AQUANEWS
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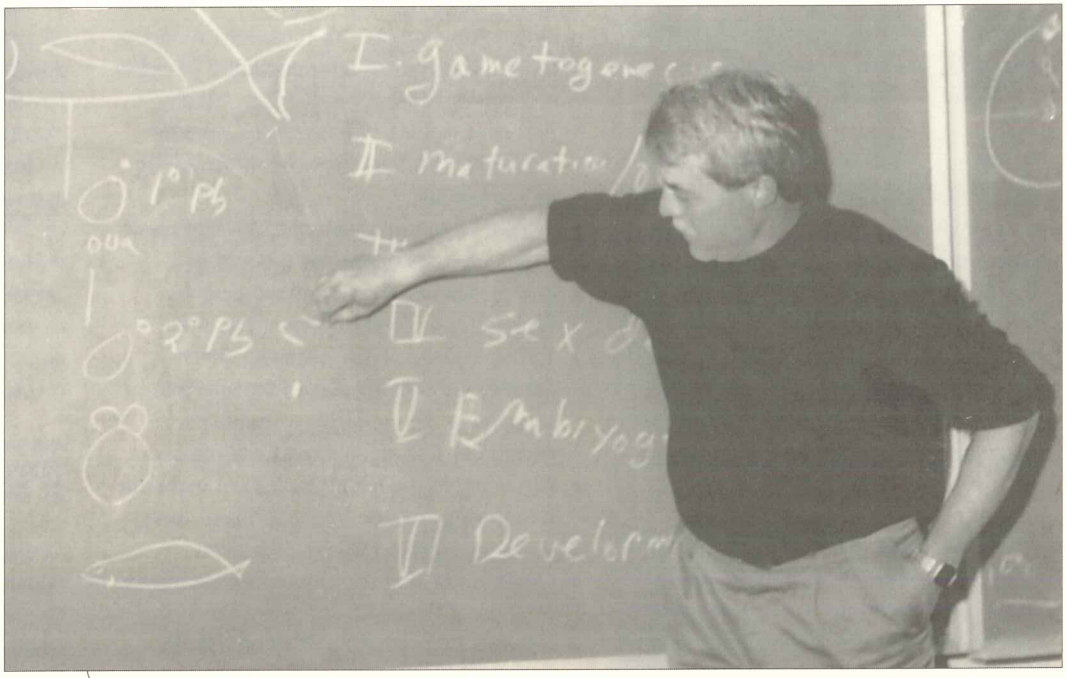
RESEARCHERS CONDUCT WORKSHOP AT ABBASSA

By Brigitte Goetze

The beginning of 1994 found CRSP researchers at Abbassa involved in an intensive work effort as the experimental phase of several Bioconversion Studies ended. This meant pond draining, fish harvest and data collection of over 30 ponds, an effort in which Egyptian and U.S. scientists collaborated. Despite their busy schedules, CRSP scientists Ali Abdelghany, Zeinab Elnagdy, Bartholomew Green, Fatma Hafez, Kevin Hopkins, Abdel Mostafa, and William Shelton took the time to conduct a three-day aquaculture workshop in January to provide in-service training for Government of Egypt personnel. They were aided in this effort by Shmuel Rothbard of the Gan Shmuel Fish Breeding Center, Israel, who was invited by Egyptian authorities to participate.

Workshop topics included fish reproduction, fish growth, and fish ecology and integrated agriculture-aquaculture research. Aquaculturists and fishery biologists from the General Authority for Fish Resource Development in Cairo, scientists from Cairo and Zagazig Universities as well as staff of the Central Laboratory for Aquaculture Research in Abbassa profited from this opportunity. The workshop was well attended, with 56 participants the first day and 42 the second and third days, even though participants coming from Cairo had to travel several hours to the meeting location at Abbassa. The event helped to inform Egyptian scientists from various agencies about the CRSP research effort and enabled Egyptian fish breeding specialists to learn first-hand about the questions their Israeli colleagues are pursuing.



