



Announcements

Workshop: *Introduction to Fish Breeding*
On Saturday, April 22, this free workshop will be presented at the Komohana Agricultural Complex in Hilo and the nearby UH Hilo farm. The session will begin with the biology of fish reproduction, and invited experts from the community will present practical examples of fish breeding strategies. The workshop will begin at 9:00 A.M., with doors opening at 8:30 for registration and refreshments. Following a lunch break near noon (participants on their own), the session will continue at the farm with a demonstration of hormone-induced spawning of Chinese catfish. Participants will need their own transportation; car pooling will be possible. For further information call Jim at 981-5199 or email jszyper@hawaii.edu.

Information Sources

Small Improvements Add Up Large scale production of food fish is a business with generally small profit margins. This is particularly true for the U.S. channel catfish industry, for which the on farm prices have

"risen to \$0.72 - 0.75 per pound." The Winter 2006 issue of *Arkansas Aquafarming* (U. Arkansas at Pine Bluff) contains an article titled *Improving Farm Efficiency*. The detailed suggestions are reminiscent of the small things automobile racers do to gain what seem like small advantages. But the article calculates specific and substantial savings in production costs. This is mentioned here to highlight the generally applicable feeding recommendations: "Feed a high quality diet. .. feed a small area of the pond and wait for the fish to consume everything .. Be observant and focus on the task .. Feed the fish to satiation but avoid overfeeding .. Avoid the tendency to work too fast .." Feed amounts to 45% of production costs for catfish. The article also takes up fuel and electrical costs. Visit www.uaex.edu/aquaculture/ArkansasAquafarming/pdf-files/v23-1_Aquafarming-January-2006.pdf.

Wireless Pond Monitoring and Aerator Control Large fish production ponds (as for catfish) are often aerated by electrical or fuel-driven floating paddlewheels to permit greater fish density by taking care of oxygen demand. Decisions about timing of

Readers' contributions are invited with aloha, and much appreciated, though not all can be used. They may be mailed, faxed or emailed to the editor at this address. Contributors understand that materials may be edited for space and other considerations. This newsletter is part of a cooperative project funded by the University of Hawaii Sea Grant Extension Service, the UH Cooperative Extension Service, and the State of Hawaii Aquaculture Development Program.

Editor: Jim Szyper

875 Komohana St., Hilo, HI 96720-2757

telephone: 808 981 5199 fax: 808 981 5211 email: jszyper@hawaii.edu

On line: www.uhh.hawaii.edu/~pacrc/bigisaquag/

aeration are often made by human observation of the pond, or by taking DO readings with a conventional meter at appropriate times. Aerators can be powered and controlled by being wired to the pond bank and from there to utility lines, or connected to power take-offs on farm tractors. This is labor intensive. It has long been possible to install DO sensors in a pond that are connected to a control system to turn on the aerators as required. This requires electric power, supplied by batteries, solar panels, or both. The UH Mariculture Research and Training Center on Oahu had a similar, entirely wire-connected pond monitoring/control system in operation during the early 1990's. The wires created limitations on distance and other factors, and electronics were more expensive then. Still, various commercial systems were developed and applied on farms.

The recent issue of the Aquaculture Magazine on line newsletter (ask to be added by emailing to newsletter@aquaculturemag.com) has an infomercial that describes a wireless, solar powered, monitoring and control system that is self contained in a floating bouy. "We are pleased that Mississippi State University has selected Integrator Aqua Systems to provide 87 research ponds with wireless technology for the purpose of collecting dissolved oxygen, temperature and pH data. Mississippi State University is known all over the world for their contribution in the research and advancement of the aquaculture industry. ..The Integrator wireless monitoring system uses a solar powered buoy with self cleaning sensors ... the oxygen readings are transmitted automatically to any PC within range (seven miles line of sight - longer with repeaters). A battery that is kept charged by a solar panel powers it. Aerator control and running status is provided by a wireless controller that is activated by wireless com-

mands from a host PC. Software is included for the host PC. The software also provides automatic alerting by telephone... visit our website at www.jwhiteassoc.com."

