

AQUANEWS

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

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Hillary Egna, new PD/A CRSP Director, and Wayne Seim, Principal Investigator for OSU in Rwanda, on-site in Rwanda last April.

FROM THE DIRECTOR'S DESK

Every year our CRSP, like other USAID-funded programs, faces the threat of reduced funding. Although the continuation of our program is not in doubt (our grant was just renewed for another five years), the amount that we will receive for each funding cycle is. Two years ago, USAID offered us a remedy. They encouraged us to begin seeking funding from other sources (called buy-ins) to add financial stability to our program and to allow us to pursue those studies that were sidelined because of funding constraints. Now, we are not only being judged by the quality and impact of our research, but on how attractive our program is to the host countries.

One measure of attractiveness is the buy-in. To date, we have received a few buy-ins from USAID Missions for facilities development and training. Limitations in funding historically have curtailed our activities in technical assistance (training, extension, etc.) and in the social sciences. Buy-ins offer us the opportunity to strengthen our program in these areas and in areas that dovetail with our global experiment. For example, we can expand

Continued P. 4

PD/A IN THE 90's

The PD/A CRSP began operating under a new grant on 1 September 1990. Highlights are summarized on page 3. The grant covers operations through 31 August 1995, and continues to support the goal of increasing the availability of animal protein through advances in pond aquaculture. The first three years will be devoted to refining the global models, which are based on data collected during the first phase of the Global Experiment. The final two years will focus on verification of the models through field testing or on-farm trials. New areas of research will include socioeconomic studies and on-farm research.

The DAST will prepare a second, more comprehensive version of the pond management manual, to include improvements based on analysis of new field data, testing guidelines at farm sites, and relations derived from computer models. The manual will be available in two forms—a printed handbook and a user-friendly computer application. The CRSP also proposes to collaborate with the International Center for Living Aquatic Resources Management (ICLARM) to prepare, print and distribute a manual of pond aquaculture research techniques.

The CRSP will continue to pursue opportunities to make contributions to human resource development in host countries. These contributions include formal and informal training, institution-building, and strengthening of linkages. Extramural funding will be sought for activities that emphasize technology transfer and social and economic aspects of CRSP research.

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Council Formed To Extend Collaboration

Recognizing the need to work smarter, as well as harder, the eight CRSPs have organized the CRSP Council with the following goals:

- to develop a joint program of communication and public relations
- to identify and implement joint CRSP research and communication
- to identify CRSP resources and capabilities for providing assistance to AID Missions and Bureaus

The directors of the CRSPs serve as the steering committee. Since its inception last November, the Council has made educational presentations to Congress, environmental groups, and the World Bank. A video based on these presentations is available (CRSP Council—the movie)! The booklet, *Global Research for Sustainable Food Production*, an overview of the CRSPs, was an instant “hit,” and is headed for a second edition as we go to press. To order a copy, contact the ME.

Through the Council’s efforts, the Bureau of Science & Technology has

made \$200,000 available to fund socioeconomic studies in CRSP projects. Only five projects from four CRSPs have received funding. Dr. Carol Engle, PD/A Principal Investigator from University of Arkansas at Pine Bluff, received \$20,000 to fund Mike Skladany’s studies in Thailand. Presently, the Council is developing Inter-CRSP opportunities. Honduras, Indonesia, Egypt, and West Africa have been identified as sites where existing CRSP investment can be amplified by drawing on other CRSP expertise. Tom Popma will travel to Burkina Faso, Mali, and Niger to explore possibilities for collaboration. David Teichert-Coddington will represent our CRSP in Honduras.

Finally, the Council has been advising AID on the formation of the new Sustainable Agriculture and Natural Resources Management CRSP, recommending panel members and recounting the CRSP experience and organization to those new to the CRSP process.

Women In Development --A Modest Proposal

Today, one-quarter of fishfarmers in Rwanda are women, thanks in part to PD/A CRSP reinforcement of Auburn’s success in technology transfer, begun by the International Center for Aquaculture. Increasing numbers of women fishfarmers may prove vital in increasing food production in Rwanda and other African countries, given the critical role women play in providing household food, and the inexorable population pressure being felt. How can these successes be documented and extended to other sites? How can the existing level of extension support be increased to include post-harvest issues such as marketing and processing? And can we compare, for the women involved, how the adoption of fish farming affects household nutritional status and economic well being?

These questions are addressed in a proposal submitted by the PD/A CRSP, Women in International Development at OSU, and the National Fish Culture Service at Kigembe, Rwanda.