Bill Shelton, U.S. P.I. on the Egypt Project, conducts a workshop session at the Central Laboratory for Aquaculture Research at Abbassa.

PD/A CRSP PROJECT REPORTS

Individual CRSP projects continue working toward the goal of understanding the dynamics of pond aquaculture, using both the Global Experiment and the locally driven research studies. The project reports that follow summarize activites through March 1994; further detail can be found in the PD/A CRSP Quarterly Reports, which can be ordered from the Management Office (address on back page).

HONDURAS

At the La Lujosa research station in Choluteca, CRSP researchers are working on a variety of studies: establishing baseline information on estuarine water quality at points along the major estuaries that supply water and receive effluents from shrimp farms; quantifying nutrient flow into and out of selected shrimp farms; and comparing yields of *Penaeus vannamei* with primary productivity and water quality in ponds receiving feed or combinations of feed and inorganic fertilizers.

The latter study was inspired by previous research that demonstrated improved profitability when organic fertilizers were substituted for feed during the first eight weeks of shrimp growth. However, farmers remained reluctant to use organic fertilizers such as chicken litter in shrimp grown for export, for fear that the crop might be considered "contaminated." Researchers began determining if the substitution of inorganic fertilizers for feed during the first eight weeks of growth will have the same positive effect on profitability without the

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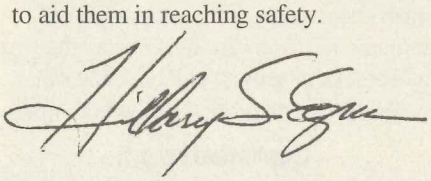
From the DIRECTOR'S DESK

As the world awakens everyday to news of devastation and death in Rwanda, people involved in the PD/A CRSP anxiously await word from many of their colleagues, friends, and families. Felicien Rwangano, a Ph.D. candidate at Oregon State University, describes a commonly felt emotion when he says, "not knowing, that's the hardest part." What little we know as of the end of May follows. We know that our expatriate researcher, Joyce Newman, and her husband are now together safely in Auburn, Alabama. We know that our former Rwandan Principal Investigator, Evariste Karangwa, and his immediate family escaped from Rwanda and are now in the U.S. We also know that Valens Ndoreyaho, the Rwandan scientist credited with the early establishment of the CRSP in Butare, and his family, were murdered in their home during the first few weeks of the war. We are pained by the knowledge that some of our colleagues at the Rwasave Fish Culture Station were murdered as they were quite possibly guarding the station. We know of the loss of our colleagues' loved ones, and we mourn for all of them. We still await news about others—some of whom we just parted with after the CRSP Annual Meeting. Rwandan scientists Jean-Damascene Bucyanayandi and Anaclet Gatera, and Belgian scientist Lieven Verheust were returning to post in Rwanda when their plane was diverted to Bujumbura, Burundi because of the downing of the airplane carrying the Presidents of Rwanda and Burundi. In the ensuing weeks, Verheust was able to reach his family in Butare, and they were evacuated to Belgium. Bucycanayandi was last seen crossing the border to be reunited with his family in Butare, and Gatera also returned to Rwanda. Day-to-day we await word from our Rwandan friends, and we are standing by, prepared to offer assistance to aid them in reaching safety.



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perceived risk of contamination from organic fertilizers.

At the El Carao freshwater station, research is underway to determine the relative growth potential and optimum stocking rate of tambaquí *(Colossoma macropomum)* in polyculture with tilapia. Tambaquí appear to gain weight faster than tilapia, especially at mean weights over 400 grams, but the tambaquí require supplemental feed to grow well, while tilapia can grow well on natural pond food alone. A polyculture of the two fish may be more efficient than a monoculture of either, and could increase production efficiency. Preliminary data indicate that tambaquí stocked at $3/m^2$ are growing more slowly than predicted.

The Honduran National Association of Aquaculturists organized a one-day conference last January to educate the farming community about sustainable shrimp culture. The La Lujosa Water Quality Laboratory played a major part in organizing the conference, and CRSP researcher David Teichert-Coddington summarized the results to date of estuarine monitoring and the implications of this work for shrimp farmers. Teichert-Coddington also contributed to a Ministry of Natural Resources program on shrimp diseases by teaching a short course on water quality in February.

