

# AQUANEWS

THE NEWSLETTER OF THE POND DYNAMICS/AQUACULTURE COLLABORATIVE RESEARCH SUPPORT PROGRAM

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## PD/A CRSP, RWASAVE CELEBRATE ANNIVERSARIES

In August the Rwasave Fish Culture Station and the PD/A CRSP marked their ten year anniversaries. Festivities were held at the station, and served both to welcome the new U.S. Research Associate, Joyce (JJ) Newman, and to inaugurate new research ponds.

The Rector of the Université Nationale du Rwanda welcomed the celebrants. Anaclet Gatera, CRSP Research Associate and station manager, served as Master of Ceremonies. Jean-Damascene Bucyanandi, Rwanda Principal Investigator for the CRSP and Lieven Verhuest, head of the Belgian-funded *Clarias* project at the station, spoke of the past and future work at the station.

After a welcoming session, the group of farmers, university personnel, and USAID officials toured the station's buildings and ponds. Staff had the opportunity to discuss CRSP research and the new *Clarias* project, which focuses on reproduction of *Clarias gariepinus*, a popular food fish in Rwanda. At the end of the tour, the Rector

formally dedicated the new project ponds.

The reception that followed the tour was another showcase of station activities. All the food—caviar, smoked and fried fish, catfish salad—was produced at the station. Celebrants enjoyed the buffet while learning more about the history of the station and its goals for the future from exhibits and laboratory tours.

Participants then enjoyed a barbeque, which again featured produce from the station—fish, of course, but also pork and vegetables, which are produced as part of the integrated farm system on the station. The celebration reaffirmed the positive relationship enjoyed by the collaborators and their respective institutions, demonstrating first-hand the fruits of collaboration.



Visitors to the Rwasave Fish Culture Station were treated to exhibits and refreshments produced on the station.

## PONDCLASS UPDATED

An updated DOS version of PONDCLASS was issued by the OSU/DAST last month. The Management Office mailed the diskette and documentation to all PONDCLASS users who had ordered the DOS version of the original release. If you should have received an update but didn't, contact Naomi Weidner in the Management Office. In addition to the PONDCLASS update, the following Notice of Publication was issued, and can also be ordered from the Management Office:

Szyper, J.P. and J.M. Ebeling.

*Photosynthesis and community respiration at three depths during a period of stable phytoplankton stock in a eutrophic brackish water culture pond.* [Originally published in *Marine Ecology Progress Series* 94:229-238, 1993.]



Staff from the Rwasave Fish Culture Station help inaugurate a new *Clarias* pond during the anniversary celebration at the station. Dance exhibitions were held in the soon-to-be-filled *Clarias* pond pictured above, as well as in the station building.



## **POND DYNAMICS/AQUACULTURE CRSP PROJECT REPORTS**

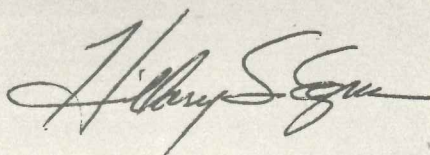
**JULY - SEPTEMBER 1993**

The Pond Dynamics/Aquaculture CRSP recently underwent an in-depth review. An External Evaluation Panel (EEP) reviewed the status of the program and individual projects within the program. A scope-of-work that specified the technical and programmatic topics requiring evaluation was approved by USAID in the summer of 1992. The review covered the five-year period from 1988 to 1993.

During the past year and a half, the EEP visited overseas CRSP research facilities, the Management Entity (ME), and attended the Annual Meeting and Technical Committee Meeting. Two of the three reviewers (Richard Neal of the National Marine Fisheries Service, and Roger Pullin of ICLARM) were new appointees to the Panel; Homer Buck was a returning member. Neal acted as Chair of the EEP.

The EEP report, which was submitted for comment in October to the ME, presents a constructive and favorable review of the program. In the EEP's words, this CRSP is "exceptional." All projects received commendations for their dedication to overall program goals. The evaluators recommended that the program receive a substantial increase in funding to support more fully the activities that are currently underfunded. The report emphasizes that the original goals of the CRSP continue to be valid because global concerns over water quality and food security are ever increasing. The ME plans to incorporate many of the EEP's recommendations into the Continuation Proposal, which will be a main topic of discussion during the forthcoming PD/A CRSP Annual Meeting.

The EEP report was published in December 1993, and can be requested from the Management Office.



The status of CRSP activities for the July through September 1993 quarter are summarized according to project. The CRSP Sixth and Seventh Work Plans provide detailed descriptions of the studies referred to. Further detail of project activities can be found in PD/A CRSP Quarterly Reports, which can be ordered from the Management Office.

### **HONDURAS**

Currently, no point of reference exists for measuring the environmental impact of shrimp farming in southern Honduras. CRSP researchers are establishing a baseline of information on selected chemical, biological, and physical characteristics of water along points in the major estuaries that supply water to and receive effluents from shrimp farms in Choluteca. This research will be useful in classifying types of estuaries, levels of pollution, and risk for degradation. The data collected will also be useful in determining the causes of yield differences among shrimp farms in the area.

