

# REGIONAL NOTES

CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

## Pohnpei Pearl Project Enters Commerical Phase

The College of Micronesia (COM) Land Grant Program plans to help launch at least four locally-owned private pearl oyster farms this summer as it ends the first year of Phase III, or the commercialization phase, of its “Pearl Project.” Two farms in Pohnpei and two to three community-based farms in the outer islands will mark the beginning of what stakeholders hope will become a thriving industry in Pohnpei.

“Once we show that pearl farms can be successful, then others will feel more comfortable and get into the action,” says Singero Singeo, executive director of the Land Grant Program at the College of Micronesia, which has its central office in Pohnpei, Federated States of Micronesia. The commercial phase began last summer with funding from USDA/CSREES and the U.S. Department of the Interior’s Technical Assistance Office.

The goal is to harvest at least 10,000 (and up to 30,000) pearls as early as 2010 or as late as 2011 in order to go to auction in Guam and/or nations such as Japan, says Singeo. By 2008 (or 2009), then, the industry’s private farms must reach an annual production level of 100,000 pearl oysters of a size suitable for seeding. Once an oyster is seeded, it takes almost two years for it to produce a pearl of appropriate market size and quality. Also in 2008, the first private farms — launched this summer with seeded oysters from the COM’s project — will conduct a test harvest with the goal of 3,000 to 5,000 pearls.

Sound like an impossible dream? Not so, suggests Masahiro Ito. The project’s chief scientist, Ito claims local men regularly produce at or above the level necessary to reach these industry goals: 20,000 to 30,000 three-month-olds from a single hatchery run. They are on schedule to complete seven runs this year, four of them by mid-June, he says. Although not all the spat produced at the hatchery (to the size of 1 to 2 mm) eventually reaches optimum size for seeding, experience has shown that 80 percent of the spat that growout in an ocean nursery for three months become two-year-old oysters ready for seeding.

The COM Land Grant employs six local technicians at its hatchery and other facilities — all of whom have proven they can successfully and regularly spawn spat and growout seeded oysters without assistance. Training in grafting and seeding from a master technician began last year, and two local people will continue with this training.

From the beginning of the Pearl Project, the plan has focused on eventual commercialization and the creation of an export market.

The heart of the project, however, has been skills training for Micronesians. “Training local people is integral to the sustainability of the project and ultimately the industry,” says Singeo. The project has invested a great deal in training opportunities. “One expert cannot handle it all. It was clear from the start of the project that we needed to train local technicians,” Ito says.

Over the last four years, the project has trained more than 70 people from local communities in ocean grow-out techniques and farm



Photo by Masahiro Ito

*The first two harvests of the COM Land Grant’s Pearl Project, conducted in 2004 and 2005, produced high-quality pearls like those pictured above.*

maintenance and more than 10 people in hatchery techniques, including microalgae culture, broodstock and farm site selection, farm set-up and ocean nursery culture, says Ito. Training began the first year in 2001, as the project team and trainees turned a run-down warehouse into a low-tech, efficient hatchery at Nett Point in Pohnpei and had their first successful spat run in the project’s first nine months.

The target was unemployed people. “Usually, you pay tuition to learn. They can’t do that here and don’t have the money,” Ito says. Instead, the project gave trainees a stipend for lunch and transportation. The project has also employed local people on a casual hire basis, since the workload is not consistent throughout the year. The best

## Letter from the director



To fulfill CTSA's mission to enhance viable and profitable U.S. aquaculture, we must work closely with industry in our region. The stronger the commitment made by the private sector, the more technical assistance CTSA should provide. In late February, I made another journey to Saipan, where I saw continued interest in aquaculture as a means to economic development in the CNMI. I also saw how local businessman Anthony Pellegrino has made a significant investment in building a sustainable shrimp farm.

That kind of commitment is exciting to see and essential to building a commercial industry in the U.S.-affiliated Pacific Islands. CTSA will work with research institutions near Saipan to help budding operations like Pellegrino's Marianas Sweet Shrimp assess and address areas where they need technical assistance. After all, an industry that is growing and making money means CTSA's own commitments are well placed and successful.

