Growing a Better Tomorrow for Hawai‘i

[Logo]
College of Tropical Agriculture & Human Resources
University of Hawai‘i at Mānoa

1998
Vision

The College of Tropical Agriculture and Human Resources 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.
In the following pages, you will read a few of the many ways that research, extension, and instruction by faculty of the College of Tropical Agriculture and Human Resources (CTAHR) of the University of Hawai‘i at Mānoa are helping to grow a better tomorrow for Hawai‘i. Watermelon growers on O‘ahu, taro growers on Kaua‘i, displaced sugarcane workers on Hawai‘i, onion growers on Maui, the entire community of Moloka‘i—all (and more) have benefited in lasting ways from CTAHR’s expertise and commitment to Hawai‘i’s agriculture and communities.

A significant recurring theme in this year’s report is the critical role played by basic research in CTAHR’s ability to help the State’s agricultural community solve its urgent practical problems. Without basic research, we would not be nearing solutions to the problems of cattle ranchers who lose thousands of calves per year to miscarriage. Molecular biological research is yielding exciting, promising results for banana growers plagued by banana bunchy top virus. The day may be drawing near when nutgrass, an expensive plague for farmers, will be controllable, thanks, again, to fundamental biological studies. CTAHR’s basic and applied research programs are separated only by time. A vigorous, ongoing basic research program at CTAHR, which is then translated into practical application, is absolutely essential for the long-term health of the State’s new diversified agriculture industry.

Another theme recurs in this report: the impact of teamwork on our ability to respond to a crisis. For example, rapid cooperation among growers, researchers, extension agents, private industry, and other agencies enabled us to quickly identify solutions to problems that threatened the taro and watermelon industries. CTAHR’s expertise was vital in these instances, but so too was its flexibility and willingness to form cooperative partnerships.

CTAHR’s mandate extends beyond the garden and the field and the barn to the communities they sustain. A third theme in this year’s report is the contributions CTAHR makes toward helping the State’s most important resource—its people—manage their lives. No story is more compelling than the success of the citizens of Moloka‘i, who, with strong strategic support from CTAHR extension faculty, won a multi-million dollar national enterprise community award.

I am proud of CTAHR staff and faculty and their accomplishments, only a few representative examples of which are featured here. Against difficult odds, our people continue to search for and find the ways to protect and advance diversified, sustainable agriculture throughout the State. They solve problems not just for today but also for tomorrow so that the people of Hawai‘i can grow a better future.

With warmest aloha,

Charles W. Laughlin
Dean and Director
College of Tropical Agriculture and Human Resources
University of Hawai‘i at Mānoa
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Enterprise Is a Community Effort on Moloka‘i

When Vice President Al Gore announced early in 1999 that the community of Moloka‘i had won one of the nation’s coveted enterprise community awards, the excitement and hope and pride on the island were palpable. The people of Moloka‘i have every reason to be enormously proud of their collective effort. Instead of caving in to adversity, the community came together, defined itself, and looked for responsible solutions to the problems created by economic distress. Literally thousands of hours of volunteer time were devoted to developing a Moloka‘i vision statement and a strategic plan to govern the development of the community in the coming years. Prominent among the many individuals who led Moloka‘i’s successful application for an enterprise community award were CTAHR extension agents who live and work on the island. Not only did CTAHR agents facilitate the writing of the application, but CTAHR programs will play a vital role in helping Moloka‘i’s people to achieve the goals they have set for themselves to improve their economy and preserve their uniquely Hawaiian lifestyle.

Fishpond restoration is among the many projects to be undertaken on Moloka‘i.
Things Are Looking Up in the Taro Patch

One year ago, Hawai‘i’s taro industry, beset by disease and falling yields, faced a frightening prospect: the demise of an industry closely entwined with the very fabric of the state’s Hawaiian identity. Today, thanks to a quick, vigorous, multidisciplinary response by CTAHR, in cooperation with taro farmers from around the State and public and private agencies, the industry can look to tomorrow with renewed hope. Plant pathologists are identifying new taro pathogens, studying their biology, and attempting to provide new disease control methods. Taro breeders are developing hardier varieties that can withstand disease. And extension agents, soil scientists, and agronomists have encouraging early results to suggest that a return to profitability may be as simple as planting farther apart and applying less fertilizer. In all these efforts, CTAHR has led the way in helping Hawaii’s taro farmers find answers to their problems.

