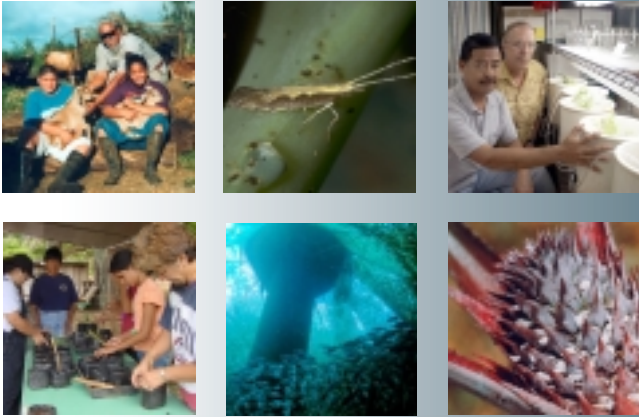


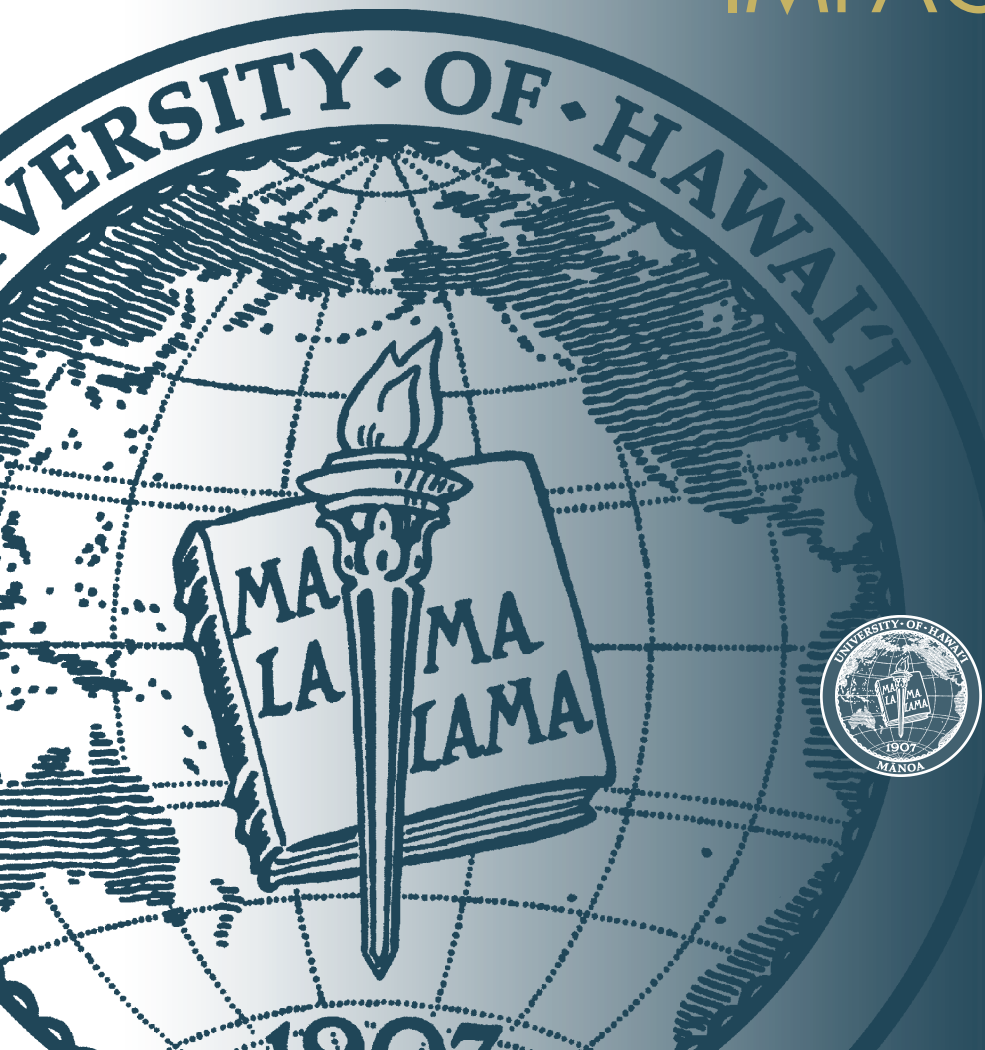
Revitalizing, Sustaining, Strengthening



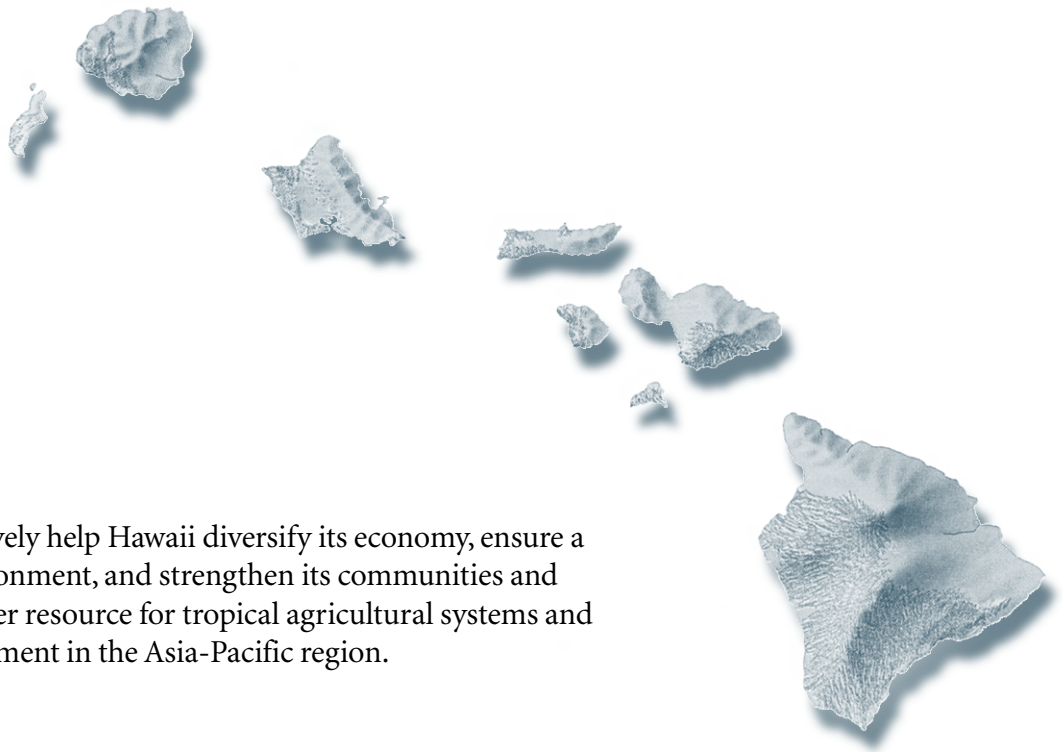
2001

IMPACT REPORT

Meeting the Challenge



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



VISION

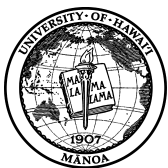
CTAHR will actively help Hawaii diversify its economy, ensure a sustainable environment, and strengthen its communities and will be the premier resource for tropical agricultural systems and resource management in the Asia-Pacific region.

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.

INITIATIVES

- Provide an excellent and relevant student-centered learning environment.
- Create new economic opportunities through research.
- Transfer useful knowledge responsively to the community at large.



**College of Tropical Agriculture
and Human Resources**

University of Hawai'i at Mānoa

College of Tropical Agriculture and Human Resources— MEETING THE CHALLENGE



"The development of agriculture must be one of the state's highest priorities to diversify and help revive a shrinking economy."

– Andrew Hashimoto,
Dean, CTAHR

When I spoke from this space last year, Hawai'i was anticipating a continuing, modest but steady, upturn in the state's economy. Tourism was booming. The legislature actually had a small pot of money with which it could begin to address some of the needs that had accumulated over several years of budget cuts and low tax revenues.

On September 11, 2001, all equations changed. Today we face the most severe fiscal crisis in the state's history: many workers have lost jobs, small businesses have failed, and the legislature must decide how to distribute the pain of an anticipated revenue shortfall of \$330 million.