*Cheng-Sheng Lee*



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Editor: Kathryn Dennis  
CTSA, University of Hawaii  
3050 Maile Way, Gilmore Hall 104  
Honolulu, Hawaii 96822-2231  
Tel: (808) 956-3529  
Fax: (808) 956-5966  
E-mail: kedennis@hawaii.edu  
Web site: www.ctsa.org

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# AQUACLIPS

## **Cyanotech tries to diversify in face of falling sales**

*By Dave Segal, The Honolulu Star-Bulletin, February 9, 2006*

Cyanotech Corp. said yesterday that demand for its products continues to decline, and the company is broadening its search for other uses, including in the dog food market, to try to revive slumping sales. The Big Island company, which produces human nutritional supplements and animal feed from microalgae, also said it is beginning a marketing campaign this quarter for its nutritional supplement BioAstin Natural Astaxanthin.

Cyanotech posted a fiscal third-quarter loss of \$294,000, or 1 cent a share, in the period ended Dec. 31 as sales plunged 27 percent to \$2.3 million. A year earlier, Cyanotech had net income of \$326,000, or 2 cents a share, on revenue of \$3.2 million.

Gerald Cysewski, chairman, president and chief executive of Cyanotech, blamed the shortfall on decreased order levels for Spirulina products and continued reduced demand for NatuRose in Japan aquaculture. NatuRose, an animal feed derived from natural astaxanthin, allows farmers to grow sea bream — called tai in Japan — with a pink flesh pigmentation. Cysewski said at the end of the fiscal second quarter that the company was looking at marketing NatuRose as a way of giving tropical fish more vivid-colored skin.

Cysewski also visited China and Hong Kong in November and said yesterday that distribution agreements signed with a Chinese-American joint venture are expected to generate orders for BioAstin and NatuRose in 2006. Those products, he said, are being registered with the Chinese government for sale in China.

## **House Dems tout 'innovation fund'**

*By Treena Shapiro, The Honolulu Advertiser, January 19, 2006*

An aquaculture company has allowed commercial fishermen to stay in Hawaii and earn two or three times more than they did a couple of years ago. A digital imaging company is going into economically challenged Hawaiian Homestead communities and training residents for technical jobs, regardless of a person's educational background.

Democratic leaders in the state House of Representatives hope their proposed \$100 million "innovation fund" will allow for the creation of more opportunities like these. "We will become the life sciences center of the Pacific," said House Majority Leader Marcus Oshiro, D-39th, in his opening-day address before the House of Representatives yesterday. House Speaker Calvin Say, D-20th, proposed the innovation fund to stimulate economic development in fields such as life science, community healthcare, digital media, advanced technology, ocean sciences, telecommunications, and alternative energy.

The fund would provide grants and business and marketing assistance to companies that would create industries and careers that pay a living wage. The obstacle will be getting it past the Senate, which agrees with the concept of stimulating research and development but not necessarily dedicating \$100 million to the fund.

Randy Cates, whose aquaculture company raises moi in submerged cages offshore for export across the country, said he'd like to see more opportunities for Hawai'i residents trained in aquaculture, otherwise, "they'll leave and go elsewhere."

## **Crews back at work on fishpond**

*By Ilima Loomis, The Maui News, January 14, 2006*

The crew of volunteers involved in rebuilding the rock wall that forms the Koeie fishpond felt more than normal dismay when a section of the wall collapsed earlier this month. "It's cultural work and spiritual work — it's not just regular work," said Kimokeo Kapahulehua, president of 'Ao'ao O Na Loko I'a O Maui, the association restoring the historic fishpond.

He estimated it would take about a month to reset the stones shaken loose from the wall that had been put up last year by the volunteers who are restoring a site that is believed to date back 1,500 years. According to some traditions, the walls were last restored by Kamehameha I.

## Pearl Project continued from Page 1

and most dedicated trainees became the six technicians that now run the project's Nett Point hatchery and nursery as well as pilot farm sites on Pakin Atoll. "By 2005, they had complete confidence in themselves. They could do spawning anytime; they could achieve larval settlement," says Ito. He speaks matter-of-factly about project success in modest terms yet easily exudes pride when he talks about "our boys."

To build that confidence, Ito explains, he took a step back from these core trainees in 2003, a difficult position as he watched them struggle on their own. "2003 was tough, but they had to learn and make their own improvements," he says.

Developing talent is critical to creating a productive industry — and so was building a hatchery. A young pearl industry needs a regular source of spat to survive. Built in 2001, the hatchery system includes six 1,000 L tanks. For growout, the project's Nett Point training facility includes 12 sets of long line, each 100 m long, in a 1 hectare area. Two sub-farms in Pakin Atoll have 11 sets of long lines.

