

# CTAHR RESEARCH NEWS

July-August 2009  
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Skip Bittenbender examines a coffee tree on the UH Manoa campus.

**Coffee, cacao,  
kava - the drinks  
are on CTAHR!**

**Getting a  
patent**

**Hawaii science  
teachers in  
CTAHR labs**

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# From the Associate Dean and Associate Director for Research

Welcome back to another new school year! I hope you had a relaxing summer to re-charge your battery! With students returning from all corners of the world, they bring back new energy to campus, along with all kinds of bacteria and viruses. CDC has issued warnings on the return of H1N1 virus, and we need to be extremely careful in our daily routine to avoid becoming infected. Wash your hands regularly, and get flu shots. CTAHR homepage (<http://www.ctahr.hawaii.edu/ctahr2001/>) has links to CDC, USDA, and other agencies for additional information.

As you may recall, the Chancellor cut our budget this year by 4%, and CTAHR used college reserves, reduction in operating cost, and hiring graduate assistants with federal fund to meet the reduction. Earlier this month, the Chancellor asked all units to cut another 6%, a total reduction of 10% from our annual budget. Additionally, the Chancellor will announce UHM specific program cuts in November. It is likely we will see further deterioration in state revenues, and thus, further reduction to our budget. If that happens, CTAHR will have to cut faculty and staff to meet those demands. However, if labor unions and the Governor come to an agreement on contract renewals, allowing furloughs to be used to meet the budget deficit, CTAHR will be in good shape fiscally. I am sorry that I cannot bring you more positive news. Stay tuned on the contract bargaining process in coming months!

Dr. Skip Bittenbender of the Tropical Plant and Soil Sciences department is our cover story this

month. Although Dr. Bittenbender is known for his guitar playing and TGIF kava party in his lab (or as Donna Ching's better half), he does serious and excellent work with coffee, kava and cacao. I will let Skip tell you the story in his own words on the next page.

Dr. Borthakur had a lab full of high school teachers this summer in his two-week biotechnology program, please read his story. Our 4-H faculty and students were engaged in their annual competition and we salute their accomplishments. We have a good guest article on patenting from OTTED. We also had a very successful new faculty orientation session last week. Follow this link ([http://www.ctahr.hawaii.edu/ctahr2001/Faculty/fac\\_orientation.html](http://www.ctahr.hawaii.edu/ctahr2001/Faculty/fac_orientation.html)) to see all the presentations.

Congratulations to the PEPS faculty (and other authors) who have been successful publishing their scientific efforts. Please take a moment now to send me your recent publications in their proper citations. We want to celebrate your accomplishments as well.

Finally, I want to say 'thank you!' to Doug Vincent for all he has contributed since the start of the *CRN* 39 issue ago.

Welcome back, and be healthy!



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Associate Dean  
and Associate  
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# Enjoying the fruits of his labors

By H.C. 'Skip' Bittenbender, Extension Specialist  
Department of Tropical Plants and Soil Sciences



Skip presenting CTAHR kava research at the International Kava Conference joins a kava circle in Suva, Fiji in the central kava market. The ladies are selling, the men buying-night watch men on their way home.

“There are many interesting agricultural problems, some are important”, I attribute this to Richard Bradfield an early practitioner of Agriculture Development. This is an American idea that grew out of our Land Grant tradition of rural empowerment via scientific facilitation of agricultural prosperity based on the family farm. Three of my mentors Stan Howell MSU retired, **Ivan Buddenhagen** formerly CTAHR and International Institute for Tropical Agriculture (Nigeria), and **Cathy Cavaletto** (TPSS retired) instilled the importance of variety evaluation and quality control when engaged in crop development.

The past few years – yes it takes years with fruit trees – my team **Erik Kling** (Boston) and **Dan O’Doherty** (Baltimore) have been evaluating seedling cacao trees for yield and chocolate quality. This year we begin planting eleven grafted selections of high yield and

quality cacao throughout the state. Our goal is creating the world of chocolate flavors in Hawaii. Thus helping to grow a tasty industry and tourist draw for Hawaii.

The 1960’s were a time of social upheaval in the world, in the US young people were inspired to join the Peace Corps or go back to farm the land. The endangered species for us was people who were dying of starvation not crows or blind spiders. As an undergraduate I majored in Biology with an emphasis in tropical botany but as luck would have it I worked for the Michigan Blueberry Growers Association in the summer. My observation as an undergrad was that botanists waited until summer to do their tropical research whereas the horticulturists were working daily on problems in Michigan. Thinking about graduate school I decided on Horticulture and a research topic on the varietal differences in blueberry flower bud cold hardiness. My PhD looked at seed storage conditions



(L-R) Skip, Shawn Steiman, Catherine Cavaletto, Mel Jackson (HARC), Roxana Myers-Cabos, Loren Gautz, Chifumi Nagai (HARC), and Robert Osgood (HARC) – just part of the CTAHR & HARC coffee team. Not shown are CTAHR’s Scot Nelson, Brent Sipes, Virginia Easton Smith, Mark Wright, and Elsie Burbano.

and seed vigor as it relates to yield, my field work was on rice in central Java.

By 1977 I was a post doc in Nigeria at the International Institute for Tropical Agriculture doing variety evaluation for upland and paddy rice production in West Africa. 1978 took me to Nepal’s Institute for Agriculture and Animals Science. It was my privilege to teach and develop research projects with various international tropical agriculture institutions to aid the development of research programs on campus.

Michigan State hired me to develop a tropical horticulture program in late 1981. Three courses were developed during my stay – Tropical Vegetables, Tropical Fruits, and Organization and Management of Agricultural Research Systems in Less Developed Countries. The latter focused on our foreign graduate students in the college. My first graduate student was from Malaysia’s Ministry of Agriculture extension division. Her topic was sources of information used for decision-making by farmers in the blueberry, apple and Concord grape industries in Michigan. This signaled my entry into the extension of research-based knowledge to growers and grower organizations.

The end of 1985 saw our family – me, Donna Ching, and Harrison – move to UH. The 1980’s and early 1990’s saw the closing of sugar plantations. My assignment was extension specialist for coffee, macadamia, guava, and avocado. During these years CTAHR’S Industry Analysis Process of various commodities was at its height. The Hawaii Department of Agriculture (HDOA) funded CTAHR in this endeavor which besides generating a case study of a commodity also identified and prioritized “bottlenecks”. It funded research and extension projects to address the bottlenecks. After completing my first coffee industry analysis Cathy Cavaletto, **Mike Nagao** and I were funded to begin the Hawaii State Coffee Trial (HSCT). The HSCT focused on evaluating promising varieties from the CTAHR coffee collection in Kona at locations around the state. Yield, seed quality, and cup quality were evaluated. Successful trial sites on Kauai, Molokai, Maui, Oahu, and to a lesser extent Big Island became the foundation of today’s expanded coffee industry that grew from 1650 acres in 1985 to nearly 8000 acres today.