Perhaps the most resounding lesson of September 11 is that Hawai'i's economy must be diversified beyond its over-reliance on tourism. Last year we saw agriculture as a growing segment of a growing Hawai'i economy. This year we are arguing that the development of agriculture must be one of the state's highest priorities to diversify and help revive a shrinking economy.

A major step the state could take toward agricultural development would be support of agribusiness incubators to give a boost to entrepreneurs by providing them technical expertise in research, field trials, economic analysis, business planning, jumping bureaucratic hurdles, and so forth. Data from the National Business Incubation Association show that 87 percent of businesses begun in incubators are still operating after five years, as opposed to only 25 percent of those that did not have incubator assistance. The College of Tropical Agriculture and Human Resources (CTAHR) envisions working closely with other state entities to staff and operate agribusiness incubators.

To be certain the college is serving the needs of its constituencies and meeting the challenges now facing the state, I have formed an advisory board of distinguished business and institutional leaders. These individuals meet periodically to review the college's activities and to advise us on where needs are greatest.

Research, instruction, and outreach at CTAHR continue to be focused on the three themes outlined last year: economic diversification, environmental sustainability, and community strengthening. On the following pages are brief, representative reports of the research and outreach being done at the college that further those goals. Watercress farmers and other vegetable growers will benefit from CTAHR's rapid identification of a new disease threat—aster yellows. Immigrant farmers

are being trained in their native languages to apply pesticides safely. CTAHR's Center on the Family is gathering critical data to assist the state in its response to the human crises created by September 11. You will read these and many other accounts of CTAHR's contributions.

The work reported here has been done by a committed faculty that is backed by an equally committed staff. I salute them for their continuing hard work on behalf of Hawai'i's agricultural producers and communities. Our goal is to help the state meet the challenges imposed by the events of 2001 and to contribute to the emergence of agriculture as one of the state's leading industries. With the level of commitment already in place at CTAHR, we are on the way to achieving that goal.

Aloha,

A handwritten signature in dark ink, reading "A. G. Hashimoto". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Andrew G. Hashimoto
Dean and Director

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ECONOMIC REVITALIZATION

The Watercress Caper

Out of nowhere, something was killing watercress on an Oahu farm.

The crime was committed quickly and stealthily. Out of nowhere, something was killing watercress on an Oahu farm. The grower didn't know what hit him and his crop. He turned to CTAHR Cooperative Extension agents to identify and stop the killer. Thus began the watercress caper. The grower asked CTAHR Extension agent Steve Fukuda for help. Fukuda called in fellow agent Randy Hamasaki and numerous other CTAHR experts. The usual suspects were first in the lineup: saline water, a plant nutrient problem, something amiss in the soil's chemistry. None of these proved to be the culprit. The list of suspects was narrowed considerably, but the mystery remained. In the meantime, the first watercress crop was destroyed, and the killer had moved to another farm. This serial killer had to be stopped. With dogged determination, CTAHR's Wayne Borth and John Hu continued their hunt, finally discovering that the lethal agent is a phytoplasma called aster yellows injected when an infected leafhopper feeds on the plant. Aster yellows and the leafhopper are unwelcome newcomers to Hawai'i. Aster yellows has a wide range of hosts and could cause serious damage to many Hawai'i crops. A fast response by CTAHR not only will help watercress growers save their industry, but also gives the state a chance to head off costly damage to other crops.



Field problem and lab science converged when chlorotic, misshapen watercress was put in solution culture. Despite an optimum nutrient environment, the plants' symptoms were not reversed. Extension agent Steve Fukuda (left) tracked the problem from its beginning, while laboratory researcher Wayne Borth provided the high-tech analysis indicating the culprit.

ECONOMIC REVITALIZATION

A concerted effort is afoot today to bring the Pacific threadfin fish, moi, back to Hawai'i consumers.



Fish raceways on a Kahuku fish farm.