Hatchery broodstock began with 25 oysters from the wild. The project team carefully selected the best oysters from the 1,000 wild specimens collected in the first year. Technicians have learned to check shell color as they check the gonad condition before spawning, says Ito. Today, the hatchery and pilot farms have 25,000 broodstock ready for spawning, plus 15,000 young adults, all of which were produced in the hatchery.

The idea is for the Pearl Project to lease its oysters, ready for seeding, to private farms at the suggested rates of 5 cents per year per juvenile or one-year-old oysters and 10 cents per year per two-year-old oysters. This year the project will have available for lease a total of 10,000 oysters: 5,000 seeded and 5,000 ready for seeding. In 2007, up to 35,000 could be ready for lease.

Demand for the project's oysters will play a role in determining how many farms will launch this summer, along with factors such

as how many businesspeople are willing to take on the risk, says Singeo. Priority will go to those farmers with the best chance for success, people with previous business management experience and resources like boats and staff.

More than a dozen potential farm sites have been identified by project technicians on Pakin Atoll and other areas such as Kitti, Mwoakilloa, and Pingelap. "When people see our less than ideal location with strong trade winds that create rough conditions and muddy water, we hope they say, 'If they can do it at Nett Point, then maybe we can do it at our place,'" Ito says.

Clearly, the new farms will need assistance. COM doesn't want to be their sole support, so it held in 2004 the first of many stakeholder meetings to discuss pearl industry development. "The College's role is one of research, extension, and training. Another institution or government agency should take responsibility for the promotion of commercial activity," Singeo says.

So far, two members of the cabinet of Pohnpei State Governor Johnny David have agreed to help. In early February, Kikuo Apis, director of the Economic Affairs Office, decided to take the lead in organizing a public sector advisory group and Yosuo Phillip, director of the semi-autonomous Economic Development Authority, decided to lead the formation of a private sector advisory group, says Singeo.

"The two gentlemen certainly are in a position to provide the necessary links between the pearl project and the government's actions as may be required," he says. Apis and Phillip could not be reached for comment by deadline.

The Pohnpei government needs to develop policies to support the development of an industry: permits for leasing ocean and lagoon areas, standards for pearl quality, tax incentives, and more. Also, a government agency could set up a small loan program to help farmers cover prohibitive costs like the services of seeding technicians, Singeo says. At the same time, he emphasizes that the government must know its place, facilitating but not operating business.

*"We have proven that we can make quality pearls from local oysters."*

—Singeru Singeo



**Continued on Page 7**

### UPDATE

**Year 19 Plan of Work.** CTSA's Board of Directors met at the East-West Center in Honolulu on Jan. 24 and approved nine proposals (listed here) as part of the package for the center's latest Plan of Work. The administrative office sent the resulting CTSA Year 19 Annual Plan of Work to the USDA on Feb. 1 for final approval. Projects approved by the USDA will likely start by August 1, 2006.

- Bioprocessing Pacific Island Byproducts for Production of Value-added Feed Ingredients
- Risk Assessment to Identify Potential Shrimp Virus Impacts in Hawaii and Development of Biosecurity Protocols
- National Aquaculture Extension Conference

- Development of DNA Markers for Pacific Threadfin Aquaculture
- Culturing the Harlequin Shrimp (*Hymenocera picta*) for the Marine Aquarium Industry
- Pacific Regional Aquaculture Information Service for Education (PRAISE) and Publications, Year 2
- Demonstration of Seedstock Transportation and Spawning Synchronization in Sturgeon
- Improving Outputs in the Commercial-scale Production of Swordtails in Hawaii
- Improved Stocks and Management Practices for Commercial Tilapia Culture in Hawaii and the Pacific Region, Year 2

# AQUA TIPS

## Developing techniques for the artificial propagation of the feather-duster worm (*Sabellastarte spectabilis*) in Hawaii

Clyde S. Tamaru, Dave Bybee, Julie Bailey-Brock, David Ziemann, and Tom Ogawa

University of Hawaii at Manoa and Oceanic Institute

*This article was written as part of the work for the multi-year project titled "Aquaculture of Hawaiian Marine Invertebrates for the Marine Ornamental Trade, Years 1 – 3," which the Center for Tropical and Subtropical Aquaculture in part funded under a grant from the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service.*