The proposal describes additional socioeconomic studies, including case studies of Rwandan fisherwomen and a study of a sample of women adopters and non-adopters of fish farming. A workshop planned for 60 Rwandan fisherwomen will go beyond simple networking to explore the feasibility of upgrading extension services to include processing and marketing issues.

PD/A Director Hillary Egna and Senior Research Associate Karen Veverica helped design the proposal, which has been submitted to the Food and Agriculture Organization (FAO), the Program Support Grant at Oregon State University, USAID/Washington, and the USAID Mission in Kigali. Proposed Principal Investigators are Revathi Balakrishnan, Director of Women in International Development at OSU, and Pelagie Nyirahabimana, Training Director for the National Fish Culture Service in Kigembe, Rwanda.

Highlights of New Grant

- Level funding of \$920,000 per year for five years
- Research expanded from on-station to on-farm
- Socioeconomic studies and technology transfer integrated into general research plan
- Global models refined during first three years
- Final two years focus on field testing
- Networking proposed with Tropical Soils CRSP and other agencies to access agricultural soil data bases
- Collaboration proposed with ICLARM to produce handbook of aquacultural research techniques
- HONDURAS—focus on oxygen dynamics, aeration, and sediment-water quality interactions
- RWANDA—focus on influence of temperature on high-elevation pond productivity, nutritional studies, and economic studies to determine most economically efficient production technologies
- THAILAND—focus on pond size and nutrient addition schedules on fish production, effects of density on intraspecific competition and maturation schedules of tilapia, development of bioassay system to determine limiting nutrients in fish ponds, supplemental feeding of fish, polyculture of *Clarias* and tilapia, and evaluation of tilapia production systems.
- DAST—focus on refining computer models that simulate water quality and fish growth in ponds, perfecting pond classification system, using data from on-farm studies to verify models, refining manual of pond management guidelines

RESEARCHERS ATTEND W.A.S. CONFERENCE

Bill Chang, Bob Fridley, Raul Piedrahita, Bob Springborn, and Jim Szyper attended the World Aquaculture Society meeting in Halifax, Nova Scotia last June. Chang presented "Ecology and Life History of Giant Catfish *Pangasiandon gigas*"; Piedrahita and Grace, "Removal of Carbon Dioxide in Intensive Aquaculture Systems"; Springborn, "Application of the Initial Value Solution of Von Bertalanffy's Growth Equation to *Tilapia nilotica* Growth"; and Szyper "Production of *Oreochromis niloticus* and Ecosystem Dynamics in Manured Ponds of Three Different Depths."

Fridley presented a preliminary report prepared by a volunteer committee of

the Marine Board of the National Research Council on the subject of the Assessment of Technology and Opportunities for Marine Aquaculture in the U.S. The report, which will be delivered in its final form in 1991, focused on the primary institutional, socioeconomic, environmental, and feasibility issues in mariculture that technology can mitigate to some extent. These included: use conflicts (e.g., common property resources and privatization); aesthetics issues; land and water use (e.g., leasing and permitting); regulatory framework and attitudes; market structure and product form; public education; discharge requirements; ecological impact and technical and economic feasibility issues.

HOPKINS GOES TO SUMMER SCHOOL

This may be the first time CRSP researchers have assisted high school researchers, but if the response is any indication, it won't be the last.

Kevin Hopkins opened a new chapter for the CRSP and for the Na Pua No'eu Center for Gifted and Talented Native Hawaiian Children this summer. Ten native Hawaiian high school students worked with Hopkins for four weeks building tanks, spawning and rearing fish and shrimp, and visiting commercial aquaculture farms throughout the islands of Hawaii. The Hawaiian fishponds served as outdoor learning labs for the students, who learned scientific principles through the workshop's "hands-on" approach. For example, students learned chemistry principles by analyzing water quality. The program is funded by the U.S. Department of Education to enrich educational opportunities for native Hawaiian children, and serves gifted native Hawaiians by providing four-week residential programs for high school students in a variety of topic areas.

Dr. David Sing, Director of the program, had high praise for Hopkin's work. "Kevin's high expectations were built in, and the students produced

college level work and responded enthusiastically." Evidence of that enthusiasm was the effort students expended on their own time, coming back to check on the fish they had spawned and doing further work with Hopkins. Angela Marumoto, a program participant, continues to work with Hopkins on a science project which addresses the CRSP research question of energy efficiency of different dispersion patterns in artificially stratified water.

This may be the first time CRSP researchers have assisted high school researchers, but if the response is any indication, it won't be the last. The Na Pua No'eu Center is already looking forward to next summer's aquaculture venture.

Director, Continued from p. 1

the field-testing of our pond dynamics models to other countries through buy-ins.