Immediately after planting the HSCT I began working with **Loren Gautz (MBBE)** to address

mechanization as labor in coffee was already limiting production. In addition to working to fine tune the mechanical harvesters, we developed and evaluated on three islands two mechanical pruning systems. The first was a mechanized version of the Beaumont-Fukunaga – developed by CTAHR horticulturists in the 1940s and ‘50s and the CTAHR top and hedge system. Both systems are used on mechanized farms across the state. My student **Sylvia Mauri (Italy)** did the economic analysis that showed the systems cost much less than hand pruning.

Working with **Don Schmitt (PEPS)** and his team we investigated the coffee replant problem in Kona. This led to the discovery of the Kona Rootknot nematode and the identification of a nematode-tolerant rootstock introduced by **Phil Ito (TPSS)**. The nematode is still in Kona, but the problem has been controlled by using CTAHR’s ‘Fukunaga’ rootstock.

More recently Hawaii’s coffee industry has received recognition by the work of **Virginia Easton Smith**

(**TPSS**) in Kona, **Sabina Swift (PEPS)** working with new growers in Kau, and all pulled together nicely by ‘The Hawaii Coffee Book’ written by my student **Shawn Steiman (Kansas City)**.

The 1980’s arrival of the tropical nut borer on imported macadamias led **Vince Jones (PEPS)** and I to quantify the damage of various macadamia pests at the state level. Working with processors we developed criteria to identify the cause of damage on kernels. The damage reduces the kernel weight but it varies by cause: Koa seed worm, Southern Green Stink Bug, Tropical nut borer, etc- so we developed adjustment factors to estimate the potential losses. The HDOA still reports nut losses using these factors applied to nut losses reported by processors. This information identified the most economically significant pests.

By the late 1990’s Hawaii and the world was rediscovering the ancient *pau hana* beverage kava also known by its Hawaii name ‘*awa*. Hawaii farmers were rapidly planting acres of kava for the nutraceutical



Kava field team - Skip, Paki Kaufusi (PhD, 2005) and Kia Weaver Okiwe (BS, 2005) harvesting root by root at CTAHR’s Magoon facility.

companies to extract the active ingredients kavalactones for reducing anxiety. I set out to determine ways to increase kavalactone yields on a per acre/day basis by evaluating variety response to farmer controllable management factors – variety, shade, fertilizer, and pruning. Kava responded to increased fertilizer and sun. Unfortunately Hawaii, a high cost producer, was not competitive with other Pacific producers. Then the unwarranted kava-liver controversy erupted in Europe killing the market for kava extracts.

The CTAHR kava multidisciplinary group: **CS Tang, Pratibha Nerurkar (MBBE) and students Klaus Dragul (Germany), Paki Kaufusi (Tonga), and Steve Lim (Honolulu), Alvin Huang and Amy Brown (HNFAS), and students MJ Hsieh (Chicago) and Padma Rao Kandukuru (India) and PEPS scientists Jeri Ooka and Scot Nelson** and I with the kava industry began working on a solution. The CTAHR Molecular Biosciences and Bioengineering (MBBE) group looked at possible toxins in the bark as a possible cause for the so-called kava induced liver problems. Amy Brown assessed liver function of kava drinkers in Hawaii. Working with our kava farmers we developed a strategy that focuses on the traditional kava beverage not extracts, and educates the public about the role kava beverage can play in our 21<sup>st</sup> century, anxious world. The tactics were to create an educational festival teamed with Hawaiian music, food and kava beverage, create a shelf-stable kava beverage that would be more readily available and to promote development of kava cafes and informal kava circles. Loren Gautz, my postdoc **Rachel Li (China)** and I developed a method

for preparing kava - 140°F warm water and 3 cycles of mixing with a high speed blender. This method increased the percentage of kavalactones removed from roots from 10% to nearly 50%. The method is now used by many kava café's and informal kava circles. Along the way we identified that Isa, a variety from Papua New Guinea, is perhaps the most productive – kavalactone lb/acre/yr – variety known. We –the St. John 112 kava circle –sponsor the kava variety tasting table at Hawaii Pacific Kava Festival. Its seventh annual festival is October 3 on UH Manoa's McCarthy Mall, join us!

The cacao to chocolate industry in Hawaii was initiated in the mid 1980's but did not take root until the Original Hawaiian Chocolate Factory in Kona and Dole's Waialua Cacao farm began selling their chocolate. The Waialua farm was planted and managed by CTAHR alums **Mike McLean** and **Michael Conway** with pods from the Waimanalo orchard planted by **Joe DeFrank (TPSS)**. My involvement increased in 2003 when the Waimanalo orchard was rehabilitated. By 2005 I was making chocolate in St. John and soon developed a novel method to ferment cacao in quantities as small as one pod. In 2008, Loren Gautz built the microfermenter chambers that we currently use. By fermenting seeds from just one tree we were able to evaluate the chocolate characteristics of the Waimanalo trees. This led to our current project to plant a Hawaii Statewide Cacao to Chocolate Trial based on selected seedling trees from CTAHRs Waimanalo and Poamoho stations, Dole's Waialua orchard identified by **CTAHR alum Chifumi Nagai**, and international varieties supplied by **CTAHR alum Francis Zee** with the USDA.



Skip and chef, Emmerich Grosch, in Kona making chocolate from scratch.



Skip commits a food safety error pouring chocolate in his lab.



Research Assistant, Dan O'Doherty, planting cacao seeds.

Our goal is creating the world's chocolate flavors in the islands using genetics, environment, management, fermentation, roasting and blending. Cacao is an open pollinated crop so most seedlings differ from the mother

tree. In order to evaluate the same unique seedlings in multiple locations required vegetative propagation not simply planting seeds from the selected trees. My student **Erik Kling** spent two years with little success trying to make rooted cuttings so that we'd have clonal trees. As we prepared to change our tactic to graft the selections onto seedling rootstock Erik began evaluating technologies for establishing cacao orchards. Not only is Hawaii the North Pole of cacao its also very windy. Erik found that for farmers establishing a seedling orchard they could save much time and money by using commercial tree shelters – 4 inch diameter, salmon-colored corrugated plastic 2-3 foot tall tubes. Directly planting seeds in these tree shelters is something completely unheard of in cacao production and the plants germinated and grew almost as fast as 6 month old transplants. Armed with the knowledge that very small plants can be planted in orchards using this technology, we began to graft. My student **Dan O'Doherty** found that we could graft our selections onto seedlings soon after germination using the same technique we used for 'Fukunaga' coffee rootstock in Kona.

Overall, I feel very fortunate to have enjoyed the fruits of my labor at CTAHR and elsewhere. I am thrilled that some of my work is making a difference for growers here and elsewhere.