The feather-duster worm (*Sabellastarte spectabilis*) has become one of the most collected invertebrates in Hawaii, making it a lucrative business for collectors. Advancements in the artificial propagation of marine species, meanwhile, have brought us closer to commercial culture of feather-duster worms. A collaborative effort between the University of Hawaii (Department of Zoology, Hawaii Institute of Marine Biology and Sea Grant College Program) and the Oceanic Institute has focused on developing techniques for the artificial propagation of the feather-duster worm. Progress made and future prospects for the feather-duster worm form the basis for this report.

The feather-duster worm currently is the fourth most collected animal (in number of individuals) in Hawaii's marine ornamental trade. Dependent on wild-caught stocks of invertebrates and fish, the marine aquarium industry has become controversial in recent years. Opponents believe the industry is unsustainable, citing reasons such as damaging collection techniques, high rates of post-catch mortality, and poor husbandry throughout the supply chain.

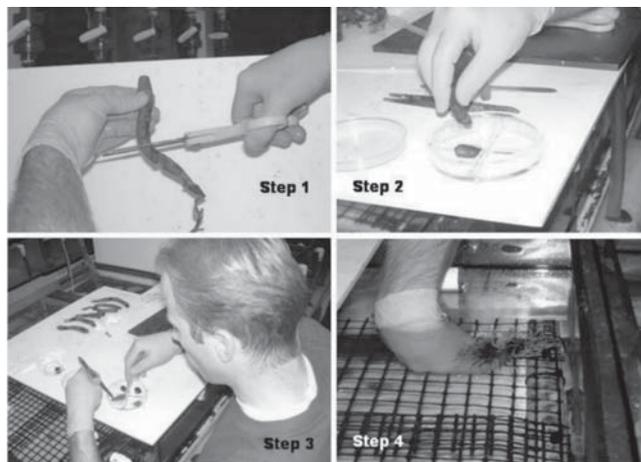
Commercial culture would provide an alternative source of the invertebrate for the aquarium trade and also ease the burden of collecting practices on coral reefs. High demand suggests that such aquaculture also has the potential to provide substantial economic benefits to commercial farmers, creating small- or large-scale industries. Realization of this potential, however, will hinge upon the successful development of culture technologies that are

cost-effective enough to overcome the economic constraints of doing business in Hawaii.

To meet the ultimate goal of artificially propagating the species requires an understanding and control of several aspects of this worm's life history. Specifically, these aspects are 1) controlling maturation and spawning of captive broodstock, 2) developing incubation and larval rearing techniques (e.g. hatchery activities) and 3) growout of hatchery reared individuals. One of the main obstacles that project work group members faced was the paucity of information regarding the reproductive biology of this species. Thus, all of the research activities represented opportunities to expand on the limited body of information and to grow equally from failures and successes.

At the Oceanic Institute, maturation trials of feather-duster worms held in captivity have been ongoing. During these indoor and outdoor trials, the project work group found shrimp pond effluent (as a food source) to be excessive when used directly and even when diluted a hundred fold. Commercially produced *Nannochloropsis oculata* resulted in maturation (e.g. possession of gametes) in both sexes of captive broodstock, although we did not achieve the stage of maturity in which spawning could be induced in wild-caught worms. Clearly, captive maturation and natural spawning remain as challenges that require further investigation.

While natural spawning of wild-caught broodstock has been intermittently reported under captive conditions, Ph.D.-candidate



**Figure 1.** The steps developed by doctoral candidate Dave Bybee for the induction of spawning the feather-duster worm.

Photos courtesy of UH Sea Grant

Dave Bybee developed and described a technique that could induce wild-caught worms to spawn on demand (2003; 2004). Figure 1 shows the steps to achieve spawning.

