CTAHR Research News

July/August 2008
Volume 4, Issue 6

John Hu holds an example of young pineapple plants used to characterize mealybug wilt of pineapple.

Virus chasers

Faculty and grads crank out the publications

FY 2008 funding summary

In this issue

From the Associate Dean and Associate Director for Research

It has been nice to not have to fight the traffic on University Avenue each morning during the summer. Unfortunately, traffic will return with the new semester. I hope you have had a relaxing summer. Jackie Tani has moved to an APT position in the Family and Consumer Sciences department. Lynnet Higuchi is doing double duty while we go through the search process for a successor. During the transition, please forgive my tardiness in responding to your project revision, multistate meeting authorization, and other issues dealing with our office.

Invasive species is a major challenge for our islands; and will continue to be one. Invasive species come in many different varieties: including weeds (December, 2006), insects (November, 2006; February, 2008), and bacteria (January, 2007). This month, we introduce you to Dr. John Hu, the virologist in the Department of Plant and Environmental Protection Sciences. It is difficult to see a virus, even if you have a good microscope, but it is not difficult to see the damages done by a virus. Hawaii used to export oranges to California until *Citrus tristeza virus* (CTV) destroyed our citrus orchards. Citrus was introduced to Hawaii back in 1792, CTV was first reported in 1952, and its vector, brown citrus aphid, was identified in 1907. The existence of both virus and its vector doomed the citrus industry in Hawaii. Dr. Hu is working to identify resistance plants so that eventually orange orchards can return to Hawaii. In addition to citrus and pineapple viruses, Dr. Hu is also working on another viral disease: Banana Bunchy Top Virus (BBTV), a disease that decimates banana farms across the state. Dr. Hu and his associates are working diligently to find solutions for our local farmers and I am sure you will enjoy reading his story as much as I did.

Our office has been very busy in the summer months getting Hatch and McIntire-Stennis project proposals reviewed and appropriated for funding. The award notices have been sent, and we are looking forward to establish all these new projects. I want to say "thank you" to all of you who submitted proposals, as well as to those who served as reviewers for this round. We received 14 Hatch Research, 13 Hatch Integrated, and 10 McIntire-Stennis project proposals. We were able to fund a total of 11 Hatch projects and 9 McIntire-Stennis projects at either $20K per year, or close to the requested amounts, with a total of $370K distributed to all projects. We will have another round of Hatch RFPs next spring. One lesson we have learned from this round is that we have a lot of excellent projects which are potentially fundable through extramural funding sources. Writing and submitting grant proposals are time-consuming, labor intensive, and ego-challenging endeavors. Nevertheless, this is part of being a faculty member of a Carnegie I research university. We have quite a few successful stories to tell, and we will share them with you in the next months. Welcome back, and have another successful semester!

C.Y. Hu
Associate Dean and Associate Director for Research

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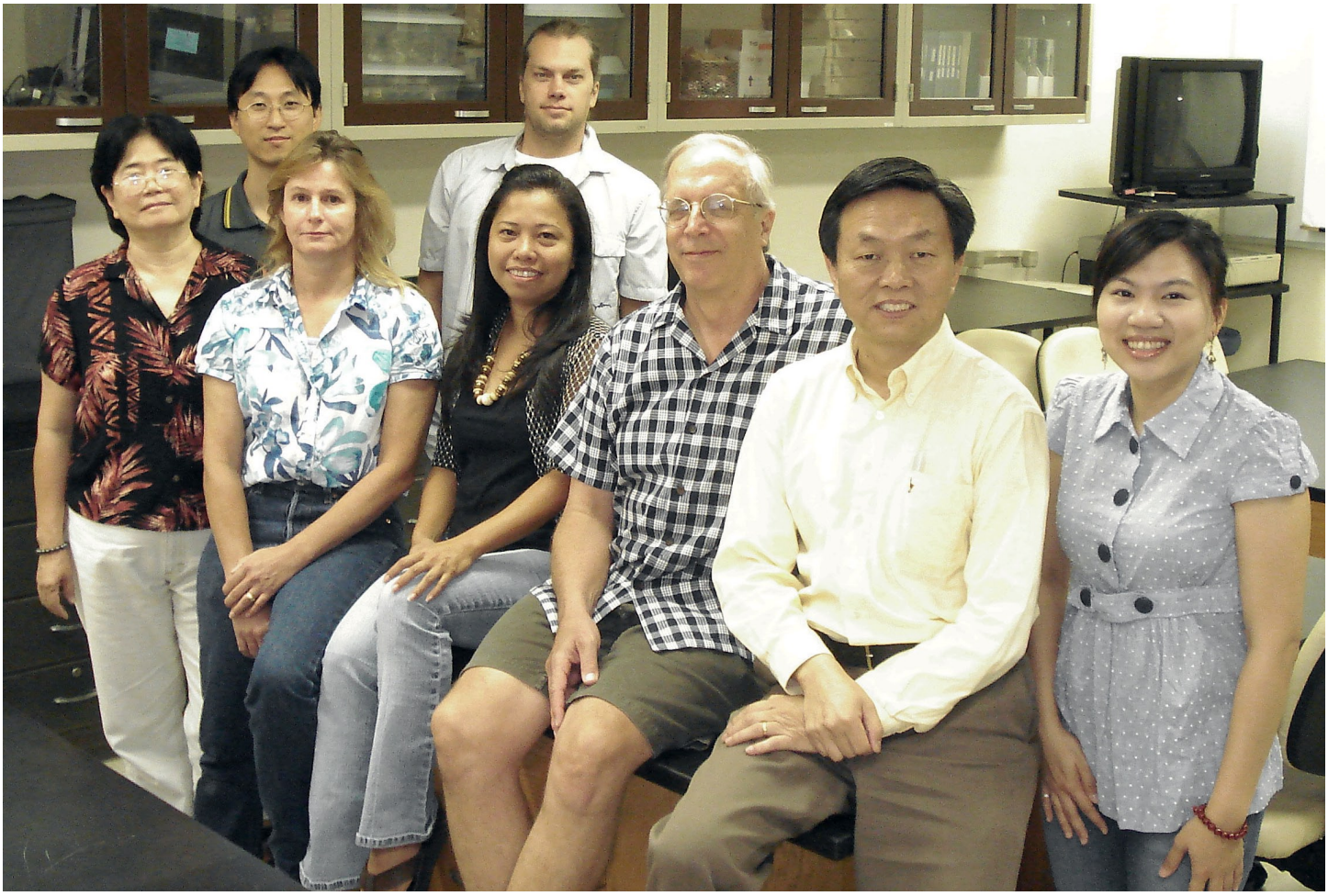
Life inside a plant virology laboratory

By John Hu
Plant Pathologist
Plant and Environmental Protection Sciences



John Hu (in yellow) is surrounded by research collaborators (l-r) Back row: Hung-Yu Ru (Umin), Michael Melzer. Front row: Kheng Cheah, Diane Sether, Verna Subere, Wayne Borth, John Hu, and I-Ching Wang.

Viral plant diseases result in farm losses of millions of dollars annually in Hawaii and the Pacific. *Banana bunchy top virus* (BBTV), *Citrus tristeza virus* (CTV), and *Pineapple mealybug wilt associated virus* (PMWaV) are viruses that respectively limit production of banana, citrus, and pineapple in Hawaii and other Pacific Islands. Since 1991 when I joined the faculty at CTAHR, I have been working with Drs. Wayne Borth and Diane Sether and other associates to combat these diseases with the tools of modern science.

Banana bunchy top virus (BBTV)

Banana bunchy top virus (BBTV) is the most devastating virus disease of bananas in many areas of Asia, Africa, and the South Pacific. Bananas are planted on 1,200 acres in the state of Hawaii and generate $9.8 million in revenues.

In 1989, BBTV was first identified in Hawaii at a farm near Punaluu, Oahu. Since 1989, it has been found in many farm and residential areas on the island of Oahu. BBTV was later found on the islands of Hawaii, Kauai, Molokai, in 1995, 1997 and 2000, respectively. New growth from infected plants is stunted and distorted, resulting in a characteristic "bunchy top" appearance. No fruit is produced on infected plants, and a high incidence of BBTV in production areas can cause complete yield loss. Specific objectives of our work are: (1) to develop rapid, sensitive, and reliable assays for detection of BBTV in plants and insects;

Wayne Borth examines tissue-cultures of pineapple.

(2) to characterize the genome organization and vector transmission of BBTV; and (3) to develop resistant transgenic banana plants to control BBTV.

Our first task was to develop a way to detect or assay a plant to see if it had BBTV. We had previously developed enzyme-linked immunosorbent assay (ELISA), dot-blot hybridization assay (dot-blot), and polymerase chain reaction (PCR) assays to detect BBTV from a single aphid vector. More recently, a real-time PCR assay incorporating a virus-specific TaqMan® probe was developed to detect BBTV from banana tissue material. The assay can be conducted on as little as 1mm square tissue and rapid DNA extraction can be conducted in a 96 well PCR tray with the addition of just two buffers and the application of heat provided by a thermocycler. The real-time PCR assay was used to evaluate banana trees over time on a commercial plantation in West Oahu in collaboration with Dr. Cerruti Hooks. The assay was capable of detecting BBTV in the plants 5-20 days before symptoms were detected by skilled plantation personnel. The development of a sensitive assay capable of detecting BBTV before symptoms are present provides a valuable tool for checking propagation materials and managing the spread of BBTV. The assay could also be used to detect BBTV in single banana aphids, *Pentalonia nigronervosa* which vector BBTV.