Updates

U.S. Aquaculture Production The semiannual USDA Economic Research Service's *Aquaculture Outlook* introduces the big picture, recent trends and near term projections, and gives tabulated data for specific products. The March 2006 issue expects increased demand for domestic aquaculture products because the economy shows growth in GDP and disposable income (which increases restaurant sales, a major outlet), and the weaker dollar make imports more expensive. Still, imports of aquaculture products are expected to increase as a percentage of domestic food supply partly because the hurricanes of 2005 hurt the production of crawfish and oysters. Also encouraging were the low 2005 prices (to level in 2006) for corn and soybeans, the primary land crops that go into feeds. Prices obtained for aquaculture products are strong, and could go further as world demand for poultry decreases (presumably because of bird flu concerns). Nonetheless, domestic broiler production will increase in 2006, as will pork and beef, which compete with domestic aquatic products. Get the full report at www.ers.usda.gov.

TECHNICAL NOTES

Health & Safety for Fish Eaters

Conflicting reports of research conclusions, along with negative messages by some advocacy groups, have created confusion in the minds of consumers of aquatic products, which translates into reduced sales of some products. In our complex rapid-communi -

cations society, reports from some sources get summarized, distilled, and passed along in other sources, until readers who may not dig deeply can be found to have persisting misimpressions. Recognizing this condition, the National Aquaculture Extension Steering Committee (a cooperative effort of USDA and NOAA Sea Grant) has begun to develop a public information initiative to disseminate the best and latest science-based information on the issue. The work is presently in an initial organizational and materials-gathering stage.

A very broad summary of the issue is that 1) contaminating substances (such as mercury and PCB's) have been analyzed in aquatic food products, with different works sometimes producing differing results due to different choices of samples and other factors; 2) government agency recommendations for the actions of citizens often include wide margins of safety above and beyond the actual conclusions of research studies, for both public-welfare and political reasons; 3) the number of citizens and the degree of potential harm appear to be much smaller than the number of citizens likely to be spared greater potential harm by accessing the beneficial health effects of eating seafood.

Item 3) above often receives minimal or no attention. The risk of harm and the gain and loss of beneficial effects are not observations in the usual sense. They are projected statistical accountings of large population groups (seafood eaters; patients with cardiovascular diseases or disease risks), derived by multiplying their numbers by estimated percentage effects. Laboratory studies of toxicity employ such concepts as "LD50," a dose that kills 50% of a test population under defined conditions. This defines a highly toxic level, but does not explain why the other 50% did not die. Risks of death from heart disease and pro-

jected benefits of beneficial factors are collected from demographic data (who dies when and why) and from large controlled studies of experimental diets and behaviors.

If this sounds a bit esoteric, it is. Most researchers in natural science are accustomed to observing and measuring and collecting data with a much more certain feel to it, even with the small uncertainties of the statistics that are used. Apart from science, most citizens are accustomed to short statements about technical matters, delivered by media wary of complication.

A new report offers "Guidelines for Ecological Risk Assessment of Marine Fish Aquaculture" from NOAA's Northwest Fisheries Science Center (at www.nwfsc.noaa.gov/assets/25/6450_01302006_155445_NashFAOFinalTM71.pdf). Ten "areas of substantive risk" are identified and discussed. Some are closely related to health risks from contaminants, others more purely environmental. Each area is "assessed for its degree of potential adversity, together with its mitigation .. This .. framework .. was developed by the World Health Organization many years ago, and its generic nature and international acceptance make its use for the risk assessment of marine fish aquaculture an ideal application." The areas are: " .. increased organic loading, increased inorganic loading, residual heavy metals, transmission of disease organisms, residual therapeutants, biological interaction of escapes with wild populations, physical interaction with marine wildlife, physical impact on marine habitat, using wild juveniles for growout, and harvesting industrial fisheries for aqua-feeds."

Read about a risk of losing benefits in "NIH says pregnant moms should eat oily fish to enhance the cognitive abilities of their children." at www.newstar.com/018727.html.