

Diversifying, Sustaining, Strengthening



2005

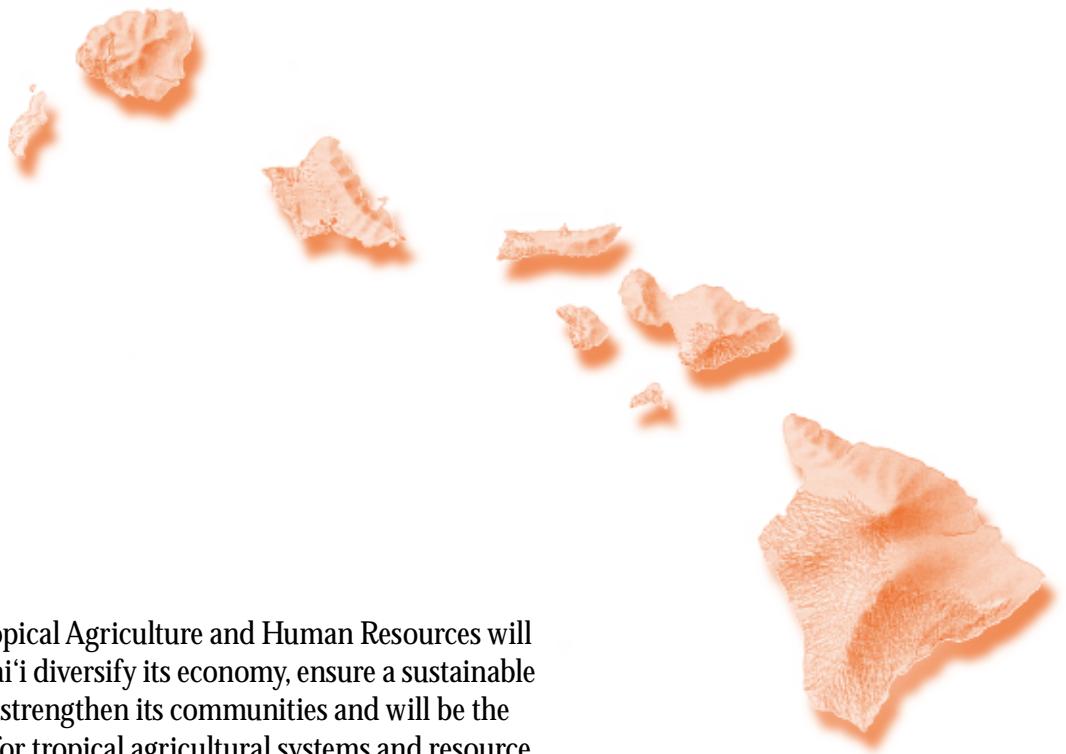
IMPACT REPORT

Cultivating Community



**College of Tropical Agriculture
and Human Resources**
University of Hawai'i at Mānoa

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



VISION

The College of Tropical Agriculture and Human Resources will actively help Hawai'i diversify its economy, ensure a sustainable environment, and strengthen its communities and will be the premier resource for tropical agricultural systems and resource management in the Asia-Pacific region.

MISSION

The College of Tropical Agriculture and Human Resources is committed to the preparation of students and all citizens of Hawai'i for life in the global community through research and educational programs supporting tropical agricultural systems that foster viable communities, a diversified economy, and a healthy environment.

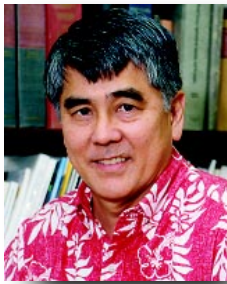


College of Tropical Agriculture and Human Resources

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College of Tropical Agriculture and Human Resources— CULTIVATING COMMUNITY



“The release of CTAHR’s 2005–2010 strategic plan is an important step, defining our path and direction.”

– Andrew Hashimoto,
Dean, CTAHR

For the College of Tropical Agriculture and Human Resources (CTAHR), the year 2005 marked the start of a new chapter, with the release of the college’s 2005–2010 strategic plan. The plan, available on-line at www.ctahr.hawaii.edu/sp2005, articulates four programmatic goals that are central to CTAHR’s mission and vision—academic excellence, a diverse economy, a healthy environment, and strong families and communities. Our 2005 Impact Report illustrates how some of the college’s many research, education, and extension activities contribute to these goals.

Our ongoing efforts to build first-rate academic programs that meet the needs of our students and their communities are reflected in the continued growth of the college. Since our reorganized curriculum first became available in Fall 2002, CTAHR’s undergraduate student population has grown by 30 percent, and our number of graduate students has increased by 50 percent. As a result, our total enrollment is at its highest level in twenty years. We are very gratified that so many students have embraced the diverse disciplines taught within the college. To meet this growing enrollment demand, we are asking the Hawai‘i State Legislature to add funds to the University of Hawai‘i’s budget for new faculty positions in the Department of Family and Consumer Sciences, which is home to 40 percent of our students, and the Department of Natural Resources and Environmental Management, which has expanded fivefold in only three years. We are also requesting faculty positions and funds to develop a statewide program in turfgrass and golf course management that will expand the agricultural and business options available to Hawai‘i students and infuse a \$50-million local industry with homegrown talent.

