



## Letter from the Director

Aloha and Happy New Year!

2014 has gotten off to a productive start for CTSA. Last week, we held our Board of Directors Meeting in Manoa, Oahu. The primary purpose of this annual meeting is to review and approve the CTSA Plan of Work.

At this year's meeting, members reviewed, discussed, and approved the six projects that comprise the FY2013 Plan of Work. In response to the USDA's recent emphasis on project impacts, the Board of Directors paid particular attention to reviewing the potential impacts and economic viability of each FY13 proposal; I greatly appreciate their participation and dedication to CTSA and its mission. We are excited to support this next round of projects aiming to improve local aquaculture and bring new economic opportunities to the region. The revised Plan of Work will now go to the USDA for final approval.

Moving forward, we are gearing up for our 2014 cycle. In the next couple of months, we will begin to develop the strategic priority areas to address in this year's Request for Pre-Proposals. Keep an eye out for our requests for your participation; we greatly appreciate your input. As always, please do not hesitate to contact us if you have any questions, comments, or concerns.

Mahalo,  
*Cheng-Sheng Lee*  
 Executive Director, CTSA

## **\*New CTSA Publication\* How To Build and Operate a Simple Small-to-Large Scale Aquaponics System**



*CTSA-sponsored researchers built this rooftop aquaponics garden at the Institute for Human Services*

## In This Issue

Letter from the Director  
 \*NEW\* CTSA Aquaponics Publication  
 CTSA 2013 AAR  
 Industry Updates & Announcements  
 January AquaClip

## Quick Links

[www.ctsa.org](http://www.ctsa.org)  
[www.oceanicinstitute.org](http://www.oceanicinstitute.org)

[Join our Mailing List!](#)

Researchers from the University of Hawaii CTAHR, in collaboration with CTSA, have published a new aquaponics 'How-To' manual based on simple and efficient technology. The manual was produced as part of the project "Aquaponics for Hawaii and the U.S. Pacific Islands: Technology Refinement and Transfer to the Commercial Sector."

This manual highlights some of the research findings of the project (specifically regarding denitrification), and provides step-by-step instructions on how to construct and maintain a simple small, medium, or large scale aquaponics operation. [Click here to download the manual on the CTSA website.](#)

## CTSA 2013 Annual Accomplishment Report

CTSA recently completed the 2013 [Annual Accomplishment Report](#). The report features a 2-page summary of each CTSA project active in 2013.

Since its inception in 1986, CTSA has funded over 240 research, demonstration, development, and extension projects. Of the 19 projects active during 2013, the five summarized below reached completion prior to December 31:

### "Pacific Aquaculture Development and Extension Support for the U.S. Affiliated Pacific Islands, FY 2011" - *PI: Masahiro Ito*

**Summary:** A lack of local skilled technicians has always been a bottleneck in aquaculture development in Micronesia. To surmount this obstacle, CTSA has funded years of work to train Micronesian technicians in sea cucumber and pearl aquaculture through the College of Micronesia (COM) Land Grant Program. The goals of this project were to help build capacity for aquaculture in the region and to utilize the resources of existing trained technicians to transfer the technology to Yap.

#### **Results at a Glance**

- Hatchery protocols for both sandfish as well as black teatfish were standardized and summarized, and will be explained in a manual.
- Several local technicians received training under this project. In Pohnpei, three technicians acquired both sandfish and black teatfish hatchery techniques; the black teatfish *H. whitmaei* was reared to the settlement and juvenile stage for the first time in history
- Experimental asexual propagation of the greenfish *Stichopus chloronotus* provided basic information about survival rates. The greenfish asexual propagation has potential to be used as an aquaculture method in places where hatchery operation is not feasible, such as remote islands.
- Work group members including atoll communities and small families in Pohnpei conducted local sales and the overseas workgroup members promoted branding and sales development of the Micronesian pearl products in Japan.