### Harry Clair 'Skip' Bittenbender

**Hometown:** Honolulu, lived here longer than any place else, born in England.

**Joined CTAHR:** 1986

**Educational History:** B.S. Biology, The Honors College, Western Michigan University, 1972; M.S. Horticulture, Michigan State University, 1974; Ph.D. Horticulture, Michigan State University, 1977.

**Specialization:** fruit and beverage crop

**Current Work:** Research and extension of Cacao, Kava, and Coffee

**Languages Spoken:** English, forgot most of Bahasa Indonesia and Nepali I learned over 30 years ago.

#### Recent publications

Bittenbender, H.C. and E. Kling. 2009. Making Chocolate from Scratch. *FS&T-33. CTAHR*, Univ. Hawaii, Honolulu, HI. 5 pp.



Paull, Robert E. and H.C. Bittenbender (2008) Guava (In) *Encyclopedia of Fruits and Nuts*, J. Janick and R. Paull (Eds) CABI Press.

Bittenbender, H.C. 2007. Coffee (In) *Irrigation of agricultural crops* (Eds) Lascano, R.J. and R.E. Sojka, Agronomy Monograph 30, American Society of Agronomy, Madison, Wisconsin.

#### Recent grants

Bittenbender, H.C. 2005. Hawaii statewide cacao trial. Hawaii Department of Agriculture. (\$38,000).

Bittenbender, H.C., M.C. Jackson, C.S. Tang. 2000. Quantifying and environmental factors for increasing kavalactones in kava. Pacific Basin Tropical and Subtropical agriculture research. (\$175,000)

Bittenbender, H.C. and L. Gautz. 1999. Mechanized pruning for sustainable mechanized coffee production. Hawaii Department of Agriculture. (\$70,000).

# CTAHR at the fair

By Gary Heusel  
State 4-H Leader

Thousands of mostly urban folks got to know more about their rural neighbors during the 37th Hawaii Farm Fair July 18 – 19 at the Bishop Museum in Honolulu. CTAHR faculty, staff and volunteers were there in force to feed the public's growing interest in green living and sustainable agriculture. Hawaii 4-H members were there to show their animals and share some of what they have learned in 4-H. The members used interactive exhibits to teach fair goers about aerospace, electricity, gardening, health, nutrition, poultry and a variety of other topics.

CTAHR's youngest students, 4-H members, representing clubs from Oahu and neighbor islands and all participated in livestock judging, exhibited

their animals, and provided interactive exhibits for children and youth visiting the fair. Three hundred plus 4-H members had the opportunity to participate from Friday through Sunday. The Big Island 4-H livestock judging team won the right to represent Hawaii at the national contest on the Mainland later this year. Those exhibiting livestock sold their animals at the auction on Sunday afternoon. Everyone had the opportunity to enjoy food, festivities, and 4-H balloons with their fellow members from throughout the state.

Thanks to efforts of so many involved with CTAHR, the public had an opportunity to rediscover agriculture and the 4-H youth development program.



Poultry Judge, Eric Bellow, recognizes Oahu 4-H members Ramon Ballard and Te'a Biemann. (Photo: Becky Settlage).





Cassandra Kawamura, Kauai 4-H member, showing her Grand Champion steer. (Photo: Becky Settlage).



Judge Darrell Hansen is evaluating the lambs shown by 4-H members Sydney Porter and Makaleka Barros!. (Photo: Becky Settlage).



# Aloha, Ruddy!

By Doug Vincent  
Department Chair, HNFAS

After over 39 years of service to CTAHR, Director of Administrative Services, Ruddy T.K. Wong, retired from the college on June 30, 2009. Ruddy joined CTAHR as an accountant in 1970 and served continuously with the College with the exception of a three period serving as a legislative aide to former Big Island Senator Malama Solomon in the late 1980's. As director overseeing CTAHR's fiscal and personnel offices, Ruddy has had an impact on all of us in CTAHR. His calm demeanor, his willingness to help others and his true aloha spirit will be missed. Ruddy was honored at a luncheon at the Waialae Country Club on June 24, 2009 with over 90 colleagues, friends and family thanking Ruddy for his service to the University of Hawaii and CTAHR. Enjoy your retirement.



Ruddy Wong reminding us that every day is a gift and we should enjoy each and every one.

# Aloha, Po-Yung Lai!

By CY Hu  
Associate Dean and Director for Research

It is my pleasure to announce Dr. Po-Yung Lai as the new Special Director of Contracts and Grants, effectively September 1. Dr. Lai is an entomologist with both master's and PhD degrees from CTAHR. He worked for Hawaii Department



Po-Yung Lai

of Agriculture (HDOA) for many years, from an entry-level position raising insects to chief of the Plant Industry Division. During his tenure with HDOA, he won the praise of colleagues for his hard work, integrity, decisiveness, and communication skills. In 1991, Dr. Lai returned to CTAHR to serve as the Assistant Dean for Extension. In this role, he encouraged faculty to focus on statewide issues identified in industry analyses, including management of pests and animal wastes and marketing of Hawaii products. He pursued negotiations and investigated disinfestation technologies to open more export markets for the state's agricultural produce. In a time when funding was scarce he identified priorities – such as pesticide registrations, sustainable agriculture, and water quality – and made the most of limited resources to meet those needs.

Dr. Lai returned to Taiwan in 1997 to establish the Institute of Tropical Agriculture at the National Pingtung University of Science and Technology. He sought and received funds to build a building, and provide merit-based scholarship for international students, most of them from developing countries. He also served as vice president for academic affairs for the university before his retirement in 2008. He was appointed as portfolio manager in Tanzania and research program coordinator in Thailand for the Global Horticulture Initiative until earlier this month.

Dr. Lai is the recipient of 2006 CTAHR Outstanding Alumnus Award. We are very fortunate to have Dr. Po-Yung Lai returning to CTAHR to share his expertise and experience and helping us administer our grants and contracts. Please stop by our office to introduce yourself when you are in Gilmore Hall.

# Summer biotechnology course for Hawaii science teachers

By Dulal Borthakur, Professor  
Department of Molecular Biosciences and Bioengineering

Genetic engineering is often called ‘molecular biotechnology’, which is a relatively new technology based on genetic engineering for producing useful products and services. This emerging technology is going to have a major impact on our lives in this century and beyond. With the completion of the human genome project, a new generation of recombinant drugs and vaccines are being developed for treatment and prevention of many illnesses. New crop plants such as ‘Golden Rice’ producing vitamin A in rice grain will revolutionize agriculture. It is important that we teach this technology now at schools. Biotechnology education is essential to stimulate interest of high school students to this rapidly growing

technology. Without proper biotechnology education there is always a danger that public may absorb negative publicity against biotechnology, transgenic crops, and their testing in Hawaii. I developed and offered this new two-credit summer course, ‘Biotechnology for teachers’, for local high school science teachers. The goal is to make sure that biotechnology education will reach high school students through their science teachers. Six high school science teachers and one research associate from CTAHR participated in the 2009 summer class. For two weeks the teachers were given hands-on training on the principles and methods of molecular biotechnology. I am planning to teach this course for the next few summers.



