



APPENDIX 7. PUBLICATIONS

Regional Research

CENTRAL AMERICA

Honduras

ASIAN INSTITUTE OF TECHNOLOGY

Publication

Munsiri, P. and B.F. Hajek, 1996. Texture and chemical composition of soils from shrimp ponds near Choluteca, Honduras. *Aquaculture International*, 4:154–168.

AUBURN UNIVERSITY

Thesis

Green, B., 1992. Water and chemistry budgets for organically fertilized fish ponds in the dry tropics. Ph.D. dissertation, Auburn University, Alabama.

Publications and Reports

Alvarenga, H.R. and B.W. Green, 1985. Production of hybrid tilapia (*Tilapia nilotica* × *Tilapia honorum*) fingerlings. CRSP Technical Report (unpubl.), 12 pp. (In Spanish.)

Alvarenga, H.R. and B.W. Green, 1986. Growth and production of all male *Tilapia nilotica* and all male hybrid tilapia (*Tilapia nilotica* × *Tilapia honorum*) in ponds. *Rev. Latinoamericana de Acuicultura*, 29:6–10. (In Spanish.)

Alvarenga, H.R. and B.W. Green, 1989. Production and economic aspects of tilapia culture in ponds fertilized with chicken litter. *Rev. Latinoamericana de Acuicultura*, 40:35–39. (In Spanish.)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1984. A system for producing hybrid tilapia (*Tilapia nilotica* ×) fingerlings at the El Carao Aquaculture Experiment Station, Comayagua, Honduras. CRSP Technical Report (unpubl.), 9 pp. (In Spanish.)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1985. Pelleted fish feed vs. corn gluten as feed for tilapia and Chinese carp polyculture in ponds. CRSP Technical Report (unpubl.). (In Spanish.)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1987. Production of hybrid tilapia (*Tilapia nilotica* × *Tilapia honorum*) in ponds using corn gluten as a supplemental feed. CRSP Technical Report (unpubl.), 13 pp. (In Spanish.)

Ayub, M., C.E. Boyd, and D.R. Teichert-Coddington, 1993. Effects of urea application, aeration, and drying on total carbon concentrations in pond bottom soils. *The Progressive Fish-Culturist*, 55:210–213.

Berrios, J.M., 1986. Growth and survival of hybrid tilapia (*Tilapia nilotica* × *Tilapia honorum*) fingerlings during the nursery phase in ponds. CRSP Technical Report (unpubl.), 16 pp. (In Spanish.)

Boyd, C.E. and B. Green, 1998. Dry matter, ash, and elemental composition of pond-cultured tilapia (*Oreochromis aureus* and *O. niloticus*). *Journal of the World Aquaculture Society*, 29:125–128.

Boyd, C.E. and D.R. Teichert-Coddington, 1992. Relationship between wind speed and reaeration in small aquaculture ponds. *Aquacultural Engineering*, 11:121–131.

Boyd, C.E. and D.R. Teichert-Coddington, 1994. Pond bottom soil respiration during fallow and culture periods in heavily-fertilized tropical fish ponds. *Journal of the World Aquaculture Society*, 25(3):210–213.

- Boyd, C.E. and D.R. Teichert-Coddington, 1995. Dry matter, ash, and elemental composition of pond-cultured *Penaeus vannamei* and *P. stylirostris*. *Journal of the World Aquaculture Society*, 26(1):88–92.
- Green, B.W., 1985. Report on the induced spawning of the silver and grass carps. CRSP Technical Report (unpubl.), 8 pp. (In Spanish.)
- Green, B.W., 1992. Substitution of organic manure for pelleted feed in tilapia production. *Aquaculture*, 101:213–222.
- Green, B.W., 1995. Polyculture of tilapia with marine shrimp. *Actas del Primer Simposio Centroamericano sobre cultivo de tilapia*, pp. 117–125.
- Green, B.W., 1997. Inclusion of tilapia as a diversification strategy for penaeid shrimp culture. In: D.E. Alston, B.W. Green, and H.C. Clifford (Editors), *Asociación Nacional de Acuicultores de Honduras and the Latin American Chapter of the World Aquaculture Society. IV Symposium on aquaculture in Central America: focusing on shrimp and tilapia*, 22–24 April 1997, at Tegucigalpa, Honduras, pp. 84–93.
- Green, B.W. and H.R. Alvarenga, 1985. Tilapia and carp polyculture in ponds receiving organic fertilization and supplemental feed. CRSP Technical Report (unpubl.), 10 pp. (In Spanish.)
- Green, B.W. and H.R. Alvarenga, 1989. The effect of different application rates of chicken litter on tilapia production. *Rev. Latinoamericana de Acuicultura*, 40:31–34. (In Spanish.)
- Green, B.W. and C.R. Engle, 1999. Commercial tilapia aquaculture in Honduras. In: B. Costa-Pierce and J. Rakocy (Editors), *Tilapia Aquaculture in the Americas, Volume 2. World Aquaculture Society, Baton Rouge, Louisiana*. (in press)
- Green, B.W. and L.A. López, 1990. Implementing the large-scale production of young males of *Tilapia nilotica* using hormonal sex inversion in Honduras. *Agronomía Mesoamericana*, 1:21–25. (In Spanish.)
- Green, B.W. and D.R. Teichert-Coddington, 1990. Comparison of two sampler designs for use with automated data acquisition systems in whole-pond community metabolism studies. *Proceedings of FAO-EIFAC Symposium on Production Enhancement in Still-Water Pond Culture at Prague: Research Institute of Fish Culture and Hydrobiology, Vodnany, Czechoslovakia*.
- Green, B.W. and D.R. Teichert-Coddington, 1991. Comparison of two samplers used with an automated data acquisition system in whole-pond community metabolism studies. *The Progressive Fish-Culturist*, 53(4):236–242.
- Green, B.W. and D.R. Teichert-Coddington, 1993. Production of *Oreochromis niloticus* fry for hormonal sex reversal in relation to water temperature. *Journal of Applied Ichthyology*, 9:230–236.
- Green, B.W. and D.R. Teichert-Coddington, 1994. Growth of control and androgen-treated Nile tilapia during treatment, nursery and growout phases in tropical fish ponds. *Aquaculture and Fisheries Management*, 25:613–621.
- Green, B.W., R.P. Phelps, and H.R. Alvarenga, 1989. The effect of manures and chemical fertilizers on the production of *Oreochromis niloticus* in earthen ponds. *Aquaculture*, 76:37–42.
- Green, B.W., D.R. Teichert-Coddington, and T.R. Hanson, 1994. Development of semi-intensive aquaculture technologies in Honduras: summary of freshwater aquacultural research conducted from 1983 to 1992. *International Center for Aquaculture and Aquatic Environments Research and Development Series No. 39, Auburn University, Alabama*, 48 pp.
- Green, B.W., D.R. Teichert-Coddington, and R.P. Phelps, 1990. Response of tilapia yield and economics to varying rates of organic fertilization and season in two Central American countries. *Aquaculture*, 90:279–290.
- Green, B.W., D.R. Teichert-Coddington, M.P. Micheletti, and C.A. Lara, 1997. A collaborative project to monitor water quality of estuaries in the shrimp producing regions of Honduras.

- Proceedings of the IV Ecuadorian Aquaculture Symposium, 22–27 October 1997. CENAIM, ESPOL, Camera Nacional de Acuicultura, Guayaquil, Ecuador. CD-ROM.
- Meckenstock, D., D.R. Teichert-Coddington, J.C. Rosas, H. van Es, M.S. Chinnan, and M.M. Murillo, 1991. CRSP Council - Honduras concept paper towards a sustainable agriculture in Southern Honduras. Proceedings of the International Sorghum and Millet CRSP Conference, 8–12 July 1991 at Corpus Christi, Texas, USA: INTSORMIL Publication No. 92-1, pp. 107–119.
- Rodriguez, R., G. Nuñez, and D. Teichert-Coddington, 1993. Evaluación de dos dietas alimenticias con diferente porcentaje de proteína, bajo dos densidades de siembra época de invierno en Granjas Marinas San Bernardo. II Simposio Centralamericano Sobre Camarón Cultivado, Tegucigalpa, Honduras. Federación de Productores y Exportadores (FPX), San Pedro Sula, Honduras, 267 pp.
- Sherman, C., 1986. Growth of all-female *Tilapia nilotica* in earthen ponds fertilized with chicken litter. CRSP Technical Report (unpubl.), 14 pp. (In Spanish.)
- Teichert-Coddington, D.R., 1988. Effects of protein diet and sowing density on the production of *Penaeus vannamei* in land tanks. Rev. Latinoamericana de Acuicultura, 35:29–44.
- Teichert-Coddington, D.R., 1993. Development of production technologies for semi-intensive fish farming during the past decade in Central America. Proceedings of Symposium on Aquacultural Research in Central America at Heredia, Costa Rica: Programa UNA/LUW Acuicultura, Escuela de Ciencias Biológicas, Heredia, Costa Rica, pp. 71–88.
- Teichert-Coddington, D.R., 1995. Estuarine water quality and sustainable shrimp culture in Honduras. Proceedings of the Special Session on Shrimp Farming, Swimming Through Troubled Water, Aquaculture '95: World Aquaculture Society, pp. 144–156.
- Teichert-Coddington, D.R., 1996. Effect of stocking ratio on semi-intensive polyculture of *Colossoma macropomum* and *Oreochromis niloticus* in Honduras, Central America. Aquaculture, 143:291–302.
- Teichert-Coddington, D.R. and B.W. Green, 1993. Comparison of two techniques for determining community respiration in tropical fish ponds. Aquaculture, 114:41–50.
- Teichert-Coddington, D.R. and B.W. Green, 1993. Influence of daylight and incubation interval on water column respiration in tropical fish ponds. Hydrobiologia, 250:159–165.
- Teichert-Coddington, D.R. and B.W. Green, 1993. Tilapia yield improvement through maintenance of minimal oxygen concentrations in experimental grow-out ponds in Honduras. Aquaculture, 118:63–71.
- Teichert-Coddington, D.R. and B.W. Green, 1993. Usefulness of inorganic nitrogen in organically fertilized tilapia production ponds. Abstracts of World Aquaculture Meeting at Torremolinos, Spain: European Aquaculture Society Special Publication No. 19, Ostende, Belgium, p. 273.
- Teichert-Coddington, D.R. and B.W. Green, 1993. Yield improvement through maintenance of minimal oxygen concentration in tilapia growout ponds in Honduras. Aquaculture, 118:1–2.
- Teichert-Coddington, D.R. and B.W. Green, 1997. Experimental and commercial culture of tilapia in Honduras. In: B.A. Costa-Pierce and J.E. Rakocy (Editors), Tilapia Aquaculture in the Americas, Vol. I. World Aquaculture Society, Baton Rouge, Louisiana, pp. 142–162.
- Teichert-Coddington, D.R. and R. Rodriguez, 1994. Relationship of penaeid shrimp yields to diet protein level, stocking density and season: a field test on commercial farms of southern Honduras. Abstracts of World Aquaculture '94, New Orleans, Louisiana, World Aquaculture Society, Louisiana State University, Baton Rouge, LA.
- Teichert-Coddington, D.R. and R. Rodriguez, 1995. Semi-intensive commercial growout of *Penaeus vannamei* fed diets containing differing levels of crude protein during wet and dry seasons in Honduras. Journal of the World Aquaculture Society, 26(1):72–79.
- Teichert-Coddington, D.R., B.W. Green, and R.P. Parkman, 1991. Substitution of chicken litter for feed in production of penaeid shrimp in Honduras. The Progressive Fish-Culturist, 53(3):150–156.
- Teichert-Coddington, D.R., B.W. Green, and R.P. Phelps, 1992. Influence of site and season on water quality and tilapia production in Panama and Honduras. Aquaculture, 105:297–314.
- Teichert-Coddington, D.R., D. Martinez, and C.E. Boyd, 1997. Solubility of selected inorganic fertilizers in brackish water. Journal of the World Aquaculture Society, 28(2):205–210.
- Teichert-Coddington, D.R., R. Rodriguez, and W. Toyofuku, 1994. Cause of cyclic variation in Honduran shrimp production. World Aquaculture, 25(1):57–61.
- Teichert-Coddington, D.R., B.W. Green, N. Matamoros, and R. Rodriguez, 1990. The substitution of chicken litter for feed in the commercial production of penaeid shrimp in Honduras. Agronomía Mesoamericana, Vol. 1.
- Teichert-Coddington, D.R., D. Martinez, E. Ramirez, J. Harvin, W. Toyofuku, R. Zelaya, and B.W. Green, 1997. Semi-intensive shrimp pond management and quality of effluents. In: D.E. Alston, B.W. Green, and H.C. Clifford (Editors), Asociación Nacional de Acuicultores de Honduras and the Latin American Chapter of the World Aquaculture Society. IV Symposium on aquaculture in Central America: focusing on shrimp and tilapia, 22–24 April 1997, at Tegucigalpa, Honduras, pp. 203–204.

Presentations

- Alvarenga, H.R. and B.W. Green. Produccion y aspectos economicos del cultivo de tilapia en estanques fertilizados con gallinaza. (Production and economic aspects of tilapia culture in ponds fertilized with chicken litter). Presented by H. Alvarenga at the 34th Annual Meeting of the Programa Colaborativo Centro Americano para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Jose, Costa Rica, 1988.
- Boyd, C.E. Shrimp farming and the environment. Presented to AAAS Annual Meeting at Philadelphia, Pennsylvania, 12–17 February 1998.
- Boyd, C.E. and L. Massaut. Perspectives for sustainable aquaculture through use of better environmental management. IV Congreso Ecuatoriano de Acuicultura, Guayaquil, Ecuador, 1997.
- Boyd, C.E. and J.F. Queiroz. Effluent management in pond aquaculture. III Symposium on Nutritional Strategies and Management of Aquaculture Wastes, Vila Real, Portugal, 1997.
- Green, B.W. Substitution of organic manure for pelleted feed in tilapia production. Presented to the FAO-EIFAC Symposium on Production Enhancement in Still-Water Pond Culture at Prague, Czechoslovakia, May 1990.
- Green, B.W. Mass production of *Oreochromis niloticus* and *Oreochromis aureus* fry in relation to water temperature. Presented to the Fourth International Symposium on Tilapia in Aquaculture at Orlando, Florida, 9–12 November 1997.
- Green, B.W. and H.R. Alvarenga. Efecto de diferentes tasas de aplicacion de gallinaza en la produccion de tilapia. (The effect of different rates of chicken litter application on the production of tilapia.) Presented by H. Alvarenga to the 33rd Annual Meeting of the Programa Colaborativo Centro Americana para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at Instituto de Ciencia y Tecnologia Agricola, Guatemala, 30 March–4 April 1987.
- Green, B.W. and H.R. Alvarenga. Intensive fingerling production of hybrid tilapia *Tilapia nilotica* × *Tilapia honorum* in earthen ponds. Presented by B. Green to the World Aquaculture Society Meeting at Guayaquil, Ecuador, 1987.
- Green, B.W. and H. Alvarenga. Sistemas de produccion de tilapia utilizando fertilizacion organica y alimentacion. Presented by H. Alvarenga to the Annual Regional Meeting of the Programa Cooperativo Centroamericano para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Pedro Sula, Honduras, 1989.
- Green, B.W. and L. Lopez. Factabilidad de la produccion masiva de alevines machos de *Tilapia nilotica* a traves de la inversion hormonal de sexo en Honduras. Presented by L. Lopez to the

- Annual Regional Meeting of the Programa Cooperativo Centroamericana para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Pedro Sula, Honduras, 1989.
- Green, B.W., H.R. Alvarenga, and R.P. Phelps. The effect of stocking rate on the production of *Tilapia nilotica* in ponds. Presented by B. Green to the 34th Annual Meeting of the Programa Colaborativo Centro Americano para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Jose, Costa Rica, 1988.
- Green, B.W., R.P. Phelps, and H.R. Alvarenga. The effect of nitrogen and phosphorous sources in fertilizers used for the production of *Tilapia nilotica*. Presented by B. Green to the World Aquaculture Society Meeting at Guayaquil, Ecuador, 1987.
- Green, B.W., D.R. Teichert-Coddington, and L.A. Lopez. Production of *Oreochromis niloticus* fry in earthen ponds for hormonal sex inversion. Presented to the World Aquaculture Society Meeting at Orlando, Florida, May 1992.
- Green, B.W., D.R. Teichert-Coddington, G.H. Ward, and C.E. Boyd. Collaborative research to support sustainable shrimp culture in Honduras: a model program. Presented to WAS '97 at Seattle, Washington, February 1997.
- Martinez, D. and D.R. Teichert-Coddington. Solubility of inorganic fertilizers in brackish water. Presented to the Third Central American Shrimp Symposium at Tegucigalpa, Honduras, April 1995.
- Milla, L., D.R. Teichert-Coddington, and D. Meyers. Biological demand of oxygen in shrimp farm water. Presented to the Third Central American Shrimp Symposium at Tegucigalpa, Honduras, April 1995.
- Rodriguez, R. and D.R. Teichert-Coddington. Substitution of inorganic fertilization for feeding in the commercial production of *Penaeus vannamei* during the rainy and dry season in Honduras. Presented to the Third Central American Shrimp Symposium at Tegucigalpa, Honduras, April 1995.
- Rodriguez, R., O.J. O'Hara, and D.R. Teichert-Coddington. Efecto de la tasa de fertilización inorgánica y calidad de agua sobre el crecimiento y economía en el cultivo semi-intensivo de camarón *Penaeus* spp. en Granja Marinas San Bernardo. Simposio Centroamericano Sobre Camarón Cultivado at Tegucigalpa, Honduras, April 1991.
- Teichert-Coddington, D.R. Problemática detectada en la dinámica del Golfo de Fonseca Hondureño y su repercusión en el cultivo de camarones. Primera Gran Reunión Nacional Camaronera, Choluteca, Honduras, January 1994.
- Teichert-Coddington, D.R. Water quality and its management in shrimp ponds. Presented to the Camarón '94 conference at Mazatlan, Mexico, February 1994.
- Teichert-Coddington, D.R. Florecimiento de algas en el Rio Choluteca. Foro: La industria de la camaricultura buscando asegurar la viabilidad a largo plazo, Choluteca, Honduras, March 1994.
- Teichert-Coddington, D.R. Relación entre calidad de agua de esteros y descarga de fincas camaroneras en el sur de Honduras. Encuentro Regional Sobre el Desarrollo Sostenido del Golfo de Fonseca y sus Cuencas at Choluteca, Honduras, May 1994.
- Teichert-Coddington, D.R. Water quality in the shrimp farming estuaries and the "X" Syndrome: Are they related? Segundo Encuentro de Gerentes y Propietarios de la industria de la Camaricultura (Second Conference of Managers and Owners in the Honduran Shrimp Culture Industry) at Choluteca, Honduras, January 1995.
- Teichert-Coddington, D.R. Characterization of shrimp farm effluents in Honduras and chemical budget of selected nutrients. Presented to the Third Central American Shrimp Symposium at Tegucigalpa, Honduras, April 1995.
- Teichert-Coddington, D.R. Pond management, estuarine water quality, and sustainable shrimp culture in Central America. Presented by Claude Boyd to the Sustainable Aquaculture '95 Conference at Honolulu, Hawaii, June 1995.
- Teichert-Coddington, D.R. and B. Green. Influence of primary productivity, season and site on tilapia production in organically fertilized ponds in two Central American countries. Presented to the FAO-EIFAC Symposium on Production Enhancement in Still-Water Pond Culture at Prague, Czechoslovakia, May 1990.
- Teichert-Coddington, D.R., B. Green, and M.I. Rodriguez. Efectos de la tasa de alimentación sobre la producción de tilapia en estanques fertilizados con gallinaza. Presented by M.I. Rodriguez to the Annual Regional Meeting of the Programa Cooperativo Centroamericana para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Pedro Sula, Honduras, 1989.
- Teichert-Coddington, D.R., R. Rodriguez, and W. Toyofuku. Causes of cyclical variation in Honduran shrimp production. Poster presented to the World Aquaculture Society Meeting at Torremolinos, Spain, 26-28 May 1993.
- Teichert-Coddington, D., B. Green, N. Matamoros, and R. Rodriguez. Substitucion de alimento por gallinaza en la producción comercial de camarones peneidos en Honduras. Presented by D. Teichert-Coddington at the Annual Regional Meeting of the Programa Cooperativo Centroamericana para el Mejoramiento de Cultivos Alimenticios (PCCMCA) at San Pedro Sula, Honduras, 1989.
- Teichert-Coddington, D.R., W. Toyofuku, J. Harvin and R. Rodriguez. Stocking density effects on survival and production. Presented to the Third Central American Shrimp Symposium at Tegucigalpa, Honduras, April 1995.

