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# IMPACT REPORT Q4

FOURTH QUARTER



Of Innovation,  
Collaboration,  
and Compassion



**College of Tropical Agriculture  
and Human Resources**

University of Hawai'i at Mānoa

*The founding college of the  
University of Hawai'i, established 1907*

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### College of Tropical Agriculture and Human Resources **Of Innovation, Collaboration, and Compassion**



*“Humans share this planet with a host of other beings, and we need to find new ways—or revisit old ones—of living cooperatively instead of working solely for our own short-term gain.”*

Sylvia Yuen  
Interim Dean/Director

With all the talk of environmental issues nowadays, one thing is becoming increasingly clear: Humans share this planet with a host of other beings, and we need to find new ways—or revisit old ones—of living cooperatively instead of working solely for our own short-term gain. Everything is so interconnected that when one thread of the tapestry breaks, the whole cloth weakens. We who live on islands are more aware of this than most; we have always known that we inhabit a finite system that demands tremendous cooperation and far-sightedness. More and more the faculty, staff, and students at CTAHR are acknowledging this truth and working to live sustainably in our island home. They merge cutting-edge techniques with traditional practices, research findings with grassroots activism.

In this quarter’s report we will be spotlighting a new look at an old Hawaiian concept: the ahupua’a, a section of land extending from the mountain to the ocean, within which nearly all of the necessities of life could be found. A recent project follows the same ideal: A bay is freed of invasive algae, then the algae is used as material for compost, which then is used to grow food and flowers. In other instances of cooperation, local livestock farmers attempting to lessen the impact of their operations on the land and waterways have been aided by a user-friendly compilation of all the regulations enacted over the past fifteen years. And we end with something a bit different, a way to lessen the impact on ourselves when other denizens of the planet decide *they* don’t want to live cooperatively with *us*: Several CTAHR students have created a group of products that provide quick, accurate, and low-cost identification of bacterial pathogens.

I hope you enjoy CTAHR’s latest offering and are inspired by the ways our dedicated faculty, students, and staff are working to make the Islands a better place—for *all* of us.

Aloha,

A handwritten signature in blue ink, appearing to read 'S. Yuen', with a stylized, flowing script.

Sylvia Yuen  
Interim Dean/Director

## Lending a Hand from Sea to Land

**M**ost of us today know Maunalua Bay as an evil-smelling mudflat choked with dark, ropy seaweed. Oldtimers, though, may remember it as a rich food source, when commercial fishing was banned and the catch limit for people living in the area was 30 fish and 5 lobster, per person, per day. While there have been many changes since then, one major contributor to the bay's near-demise has been the encroachment of the invasive alga leather mudweed (*Avrainvillea amadelpha*). According to Kimo Franklin, site coordinator for Mālama Maunalua, removing the mudweed is the first step to bringing abundance back to Maunalua Bay.

In 2006, several organizations teamed up with local community members to begin removing the invasive mudweed. The volunteers got a boost from federal Recovery Act funding awarded to The Nature Conservancy by the National Oceanic and Atmospheric Administration (NOAA), and now 50 Pono Pacific workers are clearing 23 acres for this “Great Huki” project. So far, nearly two million tons of algae have been removed. And the project is working: Areas that have been cleared have stayed clear—for over 2 years so far—and native marine life and birds are being seen regularly by residents and visitors alike.

The next question was what does one do with all that muck? This is where CTAHR's Ted Radovich and Nguyen Hue came to the rescue. In partnership with other organizations, including NOAA, the Nature Conservancy, Mālama Maunalua, Aloha ʻĀina ʻO Kamilo Nui, and Pono Pacific, CTAHR teamed up to formulate a plan to compost the invasive algae. Aloha ʻĀina ʻO Kamilo Nui/Chrysanthemums of Hawaii provided space to drop the algae and create compost piles, tended by

volunteers. While CTAHR researchers search for the best formula to decompose the invasive algae, some has already been distributed directly to several farmers for use in growing crops, produce and ornamental plants—with good results. ʻUala—sweet potatoes, a crop for which the Kamilo Nui area is historically known—has been planted using the compost and the ʻuala is flourishing. Growing food on the land while helping to restore a habitat for native species in the sea—that's taking the traditional concept of ahupuaʻa and making it work in a brand-new way!



