By and for the Big Island aquaculture community

Big Island Aquaculture News

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Announcements

Workshop: *Getting Started in Aquaculture* On Saturday, January 27, Jim Szyper will present this free workshop at Hale Aloha building on the Hawaii Community College Campus in Hilo . This session is for people who are looking for information about aquaculture for the first time, as well as those who have gathered some information and would now like to learn what can be grown in Hawaii and how to get started. The major products of Hawaii will be discussed, as well as the major considerations for starting to grow products for home use or commercial purposes. The session will begin at 9:00 A.M., and finish near noon. Sign in and refreshments will be available beginning at 8:30. Enter the campus from Kawili St. across from Mehana Brewery. Contact Jim at 981-5199 or email *jszyper@hawaii.edu* for further information.

Information Sources

Hawaii Cooperative of Organic Farmers (HICOF) Although certified organic aquaculture is not yet ready at USDA (see Updates below), interested parties can get a good start on the general topic of organic farming at the web site *www.hicof.org/*. There are links to diverse background information (including the UH CTAHR site *www.ctahr.hawaii.edu/organic/*), and the reader could begin to make contact with other organic farmers.

Speaking of UH CTAHR, they have recently made available the free 71 p. publication, Toward *Sustainable Agriculture: a Guide for Hawaii's Farmers*, edited by Jody Smith and Samir A. El-Swaify, at *www.ctahr.hawaii.edu/oc/freepubs/pdf/TSA_guide.pdf*. Other free publications can be accessed by backing off the url to end in *...freepubs/*. Examples include *General Elements and Principles of Landscape Design*, and, appropriate for the holiday and bowl-game season, *Trans Fats in Foods* and *Food Safety Tips for Tailgating.*

Auburn University Dept. of Fisheries and Allied Aquacultures has recently launched the site *www.alearn.info* to provide categorized and searchable resources on fisheries, aquaculture, and education, including the SRAC publications library. It's somewhat Alabama specific, but there is also a lot of generally useful information. A photo gal-

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 College Program, the UH Cooperative Extension Service, and the State of Hawaii Aquaculture Development Program.

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lery is available to those who register, but registration is not required for the rest of the site.

Updates

Organic Aquaculture There's a lot going on. The likely most important development for U.S. fish farmers is the recent (Winter 2006) release of the Interim Final Report of the Aquaculture Working Group, USDA National Organic Program. View or download it at *www.ams.usda.gov/nop/TaskForces/AATFInterimFinalReport.pdf*. This is a relatively late-stage step in the long process toward nationwide standards for labeling and promoting cultured fish as organic. This applies to finfish, not shellfish. The Group may consider shellfish in the future.

The concept of organic farming has expanded beyond avoidance of artificial pesticides and restricted use of fertilizers. It now involves environmentally attentive management of the entire production process. This is true in the Aquaculture Working Group report; this update note comments mainly about the issue of feeds.

A major issue has been the persistent necessity for animal protein content in feeds for many cultured fishes. The major source for this protein is wild caught fish in the forms of fish meal and fish oil. Organically farmed animal products including fish are supposed to be fed only with organic feed materials. There was no precedent for consideration of wild fish as an organic feed source. When the question arose, the fact that wild fish eat wild fish and other wild things was a quickly apparent difficulty. Wild fish will never be organic, but might they be accepted for feeding organic fish?

The working group recognized that wild fish may or may not come to be widely accepted by the community and the USDA, although they is accepted in the legislation that supports this process. The group proposed two sets of specifications for the two cases. If wild fish can be accepted, "..all such .. must be derived from fishery resources certified to be sustainably managed. Sustainability shall be determined using principles and criteria established by the Marine Stewardship Council or similar internationally recognized fisheries certification organizations." There are many further details. If wild fish are not accepted, under "alternative B .. limited amounts of fish meal and oil could be included in aquaculture feeds as additives and supplements." This is in contrast with their use as major ingredients in the first case.

Technical facts and regulatory language make all this slow reading, but that's not all there is to the issue. Salmon fishermen, noticing that "organic" carries connotations of cleanliness and sustainability, and ignoring that the term applies to farming, don't like being left out of the potential marketing benefits. This complication is detailed in a November 28, 2006 article in the New York Times, "Free or Farmed, When Is a Fish Really Organic?" by Andrew Martin. [Thanks to Gary Meltzer for passing this on.] Martin accessed the USDA report and interviewed a senior scientist from the advocacy group Environmental Defense, who was a member of the USDA group. She confirmed that "..organic is about agriculture, and catching wild animals isn't agriculture." Martin also looked into the purported marketing benefits. At a Manhattan seafood store, he found "organic" king salmon from New Zealand (they didn't say who certified it) at $13.50 / lb, wild king salmon at $22.50, and domestic farmed salmon at $9.95. The article says that most consumers, as well as the store's wholesale director, prefer the taste of wild salmon, but that the organic salmon is "more consistent." Does

this price comparison make the salmon fishermen wrong about organic labeling as a threat? ".. it will still take several years before U.S.D.A.-certified organic fish appears in stores or restaurants .." and begins to provide an answer.

TECHNICAL NOTES

Fish Transport and Oxygen

Aquarium fishes are usually transported in water contained in plastic bags inflated with oxygen from a compressed gas cylinder. The gaseous oxygen constitutes many times what the water can hold (only about 8 mg/liter in warm water), and so it diffuses into the water and maintains good concentration for many hours. This is a well-developed method applied widely with only minor variations. Food fishes and shrimps, being mostly larger than ornamentals, are handled differently and with more variation in methods. This note focuses on the use of gaseous oxygen in open containers.

Fine bubbles of pure oxygen quickly saturate nearby or well-mixed water. Therefore, efficient use requires knowing just how large a flow rate or total quantity of oxygen can support how much water and fish biomass. Experienced transporters know how much of bubbling they'd like to see, but some situations prevent frequent inspection. The quantities are detailed in a recent article in *World Aquaculture* magazine (Wurts 2006).

"Pure oxygen flow rates used for live transport generally range from 3 - 6 L/min of oxygen gas for each 378.5 L (100 gallons) of fish transport water," with adjustment according to the biomass density, i.e., the weight of product animals in each liter of water. The article discusses capacity and other figures pertinent to containers of liquid oxygen, which will be neglected here. There are specifics for compressed gas cylinders as well, but not for the small ones used in most of our modest-sized local businesses. These are easily obtained and filled at Gaspro in Hilo and other suppliers in the state. The article recommends maintaining concentrations in the water of about 2/3 saturation or more. The saturation value is dependent on temperature, but many dissolved oxygen (DO) meters have a setting to read out saturation directly. As a side note on temperature, the author notes that "0.45 kg (1 lb) of ice will lower the temperature of 38 L (10 gal) of transport water approximately 1.1 ^{o}C," without further comment; cooling is a good idea for long transports that could cause excessive heating.

The biomass specifics given refer to channel catfish, but presumably have some general value for animals of similar hardiness. The author says that, using pure oxygen gas, 2-3 catfish of 1-2 lb weight can be transported in a gallon of water at 18.3 ^{o}C. These loading rates should be reduced 25% for each temperature increase above this of 5.6 ^{o}C. That sounds like a lot of biomass density, but the catfish industry is long experienced. They expect that "1/3 of the space is occupied by fish and 2/3 is water." Transporters will do best with experience and caution, of course. Reference:

Wurts, W.A., 2006. Live transport using compressed and liquid oxygen. *World Aquaculture* 22 (3):26-27.

Merry Christmas,
a great holiday season
all around,
and
Happy New Year to all.