UNIVERSIDAD NACIONAL AUTÓNOMA DE HONDURAS

Theses

- Echeverria, M.A., 1992. Primary production in *Tilapia nilotica* production ponds fertilized with triple superphosphate. B.S. thesis, Dept. of Biology, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras. (In Spanish.)
- Garces, C., 1986. Quantitative analysis of zooplankton in fish ponds fertilized with triple superphosphate during the rainy season. B.S. thesis, Dept. of Biology, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras. (In Spanish.)
- Gomez, R., 1988. Effect of fertilizer type on the production of male *Tilapia nilotica*. B.S. thesis, Dept. of Biology, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras. (In Spanish.)
- Hernandez, Carlos, W.N., 1992. Respuesta de fitoplancton y zooplancton a fertilizante orgánico y alimento en estanques piscícolas. B.S. thesis, Dept. of Biology, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras. (In Spanish.)
- Sherman, C., 1992. All female culture of *Tilapia nilotica* in ponds fertilized with chicken litter. B.S. thesis, Dept. of Biology, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras. (In Spanish.)

UNIVERSITY OF ARKANSAS AT PINE BLUFF

Publication

- Dasgupta, S. and C.R. Engle, 1999. Nonparametric estimation of the returns to the investment in shrimp research in Honduras. *Aquaculture Economics and Management*. (submitted)

UNIVERSITY OF TEXAS, AUSTIN

Publication

- Ward, G.H., B.W. Green, and D.R. Teichert-Coddington, 1999. Estimation of carrying capacity for shrimp aquaculture in the eastern estuaries of the Gulf of Fonseca. *Proceedings of the Fifth Central American Symposium on Aquaculture at San Pedro Sula, Honduras*. (in press)

Panama ~ Aguadulce

AUBURN UNIVERSITY

Thesis

Van Wyk, P., 1986. The relationship of pump discharge and fuel efficiency to tidal height for a brackish water aquaculture pumping station. M.S. thesis, Auburn University, Alabama.

Publication

Teichert-Coddington, D.R. and M. Arrue, 1988. Efectos de dietas de proteínas y densidades de siembra sobre la producción de *Penaeus vannamei* en estanques de tierra. (Effects of protein diets and stocking density on production of *Penaeus vannamei* cultured in earth ponds.) Rev. Latinoamericana de Acuicultura, 35:29-33.

Presentations

Chavez, H. Estudio trofodinamico de *Penaeus vannamei* cultivado en estanques experimentales de aguas salobres. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

De Leon, A. El efecto de aplicar fertilizantes inorganicos en la produccion de *Penaeus vannamei* en estanques. Presented to the Second National Scientific Congress at University of Panama, Panama, November 1985.

Hughes, D.G. The marine shrimp culture industry in Panama. Presented to the First Annual Shrimp World Marketing Conference at Acapulco, Mexico, November 1984.

Hughes, D.G. Prediction of pond productivities: A challenge for aquaculture. Presented to the Pontifical Catholic University of Ecuador at Quito, Ecuador, November 1985.

Hughes, D.G. and O.M. Garcia A. La produccion de semilla de *Tilapia nilotica* en hapas: una comparacion de productividades de clima templada con clima tropical. Presented by David Hughes to First National Aquaculture Seminar at University Nacional, Heredia, Costa Rica, June 1984.

Hughes, D.G., A. Torres, and R.P. Phelps. Production and growth characteristics of *Penaeus stylirostris* and *P. vannamei* in monoculture and polyculture in fed and unfed earthen ponds. Presented by D. Hughes to the Annual Meeting of the World Mariculture Society at Orlando, Florida, January 1985.

Hughes, D.G., G. de Gomez, E. Lasso de la Vega, R.P. Phelps, and R. Pretto Malca. Rainy and dry season comparisons in *Penaeus vannamei* production ponds in Panama receiving various water exchange rates: Water quality variation. Poster session presented to World Aquaculture Society Meeting at Guayaquil, Ecuador, January 1987.

Kivers, A. Comparacion de dos rangos y dietas alimentacias con alevines de *Tilapia nilotica* en piletas de concreto. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

Kivers, A. Comparacion de tres densidades de seimbra de alevines de *Tilapia nilotica* en piletas de concreto. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

Lasso de la Vega, E. and M. Villareal. Variacion del zooplancton en estanques de cria de camarones blanco durante la estacion seca. Presented to the Second National Scientific Congress at University of Panama, Panama, November 1985.

Lore, D., H. Tunon, and R. Visuetti. Efecto de la aplicacion de abonos organicos, concentrados y pescado fresco (*Dormitator latifrons*) en la produccion de *Penaeus stylirostris* y *Penaeus vannamei*. Presented by H. Tunon to the First National Scientific Congress at University of Panama, Panama, December 1984.

Moreno, J.M. Alimentacion de la *Tilapia nilotica* en la etapa de alevinaje. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

Moreno, J.M. El uso del androgeno 17-metil-testosterona en alevinaje de *Tilapia nilotica* para la produccion de tilapia monosexuales en Panama. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

Pretto, R., G. Garson, V. Batista, and M. de Leon. Estudio preliminar del policultivo de peneidos con peces nativos de aguas salobres. Presented by R. Pretto to the Fifth Symposium of Latin American Aquaculture at Universidad Austral de Chile, Valdivia, Chile, September 1983.

Torres, A. Producción de *Penaeus stylirostris* bajo la influencia del *Penaeus vannamei*, en estanques experimentales de agua salobre con y sin alimentacion durante la epoca seca. Presented to the First National Scientific Congress at University of Panama, Panama, December 1984.

UNIVERSITY OF PANAMA

Theses

Abrego, R., 1985. Uso de androgenos en alevines de *Tilapia nilotica* para la produccion de tilapias monosexuales. B.S. thesis, University of Panama.

Chavez, H., 1984. Estudio trofodinamico de *Penaeus vannamei* cultivado en estanques experimentales de aguas salobres. B.S. thesis, University of Panama.

Hernandez de Santamaria, D., 1987. El efecto de dietas experimentales en el crecimiento y sobrevivencia de *Penaeus vannamei* cultivado en estanques. B.S. thesis, University of Panama.

Lasso de la Vega, E., 1985. Variacion del zooplancton en estanques de cria de camarones blanco durante la estacion seca. B.S. thesis, University of Panama.

Panama ~ Gualaca

AUBURN UNIVERSITY

Theses

Atencio, A., 1987. Phosphorus saturation of acidic soils in tropical fish culture ponds. Auburn University, Alabama.

Barrios, C.M., 1985. Analysis of water quality in new freshwater ponds at the Freshwater Aquaculture Station in Gualaca. Auburn University, Alabama.

Friele, M.E.F., 1985. Stomach analyses of *Macrobrachium rosenbergii*, *Tilapia nilotica*, *Colossoma macropomum* and the hybrid *Hypophthalmichthys molitrix* x *Aristichthys nobilis* in polyculture at the Gualaca Freshwater Aquaculture Experiment Station, Panama. Auburn University, Alabama.

Hughes, David G., 1988. Evaluation of seed production and sex-reversal methods for *Tilapia nilotica* and field verification in a tropical hatchery. Ph.D. dissertation, Auburn University, Alabama.

Perez, M.J., 1985. Economic and marketing study of fish and shrimp in polyculture systems in freshwater ponds at Gualaca, Chiriqui Province. Auburn University, Alabama.

Pimentel, C.A.B., 1984. Effect of liming on new unfertilized ponds at the Gualaca Aquaculture Experiment Station. Auburn University, Alabama.

Rios, R.A., 1986 Identification and dynamics of zooplankton found in tropical earthen ponds receiving chicken litter at four rates. Auburn University, Alabama.

Rodriguez, Ivonne., 1987. Feeding *Penaeus vannamei* and *Penaeus stylirostris* in nursery ponds. M.S. thesis, Auburn University, Alabama.

Serrano, A., 1987. Economics of tilapia production in monoculture or in polyculture with prawns, and utilizing manure or a commercial pellet as the nutrient input in Gualaca, Panama. Auburn University, Alabama.

Publications

- Peralta, M. and D.R. Teichert-Coddington, 1989. Comparative production of *Colossoma macropomum* and *Tilapia nilotica* in Panama. *Journal of the World Aquaculture Society*, 20(4):236–239.
- Teichert-Coddington, D.R. and R.P. Phelps, 1989. Effects of seepage on water quality and productivity of inorganically fertilized tropical ponds. *Journal of Aquaculture in the Tropics*, 4:85–92.
- Teichert-Coddington, D.R., M. Peralta, and R.P. Phelps, 1989. Seepage reduction in tropical fish ponds using chicken litter. *Aquacultural Engineering*, 8:147–154.
- Teichert-Coddington, D.R., N. Stone, and R.P. Phelps, 1988. Hydrology of fish culture ponds in Gualaca, Panama. *Aquacultural Engineering*, 7:309–320.

Presentation

- Teichert-Coddington, D.R., D.B. Rouse, A. Khater, and R.O. Smitherman. Effects of two rates of organic fertilization and two levels of alkalinity on prawn production in a prawn-tilapia polyculture. Presented to the World Aquaculture Society Meeting at Guayaquil, Ecuador, January 1987.

Peru

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE

Publications

- De Jesus, M.J. and C.C. Kohler, 1999. The commercial fishery of the Peruvian Amazon: Is it sustainable? *Fisheries Magazine* (American Fisheries Society). (submitted)
- De Jesus, M.J., C.C. Kohler, and S.T. Kohler, 1998. Sustainable aquaculture in Peru. *Aquaculture Magazine*, 24(4):23–25.

Presentations

- Alcántara, F., C. Kohler, S.T. Kohler, and M.J. DeJesus. Performance of *Piaractus brachypomus* and *Colossoma macropomum* stocked in ponds at different densities. Presented to Aquaculture '99, WAS Annual Meeting at Sydney, Australia, 26 April–2 May 1999.
- De Jesus, M.J., and C.C. Kohler. Analysis of the commercial fisheries in the Peruvian Amazon. Presented to the Illinois Renewable Natural Resources Conference, Springfield, Illinois, 4–6 March 1998.

AFRICA**Egypt**

AUBURN UNIVERSITY

Publications

- Green, B.W. and C.E. Boyd, 1995. Chemical budgets for organically fertilized fish ponds in the dry tropics. *Journal of the World Aquaculture Society*, 26(3):284–296.
- Green, B. and C.E. Boyd, 1995. Water budgets for fish ponds in the dry tropics. *Aquacult. Engineering* 14:347–356.
- Munsiri, P., C.E. Boyd, B.W. Green, and B.F. Hajek, 1996. Chemical and physical characteristics of bottom soil profiles in ponds on haplaquents in an arid climate at Abbassa, Egypt. *Journal of Aquaculture in the Tropics*, 11:319–326.

Presentations

- Green, B. and C.E. Boyd. Chemical budgets for fish ponds in the dry tropics. Presented to the World Aquaculture Society Meeting at New Orleans, Louisiana, 1994.

- Green, B. and C.E. Boyd. Water budgets for fish ponds in the dry tropics. Presented to the World Aquaculture Society Meeting at New Orleans, Louisiana, 1994.

CENTRAL LABORATORY FOR AQUACULTURE RESEARCH,
ABBASSA, EGYPT

Publications

- Abdalla, A.A.F., C.D. McNabb, and T.R. Batterson, 1996. Ammonia dynamics in fertilized fish ponds stocked with Nile tilapia. *The Progressive Fish-Culturist*, 58:117–123.
- Green, B., Z. Elnagdy, H. Hebida, and A.R. El Gamal, 1994. Pond management strategies for production of Nile tilapia in Egypt. NARP Harvest No. 2.

Presentations

- Abdelghany, A. Optimum protein requirements for Nile tilapia. Presented to the Sixth International Symposium on Fish Nutrition and Feeding at Hobart, Tasmania, Australia, 1993.
- Abdelghany, A. Optimum ratio of animal to plant protein in formulated diets for Nile tilapia. Presented to the Sixth International Symposium on Fish Nutrition and Feeding at Hobart, Tasmania, Australia, 1993.

MICHIGAN STATE UNIVERSITY

Publication

- Abdalla, A.A.F. and C.D. McNabb, 1998. Acute and sublethal growth effects of un-ionized ammonia to Nile tilapia *Oreochromis niloticus*. In: D.Randall and D. MacKinlay (Editors), Nitrogen Production and Excretion in Fish. International Congress on the Biology of Fish, Symposium Proceedings, July 27–30, 1998. pp. 35–44.

OREGON STATE UNIVERSITY

Thesis

- Gale, W.L., 1996. Sexual differentiation and steroid-induced sex inversion in Nile tilapia (*Oreochromis niloticus*): 1. Characterization of a gonadal androgen receptor; 2. Masculinization by immersion in methylidihydrotestosterone. M.S. thesis, Oregon State University, Corvallis, Oregon.

Publications

- Fitzpatrick, M.S., W.L. Gale, C.H. Slater, and C.B. Schreck, 1995. Gonadal androgen receptors in fishes. In: F.W. Goetz and P. Thomas (Editors), Proceedings of the Fifth International Symposium on Reproductive Physiology of Fish at Austin, Texas, p. 308.
- Fitzpatrick, M.S., G. Feist, W.L. Gale, C.H. Slater, and C.B. Schreck, 1994. Gonadal sex differentiation in fishes. In: D.D. MacKinlay (Editor), High Performance Fish. Proceedings of an International Fish Physiology Symposium, Fish Physiology Association, Vancouver, B.C., pp. 146–149.
- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck, 1995. Immersion of Nile tilapia (*Oreochromis niloticus*) in 17 α -methyltestosterone and mestanolone for the production of all-male populations. In: F.W. Goetz and P. Thomas (Editors), Proceedings of the Fifth International Symposium on Reproductive Physiology of Fish at Austin, Texas, p. 117.
- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck, 1996. Masculinization of Nile tilapia by short-term immersion in methylidihydrotestosterone. In: E.M. Donaldson and D.D. MacKinlay (Editors), Aquaculture Biotechnology Symposium. Proceedings of an International Fish Physiology Symposium. Cong. Biol. Fishes, Physiology Section, American Fisheries Society, Vancouver, B.C., p. 29.

- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck, 1998. Binding characteristics of a gonadal androgen receptor in Nile tilapia. Genetics and Comparative Endocrinology. (submitted)
- Gale, W.L., M.S. Fitzpatrick, M. Lucero, W.M. Contreras-Sánchez, and C.B. Schreck, 1999. Masculinization of Nile tilapia by immersion in androgens. *Aquaculture*, 178:349–357.

Presentations

- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck. Binding sites for the masculinizing steroid mibolerone in the gonadal tissue of adult tilapia (*Oreochromis niloticus*). Presented to the Western Regional Conference on Comparative Endocrinology at San Diego, California, 1994.
- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck. Binding sites for the masculinizing steroid mibolerone in the gonadal tissue of adult tilapia (*Oreochromis niloticus*). Presented to the WAS Meeting at San Diego, California, 1–4 February 1995.
- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck. Binding characteristics of a gonadal androgen receptor in Nile tilapia (*Oreochromis niloticus*). Presented to the Western Regional Conference on Comparative Endocrinology at Berkeley, California, 1996.
- Gale, W.L., M.S. Fitzpatrick, and C.B. Schreck. Masculinization of Nile tilapia by short-term immersion in methylidihydrotestosterone. Presented to the International Congress on the Biology of Fishes at San Francisco, California, 1996.

Kenya

AUBURN UNIVERSITY

Presentation

- Molnar, J., M. Lockhart, and J. Amadiva. Aquacultural development in central Kenya: Farming system, household, and community considerations. Poster presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.

OTHER

Presentations

- Bilal, P., K.M. Mavuti, J.G. Omondi, and K.L. Veverica. Plankton dynamics in tilapia (*Oreochromis niloticus*) and catfish (*Clarias gariepinus*) polyculture ponds in Central Kenya. Presented to Shallow Water Bodies in the Tropics Conference at Naivasha, Kenya, 12–16 April 1999.
- Gichuri, W.M., J.G. Omondi, K.L. Veverica. Relative condition factors (K_p) for *Oreochromis niloticus* (Cichlidae) and *Clarias gariepinus* (Clariidae) in small managed ponds. Presented to Shallow Water Bodies in the Tropics Conference at Naivasha, Kenya, 12–16 April 1999.
- Mwau, P.N., K.M. Mavuti, P.I. Bilal, and K.L. Veverica. Nitrogen and phosphorus budgets in polyculture fish ponds. Presented to Shallow Water Bodies in the Tropics Conference at Naivasha, Kenya, 12–16 April 1999.
- Oenga, D., B. Wangila, M. Muchiri, and K.L. Veverica. The history of largemouth bass *Micropterus salmoides* introduction and transfers in East Africa. Presented to Shallow Water Bodies in the Tropics Conference at Naivasha, Kenya, 12–16 April 1999.

Rwanda

AUBURN UNIVERSITY

Theses

- Hishamunda, N., 1993. The economic analysis of small-scale fish culture in Rwanda: a comparative study. M.S. thesis, Auburn University, Alabama.

- Smith, E.S., 1996. Factors affecting sex reversal of tilapia: species characteristics and feed storage conditions. M.S. thesis, Auburn University, Alabama.

Publications

- Hishamunda, N. and J.E. Moehl, 1989. Rwanda National Fish Culture Project. International Center for Aquaculture and Aquatic Environments Research and Development Series No. 34, Auburn University, Alabama, 19 pp.
- Moehl, J.F. and J.J. Molnar, 1996. Institutional requirements for aquacultural development in Africa: Lessons from Rwanda. In: C. Bailey, S. Jentoft, and P. Sinclair (Editors), *Aquacultural Development: Social Dimensions of an Emerging Industry*, Westview Press, Boulder, CO, USA/Oxford, United Kingdom, pp. 233–248.
- Moehl, J.F., K.L. Veverica, B.J. Hanson, and N. Hishamunda, 1988. Development of appropriate pond management techniques for use by Rwandan farmers. In: R.S.V. Pullin, T. Bhukaswan, K. Tonguthai, and J.L. MacLean, (Editors), *The Second International Symposium on Tilapia in Aquaculture*. ICLARM Conference Proceedings 15, Manila, Philippines, pp. 561–568.
- Molnar, J.J., C.L. Cox, P. Nyirahabimana, and A. Rubagumya, 1994. Socioeconomic factors affecting the transfer and sustainability of aquacultural technology in Rwanda. International Center for Aquaculture and Aquatic Environments Research and Development Series No. 38, Auburn University, Alabama, 16 pp.
- Popma, T.J. and B.W. Green, 1990. Sex reversal of tilapia in earthen ponds. International Center for Aquaculture and Aquatic Environments Research and Development Series No. 35, Auburn University, Alabama, 15 pp.
- Verheust, L., K.L. Veverica, and E. Rurangwa, 1991. Comparative growth and mortality of *Oreochromis niloticus* and *Clarias gariepinus* fingerlings in earthen ponds (Rwanda). In: N. De Pauw and J. Joyce (Editors), *Aquaculture and the Environment*. EAS Special Publication No. 14, pp. 318–319.
- Veverica, K., 1997. The Pond Dynamics/Aquaculture CRSP-Sponsored Proceedings of the Third Conference on the Culture of Tilapias at High Elevations in Africa. International Center for Aquaculture and Aquatic Environments Research and Development Series No. 42, Auburn University, Alabama, 26 pp.

Presentations

- Hanson, B., V. Ndoreyaho, F. Rwangano, E. Rurangwa, M. Van Speybroeck, R. Tubb, and W. Seim. Relationship between water chemistry and the growth of *Tilapia nilotica* in Rwandan (Central Africa) fish ponds fertilized with chicken manure. Presented to the World Aquaculture Society Meeting at Honolulu, Hawaii, 4–8 January 1988.
- Harwanimbaga, C., F. Rwangano, and B. Hanson. A descriptive study of plankton in Rwandan (Central Africa) fish ponds fertilized with chicken manure or triple superphosphate. Presented to the World Aquaculture Society Meeting at Honolulu, Hawaii, 4–8 January 1988.
- Newman, J.R., T.J. Popma, and W.K. Seim. Effects of temperature on maximum feed consumption and growth of juvenile Nile tilapia. Poster presented to the World Aquaculture Society Meeting at Bangkok, Thailand, January 1996.
- Veverica, K.L., N. Hishamunda, and P. Nyirahabimana. Aquaculture extension in Rwanda. Presented to the ALCOM Technical Consultation on Extension Methods for Small-holder Fish Farming in Southern Africa at Lilongwe, Malawi, 20–24 November 1995.
- Veverica, K.L., W.K. Seim, T.J. Popma, and E. Rurangwa. Cut grass as fertilizer for tilapia ponds: composting methods, application rates and timing. Presented to the Pacific Conference on Marine Science and Technology (PACON) Symposium on Sustainable Aquaculture at Honolulu, Hawaii, 11–14 June 1995.

