado, let's meet Robin and learn about weed steaming!



Safe enough to drink!



Above, left-inset: Robin Proctor, Founder of Weedsteam Hawai'i. Above: Resort steaming along the ocean.

Q: Hello, thanks for meeting with me. Please tell us a little bit about yourself.

A: Basically, I'm a passionate, driven woman that wants to make a positive impact on the world by reducing pesticide use. I want to provide the people of Hawai'i another option for weed control.

Q. Please tell us about your business, Weedsteam Hawai'i, and the services that you provide.

A: Weedsteam Hawai'i focuses on providing zero chemical weed control using a patented process called Satusteam, 100% boiling hot water! This technique originating in Australia over 20 years ago is now available in the US and our company represents Hawai'i. Since 2020 we have been successful at killing hard to kill weeds like guinea grass, cane grass, glycine and even gorse and blackberry. We are currently researching how saturated steam can help kill rust, fungus, various invasive pests and diseases. Our mission is to help reduce herbicide and pesticide use in the state, to give people and land management agencies one more option that works.

We offer weed steaming services and are the exclusive dealers of the weed steam machines.

Q: Do you provide services or assist people on all islands (Hawai'i, Kaua'i, Oahu, Kaua'i, Maui, Moloka'i, Lanai, Niihau)?

Currently, we provide weed control services to Maui island. However, we can recommend service providers on other islands. We are the exclusive dealers of the machines we use for the state of Hawai'i.

Q. How does weed steaming work?

A: The weed steam machine heats water to 250°F, we use special applicator heads for different weed situations (farm row crops, roadside, individual plants or large areas). The applicator heads release saturated steam which kills the vegetation. The superheated water explodes the plant cells on contact. We also have various spikes that we use to apply steam underground which targets and kills the roots. Some plants don't need this extra step, but it's great to have this tool when needed to kill the deep rooted weeds.

We can steam in any weather conditions; ranging from heavy winds and rain. Weed steaming kills weed seeds and plants. Sometimes weed steaming initiates seed germination depending on the plant, however, a second treatment will kill anything sprouting up.

Q. Which types of weeds does weed steaming effectively kill?

A: I haven't experienced a weed we couldn't kill or at least knock back. If you can kill the top of the plant, then any parts that resprout, you are seriously damaging the plant's underground energy reserves. Over a short period of time weed steaming will deplete plants' stored energy. Using our spike to get down 7" below ground along the root zone seriously damages unwanted plants. We have effectively killed guinea grass, cane grass, blackberry, raspberry, glycine and gorse. We are also exploring satusteam effects on other invasive species like plant diseases and insect pests.

Q. Can you weed steam next to trees and shrubs and perennials?



Steaming gravel.



Robin steaming.



Guinea grass after 1 steam.

A: Yes, we have special applicator heads that keep steam away from stems and trunks, as well as keeping bark and mulch from being displaced.

Q. Will you please explain current applications (or uses) of weed steaming in Hawai'i?

A: We've been hired to kill weeds along sidewalks, around road signs and along highways, in ditches, around solar panels, hiking paths, around schools, playgrounds, pastures, farms and along areas between resorts and the ocean. In addition to weed killing, you can also use our machines for sanitizing surfaces, removing algae, mold, mildew and even gum.

Q: When operating weed steaming machines are there any human safety or fire hazard concerns?

A: We recommend not touching the boiler part of the machine, this can be hot. Fire hazard is the same as any enclosed hot water generating machine.

Q. What are the benefits of weed steaming?

A: Weed steaming is an effective form of weed control that can be used in any weather. There is no chemical drift or overspray concern, publically supported, kills seeds, no special certification needed, environmentally friendly, 100% water. Immediate results, plant right after steaming no need to wait!

Q. Why is weed steaming a sustainable approach?

A: Weed steaming is 100% water. Steam from heated water kills vegetation and this clean water remains in the soil. Carbon footprint is similar to weed whacking in that the weed steam machines use gasoline for power, there are no chemicals used.

Q. Thanks for your time. What is the best way to contact you?

Robin Leimomi Proctor
robin@weedsteamhawaii.com
808-344-9274



COMMON PESTS OF COCONUTS IN HAWAI'I



Fringed aphids in all developmental stages, showing large amounts of honeydew on the foliage. A lady beetle larvae is also present, eating the young aphids.

Coconut palms are integral to the ambiance of Hawaiian landscapes and are also a vital part of Hawaiian culture. There are several common pests found throughout Hawaii on these iconic plants. Issues on mature palms are notoriously difficult to diagnose due to the inability to directly view the insect so be sure to know the symptoms of each. Strong winds with storms in late winter cause surging insect populations as the larval stages are dispersed in the wind and natural predators are carried away. Many of these pests are opportunistic, so keep your palms strong and healthy through good management practices. Here are a few common issues with coconut palms in Hawaii.

Cerataphis spp., the fringed aphid, lives on the underside of the palm fronds. The small, round, black aphid has a white skirt, making it resemble a soft scale. Populations surge in June to July. You will likely not see the aphid itself but will notice profuse amounts of honeydew dropping onto surfaces below, causing damage to paint and tiles. You can clean a surface, and, within an hour, see new, extremely sticky drops. In heavy infestations, the foliage will look glossy and wet from the honeydew, noticeable even from the ground. To control the

aphids, trimming the palm will remove large numbers, but be sure to control ants as they will farm the population. If you can reach the canopy of the palm, you may be able to use a variety of contact insecticides. Systemic insecticides are also effective.