We then studied BBTV isolates from Hawaii, China, and the Philippines to allow us to characterize the molecular diversity of the virus. Three single-stranded DNA (ssDNA) components were cloned, sequenced, and compared. We found that the movement gene sequences of all isolates are very similar. However, based on sequence information of the coat protein and a gene involved in virus replication (REP), the Hawaii BBTV isolate is more closely related to the Australian BBTV isolate, and the isolates from China and the Philippines are more closely related to the Taiwanese BBTV isolates. These results support the idea of separating BBTV isolates into two groups, the Asia group and the Pacific group, as suggested by James Dale from Queensland University of Technology. Resistant transgenic banana plants developed with genes from one group may, therefore, not be resistant to infection by the other BBTV group. Thus, we also cloned the coat protein, movement, and Rep genes from the Chinese and Philippine BBTV isolates for use in transformation studies to develop transgenic plants with broad and durable resistance.

An efficient system was developed to screen BBTV-resistant transgenic banana plants in greenhouse experiments. Previously, we obtained 100% BBTV infection in banana plants when five viruliferous aphids were given two days inoculation feeding time. We have

found that BBTV is acquired by banana aphids within 4 hours and is transmitted within 15 minutes of feeding. Ten viruliferous banana aphids were used to inoculate each banana plant with inoculation feeding times of one week. The inoculated banana plants were kept in the greenhouse for several months to allow symptoms to develop.

Our final task was to see if we could take all our tools and accumulated knowledge and develop a banana plant that was resistant to BBTV. Initially, we transformed banana cultivars 'Williams' and 'Grand Nain' using *Agrobacterium*-mediated transformation systems. Approximately 300 putative transgenic banana plants were obtained from transformation experiments using a meristem system with different BBTV genes. All non-transgenic control banana plants developed typical symptoms about 1 month after inoculation. Most of the putative transgenic banana plants developed typical BBTV symptoms within 1 month; several plants showed a 2–3 week delay in symptom development. Seven BBTV-resistant transgenic banana plants were obtained and characterized. BBTV symptom development was delayed for as long as 1 year after challenge inoculation. However, these plants were chimeric, which means only parts of the plants were transformed with the transgenes, and eventually they all developed BBTV symptoms. Our results demonstrated that pathogen-derived resistance technology can be used to control BBTV and that the gene constructs we used can produce BBTV-resistant plants, but we need to modify the transformation system to obtain true transgenic plants that are not chimeric.

We recently developed a more efficient system to transform and regenerate transgenic banana plants. Secondary somatic embryogenesis culture was established using immature male flower buds of banana cultivar 'Apple' (Musa spp. AAB group). An average of 75% to 85% of the secondary somatic embryos regenerated plantlets. We have also used this regeneration system to develop procedures for efficient production of 'Apple' banana transgenic plants using *Agrobacterium*-mediated transformation. The bombardment conditions were optimized, and fully transformed banana plants have been obtained. We have used our new system to produce more than 300 transgenic banana plants, using 4 different BBTV constructs based on the Rep gene of BBTV. These plants have been challenged with BBTV using aphid vectors. Several lines have survived this challenge and are currently being characterized using molecular approaches. We will multiply any BBTV-resistant plants that are identified through the challenge experiments to produce large numbers of BBTV resistant plants.

While there is still much work to be done, the successful production of resistant transgenic banana plants may provide an environmentally safe and durable approach for control of BBTV, reduce the use of insecticides, and help banana growers achieve sustainable agriculture. The establishment of a system for transformation and regeneration of bananas in Hawaii is a significant achievement and has broad applications for the control of other banana diseases and the improvement of banana quality. For example, black Sigatoka disease and various nematode diseases limit banana production worldwide. My current team members on this work include **Wayne Borth, Eden Perez, Diane Sether,** and **Kheng Cheah**.

Pineapple mealybug wilt-associated virus

Mealybug wilt of pineapple (MWP) is a devastating disease found in all the pineapple-growing regions of the world. My current team which includes Diane Sether, **Verna Subere**, **Michael Melzer**, Hung-Yu Ru

Kheng Cheah transfers tissue cultured pineapple plantlets.

Mike Melzer grafts citrus plants.

(Umin), and Kheng Cheah have been on the hunt for solutions to MWP for a number of years. The disease is characterized by severe leaf tip dieback, downward curling of the leaf margins, and reddening and wilting of the leaves that can lead to total collapse of the plant. Over the last 18 years, we have identified several important viruses which cause MWP in pineapple from Hawaii and other production regions worldwide. The Pineapple mealybug wilt associated viruses (PMWaVs) are mealybug transmitted ampeloviruses in the family Closteroviridae. Thus far, four different PMWaVs have been identified in commercially grown pineapple and in accessions maintained at the USDA-ARS germplasm respository. All of the PMWaVs identified thus far can be spread by pink and grey pineapple mealybugs, *Dysmicoccus brevipes* (Cockerell) and *D. neobrevipes* (Beardsley), respectively. The presence of PMWaV-1 and/or PMWaV-2 has been correlated with reductions in yield which manifests as a reduction in ratoon or sucker number. Furthermore, PMWaV-2 and mealybug feeding have been shown to play a role in the etiology of mealybug wilt of pineapple.

As with banana we needed to do some classification work on the pathogen so that we can study the distribution of the pathogens in the field and develop strategies to control the disease. The details are complex, but we have developed robust RT-PCR assays for detection and distinction of the four ampeloviruses. PCR assays with specific and broad-spectrum oligonucleotide pairs were developed to detect and distinguish the four different badnavirus-like groups and genetic variants in each group. DIG-labeled probes of genomic DNA

Verna Subere prepares samples for quantitative PCR.

have suggested that some of the sequences may be integrated into the genome of the pineapple. This may be indicative of a remnant of a retro-element or of the ability of pineapple badnavirus to insert portions of viral genome into the plant host, similar to banana streak badnavirus and taro bacilliform virus. Further genomic characterization is underway for the four groups.

With this information we have been able to study the transmission of the viruses by mealybug vectors, to examine the speading of the viruses in the field, and to monitor resistance of transgenic pineapple plants.

Although MWP has been studied for more than 90 years, the etiology of this disorder has been in question. We are the first to characterize the closteoviruses, to develop reliable assays to detect the viruses, and to identify factors involved in disease development. The information will be useful in developing alternative environmentally sound strategies to manage MWP. This is especially critical as Hawaii is still a producer of pineapple with over $75.5 million in farm gate revenues in 2006.

Citrus tristeza virus (CTV)

Citrus is a major fruit crop in many tropical and subtropical regions. In 2006, an estimated 102 million tons of citrus fruit were harvested worldwide. However, *Citrus tristeza virus* (CTV) is a major factor limiting citrus production throughout the world. In many citrus-growing regions, including South and Central America, the Caribbean Basin, southern Europe, South Africa, California, and Israel, CTV has been responsible for the loss of millions of mature trees at a cost of billions of dollars. CTV is transmitted most efficiently by the brown citrus aphid (BrCA). In the United States, the BrCA occurs in Hawaii and has been found recently in Florida. It threatens to become a serious problem for the citrus-growing regions of Texas, Arizona, and California. Our areas of interest include characterization of the incidence and distribution of CTV strains in Hawaii, characterization of new CTV strains found in Hawaii, development of mild-strain cross-protection and transgenic approaches to CTV management, and establishment of a field site to screen putative CTV-resistant citrus plants produced in our lab and elsewhere. Our team on this project includes Michael Melzer, **I-Chin Wang**, Wayne Borth, and Diane Sether.

We have examined 405 trees from 50 sites across the State of Hawaii for the presence of CTV using molecular and serological detection assays. Trees positive for CTV were genotyped to further characterize the infection.

Overall, 74% of Hawaii's citrus trees were infected with CTV, with no areas free from CTV in the islands. Most infections consisted of more than one CTVstrain, and it appears some strains of the virus that are found in Hawaii have not been identified elsewhere.

We have adopted mild-strain cross protection (MSCP) and transgenic approaches for managing diseases caused by CTV in Hawaii. In 2003/2004 we installed MSCP experiments on the islands of Molokai and Hawaii that compared a mild CTV strain isolated from Kurtistown, HI to a mild CTV strain commonly used in commercial citrus orchards in Florida. As with all MSCP experiments, this is a long-term project and to date no significant differences have been observed between treatments with respect to tree health and fruit yield/quality measurements. For our transgenic approach, we have transformed 'Mexican' lime plants with various CTV-derived sequences. These plants are being grown and propagated in the greenhouse and will shortly be tested for their ability to resist CTV infection in greenhouse assays. We have established a site on the island of Oahu to field-evaluate citrus plants that are potentially resistant to CTV. We will examine transgenic citrus plants for their ability to withstand the diverse CTV population of Hawaii.