RWANDA

On 6 April, the crash of President Juvenal Habyarimana's plane resulted in an unprecedented outbreak of violence in Rwanda. Research activities at the Rwasave research station and at the field sites ceased as U.S. and Belgian researchers and their families were evacuated, and host country staff sought safety in neighboring countries. At press time, there was no indication that the situation would change in the immediate future. (See *From the Director's Desk*, this page.) Data analysis and some experimental studies are being conducted at Auburn University by Joyce Newman, U.S. Research Associate.

THAILAND

A study is underway at the Asian Institute of Technology (AIT) to determine what effect stocking density has on pond carrying capacity–including fish size and total net yield–in fertilized ponds with supplemental feeding. Another study addresses the question, "How can decreasing total alkalinity best be managed in fertile ponds during a growth cycle?" Relationships among the nature of fertilizer, net CO_2 balance, and total alkalinity concentrations in pond water during typical PD/A CRSP pond fertilization experiments are being examined.

Researchers at AIT are using an automated system to monitor the diel cycles of CO_2 concentrations in pond water. They will compare estimated exchange rates with actual rates of photosynthetic carbon uptake by pond phytoplankton and with rates of carbon release during community respiration.

PHILIPPINES

Researchers at the Freshwater Aquaculture Center (FAC) at Central Luzon State University are conducting trials to determine the growth and yield of genetically improved tilapia. There are five treatments in this study; all use CRSP standard on-farm protocols for sampling and water management and the most current CRSP fertilization guidelines. Four treatments use different strains of *Oreochromis niloticus*: treatment 1 uses the Philippine strain of *O. niloticus*; treatment 2 uses the Thailand strain of *O. niloticus*; treatment 3 uses *O. niloticus* from ICLARMs Genetic Improvement of Farmed Tilapias (GIFT) project; treatment 4 uses YY-male *O. niloticus* from the FAC/ University of Wales Swansea Research Project on Genetically Manipulated Improvement of Tilapia (GMIT). Treatment 5 uses a communal culture with tagged fish from the four groups described above.

DAST

After extensive laboratory testing at the University of California at Davis (UCD),

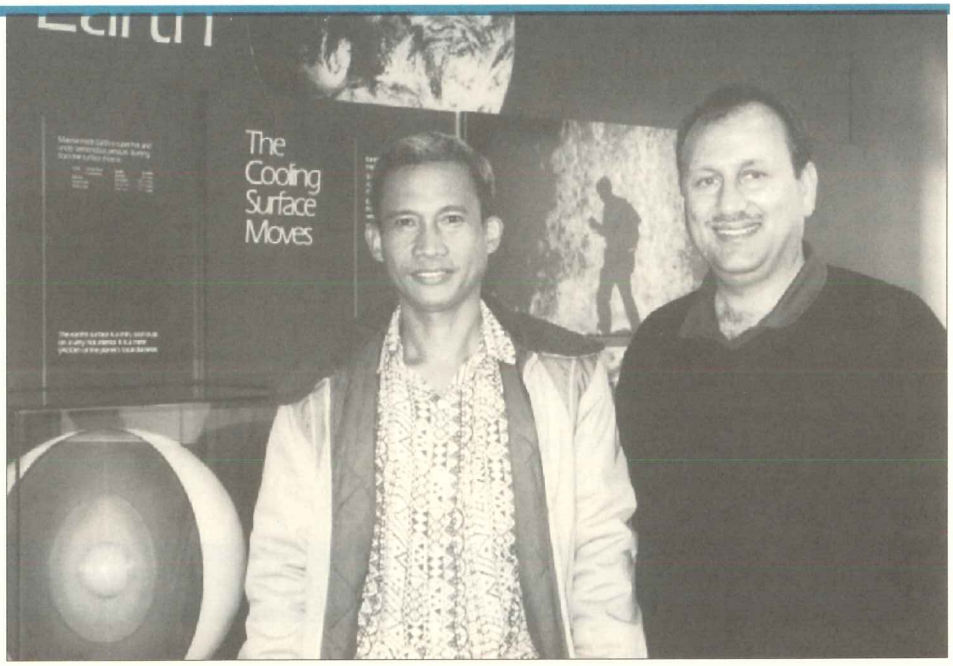
the apparatus for pond respiration measurements was field tested in Thailand, revealing some technical problems. Solutions are being investigated through continued testing in the laboratory at UCD. Data collected in the field and in the laboratory are being analyzed for inclusion in future models.