Pocket rot of taro (corm, top, and cross-section, bottom) has been threatening the existence of Hawai‘i’s taro industry.

Commodity Fact
The 1998 farmgate value for all island taro was $3.2 million.
After six years of hard, careful work, CTAHR researchers think they may see light at the end of the tunnel for Hawai’i’s banana industry. Although much remains to be done, the effort to find—or create—banana varieties resistant to one of Hawai’i’s (and the world’s) most serious banana diseases, banana bunchy top virus, may finally be paying off. Successful laboratory work must be confirmed by field trials to be sure the resistant varieties will grow and bear fruit that tastes good. Nevertheless, as a result of the dedicated work of CTAHR’s plant pathologists, Hawai’i banana farmers, whose future has been in doubt, can look to tomorrow with more confidence.
Live Long and Prosper—Without Bugs!

Which is worse? You cannot ship Hawaiian tropical flowers to your Mainland friends because of quarantine restrictions. Or, you ship and when the flowers arrive, they last for about three days before they hang their heads and die. Hawai‘i’s ornamental flower growers and marketers have struggled with these dual problems for years. Recent, successful work at CTAHR makes it much more likely that your flowers will be shipped, bug free, and when they arrive, they’ll last not just for days, but possibly for weeks. To solve the quarantine problem, flowers are actually soaked in hot water, which, strange as it may seem, kills the pests but has no significant effect on the flowers. The treatment may also extend the life of the flowers, but if it doesn’t, a dip in or spray with a chemical called benzyladenine will do the trick, extending vase life to weeks, in some cases. Cut flowers are one of Hawai‘i’s major exports. The work of CTAHR’s researchers has improved prospects for the industry immeasurably.

CTAHR’s traveling van brings hot water treatments to rural communities.

The flowers on the right were treated with benzyladenine to prolong their vase life.

Dipping cut flowers in hot water to kill pests.

Commodity Fact

The 1997 farmgate value for island cut flowers was $10 million.
Maui’s onions are known far and wide for their sweet taste.

Clean Water and Great Onions

Hawai’i’s water is known far and wide for its purity. Maui’s onions are known far and wide for their sweet taste. When do these two positives interact negatively? When over-irrigating causes fertilizers, primarily nitrates, to leach out from the onions’ roots and seep into underground water sources, not only wasting precious water but also polluting underground water resources. What to do about this problem? Contact CTAHR extension agents on Maui and agricultural engineers at Mānoa. Their research, in cooperation with Maui onion growers, has shown that a highly uniform drip irrigation system and irrigation scheduling based on the water requirements of the crop increases yields, cuts down on the amount of water used, and stops deep seepage of nitrates. Thanks to CTAHR’s expertise, Hawai’i’s water is still pure and Maui’s onions are still sweet—and high yielding!

Commodity Fact
The 1996 farmgate value for island round onions was $2.4 million.
Money 2000--A Different Approach to Y2K

For some CTAHR extension agents and specialists, Y2K—the year 2000—will not be the potential nightmare some pundits are predicting. On the contrary, it should be a dream come true: they want to help increase savings and reduce household debt in 2,000 Hawai‘i households by Y2K. You have but to pick up the newspaper or turn on the TV to know that, in Hawai‘i, the number of personal bankruptcies is soaring. It is clear, in these turbulent economic times, that Hawai‘i’s people need help to learn how to manage their money to protect not just their present but also their future. As part of a nationwide Cooperative Extension campaign, and with a $5,000 grant in hand, CTAHR extension agents have put together a program, including a telecourse (a first for the Cooperative Extension Service in Hawai‘i), to educate people in the principles of sound household money management—for example, reducing and then avoiding debt, increasing savings, using credit wisely, being an akamai consumer. With CTAHR’s guidance, 2,000 Hawai‘i families will enter the year 2000 on a sound new financial path.
“Yes, They’re Beautiful, but Do They Smell Good?”