The other goals of our strategic plan support the college’s three-part vision. Whether assisting in the development of new products and markets, advancing practices that protect the natural systems we rely on, or promoting human health and well-being, CTAHR’s faculty and staff are dedicated to improving life in Hawai‘i and throughout the Pacific region. The impact stories that follow illustrate how members of our college are working with one another and with many outside partners to serve individuals, families, and communities. We are helping both modern agribusinesses and subsistence farmers expand their sales and conserve their land. We are creating new and engaging educational experiences not only within the college but also for students at other colleges in the state and even for grade schoolers. We are building on an eighty-year tradition of nutrition education that offers Hawai‘i’s people tools and resources for longer, healthier lives. I am proud to be a part of these efforts, and I thank my colleagues in CTAHR for their excellent work.

The release of CTAHR’s 2005–2010 strategic plan is an important step, defining our path and direction. Each day brings us opportunities to act on the

college's goals and advance our progress in meeting them. As we approach the beginning of CTAHR's second century, our new plan exemplifies our commitment to serving our students, the people of Hawai'i, and the global community through outstanding instruction, outreach, and research.

Aloha,

A handwritten signature in orange ink, reading "A. G. Hashimoto". The signature is fluid and cursive, with the first name "A." and last name "Hashimoto" clearly legible.

Andrew G. Hashimoto
Dean/Director

TABLE OF CONTENTS

Nurturing Hawai'i's Agriculture	2
A Lei for All Seasons	3
A Young Country Faces Old Challenges	4
Good Health for Pacific Animals	5
Helping Cows Be Good Neighbors	6
Fighting Pests with Shower Power	7
An Unexpected Taste for Escargot	8
Growing Native	9
Hawai'i Kids Count on Us	10
Sharing Biotech Tools with Smaller Schools	11
A NEW Approach to Healthy Eating	12
A Pioneer's Lasting Legacy	13
Take the Ag Awareness Quiz	14

Nurturing Hawai'i's Agriculture

Once dominated by large-scale sugarcane and pineapple production, Hawai'i's agriculture is branching out in new directions. Diversified crops currently account for 70 percent of the state's farm revenues. To help fledgling agricultural ventures get started and existing businesses flourish, the University of Hawai'i has established an Agribusiness Education, Training, and Incubation (AETI) program through a system-wide grant from the U.S. Department of Agriculture to support institutions that serve Native Alaskans or Native Hawaiians. Nine UH campuses on four islands are participating in the grant, which funds a statewide agribusiness incubator and has also expanded student education and training in agriculture, aquaculture, culinary arts, product development, e-commerce, and biotechnology.

Housed at CTAHR, the agribusiness incubator provides consulting services to agriculture-related businesses that might not otherwise have access to such assistance. The incubator's staff members offer their clients help with financial assessment, strategy and planning, process improvement, and marketing. These services complement the technical expertise available to farmers and food processors through the college's Cooperative Extension Service. In addition, the incubator participates in community-based efforts to promote diversified agriculture.

In its first year, the incubator served 11 farming and value-added businesses located throughout the islands. During this period, two new businesses were formed, one O'ahu farmer doubled his production capacity, and a Big Island business increased its revenues by \$500,000, enabling it to increase its staff by 10 percent. Participating companies must be committed to ongoing improvement and growth, and preference is given to businesses that are owned by or employ Native Hawaiians. The incubator's services are free, but clients who have benefited are asked to contribute back to the program, whether by donating money, creating internship opportunities for UH students, or mentoring other businesses and spreading the benefits of the incubator service throughout the agricultural community. As Hawai'i agriculture expands into new markets, the AETI program is building business acumen and educating tomorrow's entrepreneurs.

In its first year, the agribusiness incubator served 11 farming and value-added businesses located throughout the islands.



Photo courtesy of Neil Tagawa

Neil Tagawa (right), director of the Agribusiness Education, Training, and Incubation program, tours Greenpoint Nursery with Harold (left) and Eric Tanouye.

A new technique helps growers overcome winter dormancy in plumeria.



Photo: Richard Criley

Treating plumeria with a chemical used to ripen fruit stimulates early flowering for winter lei.

A Lei for All Seasons

Nothing says “welcome to Hawai‘i” like a fragrant lei of locally grown plumeria blossoms. However, when our winter visitors step off the plane, very few plumeria blossoms are available, and greeters are more likely to offer them lei of imported dendrobium orchids.

Normally, plumeria trees lose their leaves and go dormant as the autumn days grow shorter. The flower buds that start to form during the long days of summer do not appear until the midwinter days warm and lengthen. CTAHR horticulturist Richard Criley has found that ethephon, a chemical used by the pineapple industry to stimulate flowering and ripen fruits uniformly, can induce plumeria trees to flower early, producing blossoms for the winter tourist season.

When ethephon is applied to a plumeria tree in September or October, it breaks down to form a non-toxic gas that causes the leaves to fall from the tree. Leaves are the “eyes” of a plant—the organs that allow it to perceive light—so a leafless, ethephon-treated plumeria tree is unable to sense the shortening day lengths and fails to go dormant. If the nights are warm enough (generally above 65°F), the plant begins to regrow. Not all shoots yield flower buds in response to treatment, but enough flowers are produced to harvest for lei. The common yellow plumeria popular with commercial growers responds well to ethephon, and the resulting winter flowers equal spring blossoms in size and quality. The treatment does not prevent spring flowering, since buds continue to push out even after the initial flush of bloom.