Blue coconut beetle, *Brontispa chalybeipennis*, feeds by scraping off the outer layer of the leaflet, leaving a brown or silvering look from the ground. The

injury resembles salt spray or wind damage to the foliage, but rather than just damage on the tips, the injury appears throughout the length of the leaflet. Minor infestations are unappealing to view but can be left on the palm, to be removed during routine trimming. Heavy infestations cause declining health as the palm cannot create enough energy. Eulopid wasps do parasitize the larval stages of the beetle but will be blown away in high winds.



Eggs of the blue coconut beetle



Damage from the blue coconut beetle eating the outer surface of the leaflet



Damage from the blue coconut beetle as seen from the ground



Blue Coconut beetles feeding in crown" Photo credit: Hannah Lutgen

Endemic to Hawaii, *Hedylepta blackburni*, the coconut leafroller, is a member of the moth family, also infesting *Pritchardia spp.* Silk threads are used to roll the leaflet for protection as the larvae eats it down to the spine. Severely damaged fronds will have almost no green material left. There are naturally occurring predators. Be patient for the palm to grow and remove the damaged foliage during routine trimming.

Damage from coconut mites is not generally seen in landscape conditions as palms are trimmed when the seeds are small. In retail situations or farms, the damage from these mites causes aesthetic issues and can reduce the crop output as the nuts may drop prematurely. *Aceria guerreronis* is a nearly microscopic pest that lives under the perianth of the seed that forms the cap-like structure holding the nut onto the stem. As the nut ages, pale yellow areas form from the cap down the sides of the nut. These areas turn brown, cracking the outer surface. Severe infestations can cause premature drop. Control is best achieved by removing infected nuts as the mites have a rapid, 10-day maturity rate.

Banana moths, *Opogona sacchari*, are small, unimpressive looking pests that cause a great deal of damage in palms throughout Hawaii. They are not only found in coconuts but almost all other palms in Hawaii, along with a variety of trees and shrubs. These moths seek out plants weakened from other pests or diseases. They are also attracted to any wound sites on the palms, such as those from routine pruning or machine damage. The moths lay eggs in the wounded areas of the plant, then the one-inch larvae burrow into the tissue, eating both living and dead material. Because they are often in the crown of the palm, symptoms such as falling leaves or drooping crowns are often the first visible signs. This can often be too late to save a palm. In young, or shorter plants, frass from the feeding larvae can be observed. If symptoms are observed in one palm, nearby plants should be inspected and treated appropriately. Keep the plants healthy with proper irrigation and fertilizer.

For information about diseases found in coconut palms in Hawaii, please refer to future issues of this Hawaii Landscape Magazine.

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Allison Wright is the Maintenance & Nursery Superintendent – Island Plant Company, LLC. She is the Co-Owner of Valhalla Flower Farm, LLC



Banana moth found inside coconut palm.



Foliage damage from the coconut leaf roller



Larval stage of the coconut leaf roller protected by silk pulling the leaflets together.

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TOOL TIPS

BY PHYLLIS JONES, OWNER OF A TO Z EQUIPMENT AND SALES



SUSTAINABILITY — THOUGHTS ON THE NEW NORMAL

Sustainability focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs—capable of being sustained.

After living through one year of the pandemic—mask wearing; hand sanitizing; social distancing; no eating out; no family gatherings; no regular school schedule—we are probably eagerly awaiting a return to the “good old days”. Business was predictable, and we could sense the ebb and flow of the business cycle; the seasonal changes. The pandemic has put an end to that. We cannot say with certainty what will be coming next, or when it will be coming. Most businesses like predictability and thrive on some degree of certainty. Since the pandemic, all we are certain of is that the grass will continue to grow and trees will need pruning. There is no certainty of how we will be able to meet the demand or even what the demand will be. When we see the big box stores with empty shelves, we realize that we are not alone in trying to predict what the end will look like.

In all honesty, I have to say, I welcomed the “new” challenges that this pandemic has brought. New questions with no answers. It forced me to re-evaluate how I was going to be sustainable in business through what seemed like an endless period. Here are some of my thoughts.

TAKE NOTHING FOR GRANTED.

Am I sure that the product that I sell have value? What makes them valuable even during uncertain times? Will the machine that you are thinking of buying ultimately save you money? Are parts readily available for these machines? Will your employees be able to use them without extensive training? How will it affect your labor costs? “Old” questions, but asked during “new” times. What will the answers be?

ASSUME NOTHING.

How will the landscape industry be impacted? With so many segments of the economy being affected, will our industry feel the effects of the slowing economy? With revenue shrinking in so many areas, will we still be able to survive without making adjustments to expenses? How long will it take for the economy to recover and what do we do until then. When it does recover, what will it look like. Will we regret the choices that we made.

It is difficult to ponder these questions when we have to confront the daily realities of survival and when we only have uncertainty before us. There is no past history to study and no “rules” to guide us. For some businesses there has been little or no change. Others have been forced to pay greater attention to pricing, stocking levels, and what their competitors are doing.

Within the industry, there were significant changes which started early last year and created a new layer of uncertainty. Many manufacturers have changed distributors, going with large distributors that have more widespread, national recognition. Freight rates have increased. Most gas powered equipment manufacturers have added a heavy dose of battery powered equipment. This may reflect their concern that EPA regulations may become more stringent, (This may work for “Joe homeowner”, but for us commercial people, we are left with fewer gas models from which to choose. For dealers, how to provide a mix of, gas-powered and battery operated units can be a difficult decision, especially when “buy ins” are big, and manufacturers want dealers to sell both. Dealers today, compete with not only box stores, but on-line sellers as well. How long can a business afford to have unsold inventory on their shelves?

We are all confronted with challenges on a daily basis, but rarely do we have an opportunity to make choices about an unknown future. Hopefully, we have used this time wisely.

Hopefully, you all are well and in good health.

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Phyllis Jones is the owner of A to Z Equipment and Sales.

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