Veverica, K.L., W.K. Seim, T.J. Popma, and E. Rurangwa. Pond dynamics and tilapia production resulting from in-pond composting. Invited paper at the World Aquaculture Society Meeting at Bangkok, Thailand, January 1996.

NATIONAL UNIVERSITY OF RWANDA (UNR)

Theses

- Bizimana, V., 1985. Essais de triage mécanique de *Tilapia rendalli* Boulenger et *Tilapia macrochir* Boulenger en vue d'un élevage monosexé. (Mechanical grading to obtain mostly male fingerlings of *Tilapia rendalli* and *Tilapia macrochir*.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur, Université Nationale du Rwanda, Butare, Rwanda.
- Gatera, A., 1990. Effet du taux d'empeisonnement et du mode de compostage sur la production des poissons en étang. (Effect of stocking rate and composting regime on production of fish in ponds.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Habineza, C., 1986. Analyse de l'effet de la fumure organique (fientes de poules) sur la croissance du *Tilapia nilotica* en étang. (The influence of chicken manure on the growth of *Tilapia nilotica* in ponds.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Hakziyaremye, E., 1984. Etude des effets de l'alimentation sur la croissance des tilapias: essais en bacs sur *T. macrochir* et *T. rendalli*. Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Harwanimbaga, C., 1987. Etude préliminaire des populations planktoniques dans des étangs de Rwasave, Butare, Rwanda. (A preliminary study of the plankton populations in fish ponds at Rwasave, Butare, Rwanda.) Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.
- Hatangimbabazi, J.D., 1989. Description des communautés planctoniques des différents habitats de quelques étangs piscicoles de Rwasave (Butare). (Description of plankton communities in different habitats of fish ponds at Rwasave (Butare)). Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.
- Hishamunda, N., 1984. Contribution à l'étude des effets de *Serranochromis macrocephala* Boulenger, sur la prolifération de *Tilapia macrochir* Boulenger, en étangs de pisciculture. (Effects of a predator fish, *Serranochromis macrocephala*, on the proliferation of *Tilapia macrochir* in fish culture ponds). Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Isangu, M.M., 1989. L'association porcs-poissons en station: étude de rentabilité financière. (Integrated pig-fish culture: an economic analysis.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Kakuze, A., 1989. Contribution à l'étude du régime alimentaire de *Tilapia nilotica* (L 1758) des étangs fertilisés de Rwasave (Butare). (A preliminary study of the feeding habits of *T. nilotica* in fertilized ponds at Rwasave, Butare.) Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.
- Mbarererehe, F., 1992. Contribution à l'étude de l'influence de la température et de la durée de traitement sur la production des alevins monosexes du *Oreochromis niloticus*. (The influence of temperature and treatment duration on the production of all-male *O. niloticus* fry.) Mémoire présenté en vue de l'obtention du Diplôme d'Ingénieur Technicien A1, Institut Supérieur d'Agriculture et d'Élevage de Busogo, Ruhengeri, Rwanda.
- Mukakarera, C., 1990. Etude hydrobiologique des ruisseaux Uwagatigita et Mbirurume de la forêt naturelle de Nyungwe. (An aquatic biology study of Uwagatigita and Mbirurume streams in the Nyungwe natural forest.) Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.
- Munyangaju, A., 1990. Etude des lacs du Bugesera en vue de proposer l'effort de pêche optimale. (A study of the lakes in the Bugesera region in order to propose an optimal fishing effort.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Murangira, J., 1992. Contribution à l'étude de la productivité de quelques graminées fourragères vis à vis trois fréquences de coupe. (Comparative productivity of eight forage grasses at three cutting frequencies.) Rapport de stage, Ecole Agricole et Vétérinaire de Kabutare, Butare, Rwanda.
- Murwanashyaka, J.N., 1989. Alimentation et parasitisme de *Clarias gariepinus* (Burchell, 1822) au Lac Ihema: impact de sa prédation sur l'évolution du stock en haplochromis. (Parasitism and feeding habits of *C. gariepinus* in Lake Ihema: impacts of its predation on haplochromis stocks.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Ndisebuye, A., 1986. Etude des conditions de reproduction de *Tilapia nilotica* en étangs de pisciculture. (A study of the conditions affecting the reproduction of *T. nilotica* in Rwandan fish ponds.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Ngarambe, O., 1986. Etude de l'influence de la fumure organique (fientes de poule) sur la dynamique des éléments fertilisants du sol de quelques étangs piscicoles de Rwasave. (The influence of chicken litter on soil and water fertility in several fish ponds at Rwasave.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Niyitegeka, D., 1990. Bilan d'azote dans les étangs piscicoles enrichis par les fertilisants de différents rapports C:N:P, Rwasave, Butare. (Nitrogen budgets in fish ponds enriched with fertilizers of different C:N:P ratios at Rwasave, Butare.) Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.
- Nsengiyumva, D., 1985. Effet de l'alimentation sur la croissance de la carpe herbivore *Ctenopharyngodon idella* Valenciennes. (Growth of the grass carp, *Ctenopharyngodon idella* Valenciennes, in response to feeding.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Nsengiyumva, V., 1989. Production des alevins monosexes de *Tilapia nilotica* Linnaeus par la méthode du "sex-reversal." (Production of *T. nilotica* fingerlings by sex reversal methods.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Rutikanga, P., 1992. Contribution à l'étude des facteurs intervenant dans le taux d'infestation des *O. niloticus* par les Diplostomatidae (maladie des points noirs). (Factors affecting the infestation rate of *Oreochromis niloticus* by Diplostomatid cysts (black spot disease).) Rapport de stage, Ecole Agricole et Vétérinaire de Kabutare, Butare, Rwanda.
- Rwalinda, P., 1990. Enrichissement du compost en azote et phosphore et ses effets sur la production du *Tilapia nilotica* (L.). (Enrichment of compost with nitrogen and phosphorus and its effects on the production of *Tilapia nilotica*, L.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.
- Uwera, M., 1987. Une étude des modalités d'échantillonnage des poissons en étangs piscicoles. (A comparative study of methods for sampling fish in ponds.) Mémoire présenté en vue de l'obtention du grade d'Ingénieur Agronome, Université Nationale du Rwanda, Butare, Rwanda.

Uzabakirho, J.D., 1989. Etude hydrobiologique des lacs Rwanyakizinga, Mihindi, Hago et Kivumba (dépression de l'Akagera, Rwanda). (Hydrobiological study of Lakes Rwanyakizinga, Mihindi, Hago and Kivumba (Akagera river basin, Rwanda).) Mémoire présenté en vue de l'obtention du grade de Licencié en Biologie Animale, Université Nationale du Rwanda, Butare, Rwanda.

Publications

- Hanson, B.J., J.F. Moehl, K.L. Veverica, F. Rwangano, and M. Van Speybroeck, 1988. Pond culture of tilapia in Rwanda, a high altitude equatorial African country. In: R.S.V. Pullin, T. Bhukaswan, K. Tonguthai, and J.L. MacLean, (Editors), The Second International Symposium on Tilapia in Aquaculture. ICLARM Conference Proceedings 15, Manila, Philippines, pp. 553-559.
- Karangwa, E., G.E. Mitchell, Jr., and R.E. Tucker, 1990. High-performance liquid chromatographic determination of 4-methyl diazole in sheep plasma and in ammoniated tall fescue hay. *Journal of Chromatography*, 532:105-133.
- Karangwa, E., G.E. Mitchell, Jr., and R.E. Tucker, 1990. Pharmacokinetics of 4-methyl diazole in sheep. *Journal of Animal Science*, 68:3277-3284.

Presentations

- Rurangwa, E. and L. Verheust. *Oreochromis niloticus* culture in Rwanda: Optimal density and feeding ration in earthen ponds. Poster presented to International Aquaculture Conference and Trade Show at Dublin, Ireland, June 1991.
- Rurangwa, E. and L. Verheust. Fish culture in Rwanda: A high altitude, developing country in central Africa. Presented to the International Aquaculture Conference and Trade Show at Dublin, Ireland, June 1991.

OREGON STATE UNIVERSITY

Theses

- Franco, L., 1991. Nile tilapia (*Oreochromis niloticus*) production in tropical microcosms fertilized with rabbit excreta. M.S. thesis, Oregon State University, Corvallis, Oregon.
- Rwangano, F., 1990. Interactions of input types and water quality on the production of *Oreochromis niloticus* (L.) in Rwandan ponds. M.S. thesis, Oregon State University, Corvallis, Oregon.
- Rwangano, F., 1998. Growth and reproduction of *Oreochromis niloticus* (L.) in tropical aquatic microcosms at fluctuating temperature regimes. Ph.D. dissertation, Oregon State University, Corvallis, Oregon.

Publications

- Balakrishnan, R., K. Veverica, and P. Nyirahabimana, 1992. Proceedings of the colloquium on Rwanda women in aquaculture. Kigembe Station, Rwanda. Women in International Development, Oregon State University, Corvallis, Oregon, 11 pp.
- Balakrishnan, R., K. Veverica, and P. Nyirahabimana, 1993. Rwanda women in aquaculture: context, contributions and constraints. Office of Women in International Development, Oregon State University, Corvallis, Oregon, 39 pp.
- Balakrishnan, R., K. Veverica, P. Nyirahabimana, and R. Rainey, 1992. An approach to integrate gender variable in Rwanda Pond Dynamics and Aquaculture Collaborative Research Support Program. Women in International Development, Oregon State University, Corvallis, Oregon, 28 pp.
- Bowman, J.R. and J.E. Lannan, 1995. Evaluation of soil pH-percent base saturation relationships for use in estimating the lime requirements of earthen aquaculture ponds. *Journal of the World Aquaculture Society*, 26(2):172-182.
- Curtis, L.R., F.T. Duren, M.D. Hurley, W.K. Seim, and R.A. Tubb, 1991. Disposition and elimination of 17 α -methyltestosterone in Nile tilapia (*Oreochromis niloticus*). *Aquaculture*, 99:192-201.

Sikoki, F.D., R.A. Tubb, and L.R. Curtis, 1986. Inhibition of hepatic UDP-glucuronyl transferase (UDP-GT) activity coincident with elevated plasma sex steroid concentrations during gonadal maturation in carp. In: R.S.V. Pullin and T. Bhukaswan (Editors), *The Toxicologist*, 6(1):553-559.

Sikoki, F.D., R.A. Tubb, and L.R. Curtis, 1988. Elevation of sex steroids and inhibition of UDP-glucuronyltransferase are out of phase during gonadal maturation in the common carp. *Comparative Biochemistry and Physiology*, 92(2):267-272.

Presentations

- Balakrishnan, R. and P. Nyirahaimana. Rwanda women's role in integrated aquaculture systems for resource sustainability. Presented to the Farming Systems Research and Extension Symposium: working paper series at Michigan State University, East Lansing, Michigan, 1992.
- Curtis, L., F. Duren, M. Hurley, and R. Tubb. Minimal residue levels after sex reversal of *Tilapia nilotica* by methyltestosterone but persistent alterations in hepatic detoxication systems. Presented to Federation of American Societies for Experimental Biology at Las Vegas, Nevada, April 1988.
- Rwangano, F., M. Van Speybroeck, E. Rurangwa, K. Veverica, and B. Hanson. Fingerling production of *Tilapia nilotica* at the Rwasave Fish Culture Station of the National University of Rwanda. Presented to the World Aquaculture Society Meeting at Honolulu, Hawaii, 4-8 January 1988.
- Seim, W. Using Eco-region classification to order pond management strategies. U.S. Forest Service Workshop on Warm Water Fish Management at Bend, Oregon, 1993.
- Tubb, R. The reduction of estradiol by liver enzymes in carp and rainbow trout. Presented to Toxicology Meetings, New Orleans, March 1986.

UNIVERSITY OF ARKANSAS AT PINE BLUFF

Publications

- Engle, C.R., 1997. Optimal resource allocation by fish farmers in Rwanda. *Journal of Applied Aquaculture*, 7(1):1-17.
- Engle, C., M. Brewster, and F. Hitayezu, 1993. An economic analysis of fish production in a subsistence agricultural economy: the case of Rwanda. *Journal of Aquaculture in the Tropics*, 8:151-165.
- Hishamunda, N., C.M. Jolly, and C.R. Engle, 1996. Estimating *Oreochromis niloticus* production function for small-scale fish culture in Rwanda. *Journal of Aquaculture in the Tropics*, 11:49-57.

Presentations

- Engle, C., D. Brown, and N. Hishamunda. Economically optimum crop mix for subsistence fish farming in Rwanda. Pond Dynamics / Aquaculture CRSP Annual Meeting at San Diego, California, 1995.
- Engle, C., D. Brown, and M. Thomas. Optimal resource allocation by fish farmers in Rwanda. Presented to the Tenth Biennial Research Symposium, Association of Research Directors at New Orleans, 1994.

SOUTHEAST ASIA

Indonesia

AGRICULTURAL UNIVERSITY OF BOGOR

Theses

- Etnawati, N., 1987. The effect of *Oreochromis niloticus* Trewavas production by increasing surface area for attached microorganisms. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.

- Gartini, T., 1986. Flow rate dependent changes in turbidity and phosphorus in the water conditioning system at Darmaga. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Harahat, I.S., 1987. Changes of nitrogen concentration of the Nile tilapia ponds which were fertilized with chicken manure. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Haryani, G.S., 1985. The growth rate, mortality and feeding habits of *Tilapia nilotica* (L.). B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Litasari, L., 1985. The composition and abundance of macrobenthos in relation to pond productivity. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Radiastuti, F., 1986. The balance of nitrogen from an irrigation canal that flows through a water conditioning system in Darmaga. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Subyakto, S., 1985. The relationship between chlorophyll *a* and Secchi disk visibility in tilapia fish ponds at Darmaga, Bogor. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Suratman, I.F., 1985. Composition and abundance of zooplankton in *Tilapia nilotica* (L.) fish ponds fertilized with triple superphosphate at Darmaga. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Tumbelaka, R., 1986. Primary productivity of aquaculture ponds at Darmaga. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Widjaja, 1985. Flushing rate of experimental *Tilapia nilotica* (L.) ponds at Darmaga and its relationship to some physical and chemical factors of the ponds. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Yulianti, S., 1986. Removal of detergents in irrigation canal water by the water conditioning system at Darmaga, Bogor. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.
- Yulisto, 1985. Effect of fish predation on macrobenthos density in aquaculture ponds. B.S. thesis, Faculty of Fisheries, Agricultural University of Bogor, Indonesia.

MICHIGAN STATE UNIVERSITY

Theses

- Abdalla, A.A.F., 1989. The effect of ammonia on *Oreochromis niloticus* (Nile tilapia) and its dynamics in fertilized tropical fish ponds. Ph.D. dissertation, Michigan State University, East Lansing, Michigan.
- Yusoff, F., 1987. Fish production, primary productivity and nutrient availability in fertilized fish ponds in Malaysia. Ph.D. dissertation, Michigan State University, East Lansing, Michigan.

Publications

- Knud-Hansen, C.F., T.R. Batterson, and I.S. Harahat, 1988. Nitrate and ammonia depletion in Indonesian aquaculture ponds fertilized with chicken manure [abstract]. *Journal of the World Aquaculture Society*, 19:42A.
- Knud-Hansen, C.F., C.D. McNabb, and T.R. Batterson, 1991. Application of limnology for efficient nutrient utilization in tropical pond aquaculture. *Proceedings of the International Association of Theoretical and Applied Limnology*, 24:2541–2543.
- Knud-Hansen, C.F., T.R. Batterson, C.D. McNabb, Y. Hadiroseyani, D. Dana, and H.M. Eidman, 1990. Hatchery techniques for egg and fry production of *Clarius batrachus* (Linnaeus). *Aquaculture*, 89:9–19.
- Knud-Hansen, C.F., T.R. Batterson, C.D. McNabb, I.S. Harahat, K. Sumantadinata, and H.M. Eidman, 1991. Nitrogen input, primary productivity and fish yield in fertilized freshwater ponds in Indonesia. *Aquaculture*, 94:49–63.

- McNabb, C.D., T.R. Batterson, H.M. Eidman, and K. Sumantadinata, 1988. Carbon limitation in fertilized fish ponds in Java [abstract]. *Journal of the World Aquaculture Society*, 19:51A.
- McNabb, C.D., C.F. Knud-Hansen, T.R. Batterson, and K. Jaiyen, 1991. A systematic approach to maximizing nutrient efficient and growth of Nile tilapia (*Oreochromis niloticus*) under semi-intensive pond culture [abstract]. *Journal of the World Aquaculture Society*, 22:40A.
- McNabb, C.D., K. Sumawidjaja, B.J. Premo, and K. Sumantadinata, 1984. Aquaculture-CRSP Indonesia project report, Cycle I, first 5-month experiment. Michigan State University, East Lansing, Michigan, 107 pp.
- McNabb, C.D., T.R. Batterson, M. Eidman, C.S. Annett, and K. Sumantadinata, 1985. Aquaculture-CRSP Indonesia project report, Cycle II, first 5-month experiment (January-June 1985). Michigan State University, East Lansing, Michigan, 105 pp.
- McNabb, C.D., T.R. Batterson, M. Eidman, B.J. Premo, and K. Sumantadinata, 1985. Aquaculture-CRSP Indonesia project report second five-month experiment. Michigan State University, East Lansing, Michigan, 71 pp.
- McNabb, C.D., T.R. Batterson, B.J. Premo, C.F. Knud-Hansen, H.M. Eidman, C.K. Lin, K. Jaiyen, J.E. Hanson, and R. Chuenpagdee, 1990. Managing fertilizers for fish yield in tropical ponds in Asia. In: R. Hirano and I. Hanyu (Editors), *Proceedings of The Second Asian Fisheries Forum*. Asian Fisheries Society, Manila, Philippines, pp. 169–172.
- Premo, B.J. and K. Sumantadinata, 1984. Laboratory manual of water quality techniques. Julia Press, Bogor, Indonesia, 43 pp.
- Yusoff, F.M. and C.D. McNabb, 1989. Effects of nutrient availability on primary productivity and fish production in fertilized tropical ponds. *Aquaculture*, 78:303–319.

Presentations

- Batterson, T.R. The problems of water quality for Indonesian fisheries. Presented to the Seminar series of the Bogor Chapter of the Indonesian Fisheries Society at Bogor, Indonesia, 20 November 1985.
- Guttman, H. and C.F. Knud-Hansen. Fish pond management by algal assay. Presented to the World Aquaculture Society Meeting at Orlando, Florida, May 1992.
- McNabb, C.D. Application of limnological technology to fish pond management. Presented to the National Institute of Biological Science at Bogor, Indonesia, December 1984.
- McNabb, C.D. Limnology of fish ponds in Java. Presented as part of the Visiting Scientists Seminar Series to College of Fisheries and Marine Science, Agricultural University of Malaysia at Serdang, Malaysia, February 1986.
- McNabb, C.D. Carbon limitation in fish culture ponds in Indonesia. Presented as part of the Visiting Scientists Seminar Series, at Lake Biwa Research Center, Shiga University, Otsu, Japan, March 1986.
- McNabb, C.D., T.R. Batterson, B.J. Premo, and J.R. Craig. Photosynthetically active radiation in tropical and temperate zone habitats. Presented to the 88th Annual Meeting of the Michigan Academy of Science, Arts, and Letters at Grand Rapids, Michigan, March 1984.
- Sumantadinata, K. Genetic characteristics of strains of Indonesian carps. Presented to Special Symposium of the Japanese Fisheries Society at Tokyo, Japan, February 1985.