The timing of the ethephon treatment is important. Apply it too early, and only flower stalks are produced, not flowers. Apply it too late, and flower production misses the peak visitor arrival period. But when a well-timed application is coupled with mild nighttime temperatures, growers can overcome plumeria’s tendency to take the winter off, spreading the beauty of this fragrant island favorite throughout the year.



Photo: Miles Hakoda

A Young Country Faces Old Challenges

After more than four centuries as a Portuguese colony, decades of Indonesian occupation, and the destruction of most of its infrastructure, Timor-Leste (East Timor) became an independent nation in 2002. The country is among the world's poorest, with a per person annual income of \$460.

Since 2003, CTAHR faculty members have worked with Timor-Leste's Ministry of Agriculture, Forestry, and Fisheries to increase agricultural yields and food security, improve household incomes, create jobs, and promote sustainable farming practices that prevent erosion and protect the environment. The project, funded by the U.S. Agency for International Development, is part of the Soil Management Collaborative Research Support Program. In this program, led since 1996 by the University of Hawai'i, six land-grant schools are working with researchers and institutions in 23 developing countries.

The Timor-Leste project combines research, extension training, and community outreach. UH faculty and Timorese ministry personnel are working with people who live in the Seical watershed, which extends from a mountain ridge-top to the sea. Faculty members share their expertise in soil nutrition, agroforestry, and farming economics and teach ministry staff how to test for soil deficiencies, but it is the local residents who decide which crops to grow and methods to adopt. Successful approaches developed at each elevation in the Seical watershed can be applied in similar agricultural and climatic zones throughout Timor-Leste's other watersheds.

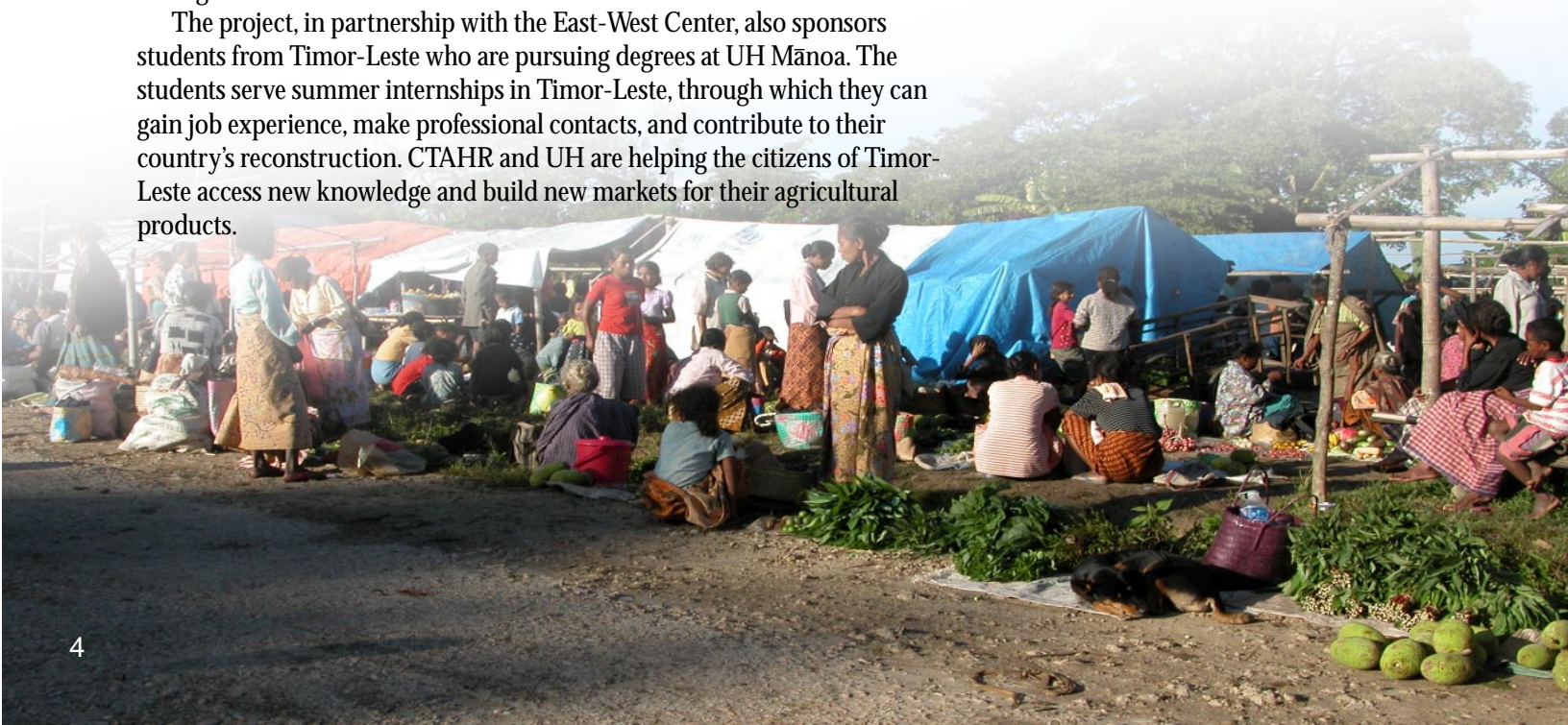
The project, in partnership with the East-West Center, also sponsors students from Timor-Leste who are pursuing degrees at UH Mānoa. The students serve summer internships in Timor-Leste, through which they can gain job experience, make professional contacts, and contribute to their country's reconstruction. CTAHR and UH are helping the citizens of Timor-Leste access new knowledge and build new markets for their agricultural products.