They are gorgeous—shiny, intensely colored, beautifully shaped, tall and elegant and spare. Shouldn’t something that looks so stunning smell good, too? Anthuriums are the State’s best selling cut flowers. Just think how many more flowers could be marketed and how much more valuable they would be if they were not only pleasing to the eye, but also to the nose. CTAHR horticulturists are hard at work on just this idea. Good progress is being made on basic research to genetically alter anthuriums to introduce long-lasting, pleasant fragrance to them. Hawaii’s anthurium growers can look forward to the day when CTAHR research makes their product even more popular and marketable.

Commodity Fact
The 1997 farmgate value for island anthuriums was $7.4 million.

A. antoiguense

Tatsuta Pink Obake

UH1299

The “family tree” of a fragrant anthurium (parents on the left, fragrant offspring above).
Growing Hawai‘i’s Future Leaders

As Hawai‘i enters the new millenium seeking innovative, creative ways out of its long-standing fiscal dilemma, the education we offer at our universities must provide students with more than simply book learning and practical skills. It must also provide them with the intangible interpersonal skills that will help to make them effective leaders and decision makers for Hawai‘i’s future. Weekend leadership camps sponsored by CTAHR over the past 18 months are intended to do just that. Students spend their time engaged in activities and listening to speakers all selected to help them learn about the value of honesty and hard work and of thinking creatively and working cooperatively. CTAHR faculty and administrators recognize that Hawai‘i’s tomorrow will be only as good as its new leaders can make it, and they are working to help those new leaders identify themselves.
Imagine taking the risk to plant a crop in a new location and watching the crop thrive, only to have it unexpectedly crash before your very eyes. This happened to a group of O‘ahu watermelon growers who hoped to escape the problems of watermelon culture in Kahuku by planting on former sugarcane land in upper Hale‘iwa. Because of rapid response by CTAHR extension agents working with researchers and the private sector, it was quickly determined that the growers’ problem was an excess of manganese in the soil. More quick action led to the planting of a collaborative field test to identify management practices the farmers could use to avoid manganese toxicity in the future. With the knowledge gained in the experiment, the growers’ yields in 1998 increased 4-fold over their previous yields at the new site, and as one farmer noted, “[they] are now able to farm here rather than pack up and move out of this former sugarcane land . . . ” CTAHR’s responsiveness helped pave the way for a brighter future for these O‘ahu farmers.

Commodity Fact
The 1997 farmgate value for island watermelons was $3 million.

Quick action led to the planting of a collaborative field test to identify management practices the farmers could use to avoid manganese toxicity in the future.
Saying “Nuts!” to Nut Grass

It has been said that the world will beat a path to the door of the person who invents a better mouse trap. How about the person who figures out how to control the world’s worst weed, purple nutsedge (called nut grass in Hawai‘i)? A path may be beaten to CTAHR’s door if promising work on nutsedge control being done by CTAHR researchers continues to be successful. Purple nutsedge, which is not just a nuisance to gardeners but also a serious weed that bedevils farmers, has underground tubers that sprout at variable times. If one could determine what induces the tubers to sprout and then devise a means to synchronize the sprouting, one could then treat an entire crop and reduce nutsedge infestation from being a major problem to being a minor one. The work at CTAHR has identified the major trigger of sprouting (fluctuating daily temperatures) and is progressing toward a means of synchronizing it. A major problem for Hawai‘i’s farmers may then become a minor one.

Purple nutsedge, which is not just a nuisance to gardeners but also a serious weed that bedevils farmers, has underground tubers that sprout at variable times.
When two particular hormones are secreted at the same time, miscarriage occurs.