Paving the Way

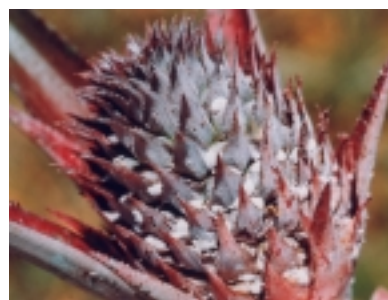
Business is risky. To be successful, one must minimize the risks—anticipate the potholes in the business road to steer around them whenever possible and drive through them cautiously when they can't be avoided. But where does one get a map to make these on-road decisions and corrections? In the business of agriculture, one turns to an agricultural economist. CTAHR is home to several agricultural economists whose work is so far in the background that they seldom get recognition. Usually, they bask in the reflected glow of someone else's success. For example, if entrepreneurs now in the business make a go of reviving the supply of and market for Pacific threadfin fish, moi to the Hawaiians, CTAHR economist PingSun Leung and his colleagues will have the satisfaction of knowing that they made an important contribution. Moi was once so highly prized that it was forbidden to all but ali'i. A concerted effort is afoot today to bring it back to Hawai'i consumers. Leung and his colleagues' work points to the most likely way a producer can culture moi profitably, whether growing them in a land-based tank system, off-shore cage facility, or the traditional Hawaiian fishponds. Armed with economic analyses from CTAHR, agricultural and aquacultural entrepreneurs have a greater chance of surviving business's inherent risks.

ECONOMIC REVITALIZATION

Poised to Win the Race

CTAHR's John Hu and his colleagues are racing against time as they search for ways to control one of the world's most serious pineapple diseases: mealybug wilt of pineapple (MWP). After years of disappointment in the laboratory, Hu and his group found two factors, mealybugs and pineapple mealybug wilt-associated virus (PMWaV), are needed to cause MWP problems. They are racing against that unknown, but probably inevitable, day when the Environmental Protection Agency bans the last chemical now available to control the ants that tend the mealybugs that harbor the virus. They are now able quickly to screen literally thousands of seedlings for virus infection so that only "clean" seedlings are planted. They have also learned what has evaded scientists around the world for years: the exact means of transmission of the virus and the complex relationship between the virus and the mealybug. With this knowledge, they are in a position to develop PMWaV-resistant pineapple so that chemical control will no longer be necessary. In 2000, pineapple was Hawai'i's number one crop, capturing 19 percent of the state's total farmgate value of agricultural sales. This important industry could be lost if PMWaV is not conquered. With an abundance of skill and a modicum of good luck, CTAHR will win the race and help save the industry.

In 2000, pineapple was Hawai'i's number one crop, capturing 19 percent of the state's total farmgate value of agricultural sales.



A young pineapple infested with Mealybugs.

ECONOMIC REVITALIZATION

Chemical companies are using Hawai'i's response to a pest problem as a model for the rest of the world.

A Model for the World



The diamondback moth in its caterpillar stage (top) and as an adult.

Chemical companies are using Hawai'i's response to a pest problem as a model for the rest of the world. The diamondback moth is a major pest of such leafy vegetables as cabbage and broccoli. Farmers were delighted when a safe, specific new chemical was approved to control the moth and horrified when, within less than two years, the moth became resistant. CTAHR agents and specialists immediately mobilized vegetable growers, the state Department of Agriculture, and chemical companies to reverse the resistance. A program was in operation within four months of discovery of the problem. It is this cooperation and coordination that the chemical companies are now holding up to customers in other parts of the world. One of the keys was accepting the premise that pest control is a regional concern. Diamondback moths (and other pests) do not stop at fences. Another key was the recognition that speed was of the essence. A third key was that the growers understood their survival depended on cooperating with each other. It all worked. Today, the resistance has been reversed. Growers are agreeing to apply pesticides on a schedule that will prevent resistance from developing again. All parties continue working as a team. The diamondback moth is under control. And the world sees Hawai'i as a site of cutting edge farm management practices.

SUSTAINABILITY

The Letter of the Law

Here's a startling estimate: one in every five farms in Hawai'i is operated by an immigrant. He (most are men) may speak and read English poorly, if at all. Here's a troubling question: if he has trouble understanding pesticide labels, does that farmer know which pesticides are appropriate for his crops and how to apply them legally? He often does not. In fact, non-English-proficient farmers in Hawai'i in 1997 were 12 times more likely than the national average to violate pesticide residue tolerances. In 2001, in cooperation with the state Department of Agriculture and others, CTAHR's Barry Brennan, then coordinator of the Pesticide Applicator Training program, began a training program specifically for non-English proficient farmers. He turned to Sabina Swift, a native Filipina (Tagalog) who had experience teaching plant protection to Laotian, Vietnamese, and Filipino farmers in their home countries. She has translated materials into the farmers' native languages and taught the first group of students safe handling techniques. Recently, she formed an alliance with a local foreign-language radio station to broadcast in Lao a 30-minute weekly program on pesticide safety. If it is successful, a second in Ilocano will be added. Immigrant farmers are an important segment of Hawai'i's growing diversified agriculture industry. CTAHR is playing a significant role in helping them succeed and protecting Hawai'i's environment from misuse of chemicals.

