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IMPACT REPORT Q2

SECOND 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*

www.ctahr.hawaii.edu

1907

SECOND QUARTER

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



"We need to continue to tell our inspirational stories of discovery and innovation, and as we grow together, I am looking forward to fruitful and exciting collaborations that will expand the work CTAHR does on the local, national, and international level."

Recognition. When I informed friends and colleagues that I had accepted a position as Dean of the College of Tropical Agriculture and Human Resources in Honolulu, Hawai'i, I received many congratulations on my good fortune. They viewed Hawai'i as a wonderful vacation destination; most were well aware of its natural beauty, sandy beaches, and surfing, but less aware of the world-class research we conduct here. That is why stories like the three in this quarter's Impact Report are especially gratifying, since they all deal with recognition of the college at the national level.

Principal investigator Andy Hashimoto (Department of Molecular Biosciences and Bioengineering) and his partners have been awarded a prestigious \$6 million grant to research locally produced biofuels that may be utilized by the US Navy. Grass-fed Angus bulls bred by Mike DuPonte and his team at the Mealani Research Station were recently rated in the top 1–5% in the country. And this summer, the college's delegates to the Smithsonian Folklife Festival were able to showcase important CTAHR projects concerning family farms, honeybees, and aquaponics to an estimated 1.5 million visitors at the National Mall in Washington, DC, during the commemoration of the establishment of the land-grant system and the USDA.

We need to continue to tell our inspirational stories of discovery and innovation, and as we grow together, I am looking forward to fruitful and exciting collaborations that will expand the work CTAHR does on the local, national, and international level.

Aloha,

A handwritten signature in gold ink that reads "Maria Gallo".

Maria Gallo
Dean and Director of CTAHR

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Fueling a Green Revolution

“I need to stop at the grass station and put some grass in my car.” No, that’s not a typo—it’s a hint of the greener future in store once CTAHR’s latest partnership with other universities, governmental agencies, and private businesses yields the information on biofuels that it promises. The College recently was awarded a \$6 million grant from USDA for a collaboration with researchers from Oregon State and Washington State University and private companies ZeaChem, Hawaiian Commercial and Sugar Company, and Hawai‘i BioEnergy LLC to evaluate the sustainability of commercial biorefineries in Hawai‘i.

The research concentrates on fast-growing grasses that can thrive in areas where they won’t compete with food crops. Sugarcane and its relative energycane, banagrass, sweet sorghum, and a Napiergrass–pearl millet cross are being researched to determine which species, growing conditions, and maturity at harvest offer the highest sustainable yields.

But it’s not just the grasses; it’s a whole system that’s being evaluated. Project partners are looking into harvesting—whether commercial harvesters can be modified for the job or whether new machinery needs to be built; storage needs; and multiple processes, like juicing, hydrolyzing, fermenting, and distilling. End products are drop-in biofuels and value-added co-products like animal feed and soil amendments. And all this for a cost that is projected to be comparable with future crude oil prices.

The project gets more timely all the time. Hawai‘i presently meets more than 90% of its energy requirements through the use of imported fossil fuels and has the nation’s highest energy costs. The U.S. Navy, which is of great economic importance to the state, has also unveiled its Great Green Fleet Initiative, which aims to use 50% renewable energy by 2020 for its ships and ground transport, thus creating a very important market for locally produced biofuels. In fact, the Navy and the US Departments of Agriculture and Energy have announced plans to build several regional biorefineries, and Hawai‘i is one of the sites being considered. And it will be CTAHR and its partners that show them how it’s done.

Test plots of banagrass varieties at CTAHR’s Waimānalo Research Station.



From left, Andrew Hashimoto, CTAHR professor/principal investigator; Lee Jakeway, director of energy development at Hawaiian Commercial and Sugar; Richard Ogoshi, CTAHR research agronomist, and Tim Eggeman, chief technology officer of ZeaChem, Inc. inspecting energy crop trials at Hawaiian Commercial and Sugar.



Mealani's Recipe for a Great Steak

The steaks are great. So say the cattle breeders at the Mealani Research Station, and if national competitions are any indication, they should know—select members of the Mealani herd have just been rated among the top Angus bulls in the country.