As the lab coat says, *science teachers do make a world of difference!* Borthakur describes experimental methods to science teachers. (L to R) Alison E. Ashford, Audrey Ragragola, Deborah L Keanini, Dulal Borthakur.



Biotechnology class photo. (L to R) Audrey Ragragola (Moanalua High School), Andrew Michaels (Waipahu High School), Joan L Matsuzaki (Roosevelt High School), Alison E. Ashford (MidPac Institute), Dulal Borthakur (Instructor), Vishal Negi (Graduate student), Steve Spielman (UH CTAHR), Deborah L Keanini (Kamehameha High School), Nicole E Schorn (Moanalua High School), and graduate student Archana Pal.



Joan L Matsuzaki is loading DNA samples on an agarose gel for electrophoresis.



Graduate student Archana Pal is explaining how to use an electrophoresis apparatus for separating DNA fragments on an agarose gel.

# The research calabash

By Doug Vincent

Department Chair, Human Nutrition, Food and Animal Sciences

## Last Calabash from Doug

As of July 1, 2009, I have returned to the Department of Human Nutrition, Food and Animal Sciences as Department Chair. I served in the Dean's Office for 7 years. The Research Calabash was born three years ago in the July-August 2006 edition. Since then, I've tried to add useful content and newsworthy items to help you succeed. This is my last calabash and I have enjoyed writing it for you. I was pleased to have served in the Office of Research during the three of the highest fiscal years of extramural funding (FY04, FY06 and FY07) and unfortunately, one of CTAHR lowest grant intakes (FY08).

## Governor Lingle Visits CTAHR's Magoon Facility



**Governor Linda Lingle** proclaimed the week of July 6-11, 2009 Hawaii Aquaculture Week. She issued the proclamation at CTAHR's Magoon (Woodlawn) Facility on Monday, July 6, 2009. **Dr. Clyde Tamaru**, (pictured), (MBBE), CTAHR's Aquaculture Extension Specialist organized the visit. Accompanying Governor Lingle was **Chancellor Virginia Hinshaw** and other UH-Manoa officials, HDOA **Chair Sandra Kunimoto** and other Department of Agriculture officials also attended. **Dean Andrew Hashimoto** hosted the event. The Governor also toured the facility, including visiting saran and glasshouses containing orchids and anthuriums; along with the academic and industry aquaculture displays. Many thanks to **Joe DeFrank**, **Craig Okazaki**, **Tessie Amore** and **Ted Radovich** (all from TPSS) and **Harry Ako** (MBBE) for impressing everyone who attended.

## UH Office of Research Services launches new web site

The [UH Office of Research Services](#) (ORS) has a new web site. The site has been reorganized with top tabs for searching for grant opportunities, applying for grants, start-up and management of grants, closing out grants and gathering information through reports. The site is more colorful and much easier to navigate. Go there and gather information!

## UH ORS Offers training for PI's and Administrative Staff

The **UH Office of Research Services** has training opportunities for both [Principal Investigators](#) and [Administrative/Fiscal Officers](#). The PI's training is online training and provides useful information both for new and old PI's alike. For Admin/Fiscal Office staff and Sponsored Program Staff, there is in class training with six modules starting Wednesdays, September 23, 2009 through October 28, 2009. The course meets from 10 am – 1 pm. [More information and registration is available online.](#)

## RTRF Sharing for Interdisciplinary Research -reprise

A new policy has been enacted regarding the sharing of the indirect cost return funds (RTRF). Typically RTRF has gone to the home of the project PI. But there have been interdisciplinary research grants received where the PI is not within the PI's unit and as such has not benefited from a portion of the RTRF. With this change in policy, effective June 15, 2009, different units may share RTRF when joint grants are funded. See [Gary Ostrander's June 15, 2009 memo](#). When a grant is funded, the UH Office of Research Services will have multiple PI's complete the [ORS Form 5\(d\)](#) to establish sharing of the RTRF. ORS will manage the process. [More information on ORS Form 5\(d\).](#)

## Seeking your kokua when submitting grant proposals

With the passage of the America Recovery and Reinvestment Act, otherwise known as the "Stimulus Package," and finally, there may be new or unanticipated funding opportunities. Regardless, there may be greater traffic through your Department offices, the CTAHR fiscal office, the UH Office of

Research Services (ORS) and through Grants.gov. Please work closely with your Department fiscal APT to assist with budgeting and preparation of the final paper work to help lessen the load on CTAHR administrative staff. One way to make things move more quickly is to give people **as much advance time to review your proposal**. The preferred time frame is to give those that review your proposals **10 working days in advance of the submission deadline**. The CTAHR Fiscal Office is also short staffed. ORS is also asking for your kokua and requesting that you **email ORS in advance of your proposal submission**. You can submit your [advance notification online](#) through the UH ORS web site.

### **Western Sustainable Agriculture Research and Education RFAs released.**

The Western Sustainable Agriculture Research and Education (WSARE) program has just released its [RFAs for FY 2010](#). SARE advances farming systems that are profitable, environmentally beneficial and good for communities through a nation wide competitive grants programs. You can find more information at the [WSARE web site](#) including the latest edition of "[Simply Sustainable](#)" the WSARE newsletter. Other information available is [tips about writing WSARE proposals](#).



Successful WSARE proposals are those that specifically address the goals of the WSARE:

- Promote good stewardship of the nation's natural resources by providing site-specific, regional and profitable sustainable farming and ranching methods that strengthen agricultural competitiveness; satisfy human food and fiber needs; maintain and enhance the quality and productivity of the soil; conserve soil, water, energy, natural resources and fish and wildlife habitat; and maintain and improve the quality of surface and ground water;
- Enhance the quality of life for farmers and ranchers and ensure the viability of rural communities, for example, by increasing income and employment - especially profitable self-employment and innovative marketing opportunities in agriculture and rural communities;
- Protect the health and safety of those involved

- in food and farm systems by reducing, where feasible and practical, the use of toxic materials in agricultural production, and by optimizing on-farm resources and integrating, where appropriate, biological cycles and controls;
- Promote crop, livestock and enterprise diversification; and
- Examine the regional, economic, social and environmental implications of adopting sustainable agricultural practices and systems.

