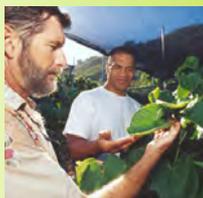


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IMPACT REPORT
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SECOND QUARTER



People,
Place,
Promise



**College of Tropical Agriculture
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SECOND QUARTER

Q2

College of Tropical Agriculture and Human Resources
People, Place, Promise



“One of the things I value most about our college is its mix of the traditional with the innovative.”

Tradition. One of the things I value most about our college is its mix of the traditional with the innovative. Last quarter, the *Impact Report* focused on cutting-edge technological solutions that allow CTAHR faculty and staff to bring the fruits of their research to the community and to invite the community to contribute to that scholarship by means of “citizen science” initiatives. Now this *Report* looks at ways we are gaining inspiration from traditional knowledge and practices, and how we can support them using modern-day scientific research and techniques. Thao Le’s use of traditional mindfulness practices benefits youth struggling with some very contemporary issues, while H.C. “Skip” Bittenbender’s work with ‘awa is not only helping to bring about a renaissance of interest in this ceremonial plant but also is aiding growers to combat diseases and other problems with its propagation. Graduate student Leina‘ala Bright’s research into aquaponically propagating lā‘au lapa‘au, Hawaiian healing herbs, greatly advances the already huge potential of this growing system, and Mike DuPonte’s use of Korean Natural Farming techniques allows home gardeners and commercial producers alike a means of raising plants and livestock more sustainably. I am excited by the ways CTAHR combines the best of both worlds, showing how modern science and traditional knowledge can mutually inform and benefit each other.

Aloha,

Maria Gallo

Maria Gallo
Dean and Director of CTAHR

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The Drink of Peace

If a tempest can be found in a teacup, then H.C. “Skip” Bittenbender is looking for the opposite in an ‘apu, or ‘awa cup. ‘Awa, or kava, is a medicinal plant that has been used for hundreds of years throughout the Pacific to create a drink that can soothe nerves, combat anxiety, and relieve pain, all while keeping the mind clear.

‘Awa’s unique properties are due to kavalactones, a chemical that produces the feeling of calm. Kavalactones are so effective at creating a sense of peace that a number of Pacific Island cultures, including Tonga and Samoa, have made a kava ceremony part of the traditional opening for group meetings to help the discussion stay calm and focused.

A specialist in the Department of Tropical Plant and Soil Sciences who also works with cacao and coffee, Dr. Bittenbender has been studying ‘awa in his Beverage Crops lab since 1998 and has maintained a kava variety collection at the Waimānalo Research Station for more than a decade. When he returned full-time to specialist duties after serving as CTAHR’s last chair of Horticulture, he wanted to help promote promising crops, and kava had become very popular with the change in laws promoting plants’ health benefits. He’s worked with Hawai’i



Dr. Bittenbender has been studying ‘awa since 1998 and has maintained a kava variety collection for more than a decade.

‘awa growers to determine how production practices affect levels of kavalactones. He and Loren Gautz (MBBE) developed a preparation method that increased the extraction of kavalactones in water from 15 to 45%. He’s also a founding member of the ‘Awa Development Council, a non-profit organization dedicated to disseminating scientific and cultural information about this important plant and its uses.

In 2003, Dr. Bittenbender and the Council organized the first Pacific Islands Kava Festival, an annual event still going strong more than 10 years later. This year’s Kava Festival is scheduled for October 4 on the Manoa campus’s McCarthy Mall and will include educational and cultural booths and talks, kava sampling, kava plants, and an ‘apu-making workshop. Dr. Bittenbender says, “It’s a great opportunity to educate a new group of people from Hawai’i and beyond about an ancient beverage that is at home with 21st-century lifestyles.”

Stress is nothing new, so instead of looking for an app for that, perhaps we should reach for the ‘apu instead.



The New Natural

Everyone's heard of organic, but what about Natural? Natural Farming is a constellation of simple, sustainable techniques that's sweeping the Islands, thanks in large part to Mike DuPonte, an Extension agent based at the Big Island's Komohana Station. Using methods that are less chemically intensive and more biologically based than conventional agricultural production, it aims to build soil health and avoid many common negative environmental impacts.

Though the principles of Natural Farming are just taking off here, they're based on practices going back centuries. Naturally occurring soil microorganisms were collected and cultured for agricultural purposes throughout Asia, but the system was first codified and explained in the 1960s in Japan by Masanobu Fukuoka. His methods were further developed and popularized by Master Cho in South Korea, whose involvement led to the common name of Korean Natural Farming (KNF).

DuPonte, an enthusiastic supporter and practitioner, recently partnered with Cho Global Natural Farming-Hawai'i to offer a series of workshops on the Big Island and O'ahu. He's also published Extension bulletins on KNF inputs such as Lactic Acid Bacteria and Fish Amino Acids. Used as soil drenches, foliar sprays, and soaks, these simple yet powerful concoctions, the cornerstone of KNE, boost plant growth and fruit quality, increase seed germination, and suppress plant disease as well as or better than imported and often non-sustainably produced fertilizers and pesticides.

They're also readily available. Many of their ingredients, including plant shoots, seawater, and fish scraps, can be found in your backyard, or at least right down the road. That's important in the system's philosophy, which holds that Indigenous Microorganisms (IMOs), those living around one's growing plants, help those plants the most.