With annual income at \$460 per person, Timor-Leste is among the world's poorest countries.



Photos: John Powley

Extension forester J.B. Friday discusses varieties of Leucaena, a nitrogen-fixing tree used for coffee shade and animal fodder, with foresters and workers at the Timor Coffee Cooperative nursery in Dili.



A distance-learning course in paraveterinary care brings much-needed expertise to Pacific Island communities

Photo: Dennis Miyahara



Good Health for Pacific Animals

The nations and territories of the Pacific Islands are home to more than 13 million farm animals but fewer than 100 veterinarians. This shortage of animal-care professionals can endanger not only animal welfare but also food safety and human health. To expand the available pool of animal-care providers, the Agricultural Development in the American Pacific project teamed with the Secretariat of the Pacific Community (SPC) and the University of the South Pacific to develop a curriculum that combines distance and on-site learning to enable community members in remote Pacific locations to train as paraveterinarians.

After an introductory orientation, students in the Paravet Program participate in 16 weeks of distance learning followed by one week of hands-on education and a final exam. As they work through the *Paravet Training Manual*, the students meet weekly with a coach in their area who has some familiarity with animal science, such as a veterinarian, a science teacher, or

a nurse. Homework is e-mailed or faxed to the headquarters of the SPC, located in Fiji. Topics in the training manual include the role of animals in Pacific Island communities, animal anatomy and diseases, livestock production techniques, veterinary medicines and methods, public health, and quarantine issues. If computers are available, students can supplement the printed manual by viewing digital video clips on a compact disc.

To date, the Paravet Program has graduated 92 students, improving access to animal care in Samoa and American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Palau, the Marshall Islands, the Solomon Islands, the Cook Islands, and Tuvalu. By helping families and farmers raise healthy animals, these graduates increase the value of livestock and enhance animal welfare in small communities. By recognizing food safety concerns and working to

prevent the transmission of animal diseases to humans, they can help protect public health throughout the Pacific region.

Photo courtesy of Anju Mangal



Instructor Peter Manuelli of the Secretariat of the Pacific Community teaches swine care to Fijian farmers.

Helping Cows Be Good Neighbors

Livestock operations add more pollutants to U.S. rivers, lakes, and coastal waters than any other activity. Waste from dairies represents a particular challenge because it contains milk fats that resist breakdown by biological treatment systems. To address this problem, CTAHR's Ping-Yi Yang, Liangjie Dong, and Charles Nelson have designed an innovative system that treats dairy wastes cheaply, quickly, and effectively. An energy-efficient demonstration system at CTAHR's Waiale'e Research Station on O'ahu's North Shore is four times faster than conventional treatment and removes 90 percent of dairy wastewater contaminants.

The waste treatment system combines five "C's": clean water, clean air, clean energy, compact design, and cost-effectiveness. A sixth C might be competition—the plan for the new technology has been recognized in national and international contests and was awarded Best Plan Overall in the 2005 Social and Environmental Technology Inventors Challenge.

The dairy wastewater treatment system, shown below, employs two patent-pending technologies. During the first stage, bacteria in sealed, airless tanks digest the organic waste, generating methane that can be used as fuel. The bacteria in these biological reactors cling to a unique plastic that concentrates them and prevents them from flowing out of the tank. After passing through the two sealed reactors, the wastewater enters a third, open tank that contains a highly porous pottery. A windmill pumps air through the tank, allowing bacteria trapped in the pottery to complete the treatment process by consuming organic waste and converting ammonia to harmless nitrogen gas. The cleaned water has no offensive odor and is used to irrigate pasture for the dairy cows.