A buy-in permits the donor to tap into the CRSP's expertise in any number of areas that suit the donor's needs. The funding mechanism is also flexible; it can be a grant or contract, depending on the amount of funding and the type of work to be performed. CRSP researchers who are at the field stations are most likely to know the specific needs of the host country and to be contacted for information by the Mission staff and others in the Host Country. The key is to attract funding for studies that are mutually beneficial to the host country and the CRSP. The possibilities for buy-ins are diverse. They range from women-in-development studies in Rwanda, to resource use efficiency studies in Thailand, to a fourth CRSP research site in Egypt. The selective use of buy-ins will enhance the ability of our CRSP to fulfill its mandate of improving the nutritional well-being of people in LDC's through advances in pond aquaculture.



Kevin Hopkins, PD/A CRSP Principal Investigator, helps students in his aquaculture class build "instant" fish tanks. Students bent wet plywood into large ovals, then lined the ovals with plastic to produce spawning and brooding tanks.

PROJECT UPDATES

RWANDA

Eugene Rurangwa, Leiven Verheust, and Karen Veverica attended a meeting on coordination of fisheries and fish culture activities in Rwanda earlier this year. The meeting was organized by the Rwandan government, which has allocated certain research domains to the Rwasave Station, the first university station of the National University of Rwanda to be granted departmental status. The station is almost self-sufficient from sales of fish, vegetables, and duck eggs.

In January, *The New York Times* ran an article on women fish farmers in Rwanda. For copies of the article, contact Naomi Weidner at the ME.

HONDURAS

Claude Boyd and Jim Szyper both visited the Honduras site this summer. Boyd brought a large series of soil samples back to Auburn for chemical analysis. Szyper spent a week at El Carao, installing an additional data logger and temperature sensors in two ponds and performing experiments as part of Auburn University, University of Hawaii, and RENARE's collaboration in Honduras.

THAILAND

Chris Knud-Hansen taught a graduate course this summer at AIT in Experimental Design and Analysis in Aquaculture. He also completed a report on fertilization for an extension manual being developed for Thai fishfarmers.

DAST

The *DAST Newsletter*, a quarterly publication designed to keep PD/A Principal Investigators informed about DAST activities, is being published by **Raul Piedrahita**.

Pond Management Guidelines are operational on the Macintosh and IBM, although there have been some difficulties in running the programs on compatible systems. The Macintosh version runs on Mac Plus and SE, but not on SE/30. Similar hardware compatibility problems were encountered with the IBM version.

AID BEGINS PLANNING FOR NEW CRSP

The number of CRSPs will increase from eight to nine, as planning continues for the Sustainable Agriculture and Natural Resources Management CRSP (SANREM). AID's Offices of Agriculture and Rural Development are organizing the effort, which is overseen by a National Research Council (NRC) steering committee. The new CRSP, funded at \$10 million for three years, will develop and expand understanding of the principles of agricultural sustainability, and devise administrative strategies to accelerate the transfer of information and in-country application of research results. Tentative plans call for the multi-disciplinary approach which typifies the CRSP model.

At the organizational meeting in July, international experts from the agricultural and natural resources management research community, including Bean Cowpea CRSP Director Pat Barnes-McConnell, identified the following essential aspects of the new CRSP:

- On-farm research methodologies that integrate agronomic, biological, ecological, sociocultural and economic factors;
- collaborative approach which includes the "end user" in planning, implementing, monitoring and evaluating research;
- identification of the scientific, economic, and sociological "critical gaps" in on-going research.

They identified several key agroecosystems to be the focus of the SANREM CRSP, including:

- semiarid
- sloping lands
- input-intensive tropical systems.

The second meeting was held in mid-November to review these research needs and possible approaches to them. Criteria and guidelines for proposals were discussed.

MILESTONES

Since *Aquanews* is now an occasional, rather than quarterly, publication, there are many milestones to be recognized. In this issue, we try to catch up with the most recent happenings. You can help us stay current by submitting noteworthy items to the editor.

CONGRATULATIONS . . .