### **All NSF grants to use FastLane for submission**

Due to increase traffic using Grants.gov with the processing of stimulus package grants, the National Science Foundation has announced that effective immediately, all new submissions to NSF will be submitted via FastLane. More information about FastLane here: <https://www.fastlane.nsf.gov/fastlane.jsp>. Find an FAQ about FastLane here: [https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane\\_Help/fastlane\\_help.htm#fastlane\\_faqs\\_introduction.htm](https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/fastlane_help.htm#fastlane_faqs_introduction.htm)

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### **CTAHR Anniversaries**

40 Years

Sekioka, Terry T. Associate Researcher, College of Tropical Agriculture and Human Resources, UH Manoa

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# A quiet time for grants, but funding still available

By Sharee Pepper  
Grant coach

The following list includes some current funding opportunities that may be of interest to CTAHR faculty. If the deadline is too short for this year, it is still a good indication of the likely due date for next year. **Let us know if we can be of any assistance with developing and editing your grant application.**

For information on submitting grants electronically on grants.gov the following publication may be useful. **USDA, CSREES Grants.gov Application Guide – A guide for the preparation and submission of CSREES applications via grants.gov.**  
[http://www.csrees.usda.gov/funding/grant\\_forms/electronic\\_app\\_guide.pdf](http://www.csrees.usda.gov/funding/grant_forms/electronic_app_guide.pdf)

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## Agriculture, Rural and Community Development Grants

\$ - USDA, CSREES - Agriculture and Food Research Initiative (AFRI) Competitive Grants Program (Note: includes prior NRI grants)  
**Deadline: all have expired (use as guide for 2010)**  
[http://www.csrees.usda.gov/funding/afri/pdfs/program\\_announcement.pdf](http://www.csrees.usda.gov/funding/afri/pdfs/program_announcement.pdf) or  
<http://www.csrees.usda.gov/funding/afri/afri.html>

\$ - USDA, CSREES - Renewable Resources Extension Act - National Focus Fund Projects  
**Deadline: August 27, 2009**  
[http://www.csrees.usda.gov/funding/rfas/rrea\\_nff.html](http://www.csrees.usda.gov/funding/rfas/rrea_nff.html).

\$ - Western Integrated Pest Management (IPM) Center - Western IPM Center 2010 Competitive Grant Programs RFA  
**Deadline: September 4, 2009**  
[http://www.wripmc.org/Research/WIPMC%20RFA%202010%206\\_30\\_09.doc](http://www.wripmc.org/Research/WIPMC%20RFA%202010%206_30_09.doc)

\$ - USDA, Hawaii State Office of Agriculture - Prescribed Grazing Management  
**Deadline: September 8, 2009**  
<http://www07.grants.gov/search/search.do?&mode=VIEW&flag2006=false&oppld=49104>

\$ - Hawaii Legacy Land Conservation Program - Funding for the acquisition & protection of threatened resources

**Deadline: September 16, 2009**  
<http://hawaii.gov/dlnr/dofaw/llcp>

\$ - USDA, Western Sustainable Agriculture Research and Education (SARE) - Farmer Rancher Grant (FRG)  
**Deadline: Dec 04, 2009**  
[https://wsare.usu.edu/grants/RFA/FRG\\_10.pdf](https://wsare.usu.edu/grants/RFA/FRG_10.pdf)

\$ - USDA, Western Sustainable Agriculture Research and Education (SARE) - Professional + Producer Grant (PPG)  
**Deadline: Dec 04, 2009**  
[https://wsare.usu.edu/grants/RFA/PPG\\_10.pdf](https://wsare.usu.edu/grants/RFA/PPG_10.pdf)

\$ - USDA, CSREES - Western Sustainable Agriculture Research and Education Program Sustainable Agriculture Tours  
**Deadline: Open until funding is exhausted**  
[http://wsare.usu.edu/grants/docs/RFA\\_SAT.pdf](http://wsare.usu.edu/grants/docs/RFA_SAT.pdf)

\$ - USDA, Rural Development Community Facilities Loan and Grant Program  
**Deadline: Applications accepted on an ongoing basis**  
<http://www.rurdev.usda.gov/rhs/cf/cp.htm>  
[http://www.rurdev.usda.gov/rhs/cf/brief\\_cp\\_grant.htm](http://www.rurdev.usda.gov/rhs/cf/brief_cp_grant.htm)

\$ - Farm Foundation Grants  
**Deadline: Applications accepted on an ongoing basis**  
[http://www.farmfoundation.org/news/templates/comm\\_template.aspx?articleid=357&zoneid=67](http://www.farmfoundation.org/news/templates/comm_template.aspx?articleid=357&zoneid=67)

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## Education

\$ - USDA, CSREES - Small Business Innovation Research Program – Phase I  
**Deadline: September 3, 2009**  
[http://www.csrees.usda.gov/funding/rfas/sbir\\_rfa.html](http://www.csrees.usda.gov/funding/rfas/sbir_rfa.html)

\$ - Kauffman Foundation Accepting Proposals for Entrepreneurship Dissertation Fellowship Grants  
**Deadline: September 23, 2009**  
<http://www.kauffman.org/research-and-policy/kauffman-dissertation-fellowship-program.aspx>

\$ - USDA, Western Sustainable Agriculture Research and Education (SARE) - Professional Development Program Grant (PDP)  
**Deadline: November 03, 2009**  
[https://wsare.usu.edu/grants/RFA/PDP\\_10.pdf](https://wsare.usu.edu/grants/RFA/PDP_10.pdf)

\$ - Human Frontier Science Program – Short Term Fellowship Program  
**Deadline: rolling – applications accepted year round**  
[http://www.hfsp.org/how/appl\\_forms\\_STF.php](http://www.hfsp.org/how/appl_forms_STF.php)

\$ - NIH - Bridges to the Baccalaureate Program (R25)  
**Deadline: September 18, 2009**  
<http://grants.nih.gov/grants/guide/pa-files/PA-07-411.html>

\$ - NSF – Active Funding Opportunities  
**Deadline: Multiple**  
[http://www.nsf.gov/funding/pgm\\_list.jsp?org=NSF&ord=date](http://www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord=date)

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### Environment, Water, Energy, Invasive Species Grants

\$ - NOAA Broad Agency Announcement (for special projects)  
**Due September 30, 2009 (closes but applications accepted on a rolling basis)**  
NOAA Office of Education:  
<http://apply07.grants.gov/apply/opportunities/instructions/oppNFA-NFA-2008-2001388-cid2112140-instructions.pdf>  
National Marine Fisheries Services  
<http://apply07.grants.gov/apply/opportunities/instructions/oppNFA-NFA-2008-2001388-cid2112136-instructions.pdf>  
National Environmental Satellite Data Information Service  
<http://apply07.grants.gov/apply/opportunities/instructions/oppNFA-NFA-2008-2001388-cid2112133-instructions.pdf>  
National Ocean Service  
<http://apply07.grants.gov/apply/opportunities/instructions/oppNFA-NFA-2008-2001388-cid2112139-instructions.pdf>

\$ - U.S. Fish and Wildlife Service - Coastal Programs  
**Deadline: September 30, 2009**  
<http://apply07.grants.gov/apply/opportunities/instructions/oppCOASTAL-09-cfda15.630-instructions.pdf>