Recently, we have initiated a project to study Citrus Blight (CB), which is a wilt disease of major importance for citrus grown in tropical and subtropical regions. CB is also a major hindrance to the local citrus industry in Hawaii. This research complements our current work on CTV, and contributes to making citrus a significant component of diversified agriculture in Hawaii. It was first reported in Hawaii in 1991, but was likely present in the islands much earlier. In Hawaii, many CB-affected trees are misdiagnosed as having *Citrus tristeza virus* (CTV)-related diseases due to the superficial resemblance between the two diseases and the high incidence of CTV in the islands. In recent years, thousands of citrus trees have been planted in Hawaii, most of them on citrange rootstocks. Due to the high susceptibility of this rootstock to CB, it is likely that a CB epidemic may soon develop in Hawaii, as has occurred in other regions affected with blight where susceptible rootstocks were utilized. In regions where CB is severe, 5-10% of trees are lost to the disease every year. Many consider CB to be the most economically serious disease of citrus in Florida where approximately 650,000 to 900,000 trees are lost to CB annually. In Sao Paulo, Brazil, an estimated 10 million trees are lost every year. In the Letsitele region of South Africa, researchers have estimated that CB would cost growers over $30 million (USD) from 1996 to 2000. As such, any insights into the etiology and pathogenesis-related gene expression associated with CB afflicted trees, and the development of practical strategies to manage CB obtained from this work, would not only benefit Hawaii's citrus industry, but also other citrus-producing regions in the world.

John Hu

Hometown: Shanxi, China
Joined CTAHR: 1991
Educational History: B.S. Plant Protection, Nanjing Agricultural University, China; M.S and Ph.D., Cornell University.
Specialization: Plant virology
Current Work: Detection, characterization, and management of plant viruses.
Languages Spoken: English, Chinese Mandarin

Selected Grants

Hu, J.S. and Sether, D. USDA-CSREES (RIPMCGP) "Environmentally-friendly strategies for management of mealybugs, ants, ampeloviruses, and mealybug wilt of pineapple" 2006-2008. $40,000.

Hu, J.S. and Sether, D. USDA-CSREES, T-STAR "Detection, distribution, and etiological role of invasive badnaviruses in pineapple" 2005-2008, $210,000.

Hu, J.S. et al. USDA-CSREES, Special Competitive Grant Program "Transgenic citrus plants with broad and durable resistance to CTV," 2004-2007. $165,000.

Selected Publications

Borth, W.B., Fukuda, S.K., Hamasaki, R.T., Hu, J.S., and Almeida, R.P.P. 2006. Detection and initial characterization of watercress yellows phytoplasma and its leafhopper vector in *Hawaii. Ann. Appl. Biol*. 149:357-363.

Melzer, M.J., Sether, D. M., Karasev, A. V., and Hu, J.S. 2008. Complete nucleotide sequence and genome organization of Pineapple mealybug wilt-associated virus 1. *Arch. Virol. 153:707-714*.

Sether, D. M., Melzer, M. J., Busto, J. L., Zee, F., and Hu, J. S. 2005. Diversity and mealybug transmissibility of Pineapple mealybug wilt associated viruses found in pineapple. *Plant Dis.* 89:450-456.

The research calabash

By Doug Vincent
Special Program Director for Grants and Contracts

New Faculty Orientation, August 21-22, 2008
The UH Manoa Center for Teaching Excellence will be hosting a **New Faculty Orientation** on **Thursday and Friday, August 21-22, 2008** in Kuykendall Hall 106 (Thursday) and the Campus Center Executive Dining Room (Friday). Events on Thursday, August 21, 2008 begin at 1:00 pm and conclude with the Chancellor's Reception at 4:30 pm. On Friday, August 22, 2008, the Orientation begins with a University of Hawaii Professional Assembly-sponsored breakfast at the Campus Center Executive Dining Room. The event concludes at 12:00 noon. For more information and to register go here: http://www.cte.hawaii.edu/Summary/NFO.html

UH ORS Changes to UH Form 5
The UH Office of Research Services is making changes to it's **UH ORS Form 5** Proposal and Contract Coordination Record Form **effective September 1, 2008**. Changes to new fields will be made to enable incorporation in to the new InfoEd Proposal Tracking System that will go live on September 1, 2008. If you've booked marked the old forms – come September 1, 2008, please refresh you forms so that you are using the correct forms. For more information, see the August ORS Newsletter here: http://www.ctahr.hawaii.edu/vincent/ORS_Newsletter_August_2008.pdf.

UH ORS Offers On-Line Training for Principal Investigators
UH Office of Research Service has developed a new **on-line training program for new principal investigators**. (Note: "Old" investigators, current staff and even graduate students might learn a bit, too!) Provided in about 60 minutes, is an overview of the entire process for submitting, receiving and managing grants, contracts and cooperative agreements. Start here to view the on-line training: http://www.hawaii.edu/ors/training/PI_Orientation/RM1T1P1_about_this_training.shtml

Registration Due Soon for UH ORS Grants and Contract Certification Program
The University of Hawaii Office of Research Services (ORS) will be again offering its Grant and Contract Certification Program this Fall Semester. The six-module program will be offered on Friday beginning in September. Space is limited so go to the ORS Web site to register. **Deadline for Registration is August 22, 2008.** On-line registration form is here: http://www.surveymonkey.com/s.aspx?sm=fr6c0W1xTX1yOS23INqhbw_3d_3d
If you complete all six modules, ORS will provide a certification. For more information see the ORS web site: http://www.hawaii.edu/ors/certification_info.html

Hawaii State Laboratories Division Offers Biosafety Training
The Hawaii State Laboratories Division is hosting a Biosafety Training entitled "LRN Fundamentals of Biosafety" on **Tuesday, August 26, 2008**. Two speakers from the Centers for Disease Control will be presenting information on BSL-3 Biosafety Laboratory Training. Program can be seen here: http://www.ctahr.hawaii.edu/vincent/Biosafety_Training_August_26.pdf. If you intend to attend this training, please RSVP by Thursday, August 21, 2008 to Ms. Rebecca Sciulli at rebecca.sciulli@doh.hawaii.gov or call at 808-453-5993.

Get Ready for TSTAR
The Requests for Applications for the Tropical and Subtropical Agricultural Research (TSTAR) Pacific Program will be out soon. While we still don't have a budget for FY 2009 funding, we will proceed as we have in the past. We expect the RFA will be out in late August with a ~November 1, 2008 due date. New this year, with the reauthorization of the TSTAR program, was the inclusion of the other American Pacific Land-Grants, i.e. American Samoa Community College; College of Micronesia and Northern Marianas College, along with University of Hawaii at Manoa and University of Guam. Stay tuned for more details.

Reminder: USDA CRIS AD 421 Annual Accomplishment Reports Due Soon
Reminder that USDA CRIS AD 421 Annual Accomplishment Reports or Final (termination) reports **will be due soon.** If you **have a USDA grant**, including TSTAR or USDA Special grants, your annual accomplishment report will be due within 90 days of the anniversary date. If your grant is ending the final (termination) report is due 90 days of the

termination date. You should receive notification from CSREES about these reports. Or you can view them at the USDA CRIS entry point here: http://cwf.uvm.edu/cris/. If you have a Hatch or McIntire-Stennis project, your annual accomplishment or final report will be due after the new federal fiscal year begins on October 1, 2008. It is prudent to begin gathering information about your projects now to avoid the rush.

UH offers free eWaste Disposal – October 20-25, 2008

The University of Hawai'i (UH) announced a free electronic waste recycling drive, **"Education & Government eWaste Disposal Days 2008**." The recycling program is open to Hawai'i residents, all public and private schools and universities, all City, County, State or Federal/Military branches in Hawai'i, small to medium sized businesses and non-profits. Events will be held between **October 20 and October 25**. Hawai'i residents are invited to drop off their eWaste on Saturday, October 25 at one of six drop off locations on UH campuses on the Big Island, Kaua'i, Maui or O'ahu, plus Kealakehe High School in Kailua-Kona. Please visit http://www.hawaii.edu/ewaste for more information including drop off sites, hours of operation and a list of acceptable electronics items. Public and private schools and universities, all City, County, State or Federal/Military branches in Hawai'i, small to medium sized businesses with fewer than 100 employees and non-profit organizations are asked to pre-register prior to participating in the free recycling event. The institutional events will be held from October 20 to October 24.