Another study in progress at Choluteca compares water quality and shrimp growth and production in ponds treated with different combinations of feed and fertilizer. Feed and shrimp samples from three different farms in southern Honduras are being analyzed for their elemental composition to calculate the optimal chemical budgets for shrimp ponds.

Claude Boyd, Auburn, visited the site in September to assist in evaluating water circulation patterns in the riverine estuaries and in the Gulf of Fonseca which supply water to shrimp farms in southern Honduras. Also in September, George Ward, University of Texas, assessed water fluxes in the estuary and commented on the possible influence of shrimp farming on water quality in the estuary. Ward also advised the CRSP researchers on how to obtain better estimates of water fluxes and how to assess the waste load in the estuary.

At the El Carao freshwater site, PONDCLASS, the CRSP pond

management expert system, is being field-tested. The program is being used to manage ponds and results will be evaluated. Soil samples from pond bottoms are being collected at the end of each production cycle and analyzed to determine changes in selected chemical variables over time.

### **RWANDA**

Researchers studied the rate of inorganic nitrogen input required to maximize primary productivity and fish yield when pond water contains excessive phosphorus and inorganic carbon. A study to analyze the economics of aquaculture production technologies has been completed, and is reported in detail in Nathanael Hishamunda's MS thesis, which was completed at Auburn University.

The Rwasave fish culture station and the Rwanda CRSP celebrated their ten-year anniversary in August (see p. 1). Also in August, Peace Corps volunteers from Burundi attended a training session in reproduction techniques for *Clarias* culture.

### **THAILAND**

A study to determine the appropriate time for the initial application of supplemental feed in fertilized ponds is in progress at AIT. The first treatment of the study was harvested in July, and the last in November. The study builds on previous fertilization experiments which show that although the natural food derived from fertilizer enrichment alone is sufficient to support tilapia growth during the early phase of the grow-out cycle, the growth rate slows at a later stage, especially when stocking densities are higher. Because inadequate natural food supply is assumed to be the limiting factor, researchers add supplemental feed to boost the growth rate throughout the grow-out cycle. If farmers can time the supplemental feeding to coincide with the critical stages when the natural food becomes inadequate to support optimal fish growth, they can increase their income.



Researchers conducted a bioeconomic evaluation for a farm trial of catfish-tilapia integrated culture at an Udorn Pathana farm in northeast Thailand. Extension trials for small-scale farmers are being planned. As a result of the continuing outreach project, a draft of an extension manual has been produced. Kwei Lin, UM Principal Investigator on-site at AIT, attended by invitation of the Royal Thai Department of Fisheries a panel session on commercial tilapia farming and gave a seminar on pond fertilization.

In July, Kevin Hopkins visited the project site in the Philippines, where regional verification of CRSP research results continues. Hopkins delivered a seminar on CRSP research in the Philippines to the staff of the Freshwater Aquaculture Center and Bureau of Fisheries and met with ICLARM staff to plan use of genetically selected tilapia.

Although Michigan State University's participation in the Thailand project ended on 31 August 1993, Ted Batterson has been appointed an At-Large Member of the Technical Committee and will continue MSUs long-standing connection with the CRSP.

## DAST

Researchers at UC Davis continue modeling light and dark respiration rates and temperature and dissolved oxygen in stratified ponds. Another model, of water quality/fish yield, focuses on describing simple distributions for solar radiation at the three current CRSP sites using the CRSP data base.

The OSU DAST is working with personnel from the CRSP Rwanda project to complete the French translation of the PONDCLASS software. The French translation of the *User's Guide to PONDCLASS* is already complete.

The decision support system is undergoing several modifications, including a possible name change to POND. The software now includes routines to calculate economic impacts of pond management strategies and allows simultaneous simulation of fish growth and water temperature. The water temperature model has been tested against field data from El Carao, Honduras and Rwasave, Rwanda.

## EGYPT

The Global Experiment is underway at the Central Laboratory for Aquaculture Research at Abbassa. Preliminary results indicate that the enhanced Egyptian treatment provides greatest fish growth. Fish weighed, on average, 107.5 g in this treatment, compared to 89.5 g for chemical fertilization, 97.1 g for fertilization followed by feed, 68.2 g for feed-only, and 72.5 g for the traditional Egyptian system.

Efforts to produce *Clarias gariepinus* fingerlings for the Global Experiment and the polyculture studies have been partially successful. Induced ovulation, insemination and incubation have been successful, but nursery pond survival has been poor. Sampling protocols for the bioconversion studies have been tested, and plant sampling methods proved to be satisfactory. Methods to estimate snails, both quantitatively and qualitatively, are still being modified.

Researchers at Oregon State University conducted biotechnology experiments to characterize the androgen receptor in tilapia gonads. Masculinization and feminization experiments on tilapia fry were also continued. Fish were immersed in 500 µg/liters of either methyltestosterone or ethynylestradiol to be grown to a size sufficient for sex determination.

Researchers at Auburn are testing progeny of tilapia to identify "YY" individuals. Eighty-two spawns from the ten populations that may contain these supermales are being cultured to a minimum of 5 cm total length.