Non-English-proficient farmers in Hawai'i in 1997 were 12 times more likely than the national average to violate pesticide residue tolerances.



Pest identification training on Waialua farms.



SUSTAINABILITY

As many as 60,000 of Hawai'i's citizens use rainwater catchment systems.

From Raindrop to Faucet

Tourists to Hawai'i's Big Island may ask why so many homes have covered swimming pools. They might be startled to learn that those aren't swimming pools—they're rainwater catchment tanks—and they contain each home's primary source of water. As many as 60,000 of Hawai'i's citizens scattered on all islands, but heavily concentrated on the Big Island, use rainwater catchment systems. No government agencies regulate the safety of these systems. Without proper maintenance, the water may be contaminated, unfit for human consumption or even skin contact. Until CTAHR educational specialist Patricia Macomber came along, homeowners were on their own to design and build their systems and keep them safe. Macomber has been researching, talking to experts, and creating guidelines, recently published by CTAHR in book form, that will help homeowners maintain a system that is as safe as possible from the time the raindrop is caught until it leaves the faucet. Because there are no testing facilities on the east side of Hawai'i, she

has assembled easy-to-use water testing kits for sale at low cost so homeowners can monitor their water and be assured it is not contaminated with fecal coliform bacteria. She conducts workshops to teach people how to manage their systems. Through CTAHR's efforts, residents are getting the tools they need to reduce the risks of unsafe water.



Patricia Macomber samples water from a rainwater catchment tank.

SUSTAINABILITY

Integrating the System

Say “integrated system” today and most people will assume you’re talking about computer networks. Not so CTAHR vegetable specialist Hector Valenzuela. For him, agriculture is an integrated system, or ideally it should be. He sees land, crop, soil, water, and especially the growers who tend them as part of an interdependent system. Valenzuela has spent his CTAHR career helping vegetable growers improve their agricultural practices so that they can grow superb vegetables in an ecologically sustainable way. Over the years, for example, Valenzuela has taught growers to become attuned to the health of their soils. When crop yields decline because of disease or nutrient depletion in soils, don’t turn to expensive, environmentally questionable chemicals to regain the losses. Try resting the soil. Try incorporating compost to replenish the lost nutrients. Try planting a new variety or a different crop or changing the planting sequence. See the soil as part of the whole. Vegetables are the most rapidly expanding segment of Hawai‘i’s agriculture industry. Valenzuela encourages growers, especially those on small acreages, to plant specialty vegetables, to create niche markets. He foresees the day when acres of vegetables will stretch across former sugarcane lands, feeding Hawai‘i and being exported around the globe, and he will have helped them get there.

Valenzuela sees land, crop, soil, water, and especially the growers who tend them as part of an interdependent system.



Hector Valenzuela works with local growers to improve the health of their soils.



SUSTAINABILITY

Pineapple growers are always looking for ways to grow bigger, healthier fruit and decrease use of chemicals.



Comparison of pineapple size without compost (top) and with compost (bottom).

An Unlikely Marriage

Dairies accumulate large amounts of animal waste and have few options for its disposal. Pineapple growers are always looking for ways to grow bigger, healthier fruit and decrease use of chemicals. What could these two realities have to do with each other? CTAHR dairy specialist, C. N. Lee, had an idea. Why not apply composted dairy waste to pineapple fields before planting? Couldn't this be a classic win-win for both parties? First, a grower had to be convinced to try it. The grower was skeptical, thus the dairy manager had to donate the compost and Lee had to lend a spreader. Initial results looked good but needed confirmation. CTAHR researchers Russell Yost and Adam Reinhart tested both the fruit yield and the soil. Their results showed that substantial quantities of composted dairy manure applied as a preplant fertilizer produced higher total pineapple yields and higher quality fruit (increased average pineapple weight), and reduced environmental contamination (nitrate leaching) as compared to using only inorganic fertilizers. The grower is safely reusing locally produced compost to increase production and simultaneously reducing potential contaminant flows into a major drinking water aquifer. The grower is now so satisfied that an unanticipated new problem has been created: there may not be enough dairy compost to meet the grower's needs!