Other

- Batterson, T.R., 1985-1987. Indonesia PD/A CRSP data diskettes for Cycles I, II, and III using LOTUS 1-2-3.
- Batterson, T.R. and C.D. McNabb, June–August 1986. MSU/CIFAD Visiting Scientist Program. Wardana Ismail, Head, Fisheries Research Facilities, Central Research Institute for Fisheries (CRIFI), Agency for Agricultural Research and Development (AARD), Department of Agriculture, Republic of Indonesia,

- Jakarta. Eight-week program on water quality techniques, and laboratory equipment and design in support of freshwater aquaculture in Indonesia.
- Kinnunen, R.E. and C.D. McNabb, March 1986. Collaborative aquaculture research: Institut Pertanian Bogor and Michigan State University. Improvement of pond culture technology and production. Broadcast: National Educational Television, Jakarta, Indonesia, 15 minutes.
- Kinnunen, R.E. and C.D. McNabb, March 1986. Water treatment for small pond fisheries. Broadcast: National News Network, Television of the Republic of Indonesia (TVRI), Jakarta, Indonesia, 3 minutes.
- Knud-Hansen, C.F., 23–29 November 1986. Workshop on water quality analyses for aquaculture ponds. Invited by Faculty of Fisheries, University of Brawijaya at Malang, East Java, Indonesia.
- McNabb, C.D., March 1986. Fisheries in the tropics. World Food Day National Teleconference. Michigan State University. Response Panel, East Lansing, Michigan.
- McNabb, C.D., H.M. Eidman, P. Suwignjo, D.L. Garling, K. Sumawidjaja, H.C. Lampe, S.M.H. Simandjuntak, R.E. Kinnunen, R.R. Nitibaskara, J. McAlister, T.R. Batterson, and C.F. Knud-Hansen, 1986. A research plan for Faculty of Fisheries, Institut Pertanian Bogor, Bogor, Indonesia. Michigan State University, East Lansing, Michigan. 30 pp. (Written in both English and Bahasa Indonesian.)
- National Educational Television and Television of the Republic of Indonesia (TVRI), Jakarta, Indonesia, 1986. Collaborative aquaculture research: Institut Pertanian Bogor and Michigan State University. Improvement of pond culture technology and production. (Videotape, 33 minutes)

The Philippines

UNIVERSITY OF HAWAII

Publications and Reports

- Carpenter, K.E., A.W. Fast, V.L. Corre, J.W. Woessner, and R.L. Janeo, 1986. The effects of water depth and circulation on the water quality and production of *Penaeus monodon* in earthen ponds. Proceedings of the First Asian Fisheries Forum at Manila, Philippines, 26–31 May 1986, pp. 21–24.
- Chiu, Y., M.P. Macahilig, and M.A. Sastrillo, 1986. Preliminary studies of factors affecting the feeding rhythm of milkfish (*Chanos chanos* Forskal). Proceedings of the First Asian Fisheries Forum Meeting at Manila, Philippines, 26–31 May 1986, pp. 547–550.
- Corre, V.L., K.E. Carpenter, E.J. Pudadera, and R.D. Fortes, 1986. The effects of feeds and fertilizer on the production of *Oreochromis niloticus* in brackish water ponds. (Unpublished paper.) University of Hawaii and University of the Philippines in the Visayas.
- Fast, A.W., K.E. Carpenter, V.J. Estilo, and H.J. Gonzales, 1988. Effects of water depth and artificial mixing on dynamics of Philippines brackish water shrimp ponds. *Aquacultural Engineering*, 7:349–361.
- Hopkins, K.D., 1988. Reporting fishpond yields to farmers. *Aquabyte*, 1(2):6.
- Hopkins, K.D. and J.D. Bowman, 1993. A research methodology for integrated agriculture-aquaculture farming systems. In: Jaw-Kai Wang (Editor), *Techniques for Modern Aquaculture*. Proceedings of an Aquacultural Engineering Conference, 21–23 June 1993, at Spokane, Washington. American Society of Agricultural Engineers. St. Joseph, Michigan, pp. 89–98.
- Hopkins, K.D. and D. Pauly, 1993. Instantaneous mortalities and multivariate models: applications to tilapia culture in saline water. In: M. Prein, G. Hulata and D. Pauly, (Editors), *Multivariate methods in aquaculture research: case studies of tilapias in experimental and commercial systems*. ICLARM, Manila, Philippines, pp. 105–111.

- Szyper, J.P., 1996. Comparison of three mixing devices in earthen culture ponds of four different surface areas. *Aquacultural Engineering*, 15(5):381–396.
- Szyper, J.P., 1996. Observations and model predictions of daily areal primary production in a eutrophic brackish water culture pond. *Ecological Modelling International Journal on Ecological Modelling and Systems Ecology*, 88:83–92.
- Young, M.J.A., A.W. Fast, and P. Olin, 1989. Induced maturation and spawning of the Chinese catfish (*Clarias fuscus*). *Journal of the World Aquaculture Society*, 20(1):7–11.

Presentation

- Fast, A.W., K.E. Carpenter, F.J. Estilo, and H.J. Gonzales. Effects of water depth on dynamics of Philippines brackish water shrimp ponds. Presented to the World Aquaculture Society Meeting at Guayaquil, Ecuador, January 1987.

UNIVERSITY OF THE PHILIPPINES IN THE VISAYAS

Thesis

- Pahila, I.G., 1986. Sorbed and soil solution phosphorus in relation to the optimum phosphorus level of lab-lab in some brackish water ponds. M.S. thesis, Dept. of Fisheries, University of the Philippines, Visayas, Philippines.

Publications

- Fortes, R.D., V.L. Corre, Jr., and E. Pudadera, 1986. Effects of fertilizers and feeds as nutrient sources on *Oreochromis niloticus* production in Philippine brackish water ponds. Proceedings of the First Asian Fisheries Forum at Manila, Philippines, May 1986, pp. 121–124.
- Minsalan, C.L.O. and Y.N. Chiu, 1986. Effects of teaseed cake on selective elimination of finfish in shrimp ponds. Proceedings of the First Asian Fisheries Forum at Manila, Philippines, May 1986, pp. 79–82.
- Sanares, R.C., S.A. Katase, A.W. Fast, and K.E. Carpenter, 1986. Water quality dynamics in brackish water shrimp ponds with artificial aeration and circulation. Proceedings of the First Asian Fisheries Forum at Manila, Philippines, May 1986, pp. 83–86.
- Ver, L.M.B. and Y.N. Chiu, 1986. The effect of paddlewheel aerators on ammonia and carbon dioxide removal in intensive pond culture. Proceedings of the First Asian Fisheries Forum, Manila, Philippines, 26–31 May 1986, pp. 97–100.

Thailand

ASIAN INSTITUTE OF TECHNOLOGY

Theses

- Ahmed, S., 1995. Assessment of chlorine as a piscicide in freshwater fish culture. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Amechi, E.O., 1995. An assessment of by-catch biomass in experimental fish ponds. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Arifin, Z., 1996. Efficacy of liming and uses of liming materials for shrimp pond management. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Baouthong, P., 1995. The effect of feeding regime on growth and body composition of shrimp (*Penaeus monodon*). M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Barte, M., 1996. Effect of aeration on water quality and fish growth in intensive culture of Nile tilapia. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Boonsong, S. Role of zooplankton in feeding juvenile tilapia (*Oreochromis niloticus*). M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.

- Chan, R., 1997. Interactive effect of feeding frequency and time of feeding for tilapia. M.Sc. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Chughtai, M.A., 1995. Effects of water spinach (*Ipomoea aquatic*) on nutrient regime and fish growth. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Guttman, H., 1990. Assessment of nutrient limitation in fertilized fish ponds by algal assay. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Jatuporn, B., 1997. Effect of aeration on water quality and fish production in fertilized ponds. M.Sc. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Jiwyam, W., 1990. The role of sediments in pond fertility. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Md, R.I., 1995. A field survey of the factors involved in the use of ponds for fish culture in Bangladesh, with emphasis on water quality. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Muthuwam, V., 1991. Nutrient budget and water quality in intensive marine shrimp culture ponds. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Narong, V. Effects of phytoplankton on nursing walking catfish fry in static and flow-through water systems. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Nguyen, P.H., 1996. Effects of salinity on fertilization for tilapia culture. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Pautong, A.K., 1991. Role of urea in fertilizing fish ponds. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Qifeng, Y., 1991. Nutrient budget and water quality in integrated walking catfish-tilapia culture. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Rachada, M., 1997. Turbidity in fish ponds in northeast Thailand. M.Sc. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Raghunath, B. Shivappa., 1997. Efficacy of probiotics and disinfectant in controlling luminescent bacteria in shrimp postlarvae under normal and stressed conditions. M.Sc. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Rai, S., 1997. Co-culture of walking catfish with Indian major carps. M.Sc. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Rao, T.V.G., 1989. Gonadal development in environmentally induced breeding of walking catfish *Clarias batrachus* (Linnaeus). M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Rungruengwudhikrai, E.-O., 1995. Characterization and classification of off-flavour of Nile tilapia. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Ruttanagosit, W., 1997. Organic matter dynamics in a closed intensive culture system for black tiger prawn (*Penaeus monodon*). Ph.D. dissertation, Asian Institute of Technology, Bangkok, Thailand.
- Shrestha, M.K., 1989. Impact of attached microorganism biomass on tilapia (*Oreochromis niloticus*) production. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Suresh, A.V. Influence of stocking density on red tilapia production in a recirculation system. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Thakur, D.P., 1996. Water quality and nutrient budget in closed intensive shrimp culture systems. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Ullah, Md. A., 1989. Nutrient release characteristics of duck manure for Nile tilapia production. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Ungsethaphan, T., 1995. An on-farm trial to investigate feeding strategies for Nile tilapia (*Oreochromis niloticus*) broodfish. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Vuthana, H., 1995. Fish pond turbidity in Cambodia. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Xie, J.J., 1995. Alternative methods for maggot production. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.
- Yi, Y., 1997. An integrated rotation culture system for fattening large Nile tilapia (*Oreochromis niloticus*) in cages and nursing small Nile tilapia in open ponds. Ph.D. dissertation, Asian Institute of Technology, Bangkok, Thailand.

Publications

- Cao, T.B., C.K. Lin, and H. Demaine, 1999. Evaluation of low-cost supplemental diets for culture of Nile tilapia in North Vietnam: I. Selection of supplemental diets. *Journal of Asian Fisheries Science*. (in revision)
- Cao, T.B., C.K. Lin, and H. Demaine, 1999. Evaluation of low-cost supplemental diets for culture of Nile tilapia in North Vietnam: II. Supplemental feeding rates in fertilized ponds. *Journal of Asian Fisheries Science*. (in revision)
- Edwards, P., C.K. Lin, and A. Yakupitiyage, 1999. Semi-intensive pond aquaculture. In: M. Beveridge and B. McAndrew (Editors), *Tilapia Culture and Exploitation*. Chapman and Hall, London. (in press)
- Yi, Y., 1999. A bioenergetics growth model for Nile tilapia (*Oreochromis niloticus*) based on limiting nutrients and fish standing crop in fertilized ponds. *Aquacultural Engineering*. (in press)

Presentations

- Yi, Y. A bioenergetics growth model for Nile tilapia (*Oreochromis niloticus*) based on limiting nutrients and fish standing crop in fertilized ponds. Presented to Aquaculture '98, WAS Annual Meeting in Las Vegas, Nevada, 15–19 February 1998.
- Yi, Y. and C.K. Lin. An integrated rotation culture system for fattening large Nile tilapia in cages and nursing small Nile tilapia in open ponds. Presented to WAS '97 at Seattle, Washington, February 1997.

AUBURN UNIVERSITY

Publications

- Boyd, C.E. and P. Munsiri, 1996. Phosphorus adsorption capacity and availability of added phosphorus in soils from aquaculture areas in Thailand. *Journal of the World Aquaculture Society*, 27(2):160–167.
- Boyd, C.E. and P. Munsiri, 1997. Water quality in laboratory soil-water microcosms with soils from different areas of Thailand. *Journal of the World Aquaculture Society*, 28(2):165–170.

Presentation

- Boyd, C.E. Water quality in laboratory soil-water microcosms with soils from different areas of Thailand. Presented to WAS '97 at Seattle, Washington, February 1997.

MICHIGAN STATE UNIVERSITY

Publications

- Knud-Hansen, C.F., 1992. Analyzing standard curves in the chemistry of waters used for aquaculture. *NAGA*, 15:16–19.
- Knud-Hansen, C.F., 1992. Pond history as a source of error in fish culture experiments: a quantitative assessment using covariate analysis. *Aquaculture*, 105:21–36.
- Knud-Hansen, C.F. and A.K. Pautong, 1993. On the role of urea in pond fertilization. *Aquaculture*, 114:273–283.
- Knud-Hansen, C.F. and T.R. Batterson, 1994. Effect of fertilization frequency on the production of Nile tilapia (*Oreochromis niloticus*). *Aquaculture*, 123:271–280.
- Knud-Hansen, C.F., T.R. Batterson, and C.D. McNabb, 1993. The role of chicken manure in the production of Nile tilapia, *Oreochromis niloticus* (L.). *Aquaculture and Fisheries Management*, 24:483–493.
- Knud-Hansen, K.D. Hopkins, and H. Guttman, 1999. A comparative analysis of the fixed-input, computer modeling, and algal bioassay approaches for identifying pond fertilization requirements. *Aquaculture*. (in press)

- McNabb, C.D., T.R. Batterson, C.K. Lin, K. Jaiyen, J.E. Hanson, and R. Chuenpagdee, 1989. Fish yield with nitrogen supplemented organic fertilizers. *World Aquaculture Society*, 20:56A.
- Shevgoor, L., C.F. Knud-Hansen, and P.E. Edwards, 1994. An assessment of the role of buffalo manure for pond culture of tilapia, part 3: Limiting factors. *Aquaculture*, 126:107–118.
- Shrestha, M.K. and C.F. Knud-Hansen, 1994. Increasing attached microorganism biomass as a management strategy for Nile tilapia (*Oreochromis niloticus*) production. *Aquacultural Engineering*, 13:101–108.

Presentations

- Knud-Hansen, C.F. and C.K. Lin. Strategies for stocking Nile tilapia (*Oreochromis niloticus*) in fertilized ponds. Presented to the Third International Symposium on Tilapia in Aquaculture at Abidjan, Côte d'Ivoire, Africa, November 1991.
- Knud-Hansen, C.F. and A.K. Pautong. The role of urea in fishpond fertilization. Presented to the World Aquaculture Society Meeting at Orlando, Florida, May 1992.

Other

- Knud-Hansen, C.F. and T.R. Batterson, 1987-1992. Thailand PD/A CRSP data diskettes for Work Plans IV, V, and VI experiments using LOTUS 1-2-3.

UNIVERSITY OF HAWAII

Publications

- Hopkins, K.D., 1992. Reporting fish growth: a review of the basics. *Journal of World Aquaculture Society*, 23(3):173–179.
- Hopkins, K.D. and A. Yakupitiyage, 1991. Bias in seine sampling of tilapia. *Journal of the World Aquaculture Society*, 22(4):260–262.
- Hopkins, K.D., M.L. Hopkins, and D. Pauly, 1988. A multivariate model of tilapia growth, applied to seawater tilapia culture in Kuwait. In: R.S.V. Pullin, T. Bhukaswan, K. Tonguthai, and J.L. MacLean (Editors), *The Second International Symposium on Tilapia in Aquaculture*. ICLARM Conference Proceedings 15, Manila, Philippines, pp. 29–39.
- Szyper, J.P. and J.M. Ebeling, 1993. Photosynthesis and community respiration at three depths during a period of stable phytoplankton stock in a eutrophic brackish water culture pond. *Marine Ecology Progress Series*, 94:229–238.
- Szyper, J. and K.D. Hopkins, 1996. Effects of pond depth and mechanical mixing on production of *Oreochromis niloticus* in manured earthen ponds. In: R.S.V. Pullin, J. Lazard, M. Legendre, and J.B. Amon Kothias (Editors), *The Third International Symposium on Tilapia in Aquaculture*. ICLARM Conference Proceedings 41, Manila, Philippines., pp. 152–159.
- Szyper, J.P. and C.K. Lin, 1990. Techniques for assessment of stratification and effects of mechanical mixing in tropical fish ponds. *Aquacultural Engineering*, 9:151–165.
- Szyper, J.P., K. Hopkins, and C.K. Lin, 1991. Production of *Oreochromis niloticus* (L.) and ecosystem dynamics in manured ponds of three depths. *Aquaculture and Fisheries Management*, 22:385–396.
- Szyper, J.P., J.Z. Rosenfeld, R.H. Piedrahita, and P. Giovannini, 1992. Diel cycles of planktonic respiration rates in briefly incubated water samples from a fertile earthen pond. *Limnology and Oceanography*, 37:1193–1201.
- Szyper, J.P., C.K. Lin, D. Little, S. Setboonsarng, A. Yakupitiyage, P. Edwards, and H. Demaine, 1995. Techniques for efficient and sustainable mass production of tilapia in Thailand. *Proceedings, Sustainable Aquaculture 95*. Pacific Congress on Marine Science and Technology, pp. 349–356.

Presentations

- Emberson, C. and K. Hopkins. Intensive culture of *Penaeus stylirostris* in plastic-lined tanks. Poster presented to the World Aquaculture Society Meeting at San Diego, California, 1–4 February 1995.
- Lin, C.K. and J. Szyper. Stratification of temperature and dissolved oxygen in tropical fish ponds. Presented to the World Aquaculture Society Meeting at Halifax, Canada, June 1990.

UNIVERSITY OF MICHIGAN

Theses

- Tain, F.H., 1999. Impacts of aquaculture extension on small-scale *Oreochromis niloticus* production in northeastern Thailand. M.S. thesis, The University of Michigan, Ann Arbor, Michigan.
- Wirat, J., 1996. Nutritional input of nitrogen in fish ponds through fixation by blue-green algae. Ph.D. dissertation, Asian Institute of Technology, Bangkok, Thailand.
- Zaenal A., 1996. Efficacy of liming and uses of lime for shrimp pond management. M.S. thesis, Asian Institute of Technology, Bangkok, Thailand.

Publications

- Buurma, B.J. and J.S. Diana, 1994. The effects of feeding frequency and handling on growth and mortality of cultured walking catfish, *Clarias fuscus*. *Journal of the World Aquaculture Society*, 25:175–182.
- Cao, T.B. and C.K. Lin, 1995. Shrimp culture in Vietnam. *World Aquaculture*, 26:27–33.
- Diana, J.S., 1993. Conservation and utilization of genetic resources in capture and culture fisheries. In: C.S. Potter, J.I. Cohen, and D. Janczewski (Editors), *Perspectives on Biodiversity: Case Studies of Genetic Resource Conservation and Development*. American Association for the Advancement of Science, Washington, D.C., pp. 89–104.
- Diana, J.S., 1995. Biology and Ecology of Fishes. Biological Sciences Press, Carmel, Indiana, 441 pp.
- Diana, J.S. and A. Fast, 1989. The effects of water exchange rate and density on yield of the walking catfish, *Clarias fuscus*. *Aquaculture*, 78:267–276.
- Diana, J.S. and C.K. Lin, 1998. The effects of fertilization on growth and production of Nile tilapia in rain-fed ponds. *Journal of the World Aquaculture Society*, 29:405–413.
- Diana, J.S. and D. Ottey, 1983. Biological principles of pond culture: Fish. In: J.E. Lannan, R.O. Smitherman, and G. Tchobanoglous (Editors), *Principles and Practices of Pond Aquaculture: A State of the Art Review*. Oregon State University Press, Corvallis, Oregon, pp. 55–66.
- Diana, J.S., D.J. Dettweiler, and C.K. Lin, 1991. Effect of Nile tilapia (*Oreochromis niloticus*) on the ecosystem of aquaculture ponds, and its significance to the trophic cascade hypothesis. *Canadian Journal of Fisheries and Aquatic Sciences*, 48(2):183–190.
- Diana, J.S., S.L. Kohler, and D.R. Ottey, 1988. A yield model for walking catfish production in aquaculture systems. *Aquaculture*, 71:23–35.
- Diana, J.S., C.K. Lin, and K. Jaiyen, 1994. Supplemental feeding of tilapia in fertilized ponds. *Journal of the World Aquaculture Society*, 25:497–506.
- Diana, J.S., C.K. Lin, and P.J. Schneeberger, 1991. Relationships among nutrient inputs, water nutrient concentrations, primary production, and yield of *Oreochromis niloticus* in ponds. *Aquaculture*, 92:323–341.
- Diana, J.S., C.K. Lin, and Y. Yi, 1996. Timing of supplemental feeding for tilapia production. *Journal of the World Aquaculture Society*, 27:410–419.
- Diana, J.S., P.J. Schneeberger, and C.K. Lin, 1988. Relationships between primary production and yield of tilapia in ponds. In: R.S.V. Pullin, T. Bhukaswan, K. Tonguthai, and J.L. MacLean (Editors), *The Second International Symposium on Tilapia in*