*Mālama Maunalua's Kimo Franklin (left) and CTAHR's Ted Radovich (right) contemplate the fate of a mountain of invasive seaweed cleared from Maunalua Bay.*



*Maunalua isn't the only area threatened by invasive algae, nor is it the only place CTAHR is helping to restore. Carl Evensen (NREM), Janice Uchida (PEPS) and Brent Sipes (PEPS) recently took their Introduction to Environmental Science students to beleaguered-but-recovering Kāneʻohe Bay to collect half a ton of the stuff as part of the course's service-learning activity, which CTAHR's Sustainable and Organic Farm Training program students took to be composted as well.*

## Knee-Deep in...Regulations

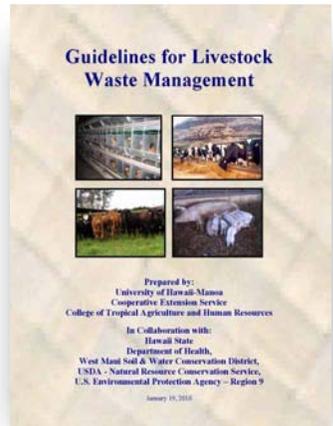
Livestock waste management can be a sticky mess. The livestock industry's ability to keep current and compliant with new guidelines grows increasingly difficult and costly.

Recognizing the importance of the livestock industry's viability in Hawai'i's economy, CTAHR's C.N. Lee and Glen Fukumoto, along with the State Department of Health, assembled a consortium of public-sector agencies and commercial livestock operators to develop a comprehensive livestock waste-management plan, the first in 13 years. The plan's objectives were to provide methods of addressing compliance issues in the most practical, efficient, and cost-effective manner and to make the information readily available to all interested individuals.

The new guidelines acknowledge the need to balance environmental stewardship and livestock operations in an island setting. Best-management practices were developed to help reduce polluted runoff from farms into drinking wells and State waters. The plan also implements agronomic practices and monitoring to minimize the odors and insect problems that can arise from livestock operations. The guidelines commend new innovations by CTAHR such as the portable dry-litter pig pen, which allows less waste to be discharged, and emphasize the importance of practices that "appropriately reuse the waste stream, such as composting." They also explain how farmers can get financing to implement new waste-management plans.

The consortium consists of CTAHR, the State Department of Health (Clean Water Branch, Wastewater Branch, and Solid Waste Branch), USDA Natural Resource Conservation Service, EPA-Region 9, and commercial livestock operators (poultry, swine, beef, and dairy producers). The West Maui Soil and Water Conservation District Office provided administrative support to the group. The effort resulted in a network of new partnerships and a greater sense of community amongst the various groups.

You can view the plan, "Guidelines for Livestock Waste Management" here: <http://hawaii.gov/health/environmental/water/wastewater/forms.html>



*The new guidelines acknowledge the need to balance environmental stewardship and livestock operations in an island setting.*



# Genetic Testing Made Easy—Well, Easier

**T**o most of us, genetic testing still sounds fairly high tech—something best left to highly trained scientists. But Ryo Kubota (PhD student, MBBE) is working to bring it closer in reach. Ryo is the lead member of the company Diagenetix, which won first place in UH-Mānoa's 2010 Business Plan competition. Diagenetix has developed “reagent mixes that enable rapid isothermal DNA detection of microbial pathogens on a disposable platform with a simple portable instrument.” In other words, with a machine that fits into the palm of the hand and a special chemical mix, it is possible to diagnose numerous infectious diseases caused by viruses and bacteria, including the H1N1 virus, by looking at the genetic structure of the pathogens. Ryo points out that the other available testing kits on the market are larger and far more expensive than the one the team has developed, which will sell for \$1,200 and can allow companies that haven't been able to

do DNA testing to start doing so. The testing can also take place more rapidly, he explains, because it can be done at a constant temperature instead of having to cycle through three specific temperatures to get the results as the other instruments do.

The Diagenetix product line of chemical reagents—several are available, depending on what pathogen is being tested for—is based on technologies developed and provisionally patented by Ryo with his research mentor Daniel Jenkins (MBBE). Other members of the Diagenetix team include Scott Shibata (MS graduate, MBBE), who is now the project manager at Hawaii Bioenergy LLC, and Jimmy Saw, who is a PhD candidate in the Microbiology program. Diagenetix triumphed over fourteen other student teams at UH that advanced to the competition semi-finals and four teams that made it to the finals. The company received prizes totaling \$10,000 in cash and more than \$17,500 in legal, marketing, and other services to develop and promote the business. Diagenetix is also the recipient of a fellowship through the Pacific Asian Center for Entrepreneurship (PACE), which supports a team of business and legal students to further develop marketing plans. The team is seeking investor support, funding through Small Business Innovation Research grants, and partnerships with non-profit agencies and other businesses.



*Diagenetix triumphed over fourteen other student teams at UH that advanced to the competition semi-finals and four teams that made it to the finals. Pictured above are PACE Executive Director Susan Yamada, Scott Shibata and Ryo Kubota.*

## COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES

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