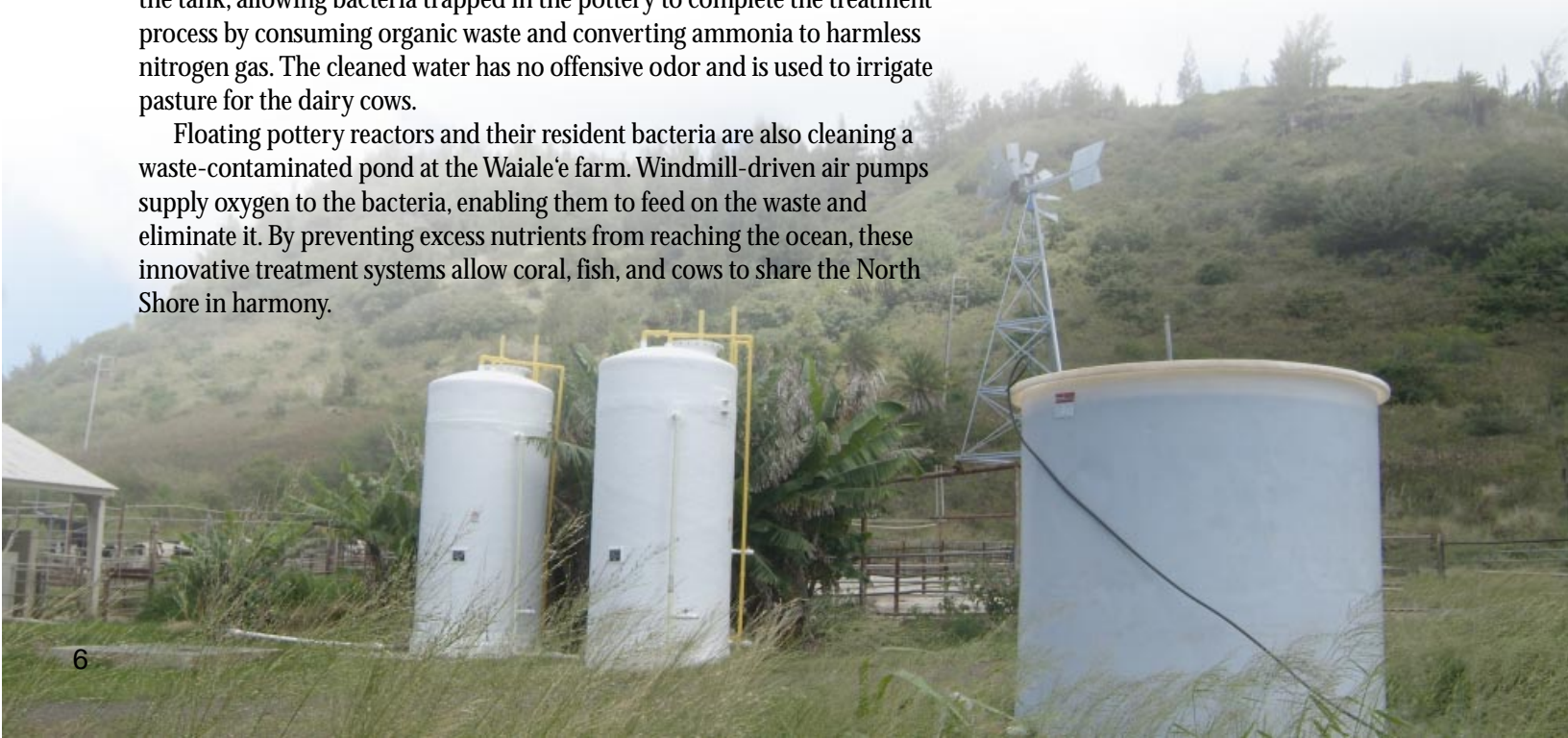
Floating pottery reactors and their resident bacteria are also cleaning a waste-contaminated pond at the Waiale'e farm. Windmill-driven air pumps supply oxygen to the bacteria, enabling them to feed on the waste and eliminate it. By preventing excess nutrients from reaching the ocean, these innovative treatment systems allow coral, fish, and cows to share the North Shore in harmony.

Four times faster than conventional treatment, an innovative system removes 90 percent of dairy wastewater contaminants.



Photos: UH Creative Services

Doctoral student Liangjie Dong compares wastewater samples before and after treatment. The treated water is clean enough for irrigating pastures.



A safe, effective control method can prevent invasive species from spreading as stowaways on potted plants.

Fighting Pests with Shower Power

In 2003, the value of Hawai'i's potted and landscaping plants topped \$62 million. But nursery owners, florists, and their customers aren't the only ones that benefit from the shipping of plants throughout the state. Transport of plants within and between the islands also creates opportunities for an unwelcome pest, the coqui frog, to expand into new territory. CTAHR is working with state agencies and private industry to prevent these noisy invaders from spreading as stowaways on plants shipped from the Big

Island to Maui, where the frogs are more localized, or to O'ahu and Kaua'i, where coqui populations are not yet entrenched.

Researchers and engineers from CTAHR, the University of Hawai'i at Hilo, and the Department of Land and Natural Resources collaborated to develop a safe and effective method for killing coqui frogs on potted plants. Showering the plants with hot water (about 115°F) for five minutes kills the frogs and their eggs. Most plants are unharmed by such treatments, and some even benefit because the hot water can also control plant-damaging insects. For example, the stinging nettle caterpillar is killed by a 25-minute shower at 117°F. Tests to determine the effectiveness of hot water against other pests are ongoing.

Bill Durston, owner of O'ahu's Leilani Nursery, has adapted this hot-water treatment, constructing a stationary treatment chamber from the

enclosed box of a delivery truck. Working with this prototype, CTAHR faculty proposed efficiency-enhancing modifications to speed the rate at which the chamber and plants heat up and to purify and recycle the heated water. These design changes were incorporated into a portable treatment chamber currently in use on the Big Island. A Hawai'i Department of Agriculture grant is being used to fund the construction at Leilani Nursery of a larger version of this improved chamber that will be available for use by any nursery. HDOA anticipates developing additional large chambers to serve other islands as well. Through teamwork, CTAHR is helping nursery professionals contain the spread of invasive species.