STRENGTHENING COMMUNITIES

Getting the Most From the Land

Here are two truths: putting seeds in the ground does not make one a farmer, nor does raising a cow make one a rancher. Not all residents of Hawaiian homestead lands are new to farming, certainly, but many have never been more than backyard gardeners. They may not appreciate that farming and ranching take skill, long hours, and total commitment. And if one means to earn a living from the land, it must be treated as a business, with careful planning and attention to financial detail. Indeed, the Hawaiian Homes Commission Act specifies that experts be hired to advise homesteaders “as to the best methods of diversified farming and stock raising.” The Department of Hawaiian Home Lands contracts with CTAHR for this purpose. Cooperative Extension agents hired specifically to work with Hawaiian homesteaders are stationed on the Big Island (Andrew Kawabata) and Moloka‘i (Kali Arce) and will be hired on Kaua‘i and Maui. These dedicated agents must be jacks-of-all-trades, knowledgeable not only about crops and livestock, but also about business to help homesteaders use their land profitably. They are on call day in and day out, ready to assist in whatever way they can. A video was produced this year to acquaint homesteaders with CTAHR’s program. Interested persons should contact their local Extension office to obtain a copy.

Not all residents of Hawaiian homestead lands are new to farming, certainly, but many have never been more than backyard gardeners.



Transplanting native Hawaiian plants (top) (agent Kali Arce second from left) and homesteaders on a field trip to the Big Island (bottom).



STRENGTHENING COMMUNITIES

Titchenal and Dobbs present the story behind the story so that people can make informed decisions about their health.

Making Healthy Choices

Nutrition and health news is big all over the United States today, and a lot of it seems contradictory. Diet gurus tell us to eat carbohydrates and shun protein or vice versa; one fitness expert tells us to concentrate on aerobic exercise and another pushes weight training; studies report that eating some long-time favorite food is actually unhealthy. How to make sense of it all? Hawai'i residents are fortunate to have help sifting through the claims and counter-claims in every Wednesday's edition of the Honolulu Star-Bulletin. There, in a regular column entitled "Health Options," written by CTAHR nutrition scientists Alan Titchenal and Joannie Dobbs, they will find science-based nutrition, fitness, and general health information. Titchenal and Dobbs try particularly to focus on breaking news and present the story behind the story so that people can make informed decisions about their health. Recently, for example, they advised readers to save their money and ignore claims that raw food enzymes are essential for health. To be sure, one should eat vegetables, but not for their enzymes. Titchenal and Dobbs estimate that their newspaper column reaches as many as 6000 people per week. CTAHR's Department of Human Nutrition, Food and Animal Sciences has an excellent nutrition program. Alan Titchenal and Joannie Dobbs extend that program into the community with reasonable, common-sensical nutrition and health information.



Photo: Honolulu Star-Bulletin

Alan Titchenal and Joannie Dobbs.

Add fruit and veggies to snack array

FOOD D7



HEALTH OPTIONS

Alan Titchenal
and Joannie Dobbs

modore Cornelius Vanderbilt found his french fries too thick and returned them to the kitchen. Thus, Saratoga chips were created — now called potato chips.