The UCD/DAST is reviewing and testing techniques suitable for developing probability distributions for the CRSP solar radiation and wind data, including simple statistical procedures and generalized weather generation programs. Means for simulating secchi disk depth changes over time are being investigated.

The OSU/DAST continued refining and testing models in the decision support system POND. One version was demonstrated to CRSP participants at the Annual Meeting. The models are organized hierarchically into three levels, allowing the user to enter data for simulations and to perform different kinds of analyses. Level 1 models simulate fish growth and water temperature, and are intended for applied management and rapid analysis of pond facilities. Level 2 models predict phytoplankton and zooplankton dynamics in addition to fish growth and temperature, and are intended for detailed pond analysis, management of optimization and numerical experimentation. At this level, both fertilization and feeding schedules are generated by the models.

EGYPT

Data analysis of the Global Experiment is underway at the Central Laboratory for Aquaculture Research (CLAR) in Abbassa. Bioconversion studies testing the efficacy of grass and black carp as control agents of unwanted organisms were completed in January. Initial data analysis indicates that grass carp might be able to control some of the nuisance plants; however, *Azolla,* a plant that floats on the water surface, and *Ceratophyllum*, a submerged living plant, seem to be little affected by the carp. Snail populations appeared to be low during the 1993 growing season; however, the effect of black carp predation remains unclear, as a satisfactory method to estimate snail populations hayet to be developed. Analysis of the data is further complicated because ponds were significantly contaminated by unwanted fish species.



Eduardo Lopez, left, Host Country P.I. for the Philippines, and Ali Abdel Ghany, Egyptian researcher, pause near an exhibit at Volcanoes National Park. The tour followed the CRSP Annual Meeting in Hilo last March. The meeting also included a workshop on integrating the social sciences into PD/A CRSP research, presentation of technical papers, and extensive prepatory work on the CRSP continuation plan.

Progeny testing to identify 'YY' male tilapia continues. Possible 'YY' individuals have been isolated and attempts to spawn them under controlled conditions have been made. However, the candidates display highly aggressive behavior which has led to the death of the females, so spawning has not yet been successful.

A second recirculating tank system was installed in a greenhouse in Abbassa, and ten earthen ponds for tilapia reproduction research were renovated, including installation of concrete harvest basins, new inlet and drain structures, and grading of pond bottoms.

Preliminary results from a biotechnology study conducted at the Hawaii Institute of Marine Biology indicate that treatment with 17α-methyltestosterone (MT) seems to have no influence on the growth performance of *O. aureus*. *O. mossambicus* treated with MT grew faster than untreated *O. mossambicus*; however, even the treated *O. mossambicus* grew more slowly than the untreated *O. aureus*.

17α-methyltestosterone (MT) immersion experiments to determine the efficacy of an alternate method for tilapia sex reversal were started at Oregon State University. Preliminary results indicated that MT was non-detectable by High Performance Liquid Chromatography (HPLC) in the immersion water after 48 hours.

SOCIAL SCIENCES

Researchers have developed a framework for interpreting current tilapia technologies by level and kind of practices, and a framework for integrating economic information across project sites. Diagrams have also been developed to summarize the knowledge system for tilapia technology in each country, the major institutional actors in the industry, the organization of private sector marketing and infrastructure, and the role of the CRSP in this larger context.