- Aquaculture. ICLARM Conference Proceedings 15, Manila, Philippines, pp. 1–6.
- Lin, C.K., 1983. Biological principles of pond culture: Phytoplankton and macrophytes. In: J.E. Lannan, R.O. Smitherman, and G. Tchobanoglous (Editors), Principles and Practices of Pond Aquaculture: A State of the Art Review. Oregon State University Press, Corvallis, Oregon, pp. 39–43.
- Lin, C.K., 1986. Acidification and reclamation of acid sulfate soil fishponds in Thailand. In: J.L. MacLean, L.B. Dizon, and L.V. Hosillos (Editors), The First Asian Fisheries Forum. Asian Fisheries Society, Manila, Philippines, pp. 71–74.
- Lin, C.K., 1986. Nutrient dynamics between inorganic and organic fertilization in tilapia culture ponds. Proceedings of the 24th Kasetsart University Conference on Fisheries, pp. 174–182.
- Lin, C.K., 1989. Occurrence of mass mortality of black tiger prawns in Taiwan. Thai Fisheries Gazette, 42:209–216.
- Lin, C.K., 1989. Prawn culture in Taiwan: What went wrong? World Aquaculture, 20:19–20.
- Lin, C.K., 1990. Integrated culture of walking catfish (*Clarias macrocephalus*) and tilapia (*Oreochromis niloticus*) in earthen ponds. In: R. Hirano and I. Hanyu (Editors), Proceedings of The Second Asian Fisheries Forum. Asian Fisheries Society, Manila, Philippines, pp. 209–212.
- Lin, C.K. and M. Boonyaratpalin, 1988. An analysis of biological characteristics of *Macrobrachium rosenbergii* in relation to pond production and marketing in Thailand. Aquaculture, 74:205–215.
- Lin, C.K. and J.S. Diana, 1995. Co-culture of catfish (*Clarias macrocephalus* × *C. gariepinus*) and tilapia (*Oreochromis niloticus*) in ponds. Aquatic Living Resources, 8:449–454.
- Lin, C.K., K. Jaiyen, and W. Muthuwana, 1990. Integrated culture of intensive and semi-intensive aquaculture: Concept and example. Thai Fisheries Gazette, 43:425–430.
- Lin, C.K., V. Tansakul, and C. Apinpath, 1988. Biological nitrogen fixation as a source of nitrogen input in fishponds. In: R.S.V. Pullin, T. Bhukaswan, K. Tonguthai, and J.L. MacLean (Editors). The Second International Symposium on Tilapia in Aquaculture. ICLARM Conference Proceedings 15, Manila, Philippines, pp. 53–58.
- Liu, K.M. and W.Y.B. Chang, 1992. Bioenergetic modelling of effects of fertilization, stocking density, and spawning on growth of the Nile tilapia, *Oreochromis niloticus* (L.). Aquaculture and Fisheries Management, 23:291–301.
- Muthuwana, W., V. Tansakul, and C.K. Lin, 1986. Nutrient dynamics between inorganic and organic fertilized ponds for tilapia culture. Proceedings of the Kasetsart University Agricultural Conference, January 1985.
- Nash, G., S. Chinabut, and C. Limsuwan, 1987. Idiopathic muscle necrosis in the freshwater prawn, *Macrobrachium rosenbergii* (de Man), cultured in Thailand. Journal of Fish Diseases, 10:109–120.
- Nguyen, M.N. and C.K. Lin, 1996. *Penaeus monodon* seed production in central Vietnam. World Aquaculture, 27:6–18.
- Shrestha, M.K. and C.K. Lin, 1996. Phosphorus fertilization strategy in fish ponds based on sediment phosphorus saturation level. Aquaculture, 142:207–219.
- Shrestha, M. and C.K. Lin, 1999. Recycling of pond mud nutrients to cowpea and taro crops. Nutrient Cycling in Agri-Ecosystems. (submitted)
- Suresh, A.V. and C.K. Lin, 1992. Effect of stocking density on water quality and production of red tilapia in a recirculated water system. Aquaculture Engineering, 11:1–22.
- Suresh, A.V. and C.K. Lin, 1992. Tilapia culture in saline waters: A review. Aquaculture, 106:201–226.
- Szyper, J.P. and C.K. Lin, 1990. Techniques for assessment of stratification and effects of mechanical mixing in tropical fish ponds. Aquaculture Engineering, 9:151–165.
- Tavarutmaneegul, P. and C.K. Lin, 1988. Breeding and rearing of sand goby (*Oxyleotris marmoratus*, Blk.) fry. Aquaculture, 69:299–305.
- Yi, Y., 1998. A bioenergetics growth model for Nile tilapia (*Oreochromis niloticus*) based on limiting nutrients and fish standing crop in fertilized ponds. Aquacultural Engineering, 18:157–173.
- Yi, Y. and C.K. Lin, 1999. Analyses for various inputs for pond culture of Nile tilapia (*Oreochromis niloticus*): Profitability and possible environmental impacts. Aquaculture Economics and Management. (in press)
- Yi, Y. and C.K. Lin, 1999. Comparative economic analyses for various grow-out strategies of Nile tilapia (*Oreochromis niloticus*) in earthen ponds. Aquaculture Economics and Management. (accepted for publication)
- Yi, Y., C.K. Lin, and J.S. Diana, 1996. Influence of Nile tilapia (*Oreochromis niloticus*) stocking density in cages on their growth and yield in cages and in ponds containing the cages. Aquaculture, 146:205–215.

Presentations

- Alimuzaman, C. and C.K. Lin. Aeration effects on erosion and water circulation in round and rectangular ponds. Presented to the World Aquaculture Society meeting at Bangkok, Thailand, February 1996.
- Diana, J.S. and C.K. Lin. Effects of fertilization rate on primary production and yield of tilapia in ponds. Presented to the World Aquaculture Society Meeting at Honolulu, Hawaii, January 1988.
- Diana, J.S. and C.K. Lin. Supplemental feeding for production of Nile tilapia *Oreochromis niloticus*. Presented to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- Diana, J.S., C.K. Lin, and D. Dettweiler. Cascading trophic interactions: a test of the hypothesis using tilapia culture data. Presented to the World Aquaculture Society Meeting at Los Angeles, California, February 1989.
- Diana, J.S., D. Clapp, P. Hudson, and G. Regal. Movements of brown trout in the AuSable River, Michigan. Presented to the American Fisheries Society meeting at Dearborn, Michigan, August 1996.
- Kaewprakaisaengkul, C., C.K. Lin, and Y. Yi. Construction and application of hapa washer. Poster presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Lin, C.K. and S. Auworatham. Effects of inorganic and organic fertilizers on zooplankton production in tilapia ponds. Presented to the 25th Kasetsart University Conference at Bangkok, Thailand, 1987.
- Lin, C.K. and J.S. Diana. Fertilization effects on pond carrying capacity in extensive culture of tilapia (*Oreochromis niloticus*). Presented to the Second International Symposium on Tilapia in Aquaculture at Bangkok, Thailand, 1987.
- Lin, C.K. and S. Kaewchum. Application of bioremediation in intensive culture of black tiger shrimp (*Penaeus monodon*). Presented to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- Lin, C.K. and J. Szyper. Stratification of temperature and dissolved oxygen in tropical fish ponds. Presented to the World Aquaculture Meeting at Halifax, June 1990.
- Lin, C.K., and Y. Yi. Comparative economic analyses for different grow-out strategies of Nile tilapia in earthen ponds. Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Lin, C.K., S. Auworatham, and V. Tansakul. Dietary consumption of zooplankton by tilapia in fertilized ponds. Presented to the Thai Fisheries Academy Seminar, 1986.
- Lin, C.K., M. Boonyaratpalin, and Y. Musig. Biological characteristics of *Macrobrachium rosenbergii* (de Man) in relation to pond production and marketing. Presented to the First Asian Fisheries Society Forum at Manila, Philippines, May 1986.
- Lin, C.K., E. Sae-Loaw, and V. Tansakul. Rearing post-larvae of *Macrobrachium rosenbergii* at high stocking density in concrete tanks. Presented to the 25th Kasetsart University Conference at Bangkok, Thailand, 1987.
- Lin C.K., Y. Yi, and J.S. Diana. Effects of management strategy on nutrient budgets in Nile tilapia (*Oreochromis niloticus*) ponds. Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Lin C.K., M.K. Shrestha, J.S. Diana, and D.P. Thakur. Management to minimize the environmental impacts of pond draining: Harvest

- draining technique and effluent quality, Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Lin, C.K., V. Tansakul, W. Muthuwana, and S. Auworatham. Production and utilization of organic carbon in tilapia culture and ponds. Presented to the Thai Fisheries Academy Seminar, 1986.
- Lin, C.K., W. Muthuwana, V. Tansakul, S. Auworatham, and C. Apinapat. Nutrient dynamics between inorganic and organic fertilized ponds for tilapia culture. Presented to the Thai Fisheries Academy Seminar, 1986.
- Musig, Y., M. Boonyaratpalin, and C.K. Lin. Water quality in *Macrobrachium* growout ponds. Presented to the 25th Kasetsart University Conference at Bangkok, Thailand, 1987.
- Muthuwana, W. and C.K. Lin. Water quality and nutrient budget in intensive shrimp culture ponds. Presented to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- Pant J., P. Promthong, C.K. Lin, and H. Demaine. Fertilization of ponds with inorganic fertilizers: Low cost technologies for small-scale farmers. Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Tansakul, V., T. Sae-Lee, and E. Sae-Loaw. Acute toxicity and treatment effect of formalin on early larval prawns, *Macrobrachium rosenbergii* (de Man). Presented to the 25th Kasetsart University Conference at Bangkok, Thailand, 1987.
- Yi, Y. An integrated cage culture system in earthen ponds: A bioenergetics growth model for Nile tilapia. Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Yi, Y. A bioenergetics growth model for Nile tilapia (*Oreochromis niloticus*) based on limiting nutrients and fish standing crop in fertilized ponds. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Yi, Y. and C.K. Lin. An integrated cage culture system in earthen ponds: stocking densities of caged Nile tilapia (*Oreochromis niloticus*). Presented to the Fourth Asian Fisheries Forum at Bangkok, Thailand, October 1995.
- Yi, Y. and C.K. Lin. An integrated cage culture system in earthen ponds: biomass of caged Nile tilapia (*Oreochromis niloticus*). Presented to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- Yi, Y., C.K. Lin and J.S. Diana. Management of organic matter and nutrient regeneration in pond bottoms. Presented to the World Aquaculture Society Meeting at Sydney, Australia, 26 April–2 May 1999.
- Yi, Y., C.K., Lin, J.S. Diana, R.B. Shivappa, and M.A.K. Chowdhury. Management of organic matter and nutrient regeneration in pond bottoms. Presented to Aquaculture '99, WAS Annual Meeting at Sydney, Australia, 26 April–2 May 1999.

Other

- Lin, C.K., 1989. Intensive pond culture of freshwater prawns and marine shrimps in Thailand. Seminar at Auburn University, Alabama, 23 May 1989.
- Lin, C.K., 1989. Overview of current aquaculture in the Orient and the USA. Seminar at United States Agency for International Development, Bangkok, Thailand, 28 July 1989.
- Lin, C.K., 1989. The problems of marine shrimp culture in Taiwan. Seminar at Royal Thai Government Department of Fisheries and Shrimp Farmers Association. Bangkok, Thailand, July 1989.
- Lin, C.K., 1989. Aquaculture in Thailand and AITs Program. Seminar at Citizens Ambassadors, Bangkok, Thailand, August 1989.
- Lin, C.K., 1990. Current status of freshwater prawn and marine shrimp culture in Thailand. Seminar at Great Lakes Fisheries Research Laboratory, Ann Arbor, Michigan.
- Lin, C.K., 1990. Effects of intensive shrimp culture on coastal environment in upper Gulf of Thailand. Seminar at Royal Thai Government Department of Fisheries and Shrimp Farmers Associations, 15–16 February 1990.

- Yi, Y. Cage culture in ponds. Seminar presented to the Sichuan Provincial Fisheries Association, Sichuan, China, 9–20 June 1999.

Global Activities

AUBURN UNIVERSITY

Theses

- Gross, A., 1999. Nitrogen cycling in aquaculture ponds. Ph.D. dissertation, Auburn University, Alabama.
- Massaut, L., 1998. Planktonic trophic interactions in catfish and sportfish ponds in the presence of an omnivorous filter-feeding fish. Ph.D. dissertation, Auburn University, Alabama.
- Sonnenholzner, S., 1999. Chemical and physical properties of shrimp pond sediment in Ecuador and some management strategies for pond preparation. Ph.D. dissertation, Auburn University, Alabama.

Publications

- Boyd, C.E., 1998. Water quality for pond aquaculture. Alabama Agricultural Experiment Station, Research and Development Series 43. Auburn University, Alabama, 37 pp.
- Boyd, C.E. and J.R. Bowman, 1997. Pond bottom soils. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 135–162.
- Boyd, C.E. and A. Gross, 1998. Use of probiotics for improving soil and water quality in aquaculture ponds, In: T.W. Flegel (Editor), Advances in Shrimp Biotechnology. BIOTEC, Bangkok, Thailand, pp. 101–106.
- Boyd, C.E. and L. Massaut, 1999. Risks associated with the use of chemicals in pond aquaculture. Aquacultural Engineering, 20:113–132.
- Green, B.W., K.L. Veverica, and M.S. Fitzpatrick, 1997. Fry and fingerling production. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 215–244.
- Molnar, J., 1999. Sound policies for food security: The role of culture and social organization. Reviews of Agricultural Economics. (in press)
- Molnar, J., T. Hanson, and L. Lovshin, 1996. Impacts of the Pond Dynamics / Aquaculture Collaborative Support Research Program as a development intervention. NAGA: The ICLARM Quarterly, 19(2):31–40.
- Sonnenholzner, S. and C.E. Boyd, 1999. Aerobic organic matter decomposition in aquaculture pond soils as measured by respiration chambers. Journal of the World Aquaculture Society. (in press)
- Sonnenholzner, S. and C.E. Boyd, 1999. Chemical and physical properties of shrimp pond bottom sediments in Ecuador. Journal of the World Aquaculture Society. (in press)
- Sonnenholzner, S. and C.E. Boyd, 1999. Decomposition of organic matter as measured by soil respiration in shrimp ponds treated with chemical and biological amendments. World Aquaculture. (submitted)
- Teichert-Coddington, D.R., T.J. Popma, and L.L. Lovshin, 1997. Attributes of tropical pond-cultured fish. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 183–198.
- Veverica, K.L. and J.J. Molnar, 1997. Developing and extending aquaculture technology for producers. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 397–414.

Presentations

- Boyd, C.E. Food safety considerations related to chemical use for water and soil quality enhancement in ponds. FAO/NACA/

- WHO Study Group on Food Safety Issues Associated with Products of Aquaculture, Bangkok, Thailand, 1997.
- Boyd, C.E. Farm level indicators and criteria for sustainable shrimp farming. FAO Ad-Hoc Expert Meeting on Indicators and Criteria for Sustainable Shrimp Farming, Rome, Italy, 1998.
- Boyd, C.E. Phosphorus chemistry in pond soils. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Boyd, C.E. Water quality management in pond aquaculture. Presented to the International Aquaculture Conference at Sao Paulo, Brazil, 26–27 August 1998.
- Boyd, C.E. Environmental management in aquaculture. Presented to Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Boyd, C.E. Environmental and sustainability issues in aquaculture. Keynote address presented to Aquaculture America '99 at Tampa, Florida, 27–30 January 1999.
- Boyd, C.E. Measurement of pH in pond bottom soils. Aquaculture '99, World Aquaculture Society Annual Meeting, Sydney, Australia, 26 April–2 May 1999.
- Boyd, C.E. and C.W. Wood. Conceptual model of aquacultural pond soil development. Presented to the Soil Science Society of America Annual Meeting, Anaheim, California, 25–30 October 1997.
- Boyd, C.E., A. Gross, and M. Rowan. Laboratory studies of sedimentation as a technique for treating pond effluents. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Massaut, L. and C.E. Boyd. Risks associated with use of chemicals in pond aquaculture. Poster presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Molnar, J. Doing development by growing fish: a cross-national analysis of the impacts of aquacultural research. Presented to the Annual Meeting of the Rural Sociological Society, Toronto, Canada, 1997.
- Molnar, J., T. Hanson, and L. Lovshin. Doing science, growing fish, teaching people: Human capital impacts of the pond dynamics aquaculture CRSP. Presented to WAS '97 at Seattle, Washington, February 1997.
- Queiroz, J.F. (presented by C.E. Boyd). Soil consideration in site selection, pond construction, and pond management. Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Smith, E.S. and R.P. Phelps. Effect of feed storage time and storage temperature on growth rate of tilapia fry and efficacy of sex reversal. Presented to the Fourth International Symposium on Tilapia in Aquaculture at Orlando, Florida, 9–12 November 1997.
- Wood, C.W., C.E. Boyd, and J. Queiroz. Aquaculture pond soil development. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Other**
- Boyd, C.E. Aquaculture pond soils with emphasis on shrimp culture. Soil Science Graduate Seminar, Texas A&M University, 1997.
- Boyd, C.E. Workshop on soil management in shrimp ponds (4 days), Guayaquil, Ecuador, (32 participants) August 1997.
- Boyd, C.E. Workshop on water quality and pond bottom soils (1/2 day), China, four locations (total of 385 participants) August 1997.
- Boyd, C.E. Workshop on water quality in shrimp ponds (3 days), Guayaquil, Ecuador (22 participants) November 1997.
- Boyd, C.E. Workshop on water and soil quality in shrimp farming (2 days), Mazatlan, Mexico (41 participants) January 1998.
- Boyd, C.E. Workshop on water quality (1/2 day), Pietersburg, South Africa (25 participants) March 1998.
- Boyd, C.E. Workshop on shrimp pond water quality (2 hr), Chantaburi and Surat Thani, Thailand (total 73 participants) May 1998.
- Boyd, C.E. Shrimp pond fertilization. Three two-hour lectures at Machelo, Perdinalis and Guayaquil, Ecuador, 11–14 August 1998.
- Boyd, C.E. Workshop on pond soil and water quality management. Conducted in Tumbes, Peru, 18–19 August 1998.
- Boyd, C.E. Pond dynamics workshop. Conducted for commercial aquaculturists, Melbourne, Australia, 3 May 1999.
- Boyd, C.E. Water quality in aquaculture workshop. Conducted for commercial aquaculturists, Adelaide, Australia, 4 May 1999.
- Boyd, C.E. Aquaculture and the environment workshop. Conducted for the Western Australia Fisheries Department, Perth, Australia, 6 May 1999.
- Boyd, C.E. Water quality in shrimp ponds workshop. Conducted for shrimp farm employees, Mahajama, Madagascar, 23 May 1999.
- Boyd, C.E. Environment management in aquaculture. Conducted for the Conference sponsored by Pacific Economic Cooperation Council, Lima, Peru.
- Boyd, C.E. Dissolved oxygen management in ponds workshop. Conducted for the Asociación Nacional de Acuicultores de Honduras, Choluteca, Honduras, 16 June 1999.
- Boyd, C.E. Soil and water quality management in shrimp ponds and Water quality management in low-water use systems lectures. Presented to the Regional Shrimp Culture Conference, Panama City, Panama, 1999.
- Lovshin, L. Integrated fish culture systems: Do they work? Presented to faculty and students of the Aquaculture Research Unit, University of the North, Pietersburg, South Africa, 20 April 1999.
- Molnar, J. (Organizer and Chair). Global shrimp farming, mangroves, and people: finding a sustainable path. 1998 Annual Meeting of the American Association for the Advancement of Science at Philadelphia, Pennsylvania, 12–17 February 1998.
- OREGON STATE UNIVERSITY**
- Theses**
- Bowman, J., 1992. Classification and management of earthen aquaculture ponds, with emphasis on the role of the soil. Ph.D. dissertation, Oregon State University, Corvallis, Oregon.
- Egna, H.S., 1998. Network analysis of international aquaculture research and development efforts in Rwanda: Tracing the flows of knowledge and technology in a USAID-funded collaborative research support program. Ph.D. dissertation, Oregon State University, Corvallis, Oregon.
- Nath, S.S., 1992. Total and available nutrients in manures for pond aquaculture. M.S. thesis. Oregon State University, Corvallis, Oregon.
- Nath, S.S., 1996. Development of a decision support system for pond aquaculture. Ph.D. dissertation, Oregon State University, Corvallis, Oregon.
- Publications**
- Bolte, J., S. Nath, and D. Ernst, 1999. Development of decision support tools for aquaculture: The POND experience. *Aquacultural Engineering*. (in press)
- Contreras-Sánchez, W.M., M.S. Fitzpatrick, R.H. Milston, and C.B. Schreck, 1998. Masculinization of Nile tilapia (*Oreochromis niloticus*) by single immersion in 17 α -methylidihydrotestosterone and trenbolone acetate. In: K. Fitzsimmons (Editor), *Tilapia Aquaculture: Proceedings from the Fourth International Symposium on Tilapia in Aquaculture*. NRAES, Ithaca, New York, pp. 783–790.
- Contreras-Sánchez, W.M., M.S. Fitzpatrick, R.H. Milston, and C.B. Schreck, 1999. Masculinization of Nile tilapia with steroids: Alternate treatments and environmental effects. In: *Proceedings of the Sixth International Symposium on Reproductive Physiology of Fish*, Bergen, Norway, 4–9 July 1999. (submitted)
- Egna, H.S., 1989. Fish pond management guidelines: A CRSP goal. *Science and Technology Agricultural Reporter*, US Agency for International Development, Washington, D.C.
- Egna, H.S., 1990. The Pond Dynamics/Aquaculture CRSP. In: *Global Research for Sustainable Food Production*. The CRSP Council, US Agency for International Development, Washington, D.C., pp. 28–32.