- Howard Horton, retired CRSP Director, who's devoting himself to (dolphin-free) albacore fishing on his 80-foot troller.
- Hillary Egna, new CRSP Director. Egna served as Acting Director from January to August, 1990. Prior to that, she was Associate CRSP Director.
- Marion McNamara, new Assistant CRSP Director. McNamara came to Oregon State University from Arizona, where she taught junior high and community college English and computer classes.
- Lydia Perry, CRSP secretary extraordinaire, now managing the office at the LaSells Stewart Center at OSU.
- Jim Bowman (OSU), Bart Green (Auburn), and Evariste Karangwa (UNR), who all became fathers this summer.
- Raul Piedrahita (University of California, Davis), appointed to a three-year term on the Research Subcommittee of the Technical Committee of the Western Regional Aquaculture Center.
- R. Oneal Smitherman, Board of Directors member, appointed Aquaculture Coordinator for United States Department of Agriculture and Director of the Office of Aquaculture. As Aquaculture Coordinator, Smitherman chairs the Joint Subcommittee on Aquaculture and provides leadership to federal agencies, such as National Marine Fisheries Service and Fish and Wildlife Service, that have interest in aquaculture.
- Bob Fridley, Board of Directors member, appointed Executive Associate Dean in the College of Agricultural & Environmental Sciences at U.C. Davis. He will be working with the Dean of the college on administrative operations, budgetary and personnel matters, facilities planning, and general college operations.

WELCOME . . .

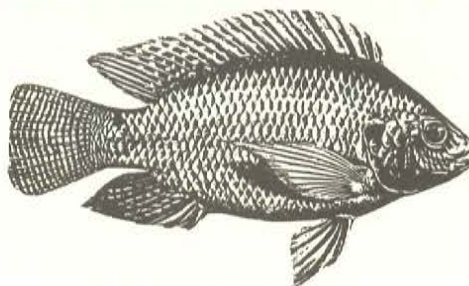
- Evariste Karangwa, our new Rwandan Principal Investigator, who's joined the Rwasave station after receiving his PhD in animal sciences at the University of Kentucky.
- Naomi Weidner, Management Office secretary.
- Steve Culberson, a graduate student joining the DAST at UCD. Culberson has worked with the Peace Corps in Gabon and Zaire.
- Ricardo Gomez, new Research Associate for the CRSP in Honduras.
- Phil Westerman, Agricultural Engineer on sabbatical at UCD, who will be working with PD/A CRSP on pond fertilization problems.

TRAVEL NOTES . . .

- David Teichert-Coddington and Bart Green attended the Symposium on Production Enhancement in Still Water Pond Fish Culture in Prague last May. While there, they visited the Trebon State Fish Farm in southern Bohemia, a facility of 7,500 ponds, many of which were constructed during the fifteenth century.

INQUIRING MINDS WANT TO KNOW . . .

What you would like to see in *Aquanews*. Please send us your story ideas, photos, comments, and suggestions. The best part of the newsletter is the part about *you*. So, get those fish (and primary productivity) stories rolling in.



PUBLICATIONS

Publications continue to be an important part of the PD/A CRSP. Since the last issue of *Aquanews*, the following have been published and distributed:

- *Collaborative Research Data Reports Vol. 3, No. 3 (Indonesia, Cycle III)*
- *Collaborative Research Data Reports Vol. 5, No. 1 (Rwanda, Cycle I)*
- *Collaborative Research Data Reports Vol. 6, Nos. 1, 2, 3 (Honduras, Cycles I, II, III)*
- *Collaborative Research Data Reports Vol. 7, No. 3 (Gualaca, Panama, Cycle III)*
- Sixth and Seventh Annual Reports
- Continuation Plan 1990-1995
- Instructions for Data Entry, Version 2.1
- Fifth Work Plan (1989-91)
- A brochure for Congress
- Implementing the large-scale production of young males of *Tilapia nilotica* using hormonal sex inversion in Honduras, B.W. Green and L.A. Lopez
- The substitution of chicken litter for feed in the commercial production of Penaeid shrimp in Honduras, D.R. Teichert-Coddington, B.W. Green, N. Matamoros, and R. Rodriguez
- Comparative production of *Colossoma macropomum* and *Tilapia nilotica* in Panama, Mendardo Peralta and David Teichert-Coddington
- Reporting fishpond yields to farmers, Kevin D. Hopkins
- A multivariate model of tilapia growth, applied to seawater tilapia culture in Kuwait, K.D. Hopkins, M.L. Hopkins, and D. Pauley.

The remaining eleven data reports are scheduled to be published by next June. The most recent *CRSP Research Reports* is "Pond Culture of Tilapia in Rwanda, a High Altitude Equatorial African Country," by B.J. Hanson, J.F. Moehl, Jr., K.L. Veverica, F. Rwangano, and M. Van Speybroek. In addition to these reports, 15 Notices of Publication have been issued since 1988. The most recent NOP's include:

CRSP researchers are reminded to contact Marion McNamara at the ME for a CRSP "accession number" (which takes the place of the old "CRSP contribution number") for each publication supported by the CRSP. In addition, each publication should acknowledge the CRSP support in a title page footnote, in an "Acknowledgements" section, or both, as appropriate. Contact the ME with any questions.