Over the next 50 years, commercially produced pretzels, popcorn and oil-roasted peanuts would all be introduced into the American diet and represent the savory and salty snacks we know today.

calories from a beverage while your attention is glued to the television. Now repeat this behavior once or twice hourly each day during the Olympics and enough calories can be consumed snacking to gain one-fourth to two-thirds pound of fat per day. If this is in addition to normal eating. And to make your

STRENGTHENING COMMUNITIES

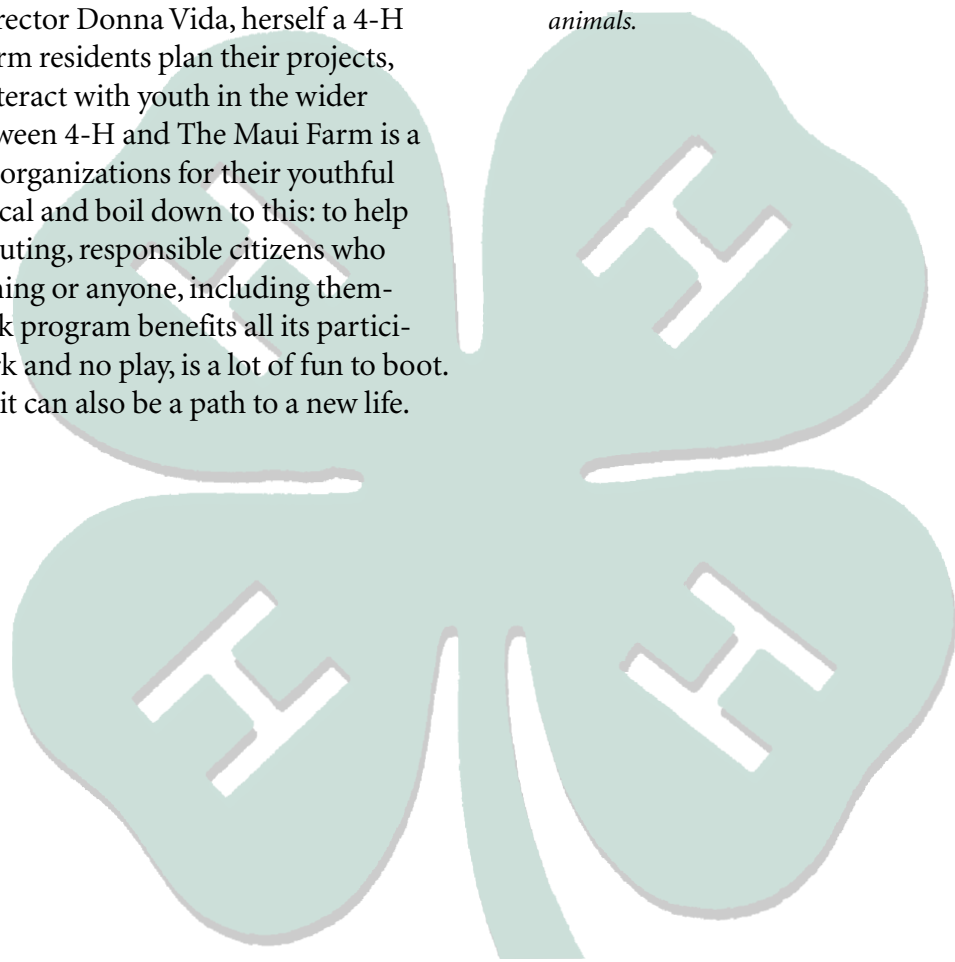
4-H and The Maui Farm: A Perfect Match

It's a triumph when any 4-Her earns a trophy at a livestock event, culminating months of hard work and loving attention to the animals. When the trophy winner comes from The Maui Farm, as did four at the last Upcountry Fair in Makawao, the triumph is that much sweeter. The Maui Farm is a temporary home for special youth who need some structured time away from their families. Six years ago, The Maui Farm joined the 4-H livestock program, a CTAHR Cooperative Extension program advised by agent John Powley. Powley works with The Maui Farm programs director Donna Vida, herself a 4-H alumna, to help The Maui Farm residents plan their projects, care for their animals, and interact with youth in the wider community. The alliance between 4-H and The Maui Farm is a natural. The goals of the two organizations for their youthful participants are nearly identical and boil down to this: to help them become caring, contributing, responsible citizens who strive to do no harm to anything or anyone, including themselves. CTAHR's 4-H livestock program benefits all its participants and, lest it seem all work and no play, is a lot of fun to boot. For those at The Maui Farm, it can also be a path to a new life.

For residents at The Maui Farm, CTAHR's 4-H livestock program can be a path to a new life.



The Maui Farm residents and their animals.



STRENGTHENING COMMUNITIES

Center on the Family has an established reputation for gathering community data to assist policy makers.