- Egna, H.S., 1991. Collaboration, aquaculture style. BIFADEC Briefs. Board for International Food and Agriculture Development and Economic Cooperation, USAID, Washington, D.C., Vol. XV, No. 6, 8 pp.
- Egna, H.S., 1993. Introduced technologies and changes in food consumption in Rwanda. Proceedings of the Oregon Academy of Sciences, vol. XXIX.
- Egna, H.S., 1994. Monitoring water quality in tropical freshwater fishponds: General applications of aircraft and satellite imagery. Fisheries Management and Ecology, 1(3):165-178.
- Egna, H.S., 1995. Psychological distress as a factor in environmental impact assessment: Some methods and ideas for quantifying this intangible intangible. Environmental Impact Assessment Review, 12:115-137.
- Egna, H.S., 1997. History of the Pond Dynamics/Aquaculture Collaborative Research Support Program. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 19-52.
- Egna, H.S., 1999. Environment, aquaculture, and food policy nexus: Case study of two USAID aquaculture projects in Rwanda. In: D.L. Soden and B.S. Steel (Editors), Global Environmental Policy and Administration. Marcel Dekker, Inc., New York. (in press)
- Egna, H.S. and C.E. Boyd (Editors), 1997. Dynamics of Pond Aquaculture. CRC Press, Boca Raton, 437 pp.
- Egna, H.S., C.E. Boyd, and D.A. Burke, 1997. Introduction. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 1-18.
- Ernst, D.H., J.P. Bolte, and D. Lowes, 1997. PD/A CRSP Central Database: An information resource for pond-based aquaculture. In: K. Fitzsimmons (Editor), Tilapia Aquaculture: Proceedings from the Fourth International Symposium on Tilapia in Aquaculture. NRAES, Ithaca, New York, pp. 683-700.
- Kapetsky, J.M. and S.S. Nath, 1997. A strategic assessment of the potential for freshwater fish farming in Latin America. FAO COPESCAL Technical Paper, No. 10, FAO, Rome, 128 pp.
- Lannan, J.E., 1990. Farming and ranching an aquatic system. Food Reviews International, 6:293-298.
- Lannan, J.E., G.A.E. Gall, J.E. Thorpe, C.E. Nash, and B.A. Ballachey, 1989. Genetic resource management of fish. Genome, 31:798-804.
- Nath, S., J. Bolte, L. Ross, and J. Aguilar-Manjarrez, 1999. Applications of geographical information systems (GIS) for spatial decision support in aquaculture. Aquacultural Engineering. (in press)
- Seim, W.K., C.E. Boyd, and J.S. Diana, 1997. Environmental considerations. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 163-182.
- Presentations**
- Bolte, J. and S. Nath. POND[®]: A decision tool for warmwater aquaculture. Presented to WAS '97 at Seattle, Washington, February 1997.
- Bolte, J., D. Lowes, and S. Nath. Geographic Information System technologies for aquaculture decision support. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15-19 February 1998.
- Bolte, J.P., S.S. Nath, P. Darakjian, and J.M. Kapetsky. Regional-scale analysis of aquaculture development potential. Poster presented to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- Contreras-Sánchez, W.M., M.S. Fitzpatrick, R.H. Milston, and C.B. Schreck. Masculinization of Nile tilapia with steroids: Alternate treatments and environmental effects. Presented to 6th International Symposium on Reproductive Physiology of Fish at Bergen, Norway, 4-9 July 1999.
- Egna, H. International Aquaculture: Research. Presented to WAS '97 at Seattle, Washington, February 1997.
- Egna, H.S., C.K. Lin, and D.Z. Clair. The Pond Dynamics/Aquaculture CRSP: Developing technologies and networks for sustainable aquaculture and rural development. Presented to Joint FAO/NACA Expert Consultation on Sustainable Aquaculture for Rural Development at Chiang Rai, Thailand, March 1999.
- Ernst, D.H. Computer tools for aquaculture management and design. Lecture presented to the Western Regional Aquaculture Expo at Sacramento, California, 1996.
- Ernst, D.H., J.P. Bolte, and S.S. Nath. Application of decision support software for aquaculture facility design. Presented to WAS '97 at Seattle, Washington, February 1997.
- Ernst, D.H., S.S. Nath, and J.P. Bolte. Software for design and management of aquaculture facilities. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15-19 February 1998.
- Kapetsky, J.M., S. Nath, and J.P. Bolte. A fish farming GIS for Latin America. Presented to WAS '97 at Seattle, Washington, February 1997.
- Nath, S. Planning, design, and management tools for aquaculture. Presented to National Aquaculture Extension Conference at Annapolis, Maryland, 9-10 April 1997.
- Nath, S., J.P. Bolte, and D.H. Ernst. A fish bioenergetics model for pond aquaculture. Presented to WAS '97 at Seattle, Washington, February 1997.
- Nath, S.S., J.P. Bolte, and D.H. Ernst. Decision support for pond aquaculture planning and management. Presented to Sustainable Aquaculture '95 at Honolulu, Hawaii, 11-14 June 1995.
- Nath, S.S., J.P. Bolte, and D.H. Ernst. Simulation models and economic optimization techniques for pond aquaculture. Poster presentation to the World Aquaculture Society Meeting at Bangkok, Thailand, February 1996.
- SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE**
- Publication**
- Kelly, A.M. and C.C. Kohler, 1997. Climate, site, and pond design. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 109-134.
- UNIVERSITY OF ARKANSAS AT PINE BLUFF**
- Publications**
- Engle, C.R., R. Balakrishnan, T.R. Hanson, and J.J. Molnar, 1997. Economic considerations. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 377-396.
- Perschbacher, P. and R. Lochmann, 1999. Effects of feeding pelleted versus non-pelleted defatted rice bran on Nile tilapia *Oreochromis niloticus* production and water quality in ponds. Asian Fisheries Science. (in press)
- Presentation**
- Engle, C.R. Teaching aquaculture economics. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15-19 February 1998.
- UNIVERSITY OF CALIFORNIA, DAVIS**
- Theses**
- Culberson, S.D., 1993. Simplified model for prediction of temperature and dissolved oxygen in aquaculture ponds using reduced data inputs. M.S. thesis, University of California, Davis, California.
- Giovannini, P., 1994. Water quality dynamics in aquaculture ponds: an investigation of photosynthetic production and efficiency variations. Ph.D. dissertation, University of California, Davis, California.
- Jamu, D., 1998. Modeling organic matter and nitrogen dynamics in integrated aquaculture/agriculture systems: Effects of cycling pathways on nitrogen retention and system productivity. Ph.D. dissertation, University of California, Davis, California.

Publications

- Culberson, S.D. and R.H. Piedrahita, 1993. Model for predicting dissolved oxygen levels in stratified ponds using reduced data inputs. In: Jaw-Kai Wang (Editor), *Techniques for Modern Aquaculture*. Proceedings of an Aquacultural Engineering Conference, 21–23 June 1993, at Spokane, Washington. American Society of Agricultural Engineers, pp. 543–552.
- Culberson, S.D. and R.H. Piedrahita, 1996. Aquaculture pond ecosystem model: temperature and dissolved oxygen prediction—mechanism and application. *Ecological Modeling*, 89:231–258.
- Eikebrokk, B., R.H. Piedrahita, and Y. Ulgenes, 1995. Rates of fish waste production and effluent discharge from a recirculating system (Biofish) under commercial conditions. *Aquaculture Research*, 26:589–599.
- Fridley, R.B., R.H. Piedrahita, and T.M. Losordo, 1988. Challenges in aquacultural engineering. *Agricultural Engineering*, 69(4):12–15.
- Giovannini, P. and R.H. Piedrahita, 1988. Analysis and modeling of dissolved oxygen in warm water aquaculture ponds. *American Society of Agricultural Engineers*, 88-5004, 30 pp.
- Giovannini, P. and R.H. Piedrahita, 1989. Analysis and modeling of diel pond dynamics: measuring phytoplankton light adaptation and saturation. *American Society of Agricultural Engineers*, 89-7556, 29 pp.
- Giovannini, P. and R.H. Piedrahita, 1990. Measuring primary production efficiency in aquacultural ponds. *American Society of Agricultural Engineers*, 90-7034, 24 pp.
- Giovannini, P. and R.H. Piedrahita, 1991. Engineering of non-fed pond systems. Proceedings of WAS/ASAE sessions at World Aquaculture Society Meeting at San Juan, Puerto Rico, 16–20 June 1991. American Society of Agricultural Engineers, Saint Joseph, Michigan.
- Giovannini, P., and R.H. Piedrahita, 1994. Modeling photosynthetic production optimization for aquaculture ponds. *Aquacultural Engineering*, 13:83–100.
- Grace, G. and R.H. Piedrahita, 1989. Carbon dioxide removal in packed column aerators. *American Society of Agricultural Engineers*, 89-7011, 21 pp.
- Grace, G. and R.H. Piedrahita, 1993. Carbon dioxide control with a packed column aerator. In: Jaw-Kai Wang (Editor), *Techniques for Modern Aquaculture*. Proceedings of an Aquacultural Engineering Conference, 21–23 June 1993, at Spokane, Washington. American Society of Agricultural Engineers, pp. 496–505.
- Grace, G. and R.H. Piedrahita, 1994. Carbon dioxide control. In: M. Timmons and T.M. Losordo (Editors), *Engineering Design and Management of Aquaculture Water Reuse Systems*. Developments in Aquaculture and Fisheries Science, 27:209–234.
- Jamu, D.M., Z. Lu, and R.H. Piedrahita, 1998. Secchi disk visibility and chlorophyll *a* relationships in aquaculture ponds. In: M.B. Timmons and T. Losordo (Editors), *Advances in Aquacultural Engineering: Proceedings from the Aquacultural Engineering Society (AES) Technical Sessions at the Fourth International Symposium on Tilapia in Aquaculture*. NRAES, Ithaca, New York, pp. 159–162.
- Jamu, D.M., Z. Lu, and R.H. Piedrahita, 1999. Relationship between Secchi disk visibility and chlorophyll *a* in aquaculture ponds. *Aquaculture*, 170(1999):205–214.
- Losordo, T.M. and R.H. Piedrahita, 1991. Modeling temperature variation and thermal stratification in shallow aquaculture ponds. *Ecological Modelling*, 54:189–226.
- Lu, Z. and R.H. Piedrahita, 1993. Nitrifying characteristics of a high rate packed column. In: Jaw-Kai Wang (Editor), *Techniques for Modern Aquaculture*. Proceedings of an Aquacultural Engineering Conference, 21–23 June 1993, at Spokane, Washington. American Society of Agricultural Engineers, pp. 345–351.
- Lu, Z., R.H. Piedrahita, and C. Dos Santos Neto, 1999. Generation of daily and hourly solar radiation values for modeling water quality in aquaculture ponds. *Transactions of the ASAE*, 41:1853–1859.
- Piedrahita, R.H., 1989. Simulation of short-term management actions to prevent oxygen depletion in ponds. *American Society of Agricultural Engineers*, 89-7555, 20 pp.
- Piedrahita, R.H., 1990. Aquaculture: Engineering and construction. In: Y.H. Hui (Editor), *Wiley Encyclopedia of Food Science and Technology*. Wiley and Sons, New York, pp. 117–126.
- Piedrahita, R.H., 1990. Calibration and validation of TAP, an aquaculture pond water quality model. *Aquacultural Engineering*, 9:75–96.
- Piedrahita, R.H., 1990. Detritus-based aquaculture systems. *Food Reviews International*, 6(3):317–331.
- Piedrahita, R.H., 1991. Engineering aspects of warmwater hatchery design. Proceedings of WAS/ASAE sessions at World Aquaculture Society Meeting at San Juan, Puerto Rico, 16–20 June 1991. American Society of Agricultural Engineers, Saint Joseph, Michigan, pp. 85–100.
- Piedrahita, R.H., 1991. Modeling water quality in aquaculture ecosystems. In: D.E. Brune and J.R. Tomasso (Editors), *Aquaculture and Water Quality*, World Aquaculture Society, Baton Rouge, Louisiana, pp. 322–362.
- Piedrahita, R.H., 1991. Simulation of short-term management actions to prevent oxygen depletion in ponds. *Journal of the World Aquaculture Society*, 22(3):157–166.
- Piedrahita, R.H. and D.E. Brune, 1989. Aquacultural engineering: aquatic habitat commands innovative thrusts. *Agricultural Engineering*, 70(1):30–32.
- Piedrahita, R.H. and P. Giovannini, 1991. Fertilized non-fed pond systems. *Aquaculture Systems Engineering*. Proceedings of WAS/ASAE sessions at World Aquaculture Society Meeting at San Juan, Puerto Rico, 16–20 June 1991. American Society of Agricultural Engineers, Saint Joseph, Michigan, pp. 1–14.
- Piedrahita, R.H. and A. Seland, 1995. Calculation of pH in fresh and sea water aquaculture systems. *Aquacultural Engineering*, 14:331–346.
- Piedrahita, R.H. and J.K. Wang, 1988. Engineering in aquaculture, an overview. Proceedings of the Joint U.S. India International Symposium on Aquaculture Research Needs for the Year 2000 at New Delhi, India.
- Piedrahita, R.H., S.S. Nath, J. Bolte, S.D. Culberson, P. Giovannini, and D.H. Ernst, 1997. Computer applications in pond aquaculture—modeling and decision support systems. In: H.S. Egna and C.E. Boyd (Editors), *Dynamics of Pond Aquaculture*. CRC Press, Boca Raton, pp. 289–324.

Presentations

- Batterson, T. and R.H. Piedrahita. Current trends, interests and concerns related to aquacultural wastes and their treatment in the United States. Proceedings of the European Inland Fisheries Advisory Commission (EIFAC)/Food and Agriculture Organization (FAO) Workshop on Economics of Waste Water Management at Stirling, Scotland, June 1994.
- Brune, D.E., C.M. Drcho, and R.H. Piedrahita. Pond oxygen dynamics: design and management strategies. Presented to Aquaculture '92 International Conference at Orlando, Florida, 21–25 May 1992.
- Culberson, S.D. and R.H. Piedrahita. Modification of stratified temperature and dissolved oxygen model to accommodate reduced data inputs: Identifying critical requirements. Presented to Aquaculture '92 International Conference at Orlando, Florida, 21–25 May 1992.
- Jamu, D.M. and R.H. Piedrahita. A nitrogen and organic matter cycling model for an integrated aquaculture-crop system. Presented to WAS '97 at Seattle, Washington, February 1997.
- Lu, Z. and R.H. Piedrahita. Modeling of temperature and dissolved oxygen in stratified aquaculture ponds using stochastic weather variables. Presented to WAS '97 at Seattle, Washington, February 1997.
- Lu, Z. and R.H. Piedrahita. The probability distributions of temperature and dissolved oxygen in stratified fish ponds under stochastic input weather variables. Presented to Aquaculture America '99 at Tampa, Florida, 27–30 January 1999.

- Piedrahita, R.H. Managing environmental impacts in aquaculture. Presented to the United States-Japan Natural Resources (UJRN) Aquaculture Panel at Kyoto, Japan, November 1992.
- Piedrahita, R.H. and G. Grace. Removal of carbon dioxide and intensive aquaculture systems. Presented to the World Aquaculture Society Meeting at Halifax, Nova Scotia, June 1990.
- Piedrahita, R.H. and G. Grace. Carbon dioxide removal for intensive aquaculture. Presented to the Workshop on Recirculating Aquaculture Systems at Baton Rouge, Louisiana, September 1991.
- Piedrahita, R.H., Z. Lu, and D. Jamu. Dissolved oxygen modeling in tropical aquaculture ponds under the Pond Dynamics/ Aquaculture Collaborative Research Support Program. Presented to the World Aquaculture Society Meeting, Bangkok, Thailand, January 1996.
- Whitman, M.H. and R.H. Piedrahita. Water quality requirements of Pacific oysters (*Crassostrea gigas*) in holding systems. Presented to the World Aquaculture Society Meeting at Los Angeles, February 1989.

Other

- Piedrahita, R.H. Aquacultural Engineering, a five-day course at the Universidad Autonoma de Baja California, Ensenada, Baja California, 23–28 November 1997.

UNIVERSITY OF GEORGIA

Presentation

- Nath, S. Geographic Information System technologies for aquaculture decision support. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Nath, S.S., B.P. Verma, G. Rosenberg, and D. Nute. Integrated, multi-perspective approaches to decision support: Case study in Honduras. Presented to the 1998 Institute of Biological Engineering Meeting at Orlando, Florida, 10–12 July 1998.

UNIVERSITY OF HAWAII

Presentation

- Szyper, J.P., R.H. Piedrahita, and P. Giovannini. Requirements for maximizing bloom stability and net oxygen production in earthen ponds. Poster presented to the World Aquaculture Society Meeting at Torremolinos, Spain, 26–28 May 1993.

UNIVERSITY OF MICHIGAN

Publications

- Diana, J.S., 1997. Feeding strategies. In: H. Egna and C. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 245–262.
- Diana, J.S., J.P. Szyper, T.R. Batterson, C.E. Boyd, and R.H. Piedrahita, 1997. Water quality in ponds. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture, CRC Press, Boca Raton, pp. 53–71.
- Lin, C.K., D. Teichert-Coddington, B. Green, and K. Veverica, 1997. Fertilization regimes. In: H.S. Egna and C.E. Boyd (Editors), Dynamics of Pond Aquaculture. CRC Press, Boca Raton, pp. 73–108.
- Springborn, R.R., A.L. Jensen, and W.Y.B. Chang, 1994. A variable growth rate modification of Von Bertalanffy's equation for aquaculture. Aquaculture and Fisheries Management, 25:259–267.
- Springborn, R.R., A.L. Jensen, W.Y.B. Chang, and C. Engle, 1992. Optimum harvest time in aquaculture: An application of economic principles to a Nile tilapia, *Oreochromis niloticus* (L.), growth model. Aquaculture and Fisheries Management, 23:639–647.

UNIVERSITY OF OKLAHOMA

Publication

- Rubinshtein, I., S. Rothbard, and W.L. Shelton, 1997. The relationship between the embryological age, cytokinesis-1 and the timing of ploidy manipulation in fish. Israeli Journal of Aquaculture/Bamidgeh, 49:99–110.

Presentation

- Shelton, W. and R. Phelps. Sex manipulation in *Oreochromis niloticus*, presented to Aquaculture America '99 at Tampa, Florida, 27–30 January 1999.

UNIVERSITY OF TEXAS

Publication

- Ward, G.H., 1996. A strategic approach to carrying-capacity analysis for aquaculture on estuaries. In: United States/Japan Natural Resource Panel on Aquaculture, United States-Japan Cooperative Program in Natural Resources. Sea Grant, Texas A&M University, 24:71–84.

OTHER

Publications

- Aguilar-Manjarrez, J. and S. Nath, 1998. A Strategic Reassessment of Fish Farming Potential in Africa. CIFA Technical Paper, No. 32. FAO, Rome, 170 pp.
- Kapetsky, J.M. and S.S. Nath, 1997. A Strategic Assessment of the Potential for Freshwater Fish Farming in Latin America. COPESCAL Technical Paper, No. 10. FAO, Rome, 124 pp.
- Nath, S.S. and J.P. Bolte, 1998. A water budget model for pond aquaculture. Aquacultural Engineering, 18(3):175–188.

Program Management Office Report Series

The following publications have been issued by the PD/A CRSP Program Management Office at Oregon State University, Corvallis, Oregon.