\$ - National Forest Foundation: Community Assistance Program  
Local Forest Partnerships Fund  
**Deadline: proposals accepted on a rolling basis throughout year**  
[http://www.natlforests.org/consp\\_05\\_cap.html](http://www.natlforests.org/consp_05_cap.html)

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### Families, Youth and Children Grants

\$ - CHS Foundation  
Rural Youth and Leadership Development  
**Deadline: rolling – applications accepted year round**  
<http://www.chsfoundation.org/programs/ryld.htm>

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### Financial Grants

\$ - Money Management International Financial Education Foundation,  
Financial Education Grants  
**Deadline: rolling – applications accepted year round**  
<http://www.mmifoundation.org/GrantSeekers.asp>

\$ - [Hitachi Foundation: Business and Communities Grants Program](#)  
Grants Address Economically Isolated Communities  
Interested organizations may submit an online inquiry to provide information about project ideas **at any time** and the Foundation's will determine if it fits their priorities.  
<http://www.hitachifoundation.org/grants/guidelines/index.html>

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### Health, Nutrition, Food & Biomedical Grants

\$ - NIH, National Cancer Institute (NCI) - Cancer Prevention Fellowship Program (CPFP)  
**Deadline: September 1, 2009.**  
<http://cancer.gov/prevention/pob>



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## Science Grants

NSF – Active Funding Opportunities

**Deadline: Multiple**

[http://www.nsf.gov/funding/pgm\\_list.jsp?org=NSF&ord=date](http://www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord=date)

\$ - National Geographic Society – Waitt Grants Program

**Deadline: Rolling**

<http://www.nationalgeographic.com/field/grants-programs/waitt-grants-application.html>

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## UH, Hawaii and Regional Grants

\$ - UH, University Research Council - Faculty Travel Funds

**Proposal Deadline: rolling – applications must be in >4 weeks before travel.**

[http://www.hawaii.edu/urc/pdf/factravel\\_g.pdf](http://www.hawaii.edu/urc/pdf/factravel_g.pdf)

[http://www.hawaii.edu/urc/pdf/factravel\\_f.pdf](http://www.hawaii.edu/urc/pdf/factravel_f.pdf)

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# Faculty publications

### Ali Fares (NREM)

Fares A., Dogan A., L. R. Parsons, T. Obreza, and K.T. Morgan. 2008. Effects of Citrus Canopy Interception on Effective rainfall Calculations Using Water Budget Analysis and TR-21 Method. *Soil Sci. Soc. of Amer. Journal*. 72:578-585.

Fares, A, 2009. Citrus Irrigation Scheduling. *Tree Forestry Science and Biotechnology* -Global Science Books 3(1)12:21.

Abbas, F. and Fares, A. 2009. Best Management Practices in Citrus Production. *Tree Forestry Science and Biotechnology* -Global Science Books 3 (I) 1:11.

Fares, A, F. Abbas, S.K. Deb, S. Paramasivam. 2009. Citrus Chemigation. *Tree Forestry Science and Biotechnology* -Global Science Books 3(I) 22:31.

Abbas, F. and A. Fares, 2009. Soil Organic Carbon and CO2 Emission from an Organically Amended Hawaii Tropical Soil. *Soil Science Society of America Journal*. 73(3) 995-1003.

### Ken Grace (PEPS)

Grace, J. K., and R. T. Yamamoto. 2009. Food utilization and fecal pellet production by drywood termites (Isoptera: Kalotermitidae). *Sociobiology* 53: 903-911.

### Paul Krushelnycky (PEPS)

Krushelnycky, P.D., and Gillespie, R.G. 2009. Sampling across space and time to validate natural experiments: an example with ant invasions in Hawaii. *Biological Invasions* DOI 10.1007/s10530-009-9471-y

### Ronald Mau (PEPS)

Piñero, J.C., Mau, R.F.L., McQuate, G.T., and Vargas, R.I. 2009. Novel bait stations for attract-and-kill of pestiferous fruit flies. *Entomologia Experimentalis et Applicata*. In Press.

Klungness, L.M., R. I. Vargas, E.B. Jang, R.F.L. Mau and K. Kinney. 2009. Susceptibility of ripe avocado to invasive alien fruit flies (Tephritidae) on the island of Hawaii. *Proc. Hawaii. Ent. Soc.* In Press.

Pinero, J. C. R. F. L. Mau, and R. I. Vargas. 2009. Managing oriental fruit fly, *Bactrocera dorsalis* (Diptera: Tephritidae) (using spinosad-based protein bait sprays in papaya orchards in Hawaii. *J. Econ. Entomol.* 102: 1123-1132

Vargas, R. I., J. C. Pinero, R.F. L. Mau, J. D. Stark, M. Hertlein, A. Mafra-Neto, R. Coler, and A. Getchell. 2009. Attraction and mortality of oriental fruit flies (Diptera: Tephritidae) to SPLAT-MAT-Methyl Eugenol with spinosad. *Entomologia Experimentalis et Applicata*. 131: 286-293.

Jang, E. B., G.T. McQuate, D. O. McInnis, R. C. Bautista, R. I. Vargas, R. F. L. Mau and Lyle Wong. Targeted cue-lure trapping, bait-spray, sanitation, sterile-male and parasitoid releases in an area wide integrated melon fly (Diptera: Tephritidae) control program in Hawaii. 2009. *Amer. Entomol.* 54: 240-250.

Vargas, R. I., R. E. Burns, R. F. L. Mau, J. D Stark, P. Cook, and J. C. Pinero. 2009. Captures in methyl eugenol and cue-lure detection traps with and without insecticides and with a Farma Tech solid lure and insecticide dispenser. *J. Econ. Entomol.* 102: 552-557.

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**Dan Rubinoff (PEPS)**

Haines, W. M. Heddle, P. Welton and D. Rubinoff. 2009. A recent outbreak of the Hawaiian koa moth, *Scotorythra paludicola* (Lepidoptera: Geometridae), and a review of outbreaks between 1892 and 2003. *Pacific Science* 63:349-369.

Hunsdorfer, A. K., D. Rubinoff, M. Attié, M. Wink, and I. J. Kitching. 2009. A revised molecular phylogeny of the globally distributed hawkmoth genus *Hyles* (Lepidoptera: Sphingidae), based on mitochondrial and nuclear DNA sequences. *Molecular Phylogenetics and Evolution* 52:852-865.

**Diane Sether (PEPS)**

Sether, D. M., Melzer, M.J., Borth, W.B., and Hu, J.S. 2009. Genome organization and phylogenetic relationship of Pineapple mealybug wilt associated virus-3 with family Closteroviridae members. *Virus Genes*: 38:414-420.

**Koon-Hui Wang (PEPS)**

Wang, K.-H., C.R.R. Hooks. 2009. Plant-parasitic nematodes and their associated natural enemies within banana (*Musa spp.*) plantings in Hawaii. *Nematropica* 39: 57-73.