Showering plants with hot water kills coqui frogs (below) and their eggs.



Photos courtesy of Arnold Hara

An Unexpected Taste for Escargot

CTAHR researchers have identified the first caterpillar known to eat snails.

When graduate student Will Haines received a snail shell with a caterpillar curled up inside, he didn't expect international attention. Colleagues in the U.S. Geological Survey had given the sample to Haines for identification to determine whether the unfamiliar caterpillar was a new invasive species and a possible threat to the diverse native organisms and valuable watershed of the Makawao Forest Reserve (shown below). Remarkably, what Haines and his professor, entomologist Dan Rubinoff, discovered about the caterpillar would be published in the prestigious journal *Science* and make headlines on five continents.

Rubinoff and Haines identified an utterly unique Hawaiian caterpillar that stalks, traps, and eats snails. All caterpillars can spin silk, but *Hyposmocoma molluscivora* uses its silk to hunt, tying its prey to a leaf and then cornering the snail in the dead end of its own shell. Of the one in every thousand or so species of moths and butterflies whose caterpillar is carnivorous, this is the first ever known to eat snails.

Our state is home to 350 known species of *Hyposmocoma*. Most of these species are endemic to a single island. Since first identifying the Maui caterpillar, Rubinoff and Haines have found different species of snail-eating *Hyposmocoma* on Moloka'i, Kaua'i, and the Big Island, revealing how our islands are hotbeds of evolution in which new species and survival strategies arise at a remarkable rate.

This novel discovery highlights how fundamental and applied biology can complement each other. Efforts to protect an important natural resource have expanded our basic understanding of insects. At the same time, as we study the evolutionary context that produces dramatic changes so quickly in Hawai'i, we gain insight into how rapid bursts of evolution affect such practical concerns as the origin of harmful viruses. Through working to conserve an environment at risk, CTAHR researchers can expand the boundaries of scientific knowledge while offering tangible benefits to Hawai'i's people.



Emerging headfirst from its casing, *Hyposmocoma molluscivora* clutches a trapped snail.

Photo courtesy of Dan Rubinoff

Photo: Will Haines

The Sherman Courtyard Native Plant and Ecosystem Garden exposes students to Hawai'i's rich biological heritage.

Growing Native



Over 90 percent of the plants that grace O'ahu's urban landscapes came from other places. Native plants are the exception even on the University of Hawai'i's Mānoa campus. In the past, CTAHR instructors teaching natural history did not have ready access to diverse examples of native and endemic plants from the islands' many climatic zones and ecosystems. Now this need is being

met through the collaborative efforts of many members of the UH Mānoa community, including the Building and Grounds Management Office, the Landscape Advisory Committee, and CTAHR faculty, staff, and students.

The Sherman Courtyard Native Plant and Ecosystem Educational Garden was dedicated on April 22, 2005 to mark the 35th celebration of Earth Day. Tucked in a quiet corner of the Mānoa campus, the garden reflects months of planning, labor, and ongoing care. Its native flora and aesthetic design serve the educational missions of two CTAHR departments: Natural Resources and Environmental Management, and Tropical Plant and Soil Sciences. As an outdoor classroom the garden helps teachers expose environmental science students to Hawai'i's rich biological heritage, and horticulture students

helped plant the garden as part of a classroom project, gaining practical experience with native plants. Hawai'i is home to 273 plants that are listed as threatened or endangered, and many additional endemic plants are rare or at risk because their native habitats are limited. Introducing these species to the state's future landscape professionals encourages their wider planting and continued survival.

The value of the Sherman Courtyard garden was recently recognized with a 2005 Betty Crocker Landscape Award from Scenic Hawaii, Inc., a nonprofit corporation dedicated to protecting and promoting our state's beauty and resources. The many individuals who have contributed to the garden's planting and upkeep have created a unique educational resource to be studied and enjoyed for many years.



Photo: Jacqueline Coates Smith

Students in a Horticultural Practices class plant a loulu (Hawaiian fan palm) that is endemic to O'ahu.



Photo: UH Creative Services

Educational specialist Jody Smith (foreground) and professor Travis Idol sit amid native plants with the Sherman Courtyard garden's 2005 Betty Crocker Landscape Award.

Hawai'i's Kids Count on Us

Each semester, youngsters bring home a report card to help parents judge how well their children are doing. Through the Kids Count project of the Annie E. Casey Foundation, each state receives its own report card, an annual assessment of its children's well-being that provides policymakers and citizens with a yardstick for measuring successes in promoting positive childhood outcomes and identifying areas that need improvement.

Locally, the Center on the Family coordinates Hawai'i Kids Count and disseminates the state's Kids Count data on-line (uhfamily.hawaii.edu/hawaii_kids_count). Ten indicators of child and youth welfare are used to rank how well children ages birth to 19 are cared for throughout the nation. Additional background information gives a more complete picture of the health, family economics, and scholastic achievements of the state's children and young adults. In the 2005 Kids Count Data Book, based on 2002 data, Hawai'i ranked 24th overall among the 50 states. The survey contains both good and bad news for the state. Our children and teens die or drop out of high school at much lower rates than the national average. However, our level of teen idleness—the percentage of teenagers who are neither in school nor employed—is among the nation's highest.