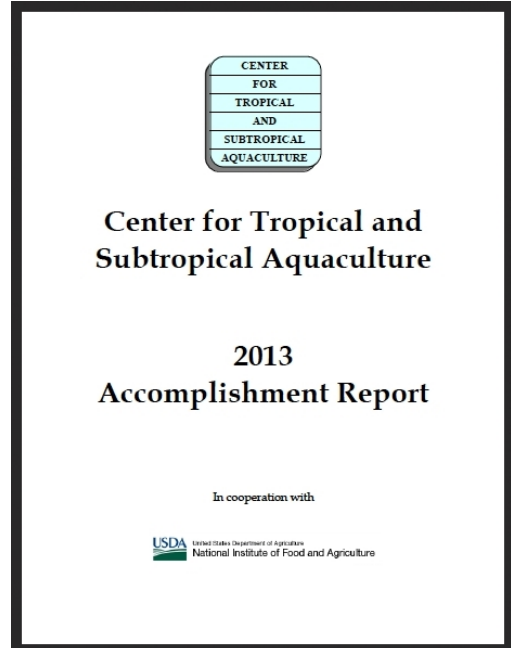
### "Mitigating the Diseases of Freshwater Cultured Fish Species in Hawaii and the Pacific Region" - *PI: Clyde Tamaru, Ph.D.*

**Summary:** The overall goal of the project was the continued expansion and diversification of the aquaculture industry in Hawaii and the region. The project sought to achieve that goal by conducting an initial epidemiology study of a Francisella-like bacteria (FLB) that would provide details of incidence and distribution of the pathogen in Hawaii and the region. Information obtained formed the basis for future research and extension efforts that may lead to the control of the Fno disease.

#### **Results at a Glance**

- Demonstration of asymptomatic carriers of Fno-DNA, and the fact that they can remain at least a year after recovering from the initial clinical outbreak of the disease.
- Exposure of the blue tilapia *O. aurea* to asymptomatic carriers as well as during an active infection did not result in a clinical outbreak of the disease.
- Estimation of the prevalence of Fno among feral stocks of tilapia are over 60% and cultured stocks at over 45% and 20%, respectively.
- Demonstration of other fish species (e.g., barracuda and Chinese catfish) being Fno positive
- Removing infected stock from an aquaponic system and allowing it to remain fallow for two weeks is a means of ridding the system of the pathogen.
- Preliminary evidence that the pathogen may not be vertically transmitted.

### "Aquaponics for Hawaii and the U.S. Pacific Islands: Technology Refinement and



## **"Aquaponics for Hawaii and the U.S. Pacific Islands: Technology Refinement and Transfer to the Commercial Sector" - PI: Kent Kobayashi, Ph.D.**

**Summary:** The overall goal of this work was the expansion of the aquaculture profession. The specific goals were to start commercial aquaponics farms for the purpose of economic development, sustainability, and food self-sufficiency. Aquaculture production in the region is small and a majority of the farmers are over the age of 50. Aquaponics is exciting to young people because it is environmentally friendly (green). It takes waste products from fish culture, remediates them, and uses it to grow healthful vegetables for people to eat. Aquaponics enhances food security and provides a sustainable supply of food for local consumption. The technology also generates local employment opportunities, as well as revenue streams.

### **Results at a Glance**

- The research group provided extensive technical assistance to five aquaponics farms: Iliili Farm, Fred Lum Farm, Otsuji Farm, and Mari's Gardens on Oahu, and a farm in American Samoa. They also helped to establish a rooftop aquaponics garden at the Institute for Human Services shelter in Honolulu.
- Work on the scientific aspects of the system has led to increased knowledge about appropriate media for plant roots, biofiltration approaches, the Nutrient Flux Hypothesis, and oxygenation/denitrification issues.
- Research found that fish feed best when dissolved oxygen (DO) levels are 5 mg/L or above. Research also determined that fertilizer nitrate (which is required at about 100 mg/L) fell to very low levels when DO values were <2 mg/L.

## **"Collection and Health Certification of Coralgroupers Broodstock in the Mariana Islands" - PI: Hui Gong, Ph.D.**

**Summary:** The purpose of this project was to begin the process of establishing a domesticated, high health population of two species of coralgroupers, *Plectropomus leopardus* and *P. leavis*, commonly known as the Leopard and the Giant coralgrouper respectively. Coralgroupers are suffering from over fishing on Guam to the point where their natural recruitment may be threatened, and there is interest to restore the natural stocks of these two species. Furthermore, the aquaculture industry of Guam has a strong desire to develop a local, high-end product that can be marketed as a live, in-restaurant product to the tourist trade.

### **Results at a Glance**

- After experiencing serious difficulty obtaining fish, researchers were able to obtain 35 live *P. areolatus* from 4 shipments that originated from Palau and Chuuk. This population was given health examinations, including PCR diagnosis of VNN and Iridovirus, and researchers gained knowledge of rearing and handling this specific species.
- By the end of this project, researchers had 26 live *P. areolatus* ranging from 202g to 1790g. VNN was not detected in the gill samples of the live fish. Thus, they could be used to establish a broodstock base to generate high health offspring upon further testing by PCR methods.