HOST COUNTRY SPECIAL TOPICS RESEARCH

A Master of Science thesis from the Asian Institute of Technology (AIT) was completed last quarter by Wirat Jiwyam from Thailand. The title of his thesis, abstracted below, was *The Role of Sediments in Pond Fertility*.

Abstract

Two experiments on the effects of sediments on pond fertility and fish production (Nile tilapia, *Oreochromis niloticus*) were conducted. The first was a grow-out study that examined five types of bottom substrate—detritus-removed, detritus accumulated, topsoil, deepsoil and fishpond-mud. Three replicates of each of the five bottom substrate types were placed in rectangular concrete tanks. The fishpond-mud substrate gave the highest average chlorophyll *a* concentration (564 mg/m³) during the last four weeks of the culture period. The chlorophyll *a* concentration in the detritus-removed treatment (16 to 401 mg/m³) was more constant over the culture period than in

the fishpond-mud substrate treatment (16 to 1609 mg/m³). Fish production was highest in the fishpond-mud substrate treatment. The value of sedimented organic matter as a direct feed for Nile tilapia was suggested by 48.9% higher net production in the detritus-accumulated treatment than in the detritus-removed treatment (983 vs 660 kg/ha/day).

The second experiment, which examined the accumulation and release of nutrients in sediments, was conducted in the laboratory. All sediment types accumulated phosphorus. This was indicated by an increase in the phosphorus content of the topsoil, deepsoil, and fishpond-mud, which were equal to 0.01%, 0.003%, and 0.08%, respectively. All soil types acted as a source of nitrogen for the water column. This was indicated by a decrease in the nitrogen content of the topsoil, deepsoil, and fishpond-mud, which were equal to 0.04%, 0.003%, and 0.26%, respectively.

MEETINGS

2-5 December 1990

**52nd Midwest Fish and Wildlife Conference,
Annual Meeting of the
North Central Division of AFS,
Minneapolis, MN, USA**

For further information (FFI): Blair Joselyn, Section of
Wildlife, MN DNR, 500 Lafayette, St. Paul, MN, 55155
USA. (612) 296-3344

12-14 December 1990

**National Symposium on Freshwater Prawns,
Kochi, India**

To review and assess state-of-the-art technology for
hatchery production of seed, feed and commercial
farming, disease diagnosis and control, processing and
export marketing of *Macrobrachium*. FFI: The
Convenor, National Symposium on the Freshwater
Prawns, College of Fisheries, Panangad,
Kochi 682 506, India

15-17 December 1990

**National Aquaculture Association
Annual Membership Meeting,
New Orleans, Louisiana, USA**

FFI: Joe McCraren: Shepherdstown, West Virginia.
(304) 876-2815 or (304) 876-0739

5-7 March 1991

**PD/A CRSP Annual Meeting,
Auburn University, Alabama, USA**

Registration forms have been mailed for the PD/A
CRSP Annual Meeting. FFI: Naomi Weidner at the
Management Entity, (503) 737-2228,
FAX (503) 737-3447

14-19 April 1991

World Fisheries Congress, Athens, Greece

A five-day global conference for the exchange of scientific
information within the natural resources community.
Goals are to assess the state of the world's fisheries
resources and to promote scientific collaboration. FFI:
World Fisheries Congress, American Fisheries Society,
5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814,
USA

16-20 June 1991

**World Aquaculture Society, San Juan, Puerto Rico
Call for papers.** Abstracts of papers for the 22nd
annual meeting of WAS are now being accepted.

Deadline for submission is **15 December 1990**. FFI:
Dr. Louis R. D'Abramo, Mississippi State University,
Department of Wildlife and Fisheries, P.O. Drawer LW,
Mississippi State, MS 39762, USA. (601) 325-3507;
FAX (601) 325-8726

11-16 November 1991

**Third International Symposium on Tilapia in
Aquaculture, Abidjan, Cote d'Ivoire**

Contributions invited on all aspects of tilapia biology
relevant to aquaculture and on applied research,
management and production, including economics and
socioeconomics. Papers may be in English or French.
Abstracts of not more than 250 words due by
31 January 1991 at: ICLARM (ISTA III),
MC P.O. Box 1501, Makati, Metro Manila, Philippines.
(63-2) 80466; FAX (63-2) 8163183; Telex (ETPI)64794
ICLARM PN/4900010376 ICL UI (USA); E-mail
(CGNET) ICLARM/(SCIENCENET) ICLARM, Manila
FFI: The Secretariat, ISTA III, Centre de Recherches
Oceanographiques (CRO), 29, rue des Pecheurs - BPV 18
Abidjan, Cote d'Ivoire

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Marion McNamara

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