Hooks, C.R.R., S. Fukuda, E.A. Perez, R. Manandhar, K.-H. Wang, M.G. Wright, and R.P.P. Almeida. 2009. Aphid transmission of Banana bunchy top virus to bananas after treatment with a bananacide. *J. Econ. Entomol.* 102: 493-499.

Hooks, C.R.R., R. Manandhar, E.A. Perez, K.-H. Wang, and R.P.P. Almeida. 2009. Comparative susceptibility of two banana cultivars to Banana bunchy top virus under laboratory and field environments. *J. Econ. Entomol.* 102: 897-904.

Wang, K.-H., B. S. Sipes, D. P. Schmitt, A. E. MacGuidwin, M. McKenry, T.J. Bliss, B.R. Kerry, and S. Costa. 2008. Plant nematological contributions to phytopathology. *APSnet Plant Pathology Online*, St. Paul, MN. <http://www.apsnet.org/online/feature>.

**Mark Wright (PEPS)**

Vorsino, A., Wieczorek, A., Wright, M.G., Ramadan, M. & Messing, R. 2009. Using molecular tools to identify and describe ecological and evolutionary processes affecting augmentative biological control. *Proceedings of the Third International Symposium on Biological Control of Arthropods*. P.G. Mason, D.R. Gillespie and C. Vincent (Eds.). pp. 124-133. (Invited paper)

Kaufman, L.V. & Wright, M.G. 2009. The impact of exotic parasitoids on populations of a native Hawaiian moth assessed using life table studies. *Oecologia* 159: 295-304.

Kaufman, L.V. & Wright, M.G. 2009. Life history, seasonal phenology and parasitism of the Hawaiian endemic moth *Udea stellata* (Lepidoptera: Crambidae). *Annals of the Entomological Society of America* 102: 104-111.

# Getting your idea patented

Disclosing an invention to the University of Hawaii:  
Why you should do it, How it is done and what happens after

By Lisa Matsunaga  
Licensing Associate, OTTED

In addition to having academic and scientific value, discoveries and inventions developed at the University of Hawaii may also have significant commercial value. University policies require employees of the University, non-employees who use its research facilities, and those who receive grant or contract funds to disclose potentially patentable discoveries and inventions to the Office of Technology Transfer and Economic Development (OTTED).

Disclosing your invention to the University of Hawaii serves several purposes:

- 1) It provides a signed, dated and witnessed record of the date you conceived of an invention and demonstrated that it actually does work or could work.

- 2) It provides a detailed description of the invention that allows the University to protect it with patents.
- 3) It allows you to participate in commercializing your technology while protecting you from ethics problems and conflicts-of-interest.
- 4) It provides information on the federal or private sponsors of the research that led to the invention so that the University can fulfill its obligations to the sponsors.
- 5) It provides background information that is helpful in identifying companies interested in licensing the discovery and supporting further research in the area.



OTTED includes, (L\_R) Lee Taylor, Lisa Matsunaga, Ann Park, and Jonathon Roberts (Dan Ishii, Interim Director, not shown).

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To fulfill your obligation to the University and initiate the protection of your invention, you need to formally disclose your invention to our office. To make this easier, a Confidential Invention Disclosure Form is provided on the OTTED website (<http://www.otted.hawaii.edu/faculty/disclosure.html>). This form allows multiple inventors to designate a primary contact; to notify UH of ownership questions and assigns inventions; and to notify research administrators of new discoveries. Attachments usually include a detailed description of the invention, a record of public disclosures, and information about research funding, sponsorship and support. Upon receipt of the Disclosure, your invention is logged in and assigned a case number. The OTTED Director reviews it and assigns it to a Licensing Associate who will contact you to schedule a time to meet to discuss the invention and explore licensing feasibility, novelty, and potential applications of the technology.

If ownership of the invention is at issue, the Disclosure will be immediately submitted to the University of Hawaii Patent and Copyright Committee (PCC) for review. The PCC Chair will schedule a meeting to give you an opportunity to explain the circumstances surrounding the development of the invention and to answer questions about it. The PCC will then make a determination of ownership: if it finds that the invention resulted from personal or private research unrelated to any research conducted at UH, and that it was developed exclusively on personal time without any cost or expense to the institution, the University will relinquish all rights in the invention to you to follow-up on your own.

If there isn't any question of ownership and the invention appears patentable, OTTED will file a US Provisional Patent Application to protect the technology, and Federal or private sponsors of the research that led to the invention will be notified. If the invention is clearly a "breakthrough" discovery with substantial commercial promise, OTTED may immediately apply for a US Utility Patent Application. At the same time, the Licensing Associate will work with you to determine commercial interest in the invention and find a company willing to bring the new technology to market. A list of targeted industries and companies will be identified. Your suggestions of companies and industrial contacts to be approached are extremely valuable in this regard. A few faculty inventors may be interested in forming their own company to develop and exploit the invention.

For some technologies, this is a viable alternative; for others, more conventional approaches may offer better opportunities.

With your help, a marketing abstract of the invention will be developed and sent to the targeted companies. The marketing abstract gives a brief summary about the technology as well as its areas of application and the benefits/advantages of the technology. If a company shows interest, complete information about the technology is provided in confidence. Company scientists, engineers and other representatives may contact you to discuss the invention and your continuing research in the area. The company may be invited to tour your laboratory and meet with you, or you may be asked to visit them. While this is taking place, license negotiations get underway. If the negotiations are successful, a License Agreement is finalized and signed and a long-term relationship between the company and the University is established. The licensee's performance is monitored through periodic financial and other reports and the licensee may provide support for further research into the technology under a separate research agreement. Most licenses include terms for the payment of fees and royalties on sales of products that use the technology, but many alternate arrangements are possible, including those in which the University receives equity in a company in exchange for a technology license. When payments are received from a company, direct expenses, such as patent, marketing, and administrative costs, are deducted, and net royalties are divided among the inventors according to UH policies.

If interested licensees are not found, the Licensing Associate will evaluate the results of the commercialization effort. If there is little or no commercial interest in the invention, title to the invention and interest in the patent application will be released to the inventors to exploit on their own outside the University. In most instances, the technology will be licensed to the inventor(s) and the inventor(s) will be asked to reimburse the University a small royalty if they are able to license the technology.

If you have any questions about the patenting process, protecting your invention, commercializing your invention, etc., please contact Lisa Matsunaga, Licensing Associate at OTTED at (808) 539-3826 or email her at [matsunag@hawaii.edu](mailto:matsunag@hawaii.edu).