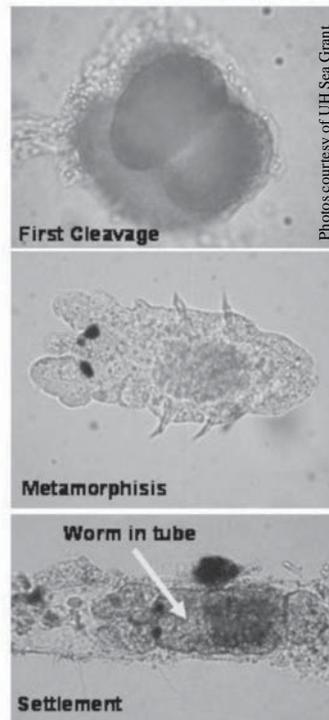
The first step involves selecting a worm and gently squeezing it until it lodges itself in the upper portions of its tube. Follow these actions with ablation of a small piece of the posterior part of the worm. Place the ablated portion of the worm in a glass Petri dish (Step 2) along with the coelomic contents. Repeat this procedure for other worms and view their contents under a compound microscope to assess the presence or absence of gametes. This process is the main way of staging the maturity of the individual worms. These techniques do not permanently harm the worms, as they will eventually regenerate a new posterior end.

In the last step, place selected individuals in glass aquaria filled with filtered seawater and equipped with aeration and let the invertebrates incubate until spawning takes place, which consistently occurs four days after stocking. Larval development (see Figure 2) proceeds quickly, as hatching occurs within seven hours after spawning and settlement occurs within seven days post-spawning (Bybee et al., 2006a).

Another challenge that we encountered was that the number of wild-caught individuals that possess the appropriate state of maturity for induction of spawning varies considerably over the course of a year. Still, sampling and histological examination of worms from the wild over a period of several years has resulted in a number of advances in the knowledge of the reproductive biology of this species.

First, examination of hundreds of individuals has led to the first description of the stages of maturation for both sexes of this species (Bybee 2005). Second, the histological evidence demonstrates that the feather-duster worm is hermaphroditic with evidence of protandry (Bybee et al. 2006b). Finally, while males and females suitable for induction of spawning trials exist throughout the year, they are more predominant during the months of October through November, a finding that apparently represents a seasonality in their reproduction (Bybee 2004).

Determining the appropriate substrate and conditions needed for settlement of worm larvae is another challenge that we need to address to make spawning practical in a commercial setting. Earlier attempts focused on the use of various substrates placed on the reef flat surrounding the Hawaii Institute of Marine Biology in Kaneohe Bay. The level of predation, however, was such that useful information could only come from experiments conducted in a laboratory setting.



In an initial experiment conducted in a 200 L fiberglass tank, we examined the settlement of larvae on different types of substrate. Table 1 summarizes below the surprising outcome. The results can only be considered preliminary, yet they are extremely encouraging. The results show a strong indication of discrete preferences for particular kinds of substrates on which the larval worms will settle. The most unexpected result, for example, demonstrated that the worms had an overwhelming preference for settlement on airstones, irrespective of whether an airstone was on or off. Even with air coming out of an airstone, the microscopic larvae hung on against the current. We plan to follow-up on this exciting ground-work with further research.

Also, we must determine the optimal growout conditions for hatchery produced seed if we are to reach the ultimate goal of commercial-scale production of feather-duster worms. We can overcome this challenge, as indicated by the preliminary results from work comparing the growth of wild-caught worms fed a diet of cultured *Chaetoceros* sp. versus worms fed untreated water from Kaneohe Bay (control).

This early data (summarized in Figure 3 on Page 6) makes clear that worms fed cultured live algae grew at a significantly ( $P < 0.001$ ) faster rate than those worms that received the Kaneohe

**Figure 2.** (left) Photomicrographs of the embryo and larvae of the feather-duster worm. **Table 1.** (below) Density of settled feather-duster worms on various substrates.

SUBSTRATE	DEI
Side of tank	
Bottom of tank	
Plastic mesh netting	
Airstone	

Bay water. A statistical model,  $Y = (0.039) * \text{Days} + 2.109$ ,  $r^2 = 0.73$ ,  $P < 0.001$  (where  $Y$  = tube diameter in mm and Days = days in culture), of the growth rate of worms fed the cultured algae also indicates that such culture techniques can attain market size within a year.

Given the results obtained to date, clearly, we can artificially propagate the feather-duster worm, an achievement that represents an alternative to the current practice of collecting them from the wild. In addition, the practical research the project work group has done toward overcoming the challenges of developing techniques for the artificial propagation of the worms has resulted in the discovery of a substantial amount of basic new information regarding the biology of the species. Thus, continuing efforts in developing marine ornamental culture methods unmistakably provide not only economic opportunities but also academic opportunities.