Data have been collected in Honduras, Thailand, and the Philippines. Farmers were visited and their perceptions of the practice of fish culture were explored. In Honduras, 52 farmers were interviewed; in the Philippines, 56 farmers in four provinces were interviewed; and in Thailand, 50 farmers in three provinces were interviewed. In Honduras, representatives from major educational centers, government research and extension facilities, and major input and processing firms were also interviewed. The Peace Corps in Honduras provided logistical support for data collection.

MILESTONES

The CRSP welcomes Marco Polo Micheletti, Technical Advisor to the Honduras Ministry of Natural Resources, and the new Host Country P.I. for Honduras. Micheletti was introduced to other CRSP participants at the Annual Meeting.

Abdel Rahman El Gamal completed his post-doctoral appointment at the USFWS Marion, Alabama, laboratory and returned to his position as Host Country P.I. for the Egypt Project, and Director of the Central Laboratory for Aquaculture Research (CLAR) in Abbassa, Egypt.

Esam Hosney has joined CLAR as Gamal El Naggar's replacement; he will be responsible for the hatchery/physiology department.

Bob Fridley has announced his retirement from his position as Executive Associate Dean at UC Davis. At the request of the Dean and the Vice Chancellor, Fridley will continue as the UCD representative on the CRSP Board of Directors.

Jean-Damascene Bucyanayandi, left, Host Country P.I. for Rwanda, and Marco Polo Micheletti, standing, new Host Country P.I. for Honduras, are pictured at the CRSP Annual Meeting in Hilo, Hawaii.

MEETINGS

International Symposium on High Performance Fish, 16-21 Jul 1994, University of British Columbia, Vancouver, British Columbia. Contact: Don MacKinley, Fisheries & Oceans Canada, 555 W. Hastings St., Vancouver, BC V6B 5G3. Tel: (604) 666-3520; Fax: (604) 666-6894.

Sixth Pacific Congress on Marine Science & Technology, 4-8 Jul 1994, Townsville, Australia. Contact: PACON 94 Local Organising Committee, C/-Conference & Events Management Townsville, Box 1630, Townsville, Queensland, Australia 4810. Tel: (61) 77 212377; Fax: (61) 77 214936.

Seventh Biennial Conference of the International Institute of Fisheries Economics & Trade, 18-21 Jul 1994, Taipei, Taiwan. Pre-conference workshop on Aquaculture Management 16 Jul 1994, Keelung, Taiwan. Contact: Dr. David Liao, National Taiwan Ocean University, Keelung Taiwan. Tel: 886 2 462 3158; Fax: 886 2 462 4565; email: a0062@crayel.ntou.edu.tw or contact: Ann Shriver, IIFET Executive Director, Oregon State University, Corvallis, OR 97331 USA. Tel: (503) 737-1420; Fax: (503) 737-2563; email: shrivera@ccmail.orst.edu

The 124th Annual Meeting of AFS, "Managing Now for the 21st Century: Food, Recreation, Diversity," 21-25 Aug 1994, Halifax, Nova Scotia. Contact: Paul Brouha, AFS, 5410 Grosvenor Lane, Suite 110, Bethesda, MD, 20814-2199 USA. Tel: (301) 897-8616.

Applications of Endocrinology to Pacific Rim Aquaculture, 8-10 Sep 1994, Bodega Bay, CA, USA. Contact: Dr. Ernie Chang. Tel: (707) 875-2061; Fax (707) 875-2009; email: eschang@ucdavis.edu

Integrated Fish Farming: An International Workshop, 11-15 Oct 1994, Jiangsu Province, China. Contact: Int'l Workshop, Asian-Pacific Regional Research & Training Centre for Integrated Fish Farming, Wuxi, Jiangsu Province 214081, PRC. Tel: 86-510-601424; Fax: 86-510-603304.

FishAsia '94, 26-29 Oct 1994, Singapore. Contact: May Loo, ITP Services Pte Ltd., 2 Jurong East St. 21, #05-19/22, IMM Bldg, Singapore 2260. Tel: (65) 2913238; Fax: (65) 2965384.

AQUANEWS

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