## **"DNA-Based Identification and Selection of High-Growth Tilapia in Hawaii, Years 1 and 2" - PI: Jinzeng Yang, Ph.D.**

**Summary:** The lack of genetically suitable seedstock of tilapia has been a limiting factor for aquaculture of the species in Hawaii. Importation of tilapia strains to Hawaii has been challenged by environmental concerns and field-testing experiments. However, tilapias existing in the wild and on farms in Hawaii can be used as genetic resources for developing high-growth tilapia and negate the need to import new strains. Microsatellite genotyping and gene expression analysis have been proven as effective tools for genetic selection of superior animals with desirable production traits. The primary objective of this project was to develop fast-growing tilapia by using existing strains and hybrids in Hawaii.

### **Results at a Glance**

- Researchers established the MtDNA CR PCR and DNA sequencing protocol for tilapia.
- A total of 420 tilapia fin samples were collected from 13 populations from local farm and wild population sites in Hawaii, and DNA was extracted and used for PCR.
- Seven different tilapia species and one hybrid have been identified, including *O. aureus*, *O. mossambicus*, *O. urolepis*, *O. niloticus*, *S. melanotheron*, *T. rendali*, and *O. niloticus* × *O. mossambicus*.
- The results from this study confirm that *O. niloticus* and its hybrids exist in the wild and captive sites in Hawaii.
- Employed qRT-PCR arrays to identify significant genes related to muscle formation and growth

-----  
[Click here to view/download the full report.](#)

## **Industry Updates & Announcements**

*NewsFlash from AquaContacts on January 16, 2014.*

### **Withdrawal of Formalin, used to control parasites on fish; and Tricaine Methanesulfonate (MS 222), used for anesthesia of fish - The FDA Center for Veterinary Medicine**

On January 16, 2014, the FDA Federal Register released a Final Rule and Notice titled "Withdrawal of Approval of New Animal Drug Applications; Argent Laboratories; Formalin; Tricaine Methanesulfonate."

To view the ruling, visit the following website: <http://www.gpo.gov/fdsys/pkg/FR-2014-01-16/html/2014-00721.htm>

Questions may be directed to David Alterman who is with the FDA Center for Veterinary Medicine in Rockville, Maryland at 240 453 6843; e-mail: [David.Alterman@FDA.HHS.gov](mailto:David.Alterman@FDA.HHS.gov)

## **AquaClip ~ 'BAP for Finfish Hatcheries' Draft Released for Public Comment**

### **BAP Hatchery Finfish Standards Draft Released**

*By SeafoodSource Staff [www.SeafoodSource.com](http://www.SeafoodSource.com). January 28, 2014*

A draft of the Best Aquaculture Practices (BAP) hatchery and nursery standards for finfish, crustaceans and mollusks is now available for public comment for 60 days.

The BAP hatchery standards for finfish, crustaceans and mollusks apply to all species for which BAP farm standards exist, including shrimp, salmon, tilapia, catfish, pangasius and mussels.

They apply to all aquaculture facilities that produce eggs and/or juvenile aquatic animals for live transfer to other aquaculture facilities. Production facilities include ponds or tanks on land with directed inflows and outflows of water, trays located intertidally on the foreshore, or rafts or cages (net pens) floating in a body of water. They do not apply to facilities that produce only aquatic animals for harvest and slaughter for human consumption.

Currently, BAP hatchery standards exist for only shrimp. Once finalized, the new BAP hatchery standards for finfish, crustaceans and mollusks will replace the existing BAP shrimp hatchery standards. Also, the new BAP hatchery standards would allow companies to pursue four-star designation for species such as salmon, tilapia, catfish and pangasius.

[Click here to read the full article.](#)

The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established and funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) under grants 2008-38500-19435, 2010-38500-20948, and 2012-38500-19566. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development. CTSA was established in 1986 and is jointly administered by the Oceanic Institute and the University of Hawaii.



Try it FREE today.

This email was sent to mbrooks@oceanicinstitute.org by [mbrooks@oceanicinstitute.org](mailto:mbrooks@oceanicinstitute.org) | [Update Profile/Email Address](#) | Instant removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).

Center for Tropical and Subtropical Aquaculture | 41-202 Kalaniana'ole Highway | Waimanalo | HI | 96795