CTAHR Academic Program Review Final Report Available On-line

UH Policy establishes that academic units must undergo periodic examination by both faculty and administration. Since the reorganization of the College in 2000, new Departments and units within CTAHR had not been reviewed. During the previous academic year, CTAHR and its individual departments completed an Academic Program Review. Because CTAHR extends far beyond the classroom and the boundaries of the Manoa Campus, the report encompasses our tripartite mission of research, extension and instruction. The final report, dated July 19, 2008, is now available for download and you can do it here: http://manoa.hawaii.edu/ovcaa/academics/program_review/pdf/CTAHR_Final_Report.pdf

CTAHR's Wayne Nishijima Nominated for Manager of the Year

Wayne Nishijima, CTAHR's Associate Dean and Associate Director for Cooperative Extension was one of UH's nominations for the 2008 Governor's Award for Distinguished State Service. Wayne was nominated for the "Manager of the Year" Award. Regardless of the outcome in the State competition, Wayne, as one of UH's nominees will be honored at a later date by the UH Board of Regents.

Wayne Nishijima with UH's other nominee Roberta Enoki and Regent Allan Langdon (far left) and President David McClain (far right)

CTAHR Forms Ecosystem Services Working Group

Ecosystem Services are the benefits that people obtain from nature. USDA CSREES has proposed an ecosystem services research portfolio to address the link between ecosystem services and human well-being. To capitalize on this potential new funding source as well as other opportunities, CTAHR has organized an Ecosystem Services Working Group to better position itself as funding opportunities becomes available. Island ecosystems are, by their nature, inherently fragile. Hawaii is also blessed with 11 of the 13 climatic zones of the world – each with their own unique ecosystems, and each one presenting different challenges toward the preservation of the services it provides to Hawaii's citizens. Simply put, our environment provides for unique research opportunities – opportunities for multi-disciplinary research programs. Without staking stock of what we can or cannot do, we won't be able to respond effectively to these opportunities. If you are interested in joining the working group or

would like more information, please contact **Doug Vincent** by e-mail at vincent@hawaii.edu and indicate your interest. We will add you to the mailing list. To read postings on the Ecosystem Services Forums, go here: http://www.ctahr.hawaii.edu/CS/forums/31.aspx. To download our first attempt to develop common themes within CTAHR, go here: http://www.ctahr.hawaii.edu/vincent/CTAHR_Ecosystem_Services_Common_Themes.pdf.

CTAHR eXchange – Blogs and Forums
CTAHR eXchange is back online. Go here: www.ctahr.hawaii.edu/cs to read blogs. There are two blogs currently available: "Sustainable Agriculture" go here: http://www.ctahr.hawaii.edu/CS/blogs/sustainable_agriculture/default.aspx and to download the CTAHR Research News blog, go here: http://www.ctahr.hawaii.edu/CS/blogs/ctahr_research_news/default.aspx. We also have several active forums – you're welcome to join in the discussions on Invasive Species (http://www.ctahr.hawaii.edu/CS/forums/7.aspx); Grants and Grant Writing (http://www.ctahr.hawaii.edu/CS/forums/25.aspx); Ecosystem Services (http://www.ctahr.hawaii.edu/CS/forums/31.aspx): Specialty Crops Research Initiative (http://www.ctahr.hawaii.edu/CS/forums/41.aspx). If you have interest, in hosting a blog or ideas for a forum, contact **Doug Vincent** at vincent@hawaii.edu for more information.

Grant Writing for Graduate Students
ANSC/FSHN/TPSS 657 Grant Writing for Graduate Students will offered again Fall Semester 2008. Registration is restricted to CTAHR graduate students or by consent. The course is a 1 CR class that meets on Tuesdays at 12:00 – 1:15 pm. The class fills up early. Contact **Doug Vincent** at vincent@hawaii.edu for more information.

Grant Coaching Available Now
The CTAHR Office of Research is offering **grant coaching support** for individuals or small groups who are currently writing grants that have indirect cost returns. We are using RTRF funds to pay for this pilot program; therefore, it is important that we invest in opportunities that result in a return to that investment. Indirect cost returns provides CTAHR, college units and PIs (that generate the RTRF) with additional, highly flexible funding that can be used to support and expand research programs. We hope that by increasing our success rates in obtaining competitive grants, we will have greater direct and indirect costs to support our research activities. So if you are currently writing grants (or you plan to write a proposal) and want help developing, polishing and refining your proposal to meet an upcoming deadline, contact CTAHR grants specialist, **Sharee Pepper** at 956-8140 or by e-mail at spepper@hawaii.edu.

Dates and Events – Mark Your Calendars Today

2008 Stockman's Fall Field Day – August 22-23, 2008 (Hawaii) and August 25-26, 2008 (Maui)
The 2008 Stockman's Fall Field Day will be held on **August 22-23, 2008** at the **Mealani Experiment Station** at Waimea on the Island of Hawaii and on **August 25-26, 2008** on **Maui** (August 25 at the Kula Community Center and August 26 at the Eddie Tam Community Center in Makawao). For more information see: http://www.ctahr.hawaii.edu/ThorneM/Events/StockmansFallMailer_072308.pdf
Program can be found here: http://www.ctahr.hawaii.edu/ThorneM/Events/SFFDProgramAgenda_070808.pdf
This year, two speakers will be making presentations: Dr. Fred Provenza from Utah State University will be discussing behavior-based grazing management. Dr. Tom Field, from Colorado State University will be discussing beef marketing and ranch profitability.

Statewide Agriculture Conference Scheduled for September 4, 2008 (with satellite events).
CTAHR, the Hawaii Farm Bureau, the Agricultural Leadership Foundation of Hawaii and the Hawaii Department of Agriculture will sponsor a statewide agriculture conference **"Growing With Intention"** on **Thursday, September 4, 2008**. "All Ag Day for Ag" will be held at the Hawaii Convention Center. Statewide commodity groups will be encouraged to meet on Friday, September 5, 2008. For more information, see the Conference web site, here: http://www.hawaiiagconference.org/index.htm. Registration is here: http://www.hawaiiagconference.org/registration.htm. In addition, there will three industry conferences on the day after the conference – **Friday, September 5, 2008**. The **13th Annual Hawaii MIDPAC Horticultural Conference "Strengthening Our Industry through Knowledge"** sponsored by the Hawaii Export Nursery Association. Find more information here: http://www.hawaiiagconference.org/midpac.htm. Also on **September 5, 2008** will be workshop on bioenergy: **Bioenergy Master Plan: A Conversation with Hawaii's Agriculture Sector**, sponsored by CTAHR, DBEDT, HDOA, US Department of Energy

and UH Hawaii Natural Energy Institute. More information is here: http://www.hawaiiagconference.org/bioenergy.htm. Finally, a youth event, **Growing the Next Generation: A Partnership with Future Farmers of America** will be held on **September 5, 2008**. This event, sponsored by the Hawaii Department of Education Natural Resources Pathway Program and Hawaii FFA will focus on providing high school students opportunities in agricultural science education, leadership development and careers in natural resources and agriculture. All events will be held at the Hawaii Convention Center.

CTAHR Alumni and Friends Annual Alumni Banquet – Friday, September 12, 2008
The CTAHR Alumni Association and Friends will be hosting it annual banquet on **Friday, September 12, 2008** at the Japanese Cultural Center, 5:30 pm – 8:30 pm. Join us for good food, good fellowship with other CTAHR Alumni and Friends and of course, door prizes. Please **RSVP and register by September 3, 2008**. See the link for more information and the registration form. http://www.ctahr.hawaii.edu/vincent/2008_CTAHR_Alumni_Association_Banquet_Flyer.pdf or contact Erica Kubota at 956-8183 or by e-mail at eoshiro@hawaii.edu

Western Sustainable Agriculture Research and Education Workshop in Kona, September, 23-24, 2008.
The Outrigger Keauhou Beach Resort will be the home of the **USDA Western Regional Sustainable Agriculture Research and Education** (SARE) workshop scheduled for **September 23-24, 2008** at the Outrigger Keauhou Beach Resort: For more information about these conferences, go here http://www.ctahr.hawaii.edu/sustainag/Conferences.asp. To make reservations, contact the Outrigger Keauhou Beach Resort here: http://outrigger.com/hotels-resorts/hawaiian-islands/hawaii-big-island/keauhou-beach-resort. There will be two other conferences after the Western SARE meeting at the Outrigger Keauhou There will be a **Farmer-Chef Conference "Partnerships for Sustainable Local Food Production"** on September 24, 2008 -September 25, 2008 http://www.hawaiifruit.net/acfconf.htm and the **18th Annual Hawaii Tropical Fruit Growers Conference** will be on Friday, Saturday, September 26-27, 2008. Visit the HTFG web site for more information: http://www.hawaiitropicalfruitgrowers.org/index.html. (Conference info not yet uploaded). Tentative Agenda is here: http://www.hawaiifruit.net/htfgconf.htm

Mealani's "A Taste of the Hawaiian Range" – Friday, October 3, 2008
The Hilton Waikoloa Village Grand Ballroom will once again host CTAHR's 13th **Annual Mealani's A Taste of the Hawaiian Range Food Festival** on **Friday, October 3, 2008** at **6:00 pm.** CTAHR, in partnership with the Hawaii Cattlemen's Association, and the Big Island Farm Bureau, will host the "premier foodie event" in Hawaii, featuring island-grown meats, vegetables and other locally-grown foods. Mark you calendar and go to the web site for more information: http://www.ctahr.hawaii.edu/taste/index.asp. Time for grind!!