CRSP RESEARCH REPORTS

- 87-1 Hopkins, K.D., J.E. Lannan, and J.R. Bowman. A data base management system for research in pond dynamics. (10/87)
- 87-2 Nash, G., S. Chinabut, and C. Limsuwan. Idiopathic muscle necrosis in the freshwater prawn, *Macrobrachium rosenbergii* de Man, cultured in Thailand. (11/87)
- 87-3 Tavarutmaneegul, P. and C.K. Lin. Breeding and rearing of sand goby (*Oxyeleotris marmoratus*, Blk.) fry. (11/87)
- 88-4 Lin, C.K. Acidification and reclamation of acid sulfate soil fishponds in Thailand. (1/88)
- 88-5 Ver, L.M.B. and Y.N. Chiu. The effect of paddlewheel aerators on ammonia and carbon dioxide removal in intensive pond culture. (2/88)
- 88-6 Carpenter, K.E., A.W. Fast, V.L. Corre, J.W. Woessner, and R.L. Janeo. The effects of water depth and circulation on the water quality and production of *Penaeus monodon* in earthen ponds. (2/88)
- 88-7 Sanares, R.C., S.A. Katase, A.W. Fast, and K.E. Carpenter. Water quality dynamics in brackish water shrimp ponds with artificial aeration and circulation. (2/88)
- 88-8 Batterson, T.R., C.D. McNabb, C.F. Knud-Hansen, H.M. Eidman, and K. Sumatadinata. Effect of chicken

- manure additions on fish production in ponds in West Java, Indonesia. (4/88)
- 88-9 Teichert-Coddington, D.R., N. Stone, and R.P. Phelps. Hydrology of fish culture ponds in Gualaca, Panama. (12/88)
- 88-10 Sikoki, F.D., R.A. Tubb, and L.R. Curtis. Elevation of sex steroids and inhibition of UDP-glucuronyltransferase are out of phase during gonadal maturation in the common carp. (12/88)
- 88-11 Minsalan, C.L.O. and Y.N. Chiu. Effects of teaseed cake on selective elimination of finfish in shrimp ponds. (12/88)
- 88-12 Fortes, R.D., V.L. Corre, Jr., and E. Pudadera. Effects of fertilizers and feeds as nutrient sources on *Oreochromis niloticus* production in Philippine brackish water ponds. (12/88)
- 89-13 Fast, A.W., K.E. Carpenter, V.J. Estilo, and H.J. Gonzales. Effects of water depth and artificial mixing on dynamics of Philippines brackish water shrimp ponds. (1/89)
- 89-14 Chang, W.Y.B. and H. Ouyang. Dynamics of dissolved oxygen and vertical circulation in fish ponds. (6/89)
- 89-15 Green, B.W., R.P. Phelps, and H.R. Alvarenga. The effect of manures and chemical fertilizers on the production of *Oreochromis niloticus* in earthen ponds. (4/89)
- 89-16 Lin, C.K. and M. Boonyaratpalin. An analysis of biological characteristics of *Macrobrachium rosenbergii* (de Man) in relation to pond production and marketing in Thailand. (2/89)
- 89-17 Chang, W.Y.B. Estimates of hypolimnetic oxygen deficits in ponds. (8/89)
- 89-18 Diana, J.S. and A.W. Fast. The effects of water exchange rate and density on yield of the walking catfish, *Clarias fuscus*. (9/89)
- 89-19 Diana, J.S., P.J. Schneeberger, and C.K. Lin. Relationships between primary production and yield of tilapia in ponds. (9/89)
- 89-20 Lin, C.K., V. Tansakul, and C. Apinhapath. Biological nitrogen fixation as a source of nitrogen input in fishponds. (11/89)
- 89-21 Teichert-Coddington, David R. and Ronald P. Phelps. Effects of seepage on water quality and productivity of inorganically fertilized tropical ponds. (12/89)
- 90-22 Chang, W.Y.B. Integrated lake farming for fish and environmental management in large shallow Chinese lakes: A review. (1/90)
- 90-23 Hopkins, K.D., M.L. Hopkins, and D. Pauley. A multivariate model of tilapia growth, applied to seawater tilapia culture in Kuwait. (1/90)
- 90-24 Hopkins, K.D. Reporting fishpond yields to farmers. (1/90)
- 90-25 Peralta, M. and D. Teichert-Coddington. Comparative production of *Colossoma macropomum* and *Tilapia nilotica* in Panama. (1/90)
- 90-26 Teichert-Coddington, D.R., B.W. Green, N. Matamoros, and R. Rodriguez. The substitution of chicken litter for feed in the commercial production of penaeid shrimp in Honduras. (5/90)
- 90-27 Green, B.W. and L.A. Lopez. Implementing the large-scale production of young males of *Tilapia nilotica* using hormonal sex inversion in Honduras. (5/90)
- 90-28 Hanson, B.J., J.F. Moehl, Jr., K.L. Veverica, F. Rwangano, and M. Van Speybroek. Pond culture of tilapia in Rwanda, a high altitude equatorial African country. (10/90)
- 90-29 Knud-Hansen, C.F., T.R. Batterson, and C.D. McNabb. Hatchery techniques for egg and fry production of *Clarias batrachus* (Linnaeus). (10/90)
- 91-30 Green, B.W., D.R. Teichert-Coddington, and R.P. Phelps. Response of tilapia yield and economics to varying rates of organic fertilization and season in two Central American countries. (1/91)
- 91-31 Szyper, J.P. and C.K. Lin. Techniques for assessment of stratification and effects of mechanical mixing in tropical fish ponds. (5/91)
- 91-32 Knud-Hansen, C.F., T.R. Batterson, C.D. McNabb, I.S. Harahat, K. Sumantadinata, and H.M. Eidman. Nitrogen input, primary productivity and fish yield in fertilized freshwater ponds in Indonesia. (7/91)
- 91-33 Piedrahita, R.H. Calibration and validation of TAP, an aquaculture pond water quality model. (10/91)
- 91-34 Piedrahita, R.H. Modeling water quality in aquaculture ecosystems. (10/91)
- 91-35 Piedrahita, R.H. Engineering aspects of warmwater hatchery design. (10/91)
- 91-36 Piedrahita, R.H. and P. Giovannini. Fertilized non-fed pond systems. (10/91)
- 91-37 McNabb, C.D., T.R. Batterson, B.J. Premo, C.F. Knud-Hansen, H.M. Eidman, C.K. Lin, K. Jaiyen, J.E. Hanson, and R. Chuenpagdee. Managing fertilizers for fish yield in tropical ponds in Asia. (12/91)
- 91-38 Green, B.W. and H.R. Alvarenga. The effect of different application rates of chicken litter on tilapia production. (12/91)
- 91-39 Alvarenga, H.R. and B.W. Green. Production and economic aspects of tilapia cultivation in ponds fertilized with chicken litter. (12/91)
- 92-40 Szyper, J.P., K.D. Hopkins, and C.K. Lin. Production of *Oreochromis niloticus* (L.) and ecosystem dynamics in manured ponds of three depths. (3/92)
- 92-41 Piedrahita, R.H. Simulation of short-term management actions to prevent oxygen depletion in ponds. (3/92)
- 92-42 Teichert-Coddington, D.R., B.W. Green, and R.W. Parkman. Substitution of chicken litter for feed in production of penaeid shrimp in Honduras. (3/92)
- 92-43 Knud-Hansen, C.F., C.D. McNabb, and T.R. Batterson. Application of limnology for efficient nutrient utilization in tropical pond aquaculture. (4/92)
- 92-44 Hopkins, K. and A. Yakupitiyage. Bias in seine sampling of tilapia. (4/92)
- 92-45 Engle, C.R. and M. Skladany. The economic benefit of chicken manure utilization in fish production in Thailand. (5/92)
- 92-46 Green, B.W. Substitution of organic manure for pelleted feed in tilapia production. (5/92)
- 92-47 Green, B.W., and D.R. Teichert-Coddington. Comparison of two samplers used with an automated data acquisition system in whole-pond, community metabolism studies. (5/92)
- 92-48 Liu, K.M. and W.Y.B. Chang. Bioenergetic modeling of effects of fertilization, stocking density, and spawning on growth of the Nile tilapia, *Oreochromis niloticus* (L.). (9/92)
- 93-49 Teichert-Coddington, D.R., B.W. Green, and R.P. Phelps. Influence of site and season on water quality and tilapia production in Panama and Honduras. (4/93)
- 93-50 Suresh, A.V. and C.K. Lin. Tilapia culture in saline waters: A review. (4/93)
- 93-51 Knud-Hansen, C.F. Analyzing standard curves in the chemistry of waters used for aquaculture. (4/93)
- 93-52 Szyper, J.P., J.Z. Rosenfeld, R.H. Piedrahita, and P. Giovannini. Diel cycles of planktonic respiration rates in briefly incubated water samples from a fertile earthen pond. (4/93)
- 93-53 This report is a duplicate of an earlier number.
- 93-54 Lin, C.K., K. Jaiyen, and W. Muthuwana. Integration of intensive and semi-intensive aquaculture: Concept and example. (5/93)
- 93-55 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. (9/93)
- 93-56 Knud-Hansen, C.F., T.R. Batterson, and C.D. McNabb. The role of chicken manure in the production of Nile tilapia, *Oreochromis niloticus* (L.). (10/93)
- 93-57 Boyd, C.E. and D. Teichert-Coddington. Relationship between wind speed and reaeration in small aquaculture ponds. (10/93)
- 93-58 Teichert-Coddington, D.R. and B.W. Green. Influence of daylight and incubation interval on water column respiration in tropical fish ponds. (10/93)

- 93-59 Knud-Hansen, C.F. and A.K. Pautong. On the role of urea in pond fertilization. (11/93)
- 94-60 Shrestha, M.K. and C.F. Knud-Hansen. Increasing attached microorganism biomass as a management strategy for Nile tilapia (*Oreochromis niloticus*) production. (5/94)
- 94-61 Springborn, R.R., A.L. Jensen, W.Y.B. Chang, and C. Engle. Optimum harvest time in aquaculture: An application of economic principles to a Nile tilapia, *Oreochromis niloticus* (L.), growth model. (2/94)
- 94-62 Hopkins, K.D. and D. Pauly. Instantaneous mortalities and multivariate models: Applications to tilapia culture in saline water. (2/94)
- 94-63 Green, B.W. and D.R. Teichert-Coddington. Production of *Oreochromis niloticus* fry for hormonal sex reversal in relation to water temperature. (2/94)
- 94-64 Engle, C.R., M. Brewster, and F. Hitayezu. An economic analysis of fish production in a subsistence agricultural economy: The case of Rwanda. (6/94)
- 94-65 Knud-Hansen, C.F. and T.R. Batterson. Effect of fertilization frequency on the production of Nile tilapia (*Oreochromis niloticus*). (9/94)
- 94-66 Teichert-Coddington, D.R., R. Rodriguez, and W. Toyofuku. Cause of cyclic variation in Honduran shrimp production. (11/94)
- 94-67 Springborn, R.R., A.L. Jensen, and W.Y.B. Chang. A variable growth rate modification of von Bertalanffy's equation for aquaculture. (12/94)
- 94-68 Diana, J.S., D.J. Dettweiler, and C.K. Lin. Effect of Nile tilapia (*Oreochromis niloticus*) on the ecosystem of aquaculture ponds, and its significance to the trophic cascade hypothesis. (12/94)
- 94-69 Ayub, M., C.E. Boyd, and D. Teichert-Coddington. Effects of urea application, aeration, and drying on total carbon concentrations in pond bottom soils. (12/94)
- 94-70 Boyd, C.E. and D. Teichert-Coddington. Pond bottom soil respiration during fallow and culture periods in heavily-fertilized tropical fish ponds. (12/94)
- 94-71 Hopkins, K.D. Reporting fish growth: A review of the basics. (12/94)
- 94-72 Hopkins, K.D. and J.D. Bowman. A research methodology for integrated agriculture-aquaculture farming systems. (12/94)
- 94-73 Diana, J.S. and K. Jaiyen. Supplemental feeding of tilapia in fertilized ponds. (12/94)
- 94-74 Knud-Hansen, C.F. Pond history as a source of error in fish culture experiments: A quantitative assessment using covariate analysis. (12/94)
- 94-75 Green, B. and D. Teichert-Coddington. Growth of control and androgen-treated Nile tilapia, *Oreochromis niloticus* (L.), during treatment, nursery and growout phases in tropical fish ponds. (12/94)
- 94-76 Teichert-Coddington, D. and B. Green. Comparison of two techniques for determining community respiration in tropical fish ponds. (12/94)
- 94-77 Teichert-Coddington, D. and B. Green. Tilapia yield improvement through maintenance of minimal oxygen concentrations in experimental growout ponds in Honduras. (12/94)
- 94-78 Teichert-Coddington, D., M. Peralta, and R.P. Phelps. Seepage reduction in tropical fish ponds using chicken litter. (12/94)
- 95-79 Giovannini, P. and R.H. Piedrahita. Modeling photosynthetic production optimization for aquaculture ponds. (2/95)
- 95-80 Culberson, S.D. and R.H. Piedrahita. Model for predicting dissolved oxygen levels in stratified ponds using reduced data inputs. (2/95)
- 95-81 Culberson, S.D. and R.H. Piedrahita. Modification of stratified temperature model to accommodate reduced data inputs: Identifying critical requirements. (2/95)
- 95-82 Teichert-Coddington, D. Development of production technologies for semi-intensive fish farming during the past decade in Central America. (2/95)
- 95-83 Teichert-Coddington, D. Effects of protein diet and sowing density on the production of *Penaeus vannamei* in land tanks. (2/95)
- 95-84 Szyper, J.P., C.K. Lin, D. Little, S. Setboonsarng, A. Yakupitiyage, P. Edwards, and H. Demaine. Techniques for efficient and sustainable mass production of tilapia in Thailand. (7/95)
- 95-85 Egna, H.S. Psychological distress as a factor in environmental impact assessment: Some methods and ideas for quantifying this intangible intangible. (7/95)
- 95-86 Bowman, J.R. and J.E. Lannan. Evaluation of soil pH-percent base saturation relationships for use in estimating the lime requirements of earthen aquaculture ponds. (7/95)
- 95-91 Green, B.W., Z.E. Nagdy, H. Hebicha, I. Shaker, D.A.R. Kenawy, and A.R.E. Gamal. Evaluation of Nile tilapia production systems in Egypt. (10/95)
- 96-87 Green, B.W. and C.E. Boyd. Water budgets for fish ponds in the dry tropics. (1/96)
- 96-88 Green, B.W. and C.E. Boyd. Chemical budgets for organically fertilized fish ponds in the dry tropics. (1/96)
- 96-89 Teichert-Coddington, D.R. and R. Rodriguez. Semi-intensive commercial grow-out of *Penaeus vannamei* feed diets containing differing levels of crude protein during wet and dry seasons in Honduras. (1/96)
- 96-90 Boyd, C.E. and D. Teichert-Coddington. Dry matter, ash, and elemental composition of pond-cultured *Penaeus vannamei* and *P. stylirostris*. (1/96)
- 96-92 Egna, H.S. Monitoring water quality for tropical freshwater fisheries and aquaculture: A review of aircraft and satellite imagery applications. (1/96)
- 96-93 Lin, C.K. and J.S. Diana. Co-culture of catfish (*Clarias macrocephalus* × *C. gariepinus*) and tilapia (*Oreochromis niloticus*) in ponds. (2/96)
- 96-94 Lin, C.K. Clarias and tilapia interaction in polyculture. (4/96)
- 96-95 Abdalla, A.A.F. and C.D. McNabb. Ammonia dynamics in fertilized fish ponds stocked with Nile tilapia. (6/96)
- 96-96 Boyd, C.E. and P. Munsiri. Phosphorus adsorption capacity and availability of added phosphorus in soils from aquaculture areas in Thailand. (6/96)
- 96-97 Teichert-Coddington, D.R. Effect of stocking ratio on semi-intensive polyculture of *Colossoma macropomum* and *Oreochromis niloticus* in Honduras, Central America. (11/96)
- 96-98 Munsiri, P. and B.F. Hajek. Texture and chemical composition of soils from shrimp ponds near Choluteca, Honduras. (11/96)
- 97-99 Moehl, J.F. and J.J. Molnar. Institutional requirements for aquacultural development in Africa: Lessons from Rwanda. (1/97)
- 97-100 Hishamunda, N., C.M. Jolly, and C.R. Engle. Estimating *Oreochromis niloticus* production function for small-scale fish culture in Rwanda. (1/97)
- 97-101 Shrestha, M.K. and C.K. Lin. Phosphorus fertilization strategy in fish ponds based on sediment phosphorus saturation level. (1/97)
- 97-102 Green, B.W. Polyculture of tilapia with marine shrimp. (1/97)
- 97-103 Diana, J.S., C.K. Lin, and Y. Yi. Timing of supplemental feeding for tilapia production. (4/97)
- 97-104 Engle, C.R. Optimal resource allocation by fish farmers in Rwanda. (4/97)
- 97-105 Szyper, J.P. Observations and model predictions of daily areal primary production in a eutrophic brackish water culture pond. (4/97)
- 97-106 Szyper, J.P. Comparison of three mixing devices in earthen culture ponds of four different surface areas. (4/97)
- 97-107 Green, B.W. Inclusion of tilapia as a diversification strategy for penaeid shrimp culture. (5/97)

- 97-108 Teichert-Coddington, D., J. Harvin, and D. Martinez. Semi-intensive shrimp pond management and quality of effluents. (5/97)
- 97-109 Veverica, K. The Pond Dynamics/Aquaculture CRSP-sponsored proceedings of the third conference on the culture of tilapias at high elevations in Africa. (6/97)
- 97-110 Yohe, J.M., P.B. McConnell, H.S. Egna, J. Rowntree, J. Oxley, R.G. Hanson, D. Cummins, and A. Kirksey. The CRSPs: International collaborative research support programs. (6/97)
- 97-111 Solubility of selected inorganic fertilizers in brackish water. (1/98)
- 97-112 Water quality in laboratory soil-water microcosms with soils from different areas of Thailand. (1/98)
- 97-113 Determination of phosphorus saturation level in relation to clay content in formulated pond muds. (1/98)
- 97-115 Influence of Nile tilapia (*Oreochromis niloticus*) stocking density in cages on their growth and yield in cages and in ponds containing the cages. (1/98)
- 97-116 Chemical and physical characteristics of bottom soil profiles in ponds on haplaquents in an arid climate at Abbassa, Egypt. (1/98)
- 97-117 Water effluent and quality, with special emphasis on finfish and shrimp aquaculture. (1/98)
- 97-118 A collaborative project to monitor the water quality of estuaries in the shrimp producing regions of Honduras. (1/98)
- 98-119 PD/A CRSP Central Database: A standardized information resource for pond aquaculture. (4/98)
- 98-120 Secchi disk visibility and chlorophyll *a* relationship in aquaculture ponds. (4/98)
- 98-121 Masculinization of Nile tilapia (*Oreochromis niloticus*) by single immersion in 17 α -methylidihydrotestosterone and trenbolone acetate. (4/98)
- 98-122 A strategic assessment of the potential for freshwater fish farming in Latin America. (4/98)
- 98-123 Experimental and commercial culture of tilapia in Honduras. (4/98)
- 98-124 Small-scale fish farming in Rwanda: Economic characteristics. (7/98)
- 98-124a Small-scale fish farming in Rwanda: Data report. (7/98)
- 98-125 Acute and sublethal growth effects of un-ionized ammonia to Nile tilapia *Oreochromis niloticus* (10/98)
- 98-126 A water budget model for pond aquaculture (10/98)
- 98-127 A strategic reassessment of fish farming potential in Africa (10/98)
- 98-128 A bioenergetics growth model for Nile tilapia (*Oreochromis niloticus*) based on limiting nutrients and fish standing crop in fertilized ponds (10/98)
- 99-129 Aquaculture extension in Rwanda (4/99)
- 99-130 Dry matter, ash, and elemental composition of pond-cultured tilapia (*Oreochromis aureus* and *O. niloticus*) (4/99)
- 99-131 The effects of fertilization and water management on growth and production of Nile tilapia in deep ponds during the dry season (4/99)
- 99-132 Relationship between Secchi disk visibility and chlorophyll *a* in aquaculture ponds (4/99)
- Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 74 pp.
- Carpenter, K.E., A.W. Fast, J. Carreon, and R. Juliano, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 4, Number 3, Philippines: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 257 pp.
- Carpenter, K.E., J. Woessner, R.D. Fortes, A. Fast, and P. Helfrich, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 4, Number 2, Philippines: Cycle II of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 501 pp.
- Diana, J.S., C.K. Lin, T. Bhukaswan, and V. Sirsuwanatach, 1987. Pond Dynamics Collaborative Research Data Reports, Volume 2, Number 1, Thailand: Cycle I of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 47 pp.
- Diana, J.S., C.K. Lin, T. Bhukaswan, V. Sirsuwanatach, and B.J. Buurma, 1990. Pond Dynamics Collaborative Research Data Reports, Volume 2, Number 2, Thailand: Cycle II of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 54 pp.
- Diana, J.S., C.K. Lin, T. Bhukaswan, V. Sirsuwanatach, and B.J. Buurma, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 2, Number 3, Thailand: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 86 pp.
- Egna, H.S., N. Brown, and M. Leslie (Editors), 1989. Pond Dynamics Collaborative Research Data Reports, Volume 1, General Reference: Site Descriptions, Materials and Methods for the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 84 pp.
- Green, B.W., H.R. Alvarenga, R.P. Phelps, and J. Espinoza, 1989. Pond Dynamics Collaborative Research Data Reports, Volume 6, Number 3, Honduras: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 114 pp.
- Green, B.W., H.R. Alvarenga, R.P. Phelps, and J. Espinoza, 1990. Pond Dynamics Collaborative Research Data Reports, Volume 6, Number 1, Honduras: Cycle I of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 94 pp.
- Green, B.W., H.R. Alvarenga, R.P. Phelps, and J. Espinoza, 1990. Pond Dynamics Collaborative Research Data Reports, Volume 6, Number 2, Honduras: Cycle II of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 94 pp.
- Hanson, B., V. Ndoreyaho, F. Rwangano, R. Tubb, and W.K. Seim, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 5, Number 2, Rwanda: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 102 pp.
- Hanson, B., V. Ndoreyaho, R. Tubb, F. Rwangano, and W.K. Seim, 1989. Pond Dynamics Collaborative Research Data Reports, Volume 5, Number 1, Rwanda: Cycle I of The Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 62 pp.
- Hughes, D., R.P. Phelps, and R.P. Malca, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 8, Number 2, Aguadulce, Panama: Cycle II of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 143 pp.
- Hughes, D., R.P. Phelps, and R.P. Malca, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 8, Number 3, Aguadulce, Panama: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 230 pp.
- Hughes, D., A.T. Diaz, R.P. Phelps, and R.P. Malca, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 8, Number 1, Aguadulce, Panama: Cycle I of The Global Experi-