A dramatic KNF showpiece is the odorless piggery. Piggens may be a by-word for foul smells, but not the ingenious Inoculated Deep Litter System, which employs IMOs to "inoculate" the system, turning it into a micro-ecosystem of beneficial microorganisms that suppress odor, deter flies, and create a healthy and comfortable environment.

"KNF for livestock production pretty much eliminates waste management problems. And animals, including humans, also need plants to eat, so incorporating IMOs into plant production is part of the 'big picture' for a more sustainable Hawai'i," says Duponte.



Plant shoots and brown sugar are all you need to create beneficial Fermented Plant Juice.

Even the pigs seem to enjoy the odorless KNF Inoculated Deep Litter System.



The Roots of Healing

Leina‘ala Bright has spent much of her life cultivating her ability to communicate with her ancestors through prayer, dreams, meditation, and connecting to her na‘au (instinctual learning). Through their inspiration she began her work with CTAHR aquaponics expert Clyde Tamaru on her unique conjunction of aquaponics and lā‘au lapa‘au, traditional Hawaiian herbal medicine.

Bright, a master’s student in the Hawai‘inuiākea School of Hawaiian Studies, is also a research assistant to Dr. Tamaru in the Department of Molecular Biosciences and Bioengineering. She’s collaborated with Jon-Paul Bingham and Bradley “Kai” Fox, presently and formerly of that department, and Andy Kaufman and Ted Radovich of Tropical Plant and Soil Sciences.

At first Bright had never heard of CTAHR, but her kumu at Hawai‘inuiākea, Levon Ohai, encouraged her, and CTAHR collaborator ‘Ilima Ho-Lastimosa of God’s Country Waimānalo soon introduced her to Dr. Tamaru. Impressed by her dedication in volunteering with his growing systems, he offered Bright a “barrelponics” set-up to conduct her experiments in growing ‘ōlena, laukahi, ‘auhuhu, pōpolo, and other traditional healing plants.

Raising plants and fish together isn’t new to Hawaiians. Bright explains that the technique expresses the spirit of Hawaiian concepts of ahupua‘a and the interdependence of living things. Aquaponics has been widely embraced by her community, Waimānalo, with its focus on food sovereignty and self-sufficiency. Bright’s research emphasizes natural resource management from a Hawaiian perspective while providing a sustainable agricultural method addressing today’s challenges of pathogens, urban encroachment, and pollution.

Bright’s most extensive work is with ‘ōlena, or turmeric, valued in many cultures for its medicinal properties. She has shown that levels of curcumin, the bioactive compound that gives ‘ōlena its anti-inflammatory and cancer-fighting qualities, are higher when it’s aquaponically grown. She’s excited to see the results of her current project with ‘ōlena and ‘auhuhu, the “fish-poison” plant which also has anesthetic properties, grown using three different agricultural methods: aquaponics—bell siphon and trickle—and soil.

Bright, a mother, grandmother, and practitioner of lomilomi, lā‘au lapa‘au, and mahi lā‘au lapa‘au as well as a grad student, is excited by the combination of cultural knowledge and scientific research. She hopes to offer, through continued collaboration with CTAHR and Hawai‘inuiākea, preventative and complimentary care alternatives, increasing access to traditional healing plants while protecting fragile natural resources.



Bright presenting her poster at the CTAHR Student Research Symposium.

Bright tends a flourishing crop of pohe kula (gotu kola).



A Living and Learning Tool for Teens

Teenagers today face a multitude of challenges in an increasingly complex world, but Thao Le has a powerful tool for them: awareness and insight into their own minds. Dr. Le, a Family and Consumer Sciences investigator, is researching how mindfulness, a traditional technique with roots in Buddhist meditation and other contemplative practices, can assist vulnerable adolescents through their development into adulthood.

Mindfulness is the ability to bring focus, attention, and awareness to the present moment. Many young adults struggle with impulse control, relationships, and self-worth, and mindfulness encourages non-judgmental acceptance and kindness to oneself regardless of mental and emotional challenges. It fosters an objective perspective that helps in understanding and transforming negative ideas and beliefs into positive behavior.

Dr. Le has brought mindfulness training to at-risk youth in Vietnam and Cambodia and on Native American reservations on the Mainland. In Hawai'i, she has implemented promising mindfulness-based programs with two groups of young adults: military youth and teens in prison. Research suggests that the unique stressors of military life can cause higher rates of anxiety and other difficulties for young adults in military families. In 2012 and 2013, through a partnership with 4-H's Operation: Military Kids, Dr. Le led a mindfulness-based adventure camp for military youth in Hawai'i focusing on physical fitness, mental fitness, and personal leadership. The camp provided a comfortable space and structure where the teens could share their experiences, insecurities, and fears for the future. The response to the camp experience was very positive, and the kids felt they had developed better coping and relational skills.

For incarcerated youth, the problems and the stakes are even higher. Dr. Le has provided mindfulness training to teens at the Hawai'i Youth Correctional Facility and found significant improvements on their stress level and immune function. Teens also reported improvements in their ability to be aware of their emotions and thoughts, and data on recidivism rates are being compiled. The Office of Youth Services recently contracted with Dr. Le to provide training in mindfulness and her mindfulness-based program to several agencies serving youth and families in Hawai'i.

Adolescence is a tumultuous time of great risk and even greater potential. Through Dr. Le's mindfulness-based programs, Hawai'i's teens can develop their minds into incredible resources that will support them throughout their lives.



Dr. Le (top) has implemented promising mindfulness-based programs with diverse groups of young adults.

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