Hawai'i Kids Count also collaborates with government officials, state and local agencies, and nonprofit organizations to improve the lives of Hawai'i's children by raising awareness of their circumstances and advancing initiatives that benefit them. Some of the program's efforts address dire conditions such as drug use by children or parents, or homelessness. Others include evaluation of the supports and services available to Native Hawaiian families, assessment of the quality of life in Hawai'i in areas such as education and health, and promotion of eating dinner together as an opportunity to strengthen family bonds. Hawai'i's kids count on adults to help them achieve their potential. Through research and advocacy, Hawai'i Kids Count is working to do just that.

This year's Kids Count Data Book ranks Hawai'i 24th overall among the 50 states in measures of child and youth well-being.



The Advances in Biotechnology Education Workshop makes Mānoa's cutting-edge research accessible to students from other campuses.



Photo courtesy of David Christopher

Workshop participants prepare for employment or further education by honing their skills in molecular biology.

Sharing Biotech Tools with Smaller Schools

Students and faculty at research institutions like UH Mānoa typically have greater access to sophisticated laboratory equipment than their colleagues at smaller schools. A summer workshop hosted by CTAHR's David Christopher and organized by CTAHR alumnus Kabi Neupane, who now teaches at Leeward Community College, is helping bridge this technology gap.

At the 2005 Advances in Bioscience Education (ABE) workshop, students and faculty from Leeward, Kapi'olani, and Windward Community Colleges and Hawai'i Pacific University had an opportunity to learn a variety of biotechnology techniques in the context of plant biology research. The eleven participants, including five student/teacher pairs, gained laboratory experience in the emerging fields of genomics and bioinformatics as well as the established fields of molecular and cellular biology. Much of the workshop was held on the Mānoa campus, enabling participants to work in a professional research lab and at the Biological Electron Microscope Facility run by the Pacific Biomedical Research Center. The bench-top skills taught in the workshop are highly valued by employers and schools.

Unlike many laboratory courses in which students perform traditional "cookbook" experiments that have predictable results, the workshop enabled participants to conduct actual research funded by the National Science Foundation to investigate part of the molecular machinery that is responsible for folding newly made proteins into the correct, three-dimensional shapes required for life. By pairing students with their teachers, the workshop format fostered collaborative problem solving, helping students prepare for graduate-level research or the job market while giving teachers a chance to learn new methods and develop new educational resources. Three of the faculty members took small projects back with them to their schools to develop further, and additional workshops are planned for 2006 and 2007. By combining an intimate learning environment with the tools of modern molecular science, the ABE workshops unite the best aspects of both large and small schools for the benefit of students and teachers alike.

A NEW Approach to Healthy Eating

The Nutrition Education for Wellness program brings together diverse outreach projects that influence choices about food and exercise.



The 2003 Hawai'i Health Survey reveals that more than half of Hawai'i adults are overweight or obese. Young people in the islands are also at risk: in some Hawai'i communities, the rate of obesity in children ages 6 to 11 is twice the national average. About three-quarters of Hawai'i residents don't eat enough fruits and vegetables, and many suffer from diabetes, heart disease, high blood pressure, or diet-related cancers.

To combine their strengths and enhance their effectiveness, CTAHR extension faculty in four counties and two college departments—Human Nutrition, Food and Animal Sciences and Family and Consumer Sciences—have joined together to coordinate their outreach in the areas of food, nutrition, and health. Under an umbrella program called Nutrition Education for Wellness, or NEW, this team of extension agents brings its varied expertise to a wide range of projects that promote healthy eating and exercise habits, encourage safe food handling practices, and improve the access of limited-income households to good nutrition. From diabetes screening to home gardening tips, money management training to youth development, NEW unites diverse outreach elements that can influence food choices. In addition to educational resources developed by members of the college, the NEW Web site (www.ctahr.hawaii.edu/new) provides extensive links to nutrition-related information available from government and nonprofit sources.

NEW's team approach has been spearheaded by extension faculty, but the program's project roster includes research and instruction components as well, such as materials developed for young athletes by food science and human nutrition students. The collaborative projects developed under the NEW umbrella reflect partnerships not only within CTAHR but also with colleagues at mainland universities and local, state, and federal agencies. By linking projects and pooling resources, NEW enables more efficient outreach to improve the health and well-being of Hawai'i's people.



As part of the Great Kaua'i Weigh Out, adults learn about the benefits of walking.

Photos courtesy of Laura Kawamura



Keiki measure the fat content of different fast foods during the Great Kaua'i Weigh Out—Kids Too.

Carey D. Miller was the first scientist to study the nutritional value of Hawaiian foods.

A Pioneer's Lasting Legacy

Raised on a ranch in Idaho, a granddaughter of pioneers, Carey D. Miller blazed her own trail in Hawai'i as the first scientist to study the nutritional value of Hawaiian foods. Miller found that the information available in nutrition textbooks from the mainland did not address the needs and diets of Hawai'i's Asians and

Pacific Islanders. Her groundbreaking work in assessing local foods, including tropical and subtropical fruits and vegetables, revealed that crops grown in Hawai'i could provide the same essential nutrients as imports. A woman ahead of her time, she urged against reliance on processed foods containing too much refined sugar and salt.