DATA REPORTS BY PD/A CRSP RESEARCHERS

- Batterson, T.R., C.D. McNabb, C.F. Knud-Hansen, H.M. Eidman, and K. Sumantadinata, 1989. Pond Dynamics Collaborative Research Data Reports, Volume 3, Number 3, Indonesia: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 135 pp.
- Bowman, J. and D. Clair, 1996. Pond Dynamics Collaborative Research Data Reports, Volume 1, Second Edition, General Reference: PD/A CRSP Site Descriptions. Pond Dynamics/

- ment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 122 pp.
- McNabb, C.D., T.R. Batterson, B.J. Premo, H.M. Eidman, and K. Sumantadinata, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 3, Number 2, Indonesia: Cycle II of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 49 pp.
- McNabb, C.D., T.R. Batterson, B.J. Premo, H.M. Eidman, and K. Sumantadinata, 1988. Pond Dynamics Collaborative Research Data Reports, Volume 3, Number 1, Indonesia: Cycle I of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 67 pp.
- Teichert-Coddington, D.R., M. Peralta, R.P. Phelps, and R.P. Malca, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 7, Number 1, Gualaca, Panama: Cycle I of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 97 pp.
- Teichert-Coddington, D.R., M. Peralta, R.P. Phelps, and R.P. Malca, 1991. Pond Dynamics Collaborative Research Data Reports, Volume 7, Number 2, Gualaca, Panama: Cycle III of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 56 pp.
- Woessner, J., R.D. Fortes, and V. Corre, Jr., 1991. Pond Dynamics Collaborative Research Data Reports, Volume 4, Number 1, Philippines: Cycle I of the Global Experiment. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 141 pp.

CRSP WORK PLANS

- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1983. CRSP Work Plan: First Experimental Cycle. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 99 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1984. CRSP Work Plan: Second Experimental Cycle. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 143 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1985. CRSP Work Plan: Third Experimental Cycle. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 128 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1989. Revised CRSP Work Plan: Fourth Experimental Cycle. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 39 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1989. Fifth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 151 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1991. Sixth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 71 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1993. Revised Seventh Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 85 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1996. Interim Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 47 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1997. Eighth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 171 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1998. Addendum to the Eighth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 31 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1999. Second Addendum to the Eighth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 18 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1999. Ninth Work Plan. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 92 pp.

CRSP ADMINISTRATIVE REPORTS

- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1983. First Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 29 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1984. Second Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 35 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1985. Third Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 37 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1986. Fourth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 28 pp.
- Pond Dynamics/Aquaculture Collaborative Research Support Program, 1988. Fifth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 49 pp.
- Egna, H.S. and H. Horton. (Editors), 1989. Sixth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 91 pp.
- Egna, H.S., J. Bowman, and M. McNamara (Editors), 1990. Seventh Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 114 pp.
- Egna, H.S., J. Bowman, and M. McNamara (Editors), 1991. Eighth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 166 pp.
- Egna, H.S., M. McNamara, and N. Weidner (Editors), 1992. Ninth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 172 pp.
- Egna, H.S., M. McNamara, J. Bowman, and N. Astin (Editors), 1993. Tenth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 275 pp.
- Egna, H.S. and M. McNamara (Editors), 1994. Eleventh Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 80 pp.
- Egna, H.S., J. Bowman, B. Goetze and N. Weidner (Editors), 1994. Eleventh Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 178 pp.
- Egna, H.S., M. McNamara, and N. Weidner (Editors), 1995. Twelfth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 95 pp.
- Egna, H.S., J. Bowman, B. Goetze, and N. Weidner (Editors), 1995. Twelfth Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 209 pp.
- Goetze, B., H. Berkman, and H. Egna (Editors), 1995. Egypt Project Final Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 30 pp.
- McNamara, M., H. Egna, B. Goetze, B. Herbison, and D. Clair (Editors), 1996. Thirteenth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 96 pp.
- Egna, H.S., B. Goetze, D. Burke, M. McNamara, and D. Clair (Editors), 1996. Thirteenth Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 206 pp.
- Clair, D., B. Goetze, D. Burke, M. McNamara, and H. Egna, (Editors), 1997. Fourteenth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 94 pp.

- Burke, D., B. Goetze, D. Clair, and H. Egna (Editors), 1997. Fourteenth Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 192 pp.
- Clair, D., B. Goetze, D. Burke, J. Baker, and H. Egna (Editors), 1998. Fifteenth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 113 pp.
- Burke, D., J. Baker, B. Goetze, D. Clair, and H. Egna (Editors), 1998. Fifteenth Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 187 pp.
- Clair, D., D. Burke, K. McElwee, M. Niles, and H. Egna, 1999. Sixteenth Annual Administrative Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 100 pp.
- McElwee, K., D. Burke, M. Niles, and H. Egna (Editors), 1999. Sixteenth Annual Technical Report. Pond Dynamics/Aquaculture CRSP, Oregon State University, Corvallis, Oregon, 189 pp.
- Chang, W.Y.B. and R. Rossmann, 1988. Changes in the abundance of blue-green algae related to nutrient loadings in the nearshore of Lake Michigan. *Hydrobiologia*, 157:271–278.
- Chang, W.Y.B., J. Diana, and W. Chapoehuk, 1983. Strengthening of Southeast Asian Aquaculture Institutions. Workshop Report to Agency for International Development.
- Ebeling, J.M. and R.H. Piedrahita, 1985. Microcomputer-based data acquisition system for aquaculture use. *American Society of Agricultural Engineers*, 85-5014, 9 pp.
- Fitzsimmons, K. 1999. Future trends for tilapia aquaculture in the Americas. In: B. Costa-Pierce (Editor), *Tilapia Aquaculture in the Americas*, Volume 2. World Aquaculture Society and American Tilapia Association, Baton Rouge, Louisiana. (in press)
- Fitzsimmons, K. 1999. Tilapia aquaculture in Mexico In: B. Costa-Pierce (Editor), *Tilapia Aquaculture in the Americas*, Volume 2. World Aquaculture Society and American Tilapia Association, Baton Rouge, Louisiana. (in press)
- Fridley, R.B., R.H. Piedrahita, and T.M. Losordo, 1988. Challenges in aquacultural engineering. *Agricultural Engineering*, 69(4):12–15.
- Gross, A., C.E. Boyd, and J. Seo, 1999. Evaluation of the ultraviolet spectrophotometric method for the measurement of total nitrogen in water. *Journal of the World Aquaculture Society*, 30:388–393.
- Gross, A., C.E. Boyd, and C.W. Wood, 1999. Ammonia volatilization from freshwater ponds. *Journal of Environmental Quality*, 28:793–797.
- Hopkins, K.D., J.E. Lannan, and J.R. Bowman, 1988. Managing a data base for pond research data—the CRSP experience. *Aquabyte*, 1(1):3–4.
- Liu, K.M. and W.Y.B. Chang, 1992. Bioenergetic modeling of effects of fertilization, stocking density, and spawning on growth of the Nile tilapia, *Oreochromis niloticus* (L.). *Aquaculture and Fisheries Management*, 23:291–301.
- Losordo, T.M. and R.H. Piedrahita, 1988. Modeling vertical water quality profiles in aquaculture ponds, review and evaluation. *Proceedings of the Conference Aquacultural Engineering: Technologies for the Future at Stirling, Scotland*. I. Cheme Symposium Series No. 111: EFCE Publications Series No. 66, Rugby, United Kingdom, pp. 313–327.
- Losordo, T.M. and R.H. Piedrahita, 1988. Simulating aquacultural pond thermal stratification with a spreadsheet model. *American Society of Agricultural Engineers*, 88-5003, 38 pp.
- Losordo, T.M., J.M. Ebeling, and R.H. Piedrahita, 1986. Stratification measurement techniques in aquaculture ponds. *American Society of Agricultural Engineers*, 86-5047, 14 pp.
- Losordo, T.M., R.H. Piedrahita, and J.M. Ebeling, 1988. An automated water quality acquisition system for use in aquaculture ponds. *Aquacultural Engineering*, 7:265–278.
- Piedrahita, R.H., 1987. Sensitivity analysis for an aquaculture pond model. In: J.G. Balchen (Editor), *Automation and Data Processing in Aquaculture*. IFAC Proc. Ser. No. 9, Proceedings of the IFAC Symposium, Trondheim, Norway, 18–21 August 1986, pp. 119–123.
- Piedrahita, R.H., 1988. Introduction to computer modeling of aquaculture pond ecosystems. *Aquaculture and Fisheries Management*, 19:1–12.
- Piedrahita, R.H. and D.E. Brune, 1989. *Aquacultural Engineering: Aquatic habitat commands innovative thrusts*. *Agricultural Engineering*, 70(1):30–32.
- Piedrahita, R.H. and G. Tchobanoglous, 1987. The use of human wastes and sewage in aquaculture. In: D.J.W. Moriarty and R.S.V. Pullin (Editors), *Detritus and microbial ecology in aquaculture: ICLARM Conference Proceedings 14*, Manila, Philippines, pp. 336–352.
- Piedrahita, R.H., J.M. Ebeling, and T.M. Losordo, 1987. Use of data acquisition systems in aquaculture. In: J.G. Balchen (Editor), *Automation and Data Processing in Aquaculture*. IFAC Proc. Ser. No. 9, Proceedings of the IFAC Symposium, Trondheim, Norway, 18–21 August 1986, pp. 259–262.

Other Published Work by CRSP Researchers

Publications

- Boyd, C.E., 1998. Mechanical aeration in pond aquaculture. In: *Proceedings Second International Symposium on Aeration Technology*, American Society of Mechanical Engineers, Washington, D.C., pp. 1–6.
- Boyd, C.E. 1998. Pond water aeration systems. *Aquacultural Engineering*, 18:9–40.
- Boyd, C.E., 1999. Aquaculture sustainability and environmental issues. *World Aquaculture*, 30(2):10–13 and 71–72.
- Boyd, C.E., 1999. Codes of practice for responsible shrimp farming. *Global Aquaculture Alliance*, St. Louis, Missouri, 42 pp.
- Boyd, C.E. and J.W. Clay, 1998. Shrimp aquaculture and the environment. *Scientific American*, June 1998, 278(6):42–49.
- Boyd, C.E. and A. Gross, 1999. Biochemical oxygen demand in channel catfish pond waters. *Journal of the World Aquaculture Society*, 30:349–356.
- Boyd, C.E. and H.R. Schmittou, 1999. Achievement of sustainable aquaculture through environmental management. *International Journal of Aquaculture Economics and Management*, 3:1–11.
- Boyd, C.E. and C.S. Tucker, 1998. *Pond Aquaculture Water Quality Management*, Kluwer Academic Publishers, Boston, MA, 700 pp.
- Brune, D.E. and R.H. Piedrahita, 1982. Operation of a retained biomass nitrification system for treating aquaculture water for reuse. *Proceedings of the First International Conference on Fixed-Film Biological Processes*, pp. 845–869.
- Chang, W.Y.B., 1986. Aquaculture research in China. *China Exchange News*, CSCPRC, National Academy of Sciences, 14(2):13–16.
- Chang, W.Y.B., 1986. Practical methods for treating fish during oxygen stress in ponds. *Aquaculture Magazine*, 13(4):20–22.
- Chang, W.Y.B., 1986. Vertical oxygen dynamics of shallow tropical impoundments in the Pearl River Delta, China. *Tran. Amer. Phys. Union*, 66(51):13–1.
- Chang, W.Y.B., 1987. A historical center of fish culture in China: Lake Tai/Yangtze River Delta. *Aquaculture Magazine*, 13:39–42.
- Chang, W.Y.B., 1987. Fish culture in China. *Fisheries*, 12(3):11–15.
- Chang, W.Y.B., 1987. Large lakes of China. *J. Great Lakes Res.*, 13(3):235–249.
- Chang, W.Y.B., 1989. Estimates of hypolimnetic oxygen deficits in ponds. *Aquaculture and Fisheries Management*, 20:167–172.
- Chang, W.Y.B., 1989. Integrated lake farming for fish and environmental management in large shallow Chinese lakes: A review. *Aquaculture and Fisheries Management*, 20:441–452.
- Chang, W.Y.B. and H. Ouyang, 1988. Dynamics of dissolved oxygen and vertical circulation in fish ponds. *Aquaculture*, 74:263–276.

- Piedrahita, R.H., G. Tchobanoglous, and B. Moore, 1987. Effect of organic matter addition to fish culture systems. *Transactions of American Society of Agricultural Engineers*, 30(1):233–237.
- Piedrahita, R.H., D.E. Brune, G. Tchobanoglous, and G.T. Orlob, 1984. A general model of the aquaculture pond ecosystem. *Journal of the World Mariculture Society*, 14:355–366.
- Potts, A.C. and C.E. Boyd, 1998. Chlorination of channel catfish ponds. *Journal of the World Aquaculture Society*, 29:432–440.
- Rodriguez, F. and T. Popma, 1999. *Tilapia aquaculture in Colombia*. In: B.A. Costa-Pierce and J.E. Rakocy, (Editors), *Tilapia Aquaculture in the Americas*, Volume 2. World Aquaculture Society, Baton Rouge, Louisiana. (in press)
- Smith, D.W. and R.H. Piedrahita, 1988. The relation between phytoplankton and dissolved oxygen concentration in fish ponds. *Aquaculture*, 68:249–265.
- Teichert-Coddington, D.R. and R.O. Smitherman, 1988. Lack of response by *Tilapia nilotica* to mass selection for rapid early growth. *Transactions of the American Fisheries Society*, 117:297–300.
- Teichert-Coddington, D.R., L.L. Behrends, and R.O. Smitherman, 1990. Effects of manuring regime and stocking rate on primary production and yield of tilapia using liquid swine manure. *Aquaculture*, 88:61–68.
- Yohe, J.M., P. Barnes-McConnell, H. Egna, J. Rowntree, J. Oxley, R.G. Hanson, D. Cummins, and A. Kirksey, 1991. The Collaborative Research Support Programs (CRSPs): 1978 to 1990. In: *Toward Sustainability—A Plan for Collaborative Research on Agriculture and Natural Resource Management*. National Academy Press, Washington, D.C., 36 pp.
- Yohe, J.M., P. Barnes-McConnell, H. Egna, J. Rowntree, J. Oxley, R.G. Hanson, D. Cummins, and A. Kirksey, 1995. The CRSPs: International Collaborative Research Support Programs. In: J.F. Leslie and R.A. Frederiksen (Editors), *Disease Analysis through Genetics and Biotechnology*. Iowa State University Press, Ames, Iowa, 321 pp.
- Presentations**
- Bowman, J. Soil pH and liming: A review of acidity/alkalinity management practices in aquaculture. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Boyd, C.E. Use of probiotics in aquaculture. Presented to Fifth Asian Aquaculture Conference, Chiang Mai, Thailand, 1998.
- Boyd, C.E. Shrimp farming and the environment. Presented to the IV Ecuadorian Symposium on Aquaculture, Guayaquil, Ecuador, 22–27 October 1997.
- Boyd, C. E. Soil and water quality management in shrimp farming. Presented to Aquaculture Brazil '98 at Recife, Brazil. 1998.
- Boyd, C.E. Control of suspended solids in effluents from coastal aquaculture ponds. Presented to Aquaculture '99, World Aquaculture Society Annual Meeting, Sydney, Australia, 26 April–2 May 1999.
- Boyd, C.E. Promoting environmentally responsible aquaculture to meet world food needs. Presented to Aquaculture '99, WAS Annual Meeting at Sydney, Australia, 26 April–2 May 1999.
- Boyd, C.E.. The Global Aquaculture Alliance Codes of Practice. Aquaculture '99, World Aquaculture Society Annual Meeting, Sydney, Australia, 26 April–2 May 1999.
- Boyd, C.E. Water quality in channel catfish farming. Presented to Aquaculture '99, World Aquaculture Society Annual Meeting, Sydney, Australia, 26 April–2 May 1999.
- Brown, C. Ontogeny of digestive enzymes in marine larvae: Dietary and hormone effects. Presented to Aquaculture '99, WAS Annual Meeting at Sydney, Australia, 26 April–2 May 1999.
- Brown, J.J., E.P. Glenn, and K.M. Fitzsimmons. Forage crop production on highly saline aquaculture effluent. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Chang, W.Y.B. Large lakes in China. Presented to 29th Conference of the International Association for Great Lakes Research, 26–29 May 1986.
- Chang, W. China integrated aquaculture: An efficient ecological system. Presented to the Limnology & Oceanography 1987 Annual Meeting.
- Chang, W. The world's highest lake: Tibetan Lakes. Presented to 30th Conference of the International Association for Great Lakes Research, 1987.
- Couplets, I.I. I dream of a pond with 5Y3/2 soil/With runoff well managed so as not to spoil/A countryside verdant where farmers work smarter/For more fish to eat and more fish to barter. (in verse)
- Fitzsimmons, K. High school students and aquaculture projects. Presented to Aquaculture America '99 at Tampa, Florida, 27–30 January 1999.
- Fitzsimmons, K. and B.C. Posadas. Consumer demand for tilapia products in the U.S. and the effects on local markets in exporting countries. Presented to the Fourth International Symposium on Tilapia in Aquaculture at Orlando, Florida, 9–12 November 1997.
- Lin, C.K. Inland marine shrimp culture and its legislative, environmental and socio-economic implications in Thailand. Presented to Aquaculture '99, WAS Annual Meeting at Sydney, Australia, 26 April–2 May 1999.
- Lin, C.K. and C. Limsuwan. Management strategies and approaches for water quality improvement in shrimp farming. Presented to the American Association for the Advancement of Science at Philadelphia, Pennsylvania, 12–17 February 1998.
- Lin, C.K., J.B. Hambrey, and J. Szyper. Environmental impact assessment for a shrimp farm project in Tanzania: a case study. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Lin, C.K., W. Ruttanagosrigit, D. Thakur, and P. Wanuchsoontorn. Organic matter and nutrients in sludge of closed ponds for intensive shrimp culture. Presented to Aquaculture '98, WAS Annual Meeting at Las Vegas, Nevada, 15–19 February 1998.
- Muthuwan, V. and C.K. Lin. Green water recirculating system for intensive culture of marine shrimp (*Penaeus monodon*). Presented to the Fifth Asian Fisheries Forum at Chiang Mai, Thailand, 10–14 November 1998.
- Phelps, R.P., K.L. Veverica, R.S. Weyers, and J.J. Duffy. Induced spawning of the red snapper, *Lutjanus campechanus*, using three different hormone treatments. Poster presented to the World Aquaculture Society Meeting at Bangkok, Thailand, January 1996.