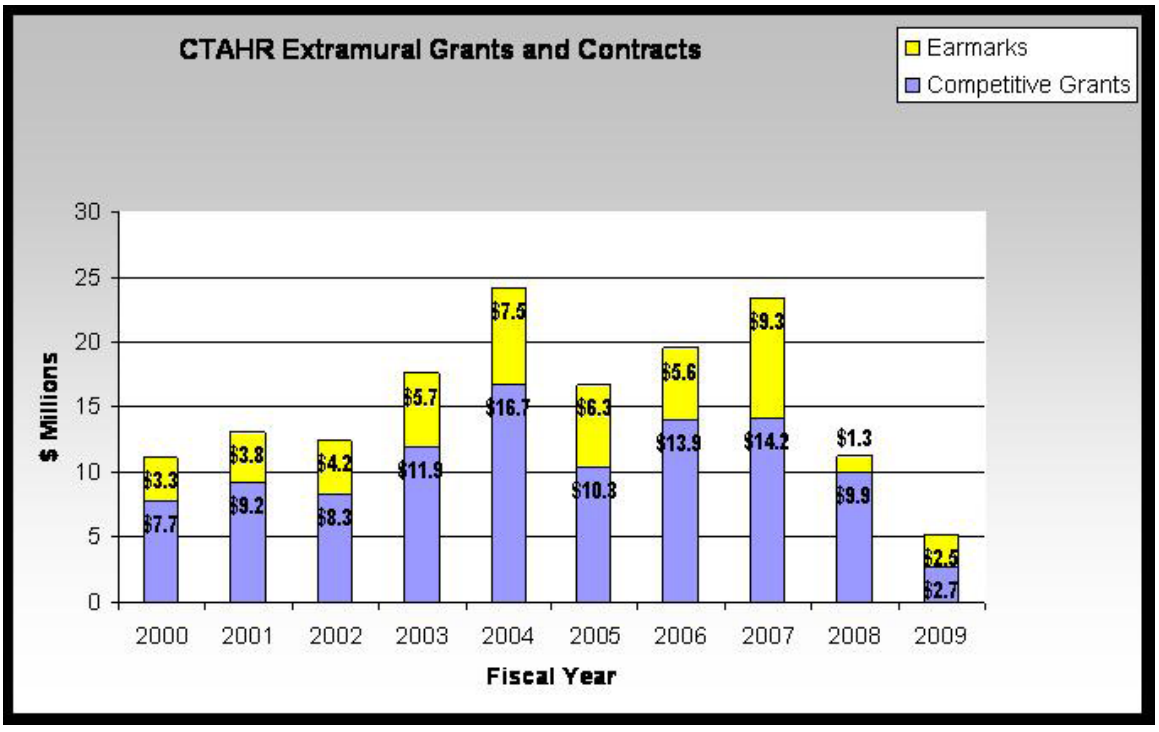
Grant funding in FY 2008 was dismal – FY 2009 looks better!

By Doug Vincent
Special Program Director for Grants and Contracts

When we last reported to you in May – June 2008 edition of the *CTAHR Research News*, the grants and contracts funding was for Hawaii FY 2008 was awful. At the time of the publication, with 7 weeks left in the fiscal year, CTAHR had only received 92 awards for $9.153 M. While more grants came in, we ended Hawaii FY 2008 at the LOWEST level of funding (11.197 M) since FY 2000 and the fewest awards (114) since FY 2003 when we only received 111 awards. The loss of most of the Federal FY 2007 earmarks showed itself in the Hawaii FY 2008. But that loss of about $4.5 M in funding does not fully explain the losses in funding or awards in Hawaii FY 2008 when compared with the previous year. Compared to FY 2007, CTAHR received only 47% of the funding and 62 fewer awards. The earmark awards generally would have amounted to 30-35 awards. It's a huge discrepancy not easily explained. Since 2000, on average we've received $17M in funding and 135 awards.

For FY 2009, things are looking better. Thus far we've received 47 awards for 5.186M in funding as of August 13, 2008 but note that nearly half the funding is coming from the restored earmarks. While we are grateful to our delegation for the hard work that they do for us, the reliance on earmarks will be difficult to sustain. The rhetoric in some members of Congress and from at least one of the presumptive Presidential candidates is that process of earmarking funds in the budget must end. Even though the new federal fiscal year will start on October 1, 2008, we are a long way from knowing what our funding will be. We need to plan for the day when the earmarks no longer exist, and to do so, if we wish to work, we need to go after competitive grants.

Below is a listing of grants and contracts received since our last publication of the CTAHR Research News. The table is separated into thirds. FY 2008 Grants and Contracts received since the May edition of CRN, FY 2008 Competitive Grants and Contracts (which among them include sizeable USDA and NSF grants) and the bottom third, are the earmark-funded awards received thus far this fiscal year. My hope is that by the end of the FY 2008 Hawaii fiscal year, we will see a considerable increase in the number of grants in the middle third section.



CTAHR Extramural Grants separated by earmark-funding awards and competitive awards. FY 2009 are year to date.
Source: UH Office of Research Services.

Since Last Publication of CRN in May

First name	Last name / Dept	Project Name	Funder	Amount
Michael	Duponte / HNFAS	Technical and Economical Feasibility of Produciton of Alternative Animal Feeds for Piggery, Big Island, Hawaii	County of Hawaii	$40,101
Ken	Grace / PEPS	Research, Assessment, and Educational Tools for Sustainable Termite Management	DA-Dept of Agriculture	186,450
Naomi	Kanehiro / HNFAS	Nutrition Service for Older Adults	Hawaii - Executive Office on Aging	49,900
Michael	Kawate / PEPS	IR-4 HQ Support for the Western Region Collaborator 2008 (Coffee Processing Equipment)	State University of New Jersey (Rutgers)	20,400
James	Leary / PEPS	The Evaluation of Native Hawaiian Plants as New Cover Crop Selections in Local Organic Vegetable Production	Hawaii - Dept. of Agriculture	38,856
Qingxiao	Li / MBBE	Studies on Risk Assessment of Hazardous Substances by Omics	Rural Development Admin - Korea	120,000
Creighton	Litton / NREM	The Invasive Species/Wildfire Cycle: Fuel Load, Microclimate, Fire Potential and Fire Behavior in Dominant Grasslands and Adjacent Forests	USDA Forest Service	54,982
Spencer	Malecha / HNFAS	Assessment of the Aquaculture Potential of Native Hawaiian Lobsters and Shrimp as Sustainable Co-culture Crops in Commercial Fish Cages	Hawaii - Dept. of Agriculture	24,461
Susan	Miyasaka / TPSS	Ensuring Sustainability of Taro for Future Generations	Hawaii - Dept. of Agriculture	35,019
Claire	Nakatsuka / FCS	Joint Family Support Assistance Program Operation Military Kids	Kansas State	75,000
Pratibha	Nerurkar / MBBE	Longevity Foods, Sirt Activation and Diabetic Dyslipidemia	National Institutes of Health	169,540
Brent	Sipes / PEPS	Nematode Resistant Rootstock Improvement for Hawaii Coffee Growers	Hawaii Agriculture Research Center	28,560
Brent	Sipes / PEPS	Improving and Extending the Superhero Status of the Sunn Hemp to Other Growers in Need of Help	Utah State University	10,000
Brent	Sipes / PEPS	Potato Cyst Nematode Survey	DA-Dept of Agriculture	13,800
Brent	Sipes / PEPS	State-wide Survey for Soybean Cyst Nematode Presence	DA-Dept of Agriculture	29,740
Raymond	Uchida / ADSC	Characterization of Hazardous Sustances	DOH - Office of Hazard Evaluation and Emergency Response	537,976
Koon-Hui	Wang / PEPS	Developing Management Strategies for a Newly Found Plant-Parasitic Nematode, Heliocotylenchus multicintus, Damaging Banana Plantings in Hawaii	Hawaii - Dept. of Agriculture	33,472
Ania	Wieczorek / TPSS	Testing the Potential Gene Flow from Genetically Engineered crops to Native Species in the Hawaiian Islands	Hawaii - Dept. of Agriculture	49,680
Mark	Wright / PEPS	Varroa Mite Surveillance and Control in Hawaii to Prevent Spread of the Pest on Honey Bees on the Island of Oahu to Honey Bees Statewide	Hawaii - Dept. of Agriculture	468,024
Loriena	Yancura / FCS	Research on Grandparents Raising Grandchildren in the Department of Education	Hawaii - Executive Office on Aging	4,000
Sylvia	Yuen / COF	Baby SAFE Program Report	DOH - Maternal and Child Health Branch	29,000
Since Last Publication of CRN in May			**21**	**$2,018,961**
FY 2008 (State)			**114**	**$11,197,959**