During her 36 years with CTAHR, Miller established the University of Hawai'i's research, instruction, and outreach programs in food science and nutrition. She arrived at UH in 1922 to head the Home Economics Department, which at the time had only one student major. Under her guidance, student enrollment in the department expanded dramatically, growing to 160 majors by the time she stepped down as chair 23 years later. Today, the instructional programs once housed in the Home Economics Department are among the college's most popular, with more than 400 majors in Fall 2005.

Having struggled to fund her own education, Miller left most of her estate to student scholarships upon her death in 1985. Since then more than \$335,000 has been dispersed to 161 students of home economics, food science and human nutrition, and family resources. This year, alumni in these fields gathered at the Mānoa campus building that bears Miller's name to mark two decades of generous student support. At that event, her remaining estate—more than \$670,000—was donated to 11 local nonprofits that work in the areas of family services, education, dietetics, and gardening, including organizations that will continue the tradition of Carey D. Miller scholarships. Generations of students have benefited from this remarkable professor's life and legacy. Today they honor her memory as they carry on her work.



Photo courtesy of Doug Young

Professor Miller (left) established the University of Hawai'i's food science and nutrition programs in 1922 and taught in the college for 36 years. Following her retirement, a Mānoa campus building was named in her honor (right).



Photo: Ian Ross

Take the Ag Awareness Quiz

1. What is a phytochemical?
2. Is a coffee bean a bean?
3. Do large fish produce fewer offspring than small fish of the same species?
4. Can corn pollinate papaya, taro, coffee, or Hawai'i's native plants?

Kaua'i's Agricultural and Environmental Awareness Day teaches keiki the importance of farming and resource conservation.

Fifth graders, educators, and community members heard the answers to these and other thought-provoking questions at the ninth annual Agricultural and Environmental Awareness Day, held in March 2005 at CTAHR's Kaua'i Agricultural Research Center. The festivities, which included displays and lectures by more than 30 businesses, nonprofit organizations, government agencies, and colleges from throughout the state, gave more than 500 participants a greater understanding of Hawai'i's agriculture and environment.

The value of Ag Awareness Day extends beyond the learning of scientific facts. By exposing young people to important issues in farming and conservation, and by showing them the diverse job opportunities available in these fields, the event helps our youth become better stewards of Hawai'i's resources and raises their awareness of careers in agriculture and environmental science. Tracing the path that our food takes from farm to table helps youngsters connect to the land in a meaningful, memorable way.

This fun and educational event represents a decade-long partnership between CTAHR, the Kaua'i County Farm Bureau, the County of Kaua'i, agencies of the federal, state, and local government, and the agricultural community. Key to the event's success are financial support from the Kaua'i County Farm Bureau and the County of Kaua'i's Office of Economic Development, and the volunteer service of students from Kapa'a High School's Junior ROTC and Kaua'i High School's Work Readiness Program. As Kaua'i's children form opinions about the place where they live and their role in the world, Agricultural and Environmental Awareness Day opens doors to future learning.



Fifth graders explore educational displays at the 2005 Ag Awareness Day.

Photo: Charles Kinoshita

- ANSWERS:
1. A substance derived from a plant, usually one that isn't a required nutrient but does promote human health.
 2. No. A coffee bean is a seed, but the coffee plant isn't a legume (member of the bean family), so coffee seeds aren't beans.
 3. No. Within a species, large fish tend to produce more offspring than small fish.
 4. No. Corn has no close relatives in Hawai'i, so corn pollen released here can only pollinate other corn plants.

COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES

University of Hawai'i at Mānoa

3050 Maile Way, Gilmore Hall 202

Honolulu, HI 96822

www.ctahr.hawaii.edu

ADMINISTRATION

Andrew G. Hashimoto, Dean and Director, 808-956-8234

C.Y. Hu, Associate Dean and Associate Director for Research 808-956-8131

Wayne Nishijima, Associate Dean and Associate Director for Cooperative Extension, 808-956-8397

Charles Kinoshita, Associate Dean for Academic and Student Affairs, 808-956-6997

Kelvin Sewake, Interim Hawai'i County Administrator, 808-981-2823

Terry Sekioka, Interim Kaua'i County Administrator, 808-274-3471

Harold Keyser, Maui County Administrator, 808-244-3242

James Thompson, O'ahu County Administrator, 808-956-7138

DEPARTMENTS

Family and Consumer Sciences

Barbara Yee, Chair, 808-956-8105

Human Nutrition, Food and Animal Sciences

Halina Zaleski, Chair, 808-956-8236

Molecular Biosciences and Bioengineering

Harry Ako, Chair, 808-956-8384

Natural Resources and Environmental Management

Carl Evensen, Chair, 808-956-8708

Plant and Environmental Protection Sciences

J. Kenneth Grace, Chair, 808-956-7076

Tropical Plant and Soil Sciences

Robert E. Paull, Chair, 808-956-8351

Impact Report Staff

Dale Uno, Director, Office of Communication Services

Kathleen Vickers, Writer

Dale Evans, Editor

Miles Hakoda, Graphic Designer

Sharon Tasato, Circulation Services

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Cultivating Community