#### Acknowledgements

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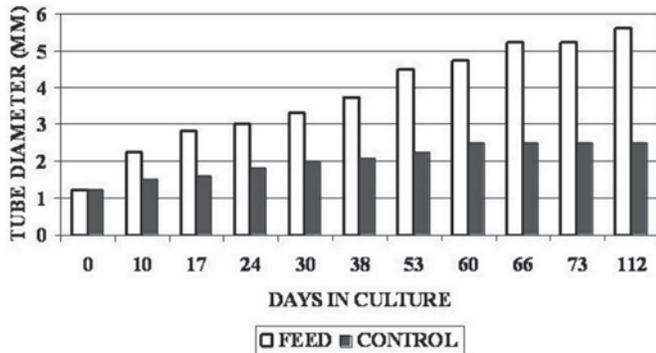
- USDA, CTSA through grants #2001-38500-10480, #2002-38500-12039, #2003-38500-13092
- A grant/cooperative agreement from the National Oceanic and Atmospheric Administration, Project A/AS-1, which is sponsored by the University of Hawaii at Manoa Sea Grant College

## AquaTips continued from Page 5

Program, SOEST, under Institutional Grant Numbers NA16RG2254 and NA09OAR4171048 from the NOAA Office of Sea Grant, Department of Commerce. UNIHI-SEAGRANT-AR-04-01

- State of Hawaii Department of Agriculture, Aquaculture Development Program

The views expressed herein are those views of the authors and do not necessarily reflect the views of the USDA, CTSA, NOAA or any of its sub-agencies.



## References

- Bybee, D. R. 2003. Reproduction of the Sabellid Polychaete *Sabellastarte spectabilis* in Kaneohe Bay, Oahu, Hawaii (abstract). Twenty-eighth Annual Albert L. Tester Memorial Symposium. University of Hawaii at Manoa, Honolulu, Hawaii, USA, 16–17 April 2003. *Pacific Science* 58(1):120.
- Bybee, D. R. 2004. Spawning periodicity and gametes in the fan worm *Sabellastarte spectabilis* (abstract). Twenty-ninth Annual Albert L. Tester Memorial Symposium. University of Hawaii at Manoa, Honolulu, Hawaii, USA, 11–12 March 2004. *Pacific Science* 59(1):112.
- Bybee, D.R. 2005. Spawning periodicity and gametogenesis in the fan worm *Sabellastarte spectabilis* *Pacific Science* 55(1):100.
- Bybee, D.R., J.H. Bailey-Brock, and C.S. Tamaru. 2006a. Larval development of *Sabellastarte spectabilis* in Hawaiian waters. *Scientia Marina*. in press.
- Bybee, D.R., J.H. Bailey-Brock, and C.S. Tamaru. 2006b. Evidence for sequential hermaphroditism in *Sabellastarte spectabilis* (Polychaeta: Sabellidae). *Pacific Science* 60(4): in press. ✉

**Figure 3.** (left) Comparison of growth between feather-duster worms fed live *Chaetoceros* sp. and worms fed untreated Kaneohe Bay water.

## 8<sup>th</sup> Annual HAA Conference

The Hawaii Institute of Marine Biology (HIMB) will host the next annual conference of the Hawaii Aquaculture Association at its Coconut Island facility. This year's theme focuses on opportunities for Hawaii's aquaculture industry to participate in the expanding global marketplace.

Invited speakers will include **John Forster**, Ph.D., who has 40 years experience in the European and U.S. aquaculture industries and has served as editor of *SeaFood Business* magazine, and **Linda Chavez**, Esq., a senior NOAA seafood industry advisor.

Interested speakers from the Hawaii research, extension, and production sectors are encouraged to email potential presentation titles to Jeff Koch at [jkoch@hawaii.rr.com](mailto:jkoch@hawaii.rr.com) and Ron Weidenbach at [hawaiiifish@msn.com](mailto:hawaiiifish@msn.com) as soon as possible for consideration. For more information and/or to request to be put on an email list for event updates, contact Dean Toda at [dtoda@hawaiiiaquaculture.org](mailto:dtoda@hawaiiiaquaculture.org).

As always, the conference will include a continental breakfast and a gourmet lunch, and it will conclude with the delightful "Taste of Hawaii Aquaculture" prepared by several of Hawaii's leading seafood chefs. Free shuttle service will be provided from Windward Mall to the HIMB pier, with boat transport out to HIMB.