Competitive Grants and Contracts

First name	Last name / Dept	Project Name	Funder	Amount
Anne	Alvarez / PEPS	New Technologies for Assessment and Control of a Bacterial Pathogen Distributed by Seed in International Trade	DA-Dept of Agriculture	$15,000
Dulal	Borthakur / MBBE	Producing Mimosine-free Leucaena leucocephala Through Metabolic Pathway Engineering	National Science Foundation	272,132
Richard	Criley / TPSS	New Tropical Ginger Cut Flowers	International Cut Flower Growers Assocation	1,775
Jonathan	Deenik / TPSS	Subregional Showcase Conference for Hawaii	DA-Sustainable Agriculture Research & Education	25,000
Michael	Duponte / HNFAS	Technical and Economic Feasibility of Production of Alternative Animal Feeds	Hawaii-Dept of Agriculture	49,225
Michael	Duponte / HNFAS	Janong Natural Farming: A Completely Integrated Waste Management System for Small Swine Farms	Farm Pilot Project Coordination Inc.	41,000
Kent	Fleming / NREM	Farm Revenue Insurance Strategies to Management Marketing Risks in Hawaii	DA-Dept of Agriculture	29,998
Grace	Fong / FCS	Learning to Grow 2008-2009	Hawaii - Dept of Human Services	450,910
Chennat	Gopalakrishnan / NREM	Journal of Natural Resources Policy Research	Univ of Hawaii Foundation	3,300
Soojin	Jun / HNFAS	Design of a Continuous Flow Microwave Pasteurizer	Univ of Hawaii Foundation	6,000
Naomi	Kanehiro / HNFAS	Nutrition and Consultation and Review	Hawaii-Dept of Human Services	75,000
James	Leary / PEPS	Rapid Response Mitigation and Monitoring of Incipient Post-Fire Weed Invasions Surrounding the Kanakaleonui Bird Corridor in Humuula	Hawaii - Dept of Hawaiian Home Lands	14,000
Christopher	Lepczyk / NREM	Research Starter Grant-Understanding the Relationship Between Housing Density and Forest Structure on Avian Communities Across Forested Landscapes	National Science Foundation	50,000
Creighton	Litton / NREM	An Experimental Test of the Impacts of Rising Temperature on Carbon Input, Allocation, and Loss in Model Forests	National Science Foundation	134,980
Stuart	Nakamoto / HNFAS	Blueberry and Tea Research and Extension in Waimea 2008	County of Hawaii	13,000
Aurora	Saulo / TPSS	Mainstream Ethnic Foods of Concern to the US Marketplace and Their Impact on Food Safety	DA-Dept of Agriculture	487,619
Koon-Hui	Wang / PEPS	Rehabilitating Ex-urea and Ex-nematicide Addicts: Demonstrating How a Green Manure/solarization System Can Be Used to Improve Soil Health	DA-Natural Resources Conservation Service (NRCS)	75,000
Loriena	Yancura / FCS	Educating Family Caregivers on Health Care Fraud	Hawaii - Executive Office on Aging	25,000
Sarah	Yuan / COF	Developing Indicators for Quality of Life in Hawaii	Hawaii - Dept of Business & Economic Development	49,741
Sylvia	Yuen / COF	State Prevention Framework State Incentive Grant Evaluation	Hawaii - Dept of Health	299,980
Sylvia	Yuen / COF	Memorandum of Agreement Relating to Quality Care for Home-Based and Center-Based Child Care Providers	Hawaii - Dept of Human Services	517,022
Halina	Zaleski / HNFAS	Waiaka Hog Farmers Cooperative	Hawaii Agricultural Development Corporation	18,143
Conpetitive Grants and Contracts			**22**	**$2,653,825**

Earmark-Funded Grants and Contracts

First name	Last name / Dept	Project Name	Funder	Amount
Harry	Ako / MBBE	Identifications of Shrimp Muscle Regulatory Genes	DA-Cooperative State Research Service	$69,620
Jonathan	Deenik / TPSS	Soil Organic Matter Management to Improve Soil and Crop Quality on Intensive Vegetable Farms in Hawaii	DA-Cooperative State Research Service	66,000
Virginia	Easton-Smith / TPSS	Ecology and Management of Black Twig Borer on Coffee in Hawaii	DA-Cooperative State Research Service	32,443
Ali	Fares / NREM	Testing of Existing and Development of New Temperature and Salinity Corrected Capacitance Based Moisture Sensors as Irrigation Scheduling Tools	DA-Cooperative State Research Service	41,626
James	Friday / NREM	Developing Productivity Models and Silvicultural Guidelines for Growing and Managing the Native Hawaiian Hardwood Acacia Koa	DA-Cooperative State Research Service	69,767
John	Hu / PEPS	Detection, Distribution, and Etiological Roles of Badnaviruses in Hawaii	DA-Cooperative State Research Service	59,415
Mike	Kawate / PEPS	Decision Support Systems to Identify and Prioritize Pest Management Needs for Turfgrass, Cucurbits and Potted Orchids	DA-Cooperative State Research Service	99,750
Yong	Li / HNFAS	An Integrated Approach for the Quality Improvement of Guava Puree and Kava Beverage by a Non-Thermal Dense Phase Carbon Dioxide Pasteurization	DA-Cooperative State Research Service	48,844
Yong	Li / HNFAS	Survival, Recovery, and Quantification of Target Pathogenic Bacteria in Pineapple, Guava, and Orange Juices	DA-Cooperative State Research Service	108,326
Richard	Manshardt / TPSS	A Practical Phenotypic Marker for Early Determination of Sex in Papaya Seedlings	DA-Cooperative State Research Service	23,701
Russell	Messing / PEPS	Natural Enemies of Invasive Tephritid Fruit Flies: Evaluation of New Candidate Species	DA-Cooperative State Research Service	67,042
Wayne	Nishijima / ADMIN	Molecular Characterization of Disease Resistance Loci to Phytophthora in Carica Papaya	DA-Cooperative State Research Service	90,498
Robert	Paull / TPSS	Construction of a Molecular Cytogenetic Map of Papaya Chromosomes	DA-Cooperative State Research Service	129,986
Robert	Paull / TPSS	TPSS Critical Research Needs: Sustainable Farming Systems in Hawaii	DA-Cooperative State Research Service	158,841
Gernot	Presting / MBBE	Genomic Barcoding of Phytopathogenic Bacteria Important to Hawaii Agriculture	DA-Cooperative State Research Service	53,981
Gernot	Presting / MBBE	A DNA Barcode Database for Invasive and Native Plant Species Identification in Hawaii	DA-Cooperative State Research Service	114,536
Winston	Su / MBBE	An Integrated Approach for Efficient Production of Plant-derived Antibodies	DA-Cooperative State Research Service	135,416
Janice	Uchida / PEPS	Effective Strategies for Sustainable Vanilla Production in Hawaii	DA-Cooperative State Research Service	95,530
Janice	Uchida / PEPS	Molecular Identification and Characterization of Fusarium Oxysporum f.sp. koae, the Causal Agent of Koa Wilt in Hawaii	DA-Cooperative State Research Service	134,754
Doug	Vincent / ADMIN	Protecting Papaya from Pests and Diseases	DA-Dept of Agriculture	75,900
Doug	Vincent / ADMIN	Tropical and Subtropical Agricultural Research (T-STAR) for Hawaii: Management 2008	DA-Cooperative State Research Service	335,453
Charles	Weems / HNFAS	Luteal and Endometrial LH Receptor Function Modulated by PGE1, PGE2, PGF2a, LH, and Estrogen	DA-Cooperative State Research Service	151,124
Ania	Wieczorek / TPSS	Development of Unique Molecular Markers for Rapid Identification of Potentially Invesive Weeds in Hawaii	DA-Cooperative State Research Service	136,992
Mark	Wright / PEPS	Exploration, Genetic Characterization, and Host Range Testing of Parasitoids for Biocontrol of the Erythrina Gall Wasp, Quadrastichus erythrinae Kim	DA-Cooperative State Research Service	191,144
Jinzeng	Yang / HNFAS	Growth Hormone Receptor DNA Polymorphisms and Growth Traits in Grass-fed Cattle Populations	DA-Cooperative State Research Service	41,787
Earmark-Funded Grants and Contracts				**25 $2,532,476**
FY 2009 YTD				**$5,186,301**

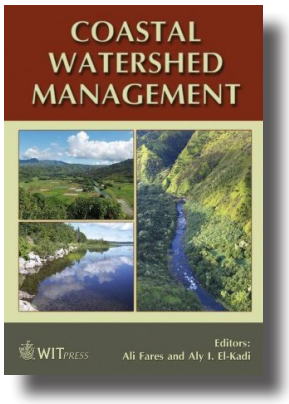
New faculty publications

Dulal Borthakur (MBBE)
Walton CB, Inos ABH, Andres OA, Jube S, de Couet HG, Douglas JT, Patek PQ, Borthakur D (2008) Immunization with hybrid recombinant Mycobacterium tuberculosis H37Rv proteins increases the TH1 cytokine response in mice following a pulmonary instillation of irradiated mycobacteria. *Vaccine* 26 26,4396-4402.

