

Dissolved oxygen (DO) levels undergo diurnal cycles and if the level falls below critical values for extended periods, drastically retarded growth or fish death occurs. Stocking rates are also limited by DO levels. To boost production, intensive and semi-intensive aquaculturists rely on mechanical aerators to augment DO levels by increasing air-water contact. Vertical pumps, pump-sprayers and paddle wheel aerators splash water into the air while propeller-aspirator and diffused air systems release air bubbles into the water. Anchored floating and levee emplaced aerators are generally driven by electric motors while mobile trailer-mounted emergency systems are usually powered by farm tractor power-take-offs, or small gasoline or diesel engines. Aside from oxygenation, aerators induce water circulation which is important in ponds which have temperature or dissolved oxygen stratifications. Oxygen transfer efficiency experiments showed that paddle wheel systems were the most efficient and diffused air systems the least. However, pond size, total aeration time per season and various economic factors determine the most cost-effective system for a particular farm set up.

For this article, the Aquatic Sciences and Fisheries Abstracts (ASFA) covering the period 1971 to November 1990, the

Who's Working On Fishpond Aeration?

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ICLARM library and professional staff collections were used in the literature search.

A total of 97 articles were found. Publication rates were 0.6 articles per year in 1970-1974, 1.2 in 1975-1979, 7.0 in 1980-1984, and 9.6 in 1985-1989 (Fig. 1). Sixty-two per cent were published in journals, 24% were conference proceedings, 7% in books or book chapters, 4% in reports. Three were unpublished theses. Ninety per cent of the articles were in English. Other languages used were Hebrew, Chinese and Spanish.

No international symposia or meetings specifically on the subject were found through the literature search, though it was discussed in some international aquaculture meetings.

Some of the recent publications include: *Aeration systems in aquaculture* by C.E. Boyd and B.J. Watten, published in *Reviews in Aquatic Sciences* 1(3):425-472 in 1989; *Water quality management and aeration in shrimp farming*, Fisheries and Allied Aquacultures Departmental Series No. 2 by C.E.

Boyd, published in 1989 by the Fisheries and Allied Aquaculture Department, Alabama Agricultural Experiment Station, Alabama, USA; *An economic comparison of aeration devices for aquaculture ponds* by C.R. Engle published in *Aquacultural Engineering* 8(3):195-207 in 1989; *Design of airlift pumps for water circulation and aeration in aquaculture* by N.C. Parker and M.A. Suttle in *Aquacultural Engineering* 6(2):97-110 published in 1987; and *Water quality dynamics in brackishwater shrimp ponds with artificial aeration and circulation* by R.C. Senares et al. in *The First Asian Fisheries Forum*, Asian Fisheries Society, Manila, Philippines, pp. 83-86, published in 1986.

Some of the institutions conducting research in aquacultural aeration include: the Fisheries and Allied Aquacultures Department, Alabama Agricultural Research Station, Auburn University, Auburn, Alabama 36849, USA (contact: C.E. Boyd); U.S. Fish and Wildlife Service, Southeastern Fish Cultural Laboratory, Marion, Alabama 36756, USA (contact: N.C. Parker); and the Faculty of Agricultural Engineering, Technion-Israel Institute of Technology, Haifa IL 32000, Israel (contact: Y. Avnimelech). Other contact persons include: A. Fast, Mariculture Research and Training Center, Hawaii Institute of Marine Biology, University of Hawaii, P.O. Box 1346 Kaneohe, Hawaii 96744, USA; G. Zohar, Ministry of Agriculture, Shaham, Israel; and C.R. Engle, Department of Agriculture, University of Arkansas at Pine Bluff, Pine Bluff, Arkansas 71601, USA.

A USAID Collaborative Research and Support Program with the Brackishwater Aquaculture Center of the University of the Philippines in the Visayas, Iloilo 5001, Philippines, conducted research on water quality dynamics in brackishwater fishponds.

ICLARM can provide more information on aquaculture aeration. Write to the Selective Fisheries Information Service, ICLARM, MC P.O. Box 1501, Makati, Metro Manila, Philippines, for details and costs involved.

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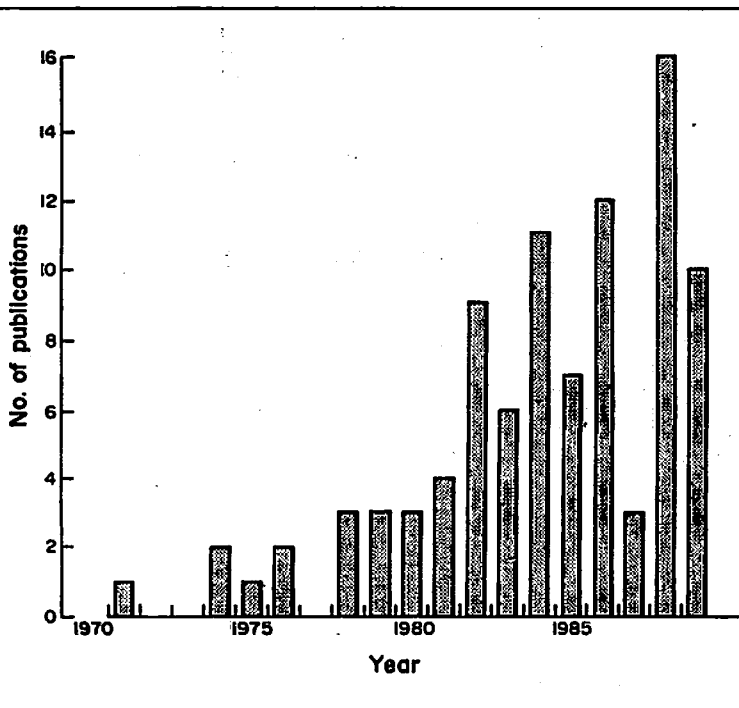


Fig. 1. Growth of the literature over time. Note there is a delay in the inclusion of materials in the databases used. (N = 97).