Networking the Ohana

The attacks of September 11, 2001, struck not only New York, Washington, DC, and Pennsylvania. They struck every state in varying degrees. Among the hardest hit has been Hawai'i. Our state's economy has taken a blow unlike any it has ever sustained. Governor Cayetano convened emergency task forces to assess the effects not only on business but also on

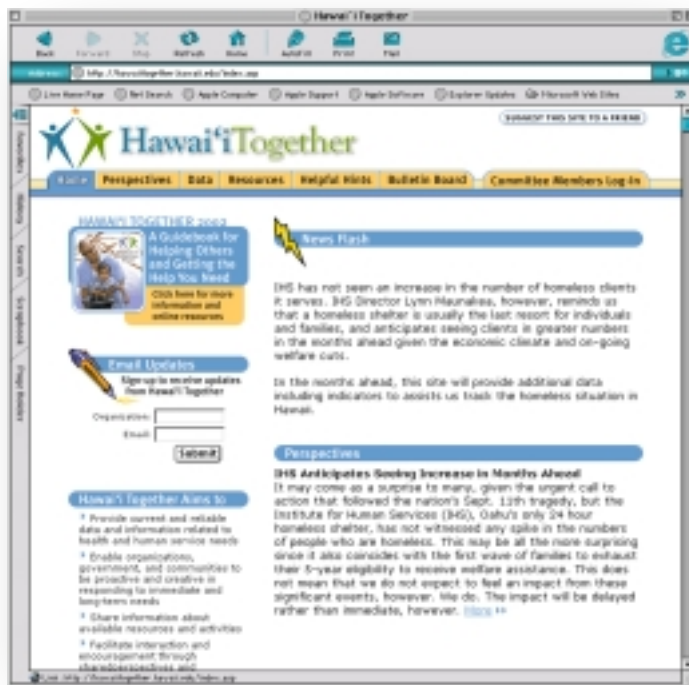
human needs. Hawai'i Together, the human needs task force, quickly realized the urgent requirement for valid, reliable, timely, county-based data to enable state agencies to direct their assistance most effectively.

CTAHR's Center on the Family, which was represented on the task force, was the obvious choice for the job. Center on the Family has an established reputation for gathering community data to assist policy makers.

Project manager Ivette Stern, with the invaluable help of Shi-Jen He and Anees Kadir, has created a one-stop web site where anyone has access to data, resource information, helpful tips, and links to helping organizations throughout the state. With the site, agencies, businesses, non-profit institutions, and political leaders will be able to pinpoint exactly where problems are most severe.

These data are particularly necessary when

money is in short supply. CTAHR is proud to make a vital contribution as the state seeks to recover from the effects of our national tragedy.



<http://hawaiiitogether.hawaii.edu>

STRENGTHENING COMMUNITIES

Keeping the Home Fires Burning

Family-owned businesses are part of Hawai'i's heritage. We can all remember the "mom and pop" store down the street or the small family-run restaurant where even the keiki worked. Today these businesses provide diverse services; they are a part of the local economy that cannot be ignored. At a time of fiscal instability, as the state is now experiencing, how can we keep family-owned enterprises afloat? What factors influence whether a family-owned business will survive beyond one generation? How does the business affect the family and vice versa? CTAHR associate professors Diane Masuo and Grace Fong looked at exactly these questions in a joint project with 16 other universities. For their efforts, Masuo, Fong, and their colleagues won national recognition, the 2001 USDA Northeastern Regional Agricultural Experiment Stations Directors Research Award for Excellence. Their findings indicate that strong families are more likely to create strong businesses than vice versa. A home that is stable and secure has the best chance of making a business successful. Another, perhaps surprising, finding is that businesses run from remote locations have a greater chance of survival than those run from the home. With information provided by CTAHR researchers, policy makers and lenders have a clearer picture of how to help family-owned businesses continue to contribute to Hawai'i's economy.

What factors influence whether a family-owned business will survive beyond one generation?



Matsumoto Shave Ice is a well known family business frequented by locals and visitors from around the world. Momoyo and Mamoru Matsumoto (above) established M. Matsumoto Grocery Store in 1951. Their youngest son, Stanley, and wife Noriko (below) operate the store today.



COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES

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