A main concern of producers of beef throughout the state has been an inconsistent product. Cattle need to gain lots of weight and gain it fast before they become too old and tough to please today's consumers' discriminating palates. Most cattle are confined in feedlots and given high-calorie feed like corn until they reach 1,200 pounds of luscious, marbled beef, but Hawai'i ranchers don't have that option—there's not enough land to grow all that food just to give to animals. And with the demise of the sugar and pineapple industries, by-product feeds such as silage and bagasse have fallen off as well. Producers had to send their calves to the Mainland for "finishing"—gaining that all-important weight—and then import the beef back once it had been slaughtered. Not a very efficient method, and less than desirable for the increasing numbers of people looking to eat local.

Hawai'i—the Big Island, particularly—does have grass, and cattle will thrive on it, but they don't tend to finish as rapidly. Enter the Mealani breeding team, led by Mike DuPonte, who were determined to find a way to raise plump, juicy cattle on an all-grass diet. They began an intensive breeding program—not genetic engineering, but old-fashioned selective breeding. They also utilized cutting-edge technologies such as ultrasound to assess marbling without slaughtering the animal, and DNA testing to determine each bovine's potential tenderness, its efficiency in converting forage to beef, and other carcass merit characteristics. Another Mealani strategy is intensive grazing rotation, so the herds only eat the youngest, most calorie-rich grass.

The team has succeeded far beyond their hopes. This past year they sent 10 bulls to Pfizer's HD 50K genome program, used to evaluate the best Angus bulls in the country—five were rated in the top 5%, and one in the top 1% of bulls nationwide! Among the criteria used by the judges were feed use efficiency, average daily weight gain, tenderness, and ribeye size. But don't take Pfizer's word for it—try the savory taste of success and self-sufficiency for yourself!

Some members of Mealani Research Station's prize herd on Hawai'i Island.



Mealani breeding team leader Mike DuPonte teaching an artificial insemination class to CTAHR Pre-Veterinary Program students.



Planting a Beautiful Relationship

Abraham Lincoln did even more than he's commonly known for—he brought two important American agricultural institutions into existence. In 1862 he signed into law two acts, one creating the United States Department of Agriculture, the other, the Morrill Act, establishing the land-grant college system. Under this system, institutions of higher learning were, well, granted land on which to establish agricultural colleges to strengthen the country's farming knowledge. It was under this act that what is now the University of Hawai'i was created, with pig farms and experimental plots surrounding its lone building, and it is CTAHR that remains the college most closely aligned with the original land-grant mission.

Sharing their birth year, CTAHR and the USDA fittingly share and share alike in other ways, working together on important initiatives for the state such as the biocontrol of the erythrina gall wasp that decimated Hawai'i's native wiliwili (*Erythrina*) trees. After the two came together to identify, test, and regulate the release of a predator of the wasp, the wiliwili is beginning to make a comeback in the Islands.

So when the two acts' 150th birthday came around, the college and the Department of Ag decided to celebrate...together! The institutions commemorated the day by planting a CTAHR-grown tree, a relative of the wiliwili, and dedicating a plaque honoring the acts that had brought them into being and the partnership that had nurtured their potential.

Just recently CTAHR further marked the anniversary by sending delegates to the nationwide celebration of the USDA's establishment, a 10-day commemoration on the National Mall in Washington, DC, incorporated into the annual Smithsonian Folklife Festival. Members of the college demonstrated their programs supporting Native Hawaiian farmers and the ease of growing crops and Hawaiian healing herbs with tilapia in an aquaponic system. Also featured was CTAHR's Honeybee Project, which stresses not just honey production but also the extremely important pollination services bees provide. Bringing a breath of aloha to the nation's capitol, the representatives returned with new ideas and inspiration from the other land-grant colleges as well, energized and ready for the next century and a half of the learning, teaching, and service that CTAHR was created to do.

Former Interim Dean Sylvia Yuen (second from left), USDA Farm Services Executive Director Diane Ley (second from right) and other USDA officials pose with the newly dedicated non-endemic wiliwili tree commemorating USDA's 150th Anniversary.



Glenn Teves presenting a colorful array of posters depicting various CTAHR programs on the National Mall in Washington, DC.



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