In July, NARP personnel favorably reviewed project progress at the Central Laboratory for Aquaculture Research in Abbassa. Bill Shelton, University of Oklahoma, traveled to Abbassa to work with researchers there on bioconversion studies. C. Kwei Lin visited the Abbassa station in November, and held three seminars on cultural practices of fish and crustaceans. Seminar participants included attendees from Zagazig and Cairo Universities and government agencies.



Bill Gale, U.S. Graduate Research Assistant on the Egypt Project at Oregon State, determines the sex of tilapia as part of a biotechnology experiment.

## PROGRAM MANAGEMENT OFFICE

Highlights of activities included the production and distribution of several publications, including the revised Seventh Work Plan, a revised Annual Report Guidelines for Authors, and a brochure for the Egypt Project.

A publisher was selected for the new CRSP book, *Dynamics of Pond Aquaculture*. The editors informed all participating authors of the schedule and organization of the book.

A preproposal was submitted to USAID for training in integrating socioeconomic analysis into the CRSP proposal development process.

Director Hillary Egna visited the Egyptian research site in September to review project status and met with NARP and USAID personnel.



# M E E T I N G S

# MILESTONES

Water Quality and Pond Soil Management for Sustainable Aquaculture, 21 Feb - 11 Mar 1994, Bangkok, Thailand. Contact: Aquaculture Short Course Unit, School of Environment, Resources and Development, Asian Institute of Technology, G.P.O. Box 2754, Bangkok, 10501, Thailand. Tel: (662) 524-5484; Fax: (662) 524-5473.

Uses & Effects of Cultured Fishes in Aquatic Ecosystems, 12-17 Mar 1994, Albuquerque, NM, USA. Contact Delano Graff, Commonwealth of Pennsylvania, Fish & Boat Commission, Bureau of Fisheries, 450 Robinson Lane, Bellefonte, PA 16823, USA. Tel: (814) 359-5154; Fax: (814) 359-5153.

Pond Dynamics/Aquaculture CRSP Annual Meeting, 28-31 Mar 1994, Hilo, Hawaii. Contact: Naomi Weidner, OIRD, Oregon State University, Corvallis, OR 97331-1641, USA. Tel: (503) 737-6417; Fax: (503) 737-3447.

International Symposium and Workshop on Stock Assessment in Inland Fisheries, 11-15 Apr 1994, Hull, England. Contact: Dr. I.G. Cowx, The University of Hull, International Fisheries Institute, Hull, HU6 7RX, U.K. Tel: 0482-466421; Telex: 592592 KH MAIL G Ref HULIB 375; Fax: 0482-470129.

2nd International Symposium on Nutritional Strategies and Management of Aquaculture Waste, 24-27 Apr 1994, Aalborg, Denmark. Contact: Dr. C.Y. Cho, Fish Nutrition Research Laboratory, Dept. of Nutritional Sciences, University of Guelph, Guelph, Ontario, Canada, N1G 2W1. Fax: (519) 763-5902

Fishery China '94, 8-11 May 1994, Shenzhen International Exhibition Centre, China. Contact: Panasia Conventions & Exhibitions Lt., Suite 1101, On Hong Commercial Building, 145 Hennessy Road, Wanchai, Hong Kong. Tel: (852) 861-1331; Fax: (852) 861-3228.

International Conference on Agrotechnology in the Commonwealth: Focus for the 21st Century, 24-26 May 1994, Singapore. Contact: Dr. Hedy Goh, Secretariat, c/o Dept. of Biotechnology, Ngee Ann Polytechnic, 535 Clementi Road, Singapore 2159.

Fifth International Symposium on Genetics in Aquaculture, 19-25 June 1994, Halifax, Nova Scotia, Canada. Contact: Pamela Gaines, Marine Gene Probe Laboratory, Life Sciences Centre, Dalhousie University, Halifax, Nova Scotia, Canada, B3H 4J1. Tel: (902) 494-1398; Fax: (902) 494-3736.

•Raul Piedrahita completed a sabbatical in Norway and returned to UC Davis. Prior to his return, he made a presentation at Wageningen Agricultural University in The Netherlands, where researchers initiating a project in Costa Rica indicated interest in collaboration with the CRSP.

•Piedrahita, Bartholomew Green, Fatma Hafez, Gamal El Nagar, and Jim Szyper attended the May meeting of the World Aquaculture Society meeting in Torremolinos, Spain.

•Steve Culberson completed his M.S. degree and has begun work on his Ph.D. in Ecology at UC Davis under the direction of Dr. Ted Foin.

•Dr. Abdel Rahman El Gamal accepted a six-month, NARP-sponsored post-doctoral appointment at the USFWS Marion, Alabama, laboratory. He is expected to return to Egypt in late February or early March 1994.

•Dr. Ali Ezzedin Abdelghany has been named Director of the Central Laboratory for Aquaculture Research and Egyptian Principal Investigator for the Egypt PD/A CRSP.

•The CRSP welcomes John Wassell, a new research assistant at University of Hawaii, Hilo. Wassell has been hired as Assistant Data Base Manager for the CRSP Central Data Base.

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Marion McNamara

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