Awaya JD, Tittabutr P, Li QX, Borthakur D (2008) Pyruvate carboxylase is involved in metabolism of mimosine by *Rhizobium sp.* strain TAL1145. *Archives of Microbiology* DOI 10.1007/s00203-008-0384-4

Tittabutr P, Awaya JD, Li QX, Borthakur D (2008) The cloned 1-aminocyclopropane-1-carboxylate (ACC) deaminase gene from Sinorhizobium sp. strain BL3 in *Rhizobium sp.* strain TAL1145 promotes nodulation and growth of *Leucaena leucocephala*. *Systematic and Applied Microbiology* 31:141-150.

Ali Fares (NREM)
A. Fares and A.I. El-Kadi. 2008. *Coastal Watershed Management*. Progress in Water Resources, Vol 13. WIT Press. London. 432 pages.



Kenneth Grace (PEPS)
Gentz, M. C., and J. K. Grace. 2008. Native Boron Levels and the Effect of Boron Treatment on *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae), *Coptotermes acinaciformis* (Froggatt) (Isoptera: Rhinotermitidae), and *Mastotermes darwiniensis* Froggatt (Isoptera: Mastotermitidae). *Journal of Entomological Science* 43: 217-224.

John Griffis (TPSS)
Griffis, Jr. J.L. and M.M. Manners. Propagation by Leaf Cuttings. In: C. Beyl, and R. Trigiano, (ed.) *Plant Propagation Concepts and Laboratory Exercises.* CRC Press, Boca Raton, June, 2008, p. 245-251

Travis Idol (NREM)
Youkhana A and Idol T. 2008. First-year biomass production and soil improvement in *Leucaena* and *Robinia* stands under different pollarding systems. *Journal of Tropical Forestry* 20:181-187.

Morales RM, Miura T, and Idol T. 2008. An assessment of Hawaiian dry forest condition with fine resolution remote sensing. *Forest Ecology and Management* 255:1524-1532.

Soojin Jun (HNFAS)
J.Y. Shim, I.K. Cho, H.K. Khurana, Q.X. Li, AND S. Jun. 2008. Attenuated Total Reflectance–Fourier Transform Infrared Spectroscopy Coupled with Multivariate Analysis for Measurement of Acesulfame-K in Diet Foods. *Journal of Food Science*. Vol. 73, Nr. 5, 2008.

Harpreet Kaur Khurana, Il Kyu Cho, Soojin Jun, Jae Yong Shim, and Qing X. Li, 2008, Application of Multi Bounce Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy and Chemometrics for Rapid Determination of Aspartame in Soft Drinks, *Journal of Agriculture and Food Chemistry* 56:778-789

Krishnamurthy, K., H.K. Khurana, S. Jun, J. Irudayaraj, and A. Demirci. 2008. Infrared heating in food processing: An overview. *Comprehensive Reviews in Food Science and Food Safety*. 7(1):2-13

Soojin Jun, Sudhir Sastry, and Chaminda Samaranayake, 2007, Migration of Electrode Components during Ohmic Heating of Foods in Retort Pouches, *Innovative Food Science and Emerging Technologies* 8(2): 237-243

Soojin Jun and Sudhir Sastry, 2007, Reusable Pouch Development for Long Term Space Mission: 3D Ohmic Model for Verification of Sterility Efficacy, *Journal of Food Engineering* 80(4): 1199-1205

R. B Pandit, R. Somavat, S. Jun, B. Heskitt, and S. Sastry, 2007, Development of a light weight ohmic food warming unit for a Mars exploration vehicle. *World of Food Science*. Volume 2: Food and Space.

Christopher Lepczyk (NREM)
Christopher A. Lepczyk, Christopher J. Lortie, Laurel J. Anderson. 2008. An ontology for landscapes. *Ecological Complexity* 5 (2008) 272-279.

Doug Vincent (Administration)
Empey Campora C., J. Dierking, C.S. Tamaru, Y. Hokama, and D. Vincent. 2008. Detection of ciquatoxin in fish tissue using sandwich ELISA and neuroblastoma cell bioassay. *J. Clin. Lab. Analy.* 22(4):246-53.

Ania Wieczorek (TPSS)
Le Roux, J.J., Wieczorek, A.M., Meyer, J-Y. 2008. Genetic diversity and structure of the invasive tree *Miconia calvescens* in Pacific islands. *Diversity and Distributions* (DOI: 10.1111/j.1472-4642.2008.00504.x).

Le Roux, J. J. and Wieczorek, A. M. 2008. Isolation and characterization of polymorphic microsatellite markers from velvet tree, *Miconia calvescens* DC. (Melastomataceae). *Molecular Ecology Notes* (10.1111/j.1755-0998.2008.02102.x).

Le Roux, J., Wieczorek A.M., Wright, M.G., Tran, C. 2007. Super-Genotype: Global Monoclonality Defies the Odds of Nature, *Public Library of Science* ONE 2(7): e590. doi: 10.1371/journal.pone.0000590. 9 pp.

Le Roux, J. J. and Wieczorek, A. M. 2007 Isolation and characterization of polymorphic microsatellite markers from fireweed, *Senecio madagascariensis* Poir. (Asteraceae). *Molecular Ecology Notes* 7: 327-329.

Summer's over and it's time to get back to work!

By Doug Vincent
Special Program Director for Grants and Contracts

How time flies! New academic years are a time for renewed enthusiasm with new faculty, new students, new classes, new projects and yes, **new funding opportunities.** The new grant season is upon us and below we have listed lots of new opportunities for funding. I have enlisted the outstanding assistance of **Dr. Sharee Pepper**, CTAHR's grant specialist, to develop a list of open proposals. Together we will put together funding opportunities for your consideration and we hope, your action. But don't just rely on this list, there are several, very user-friendly means to find funding opportunities. The most obvious is **Grants.gov** (www.grants.gov). Grants.gov has a very robust search engine and if you want personalized service you can set up an e-mail subscription so that Grants.gov can e-mail you new notices using specific criteria – such by agency. Don't want to be troubled by Grants.gov or have a particular agency you want information – many agencies such as NSF and NIH will set up specific e-mail alerts. Or you can subscribe to RSS feeds from these agencies to notify you when new opportunities come open. Not keen about dealing with Grants.gov – the University of Hawaii maintains a subscription to the **Illinois Research Information Service (IRIS)**, (http://www.library.uiuc.edu/iris/). The IRIS system also has a very good search engine for grant opportunities and you can also set up an IRIS Alert using your e-mail address. Go here to set up an IRIS e-mail alert: http://iris.library.uiuc.edu/~iris/alert/. Another avenue is **Community of Science (COS)** – as a University of Hawaii member (if you have @hawaii.edu e-mail address, you can join Community of Science (http://login.cos.com/). COS is the largest source of grant information on the web. If you don't want to join COS, the UH Library maintains a portal to search for grant opportunities on COS, go here: http://micro189.lib3.hawaii.edu/ezproxy/details.php?dbId=430. If seeking private foundation funding is your desire – then Hamilton Library maintains a subscription to the Foundation Directory Online Professional – but you can only access it at the Library. There are many avenues to seek funding opportunities. You have to take some initiative but having done so; you can be set up to find specific opportunities in your quest for funding. Give it a try. In the mean time, peruse the list below and we'll be back next month with more opportunities.

$ - 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

Agricultural Grants

$ - USDA, ARS –
Evaluation of Woody Landscape Plant Germplasm
Deadline: October 15, 2008
URL: http://www.ctahr.hawaii.edu/vincent/WLPCGCRFP08.pdf

$ - USDA, CSREES
Critical Issues: Emerging and New Plant and Animal Pests and Diseases
Proposal Deadline: September 30, 2008
http://www07.grants.gov/search/search.do;jsessionid=H0HBC21DQnVBn5CCPqypTBQLf52F396VdNT05VynCrhbCh46ZKZc!834976773?oppId=15582&flag2006=true&mode=VIEW

$ - USDA, CSREES
Western Sustainable Agricultural Research and Education Program
Professional Development Program Grants
Proposal Deadline: November 3, 2008
http://wsare.usu.edu/grants/docs/RFA_PDP.pdf

$ - USDA, CSREES
Western Sustainable Agricultural Research and Education Program
Farmer/Rancher Research & Education Grants
Proposal Deadline: December 5, 2008
http://wsare.usu.edu/grants/docs/RFA_FRG.pdf

$ -USDA, CSREES
Western Sustainable Agricultural Research and Education Program
Professional & Producer Grants
Proposal Deadline: December 5, 2008
http://wsare.usu.edu/grants/docs/RFA_PP.pdf

$ - USDA, Agricultural Marketing Service
Specialty Crop Block Grant Program
Proposal Deadline: March 5, 2009
http://apply.grants.gov/opportunities/instructions/oppUSDA-AMS-SCBGP-030509-cfda10.169-instructions.doc

$ -USDA, CSREES
Western Sustainable Agriculture Research and Education Program
Sustainable Agriculture Tours
Proposals: Open until funding is exhausted
http://wsare.usu.edu/grants/docs/RFA_SAT.pdf