Register early as seating will be somewhat limited and attendance will be on a first come, first serve basis.

**Place: HIMB**

**Date: June 15, 2006**

**Time: 8 a.m. to 7 p.m.**

## New CTSA Publication Coming Next Month!

### Direct Marketing Hawaii's Freshwater Ornamental Aquaculture Products

#### Aquafarmer Information Sheet #152

##### *a Preview*

Freshwater ornamental wholesaling was examined at two distribution levels for three scales of production. The impact of an enterprise's size on profitability was examined for small, large, and co-operative size farms, producing 8, 26, and 40 ornamental fish product lines at farms with corresponding water capacities of 27,000 gallons, 180,000 gallons, and 540,000 gallons. A partial budget analysis was conducted for each farm to investigate the feasibility of a change in business strategy from farmgate sales to secondary or primary wholesaling.

Partial budget analyses were conducted using a spreadsheet model for each of the freshwater ornamental operations. A major component of the model was a product mix module that optimized the selection of ornamental freshwater fish cultured for each farm based on sale price, farmgate price, pack density, water consumption, variety of species, and demand. The freshwater ornamental product mixes used in the analyses were based on the secondary wholesaler scenario with farmgate values of \$57,649, \$227,066, and \$703,732 for the small, large, and co-operative farms.

A follow-up to CTSA Publication #151, this information sheet was authored by Lotus E. Kam and PingSun Leung, both of the Department of Molecular Biosciences and Bioengineering, College of Tropical Agriculture and Human Resources, University of Hawaii, and by Clyde S. Tamaru of the University of Hawaii's Sea Grant Extension Service.

To request a copy, send an email to [kedennis@hawaii.edu](mailto:kedennis@hawaii.edu). You will also be able to download a PDF version from [www.ctsa.org](http://www.ctsa.org).

## Pearl Project continued from Page 3

A lot of people, resources, and institutions must come together by this summer, not to mention by 2010, when Singeo and Ito hope the industry will harvest at least 10,000 pearls, the minimum number it takes to attract serious buyers.

Almost two years ago, Ito conducted the first test harvest with oysters that had been seeded only 10 months before. Despite the early timing (harvesting usually occurs 20 to 22 months after seeding), the July 2004 harvest resulted in a high percentage of high quality (11–31%, 64–81% and 16–26% for A-grade luster-flaw, green rate, and blue rate, respectively) and roundness (13–31% for round rate), Ito reports. The project has completed a harvest every summer since then and follow-up experiments this year may show more detailed results, he says.

“We have proven that we can make quality pearls from local oysters,” says Singeo. Determined and hopeful that past success predicts an impressive future for the project in its commercialization phase, he appraises project achievements in establishing a hatchery, spawning, training and demonstration, seeding and quality pearl production, scientific research, and jumpstarting stakeholder meetings and support activities.

As Ito puts it, “We are just doing what we planned.”

Even so, the plan means a great deal to a great many people, even if they don’t know it yet. “Micronesia really needs economic development projects,” Singeo says, noting that the Compact of Free Association between the United States and the Federated States of Micronesia won’t last forever. “The only way for the islands to survive in the future, to have the money to support a government and infrastructure, is to have money coming from exports,” he says. Pearls are ideal because shelf life is long, weight and shipping costs are low, and selling prices are not cheap. —KD

## Marine Ornamental Culture

### A Seminar at the Oceanic Institute

**Location:** OI’s Learning Center

**Date:** Wednesday, April 5, 2006

**Time:** 2:30 p.m.

*Pictured at right is a 15-day-old flame angelfish larvae raised at the Oceanic Institute.*

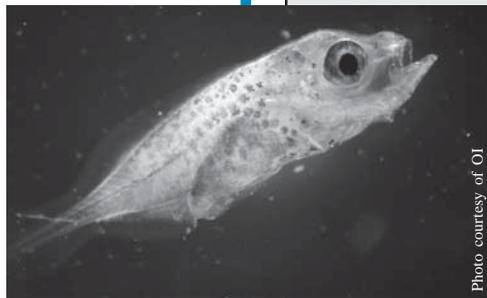


Photo courtesy of OI

Oceanic Institute invites you to attend a seminar and tour of our marine ornamental research program’s maturation and hatchery facilities. **Charles Laidley**, Ph.D., and the Finfish Department plan to cover topics such as broodstock maturation, live feeds (algae and copepod) production, and larval rearing. Enjoy post-seminar pupus.