CTAHR patents include →

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# CTAHR patents

By Sharee Pepper  
Grant coach

(<http://www.ctahr.hawaii.edu/ctahr2001/Research/Patents.html>)

## **Colocasia plant named "Blue Hawaii"**

Inventor:

Dr. John Cho, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US PP20,003 Date Issued – May 19, 2009

## **Colocasia plant named "Diamond Head"**

Inventor:

Dr. John Cho, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US PP19,939 Date Issued – April 21, 2009

## **Colocasia plant named "Hawaiian Eye"**

Inventor:

Dr. John Cho, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US PP19,884 Date Issued – March 31, 2009

## **Colocasia plant named "Hilo Bay"**

Inventor:

Dr. John Cho, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US PP20,108 Date Issued – January 16, 2009

## **Colocasia plant named "Maui Magic"**

Inventor:

Dr. John Cho, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US PP19,625 Date Issued – January 13, 2009

## **Bionest Reactor for the Application of Anaerobic Wastewater Treatment and Bioenergy Recovery**

Water pollution control due to runoff from agricultural feeding operations is a huge problem nationwide. In the United States, the U.S. Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) are working together to improve America's waters. Researchers at the University of Hawai'i have developed an unique and efficient anaerobic reactor which removes organic pollutants and produces methane gas.

[more](#)

Inventors:

Dr. Pingyi Yang, University of Hawai'i, College of Tropical Agriculture and Human

Mr. Liangjie Dong, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US 7,226,539 Date Issued – June 5, 2007

## **Novel fluorescent nanosensor proteins**

Two innovative sensor-protein platforms are disclosed.

These sensors are designed for highly sensitive fluorescence resonance energy transfer (FRET)-based molecular assays.

Both sensors are suited for homogeneous assays, with one of the sensors designed for noncompetitive assays, and the other for competitive assays. A wide range of molecular recognition domains (e.g., peptide epitopes) can be incorporated into these

nanosensor proteins using recombinant DNA technology to create a vast variety of unique sensors.

Inventors:

Dr. Wei Wen (Winston) Su, University of Hawai'i, College of Tropical Agriculture and Human

Patent No. US 7,247,443 B2 Date Issued – July 24, 2007

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## **A P. falciparum Merozoite Surface Protein-1 Malaria Vaccine Produced in Transgenic Plants**

This technology describes a method of producing transgenic tobacco plants that synthesize the complete P. falciparum MSP1 p42 polypeptide.

Inventors:

Sandra Chang, Tropical Medicine & Medical Microbiology

Benjamin Vine, Tropical Medicine & Medical Microbiology

Wei-Wen Su, Molecular Biosciences & Biosystems Engineering

Robert Bugos, Molecular Biosciences & Biosystems Engineering

Patent No. 7,037,681 Date Issued – May 2, 2006

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## **Recombinant bacteria for use in insect control**

The present invention relates to recombinant bacteria genetically engineered from insect hosts to express toxic gene products in a pest insect. The present invention also relates to a method of controlling an insect population using such a recombinant bacteria as a delivery agent throughout an insect colony.

Inventors:

Claudia Husseneder

Dr. J. Kenneth Grace, University of Hawai'i, College of Tropical Agriculture and Human Resources

Darcy E. Oishi

Patent No. 6,926,889 B2 Date Issued – August 9, 2005

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## **Sex Control in Shrimp and Prawn Aquaculture**

A novel approach to isolate the Androgenic sex hormone (AH) from the crustacean freshwater prawn and marine shrimp using in vitro glandular secretion of the AH from AH-producing Androgenic glands.

Inventors:

Spencer R. Malecha, Human Nutrition, Food and Animal Sciences

Piera S. Sun, Pacific Biomedical Research Center

Patent No. 6,740,794 B1 Date Issued – May 25, 2004

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## **Bio-Engineering Continuous Production of Marine Microalgae (Chaetoceros sp.)**

A major difficulty in utilizing naturally occurring substances is to produce them in sufficiently high concentrations, in large enough quantities, and at competitive cost. By managing environmental conditions such as nutrition, and by varying the amount of algae to be harvested daily, a process has been developed that directly produces desired diatoms in open systems from ocean water without inoculation.

Inventors:

Jaw-Kai Wang, Biosystems Engineering

Timothy Hering, Kona Bay Oyster & Shrimp Company

Patent No. 6,673,592 Date Issued – January 6, 2004

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**Production of Transgenic Plants Comprising the Winged Bean Lysine Rich Protein**

An 18-KD protein containing 10.8 mol% lysine was identified from winged bean and the cDNA encoding this protein has been cloned and its nucleotide sequence determined.

Inventors:

Dr. Samuel S. M. Sun, University of Hawai'i, College of Tropical Agriculture and Human Resources

Ms. Liwen Xiong, National Engineering Research Center for Vegetables, China

Dr. Yuxiang Jing and Dr. Bolin Liu, Institute of Botany, Academia Sinica, China

Patent No. 6,184,437 Date Issued – February 6, 2001

**Sweet Protein Mabinlin**

A sweet protein derived from Mabinlang (Capparis masakai) that is 400 times sweeter than sucrose.

Inventor:

Samuel S.M. Sun, Department of Plant Molecular Physiology

Patent No. 6,051,758 Date Issued – April 18, 2000

**Mechanically Loaded Direct Air Commodity Disinfestation Chamber**

A new design of a disinfestation chamber for agricultural products consists of circulating hot air over the commodity in a chamber to raise the temperature of the commodity to a certain level for a period of time sufficient to kill the infecting insect.

Inventors:

Michael Williamson, Agricultural Engineering

Paul Winkelman, Agricultural Engineering

Patent No. 5,792,419 Date Issued – August 11, 1998

**Solid Appliance Fermentation Technology for Inoculants (SAFTI)**

The packaging design allows mixture of beneficial microorganisms into growth medium within a self-contained unit, making it portable to the site of application.

Inventors:

Paul Singleton, Nitrogen Fixation by Tropical Agricultural Legumes (NifTAL) Project

Joseph Rourke, Nitrogen Fixation by Tropical Agricultural Legumes (NifTAL) Project

Michael Sadowsky, University of Minnesota

Patent No. 5,507,133 Date Issued – April 16, 1996

**Manufacturing of Acridity-free Raw Flour from Araceae Tubers**

A method of removing acridity from Araceae (taro) tubers without cooking has been developed.

Inventors:

Alvin Huang, Food Science & Human Nutrition

James Hollyer, Agricultural and Resource Economics

Patent No. 5,464,646 Date Issued – November 7, 1995

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**Termite Barrier**

An environmentally acceptable barrier against subterranean termites has been developed and is now available for use.

Inventor:

Minoru Tamashiro, Entomology

Patent No. 5,094,045 Date Issued – March 10, 1992

**Efficient Regeneration and Transformation of Banana Using Secondary Somatic Embryogenesis via Microprojectile Bombardment**

Secondary somatic embryogenesis was established using immature male flower buds of banana cultivar 'Apple' (Musa ssp. AAB group).

Inventors:

Dr. John S. Hu, University of Hawai'i College of Tropical Agriculture and Human Resources

Mr. Said M. Khalil, University of Hawai'i College of Tropical Agriculture and Human Resources

*Last updated on 6/17/2009*