Education Grants

$ - USDA, CSREES – Grantsmanship Workshops and Writing Winning Grants Workshops
Washington, DC (sep 30- Oct 1) & Salt Lake City (Oct 7-8)
Deadline extended to August 29, 2008
http://extension.usu.edu/grantsmanship

$ - National Science Foundation (NSF)
Informal Science Education**Letter of Intent Due: September 18, 2008**
Proposal Deadline: December 18, 2008
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08547

$ - U.S. Department of Education
Special Education Research CFDA 84.324A-2
Evaluation of State and District Evaluation Programs and Policies CFDA 84.305E
Education Research and Development Centers CFEA 84.305C
Education Research Training CFDA 84.305B
Special Education Research Training CFDA 84.324B
Proposal Deadlines: October 26, 2008
http://a257.g.akamaitech.net/7/257/2422/01jan20081800/edocket.access.gpo.gov/2008/pdf/08-911.pdf

$ - NSF
Graduate Research Fellowship Program
Deadlines: November 3-12 (depending on field of study)
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08593

Environment, Water, Energy, Invasive Species Grants

$ - NOAA, National Marine Fisheries Service (NMFS)
Protected Species Cooperative Conservation
Deadline: September 17, 2008
http://www.grants.gov/search/search.do;jsessionid=LHGGL1rlSfvvNvKFnJpbPQvVJlSdlRWkyrhFlpQtNyypXb3v6WZR!-672131886?oppId=42309&flag2006=false&mode=VIEW

$ - Hawaii Tourism Authority (HTA)
Natural Resources Program
Deadline September 22, 2008
http://www.hawaiitourismauthority.org

$ - U.S. Department of Interior, U.S. Fish and Wildlife Service (FWS)
Coastal Programs
Proposal Deadline: September 30, 2008
http://ecos.fws.gov/coastal/viewContent.do?viewPage=home

$ - U.S. Department of Interior, FWS
Partners for Fish and Wildlife Program
Proposal Deadline: September 30, 2008
http://ecos.fws.gov/partners/viewContent.do?viewPage=home

$ - U.S. Department of Interior, FWS
Small Grant Program
Deadline: October 30, 2008
http://www.fws.gov/birdhabitat/grants/nawca/Small/index.shtm

$ - U.S. Department of Energy, Chicago Science Center
Energy Frontier Research Center
Letter of Intent Due: July 1, 2008 (optional)
Proposal Deadline: October 1, 2008
https://e-center.doe.gov/iips/faopor.nsf/UNID/933104E42D0185E58525742100694C78?OpenDocument

$ - U.S. Environmental Protection Agency
Broad Agency Announcement for Conferences, Workshops and/or Meetings
Proposal Deadlines: December 9, 2008
http://es.epa.gov/ncer/rfa/2008/2008_baa.html

$ - 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

Families, Youth and Children Grants

$ - National Gardening Association
Youth Garden Grants
Proposal Deadline: November 15, 2008
http://www.kidsgardening.com/YGG.asp

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

Financial Grants

$ - U.S. Department of Health and Human Services, Administration for Children and Families
Assets for Independence Demonstration Grants
Proposal Deadlines: January 15, 2009, March 25, 2009
http://www.acf.hhs.gov/grants/open/HHS-2008-ACF-OCS-EI-0053.html

Money Management International Financial Education Foundation
Financial Education Grants
Proposal Deadline: rolling – applications accepted year round
http://www.mmifoundation.org/GrantSeekers.asp

Health, Nutrition, Food, Biomedical Grants

$ - HHS, FDA
Food Safety Research: Investigations Focused on Promoting the Safety of Produce
Deadline: September 2, 2008
URL: http://edocket.access.gpo.gov/2008/pdf/E8-12159.pdf

$ - Robert Wood Johnson Foundation (RWJF)
Health Disparities Research Program
Deadline: September 18, 2008
http://fconline.foundationcenter.org/pnd/15014579/rwjforg

$ - U.S. Department of Health and Human Services, National Institutes of Health (NIH)
Improving Diet and Physical Activity Assessment (RO1)
Letters of Intent Due: January 16, 2009 (optional)
Proposal Deadline: February 16, 2009
http://grants.nih.gov/grants/guide/pa-files/PAR-07-259.html

$ - U.S. Department of Health and Human Services, NIH
Improving Diet and Physical Activity Assessment (R21)
Letters of Intent Due: January 16, 2009 (optional)
Proposal Deadline: February 16 & May 7, 2009
http://grants.nih.gov/grants/guide/pa-files/PAR-07-259.html
http://www07.grants.gov/search/search.do;jsessionid=LHSfIHFSL4pBXG0Dtb7PpzkdDBMHJSl6vhyGyQ1tpTnGcSJ2WfZD!488375993?oppId=8282&flag2006=true&mode=VIEW

$ - NIH
Pilot and Feasibility Clinical Research Studies In Digestive Diseases And Nutrition
Deadline : May 7, 2009
http://www07.grants.gov/search/search.do;jsessionid=LHSfIHFSL4pBXG0Dtb7PpzkdDBMHJSl6vhyGyQ1tpTnGcSJ2WfZD!488375993?oppId=8805&flag2006=true&mode=VIEW

$ - NIH
Exploratory/Developmental Clinical Research Grants in Obesity (R21)
Deadline : May 7, 2009
http://www07.grants.gov/search/search.do;jsessionid=LHSflHFSL4pBXG0Dtb7PpzkdDBMHJSl6vhyGyQ1tpTnGcSJ2WfZD!488375993?oppId=8575&flag2006=true&mode=VIEW

Humanities Grants

$ - National Endowment for the Humanities
Collaborative Research Grants
Proposal Deadline: November 4, 2008
http://www.neh.gov/grants/guidelines/collaborative.html

Rural and Community Development Grants

$ - 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

$-Farm Foundation Grants
Deadline: Applications accepted on an ongoing basis
http://www.farmfoundation.org/news/templates/comm_template.aspx?articleid=357&zoneid=67

Science Grants

$ - USDA, CSREES
FY 2008 Small Business Innovation Research Program (SBIR) – Phase I
Deadline: Sep 04, 2008
http://www.csrees.usda.gov/funding/rfas/sbir_rfa.html

$ - NSF (and USDA)
Interagency Opportunities in Metabolic Engineering
Deadline: October 22, 2008
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08588

$ - NSF
Industry/University Cooperative Research Centers Program
Deadline: January 2 2009 (Letter of Intent)
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08591

$ - NIH, CDC, & FDA
PHS 2008-02 Omnibus Solicitation of the NIH for Small Business Technology Transfer Grant Applications (Parent STTR [R41/R42]) & Small Business Innovation Research Grant Applications (Parent SBIR [R43/R44])
Deadline: January 7, 2009
http://www07.grants.gov/search/search.do;jsessionid=LHSflHFSL4pBXG0Dtb7PpzkdDBMHJSl6vhyGyQ1tpTnGcSJ2WfZD!488375993?oppId=16619&flag2006=true&mode=VIEW

$ - National Science Foundation
Science, Technology, and Society
Proposal Deadlines: February 1, 2009
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08553

Training

$ - NSF
Graduate Research Fellowship Program
Deadline: November 03, 2008 - Interdisciplinary Fields of Study;
November 05, 2008 - Mathematical Sci; Computer and Info Sci and Engineering;
November 06, 2008 - Social Sciences; Psychology; Geosciences;
November 07, 2008 - Life Sciences;
November 10, 2008 - Chemistry; Physics and Astronomy;
November 12, 2008 - Engineering
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08593

$ - Human Frontier Science Program
Short Term Fellowship Program
Proposal Deadline: rolling – applications accepted year round
http://www.hfsp.org/how/appl_forms_STF.php

UH, Hawaii and Regional Grants

$ - Hawaii Community Foundation
Hawaii People's Fund Grants
Proposal Deadline: September 1, 2008
http://www.hawaiipeoplesfund.org/grantmaking/

$ - Hawaii Audubon Society
Hawaii Audubon Society Research Grants
Proposals Deadline: September 1, 2008
http://www.hawaiiaudubon.com/haspdf/grant.pdf

$ - Hawaii Community Foundation
Cooke Foundation Grants
Proposal Deadline: September 1, 2008
http://www.cookefdn.org/

$ - Hawaii Community Foundation
Rev. Takie Okumura Family Fund – Children and Youth
Proposal Deadline: September 15, 2008
http://www.hawaiicommunityfoundation.org/doc_bin/grant_rfps/2008/Okumura_RFP_2008.pdf

$ - University of Hawaii (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_f.pdf

Other

$ - Department of Homeland Security (DHS) Science and Technology (S&T) Directorate
International Research in Homeland Security Science & Technology Mission Areas **Deadline: September 30, 2008**
http://www.grants.gov/search/search.do;jsessionid=LHGGL1rlSfvvNvKFnJpbPQvVJlSdlRWkyrhFlpQtNyypXb3v6WZR!-672131886?oppId=40993&flag2006=false&mode=VIEW

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