For more information, please contact Gary Karr at (808) 259-3159 or [gkarr@oceanicinstitute.org](mailto:gkarr@oceanicinstitute.org).

## Around the Pacific

The University of Hawaii has a new Aquaculture Coordinator in Albert G.J. Tacon, Ph.D., who took the position on Jan. 1. He has a one-year, \$350,000 contract to lead development of a world-class aquaculture program within the 10-campus system. “Currently, I’m taking stock of what assets and capabilities we have and of how we can better work together and serve the needs of the aquaculture sector and the state,” Tacon says. I hope to have a more revealing interview with Tacon once he’s more settled in to his new post, so watch for it in our next issue.

In mid-January, the Marine Aquaculture Task Force — a group supported by The Pew Charitable Trusts and charged with making recommendations to Congress and NOAA regarding guidelines for aquaculture in federal waters — met for three days at the Oceanic Institute in Waimanalo. OI President Bruce Anderson is one of nine task force members, who come from a variety of backgrounds and include government regulators and environmental advocates. A look at the roster shows that The Trusts tried to put together a somewhat balanced panel.

“It’s an interesting group,” says John Corbin, who as manager of the state’s Aquaculture Development Program made a presentation to the task force about Hawaii’s leasing process. “The task force asked a number of good questions,” he reports. “Having the group meet here was a real opportunity because Hawaii has an open-ocean leasing process complete with effective community input and environmental monitoring. More important, it’s been working for seven years, and our offshore companies lead the nation in moving aquaculture offshore.”

Will the group pave the way for commercial development of the United States Exclusive Economic Zone (EEZ) or put up roadblocks in its report due this summer? “In the worst case scenario, the task force could suggest complex and costly studies and regulatory processes that will over-regulate and stifle a budding industry sector before it even exists,” Corbin says. “Clearly, the U.S. should not continue to rely on imports to meet

growing consumer demand for seafood, and EEZ aquaculture development must be an important piece of increasing domestic seafood production.”

Of course, the experience of Hawaii’s pioneering producers illustrates that the government must do more than merely not impede development. “What is needed is an incentivized development environment that will encourage and indeed compel the private sector to take the financial risks

necessary to make it happen,” says Corbin.

A bill that would give the U.S. Secretary of Commerce the authority to establish and implement a regulatory system for aquaculture in the EEZ, the National Offshore Aquaculture Act of 2005 was introduced into the Senate last year on June 8 by Sens. Daniel Inouye, D-Hawaii, and Ted Stevens, R-Alaska. No change in the status of bill S.1195 has occurred since it was read twice and referred to the Senate Committee on Commerce, Science, and Transportation last summer. —KD

# CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

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The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established by Congress in 1986 to support research, development, demonstration, and extension education to enhance viable and profitable U.S. aquaculture. Funded by an annual grant from the U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (USDA/CSREES), the centers integrate individual and institutional expertise and resources in support of commercial aquaculture development.

CTSA currently assists aquaculture development in the region that includes Hawaii and the U.S.-affiliated Pacific Islands (American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Palau, and Republic of the Marshall Islands).

In its 18 years of operation, CTSA has distributed more than \$9 million to fund more

than 185 projects addressing a variety of national aquaculture priorities.

Each year, the Center works closely with industry representatives to identify priorities that reflect the needs of the aquaculture industry in its region. After consultation with appropriate technical experts, CTSA responds with a program of directed research that has these pre-determined priorities as the focus of project objectives. The Board of Directors is responsible for overseeing CTSA's programmatic functions. The Center disseminates project results through its print publications, hands-on training workshops, and Web site.

CTSA is jointly administered by the Oceanic Institute and the University of Hawaii. The main office is located at the Oceanic Institute's Makapuu Point site on the island of Oahu in Hawaii.

For more information, contact Cheng-Sheng Lee, Ph.D., Executive Director, by telephone (808) 259-3107, fax (808) 259-8395 or e-mail ([cslee@oceanicinstitute.org](mailto:cslee@oceanicinstitute.org)).



Oceanic Institute  
and University of Hawaii  
3050 Maile Way, Gilmore Hall 213A  
Honolulu HI 96822-2231

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