A livestock operator’s future depends on the cows in his herd giving birth to calves every year. In the United States, that prospect is by no means guaranteed because 30% of cows miscarry their calves early in pregnancy and another 10% later in the term (the worldwide figures are worse). The percentage of such miscarriages is higher in tropical settings—in Hawai’i, livestock operators may lose 40% of their calves in early pregnancy. This kind of economic loss is devastating and has caused the collapse of some livestock operations in Hawai’i. A years-long effort by CTAHR researchers to learn why miscarriage is so common is beginning to pay off. The culprits? Hormones. When two particular hormones (PGF2α and estradiol-17β) are secreted at the same time, miscarriage occurs. Work is now underway to determine ways to manage the timing of the hormones so that pregnancies can be carried to term. Livestock operators in Hawai’i will save millions of dollars from the outcomes of this CTAHR research.

A proud calf with his mother. Hawai’i’s livestock producers lose up to 40% of their calves annually to miscarriage.

Commodity Fact
The 1997 farmgate value for island beef was $14.3 million.
Occasionally, unwelcome visitors come to Hawai‘i’s beautiful islands and decide to stay forever. The devastating weed banana pokā, which thrives in and threatens Hawai‘i’s forests and unique native vegetation, is one of those visitors. Banana pokā was introduced to Hawai‘i, no one knows exactly how, from South America. As it happens, the best and cheapest way to rid the State of the weed is to attack it with a natural enemy, but that means returning to its native habitat to find the enemy. CTAHR researchers went to South America and found a fungus that attacks banana pokā and nothing else. They obtained permission from the State and federal governments to import it, confirmed that it truly would attack only banana pokā, and about two years ago began to test it at pokā-infested sites on the Big Island, Maui, and Kaua‘i. On those sites where acid rain does not fall, the result has been spectacularly successful—pokā is dead or dying. The problem posed by banana pokā has not been completely solved, but CTAHR’s efforts have given the State a fighting chance to eliminate this unwelcome visitor from our shores and protect our unique environment.

CTAHR researchers went to South America and found a fungus that attacks banana pokā and nothing else.

Photos of the same banana pokā-infested forest site in 1996, before treatment (left), and in 1998, following treatment (right) with a fungus specific for banana pokā. The treatment will eliminate banana pokā in these areas.

Banana pokā leaf infected with a fungus that attacks only banana pokā.
What qualities enable one family, threatened by the terrible upheavals inherent in job loss, to hang together with love and humor and resilience, while the family next door, threatened in the same way, comes apart? If we can identify those qualities, perhaps we can use the knowledge to ease the way for other families similarly threatened in Hawai‘i’s weak economy. Exactly that premise guided CTAHR faculty when they studied families of displaced sugar workers on the Island of Hawai‘i. Armed with the information gained from the study, CTAHR staffers are working closely with families, service providers, and policy makers across the State to educate everyone that job loss is a family event that can be survived if the family holds together. CTAHR is helping to manage the present and lay the groundwork for a brighter tomorrow.

Big Island families that have been faced with the economic and emotional upheavals of job loss.
Getting the Word Out

So, you want the latest information on growing taro in Hawai‘i, mauka to makai? Or, you need advice on how to control pests in your dendrobium orchids? Or, you are “surfing the ‘net” in search of answers to your questions about undergraduate programs in tropical agriculture? CTAHR can provide you with all this and more. A resurgent communications program at CTAHR has seen the publication in 1996 of This Hawai‘i Product Went to Market, in 1998 of Taro: Mauka to Makai, and in 1999 of Growing Dendrobium Orchids in Hawai‘i. All three books provide Hawai‘i’s agricultural community and the public at large with the most up-to-date information available on their subjects. More books are waiting in the wings—books on coffee and corn and managing personal finances, for example. The college’s communications initiatives do not stop at book publishing. A weekly video show on public access television (Saturdays, 6:30-7:30 p.m., your local public access channel), a Web site that is in the process of being rejuvenated, regular use of closed circuit television to link counties with the Mānoa campus, planned use of realtime videoconferencing: all of these demonstrate CTAHR’s commitment to linking the entire State to the college’s unique pool of experts.

Visit the CTAHR Web site.
<http://www.ctahr.hawaii.edu>
“Solving agricultural, family, and community problems is science in action.” CTAHR’s programs in pursuit of the University’s Land Grant mission have always been testimony to the truth of that statement.
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