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## Aquaculture And The University Of Maryland

What's going on in aquaculture within the University System of Maryland? We'd like to give you a complete rundown on all the things going on at our institution but just don't have enough space in this newsletter to do that! But we will give you a brief tour of our facilities and the units involved in aquaculture and hope you'll want to find out more.

The University of Maryland considers aquaculture to be an important part of our agricultural industry. Aquaculture has long been a part of our state and the business has experienced a sustained growth over the past decade. The University will continue to be a part of that development with strong research and outreach programs designed to answer critical questions for our industry and provide the best teaching and educational products for that support.

The University currently operates several facilities dedicated to aquaculture:

- The University of Maryland Center for Environmental Science' Horn Point Environmental Lab near Cambridge is the site of oyster and striped bass hatcheries. Constructed in 1976 to conduct research on oysters, the facility has had and continues to have a prominent place in the development of aquaculture on these important animals. It is one of the only commercial scale oyster hatcheries located on brackish water. Current research includes production of seed oysters for rehabilitating areas devastated by disease and domestication work on striped bass for aquaculture. The faculty involved in these projects have joint appointments with the Sea Grant Extension Program as Shellfish and Finfish Aquaculture Specialists.
- The Crane Aquaculture Facility, located in Baltimore County, was constructed and formerly operated by the Baltimore Gas and Electric Company. It is currently operated by the Agricultural Experiment Station and conducts work on the domestication of striped bass. The stocks include some of the most important groups of domesticated animals developed to date and the facility has had the active support of the expanding striped bass aquaculture industry.

- The Aquaculture Facility at Fells Point belongs to the Maryland Biotechnology Institute. Here, research into the high tech world of genetics and bioengineering is carried out which will help carry the industry into the future. Among the most prominent project are those which will allow the spawning of striped bass on demand, thereby reducing the reliance upon an annual spawning run of natural stocks. Also among projects carried out here are studied to produce oysters which will survive in the face of the severe challenges of the diseases which have led to the virtual collapse of the shellfish industry in the Mid Atlantic.
- At the University of Maryland Eastern Shore, the Small Farm Institute conducts work on the application of closed or recirculation system technology to the local industry. Included in this is the use of hydroponics for innovative waste handling. Specialists on staff include a fish disease diagnostician and a new cooperative unit with the National Biological Service is led by a specialist in fish nutrition.
- At the College Park campus the new Animal Science/Agricultural Engineering complex contains "wet" labs for research into aquaculture and seafood topics. The Ag Engineering Department is engaged in research on biofiltration, waste treatment, and seafood processing technology and has an Aquacultural Engineering option in their graduate programs. The Animal Science Department has been engaged in several seafood technology research projects and has laboratory space for future work included in their new facilities.
- A Fish Disease Diagnostic Unit is located in the Avrum Gudelsky School of Veterinary Medicine at College Park and is available for industry to obtain identification and control measures for health problems occurring in their fish stocks. Many growers have utilized the services of this highly regarded staff of professionals and they are always ready to work with producers to identify and help control diseases which can ruin fish production in a short time.
- The Pathology Department at the School of Medicine at the University of Maryland Baltimore City also contains a diagnosis unit that works with industry for fish health and control problems.

These units represent a substantial commitment of resources by the University to aquaculture and fisheries and demonstrate the interest in this industry by faculty members. The Sea Grant Extension Program has formal and informal ties to most of these units in providing outreach programs to the industry. Outreach activities include workshops and conferences to disseminate current research information to the industry and one-on-one work with producers to help develop new aquaculture businesses and expand existing ones.

The [Sea Grant Extension Program](#) consists of three Area Agents backed up by five specialists in disciplines related to fisheries and aquaculture. The SGEP conducts programs from a few hours duration on general topics to week long, intensive short courses in such areas as Striped Bass and Hybrid Production and Oyster Aquaculture. Agents and specialists also assist in planning and conducting regional programs such as "Aquaculture In The Mid Atlantic", an annual conference begun in Maryland in 1979 and currently sponsored the Land Grant and Sea Grant Colleges and state aquaculture associations in six Mid Atlantic states.

For further information on the programs and services of the University of Maryland for aquaculture, [contact your local Area Agent](#).

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## Soft Crab Production Workshops Scheduled

Maryland producers can learn about the latest equipment and methods for shedding soft crabs at four regional workshops to be held this spring. Sponsored by the Sea Grant Extension Program of the University of Maryland Cooperative Extension Service, the programs are open to all people. On the Western Shore, programs will be held at the Town Hall in Chesapeake Beach in Calvert County on Tuesday, April 25 and the Charlotte Hall Library in St. Marys County on Wednesday, April 26. The following week the program will move to the Eastern Shore and be held at the Wicomico County Extension Office in Salisbury on Tuesday, May 2 and at the Senior Center in Centreville in Queen Anne's County on Wednesday, May 3. Both meetings are scheduled from 7 to

9 pm.

The workshops will cover flow-through and recirculation systems. There have been many innovations in crab shedding in recent years and the program will show how to design the best system for you and how to operate it for maximum profitability. Seafood production requires people skilled in various management techniques and recirculating, or closed, production systems allow you manage your water quality better than any other. That's why there are several hundred of these systems currently operating in Maryland. Rich Bohn, Area Agent for Southern Maryland and Don Webster, Area Agent for the Eastern Shore will be teaching the programs. Both have worked with closed shedding systems for many years and their program will include slides of innovations in the industry.

Some of the topics to be discussed will be: choosing the system that's right for you; shedding systems components and how they fit together; biofilter design, start up and maintenance; and monitoring your water quality for healthy production. They will also include handling tips for keeping mortality low. There will be information packets for those attending which will include designs and monitoring charts to be able to run your system more efficiently.

While there is no charge for attending either of these meetings, pre-registration is requested to ensure that enough program materials are available for those who attend. Please call Thelma Robinson at the St. Mary's County Extension Office at 301-475-4482 to register for the Western Shore programs or June Thomas at the Wye Research and Education Center in Queenstown at 410-827-8056 to register for the Eastern Shore programs.

This program is part of a series of aquaculture educational programs presented by the [University of Maryland Sea Grant Extension Program](#) throughout the year. For more information, [contact your local Area Agent](#) to find out about educational programs directed at aquaculture, a "growing" Maryland business.

The [Maryland Cooperative Extension Service](#) offers its programs and services to all regardless of race, color, religion, age, national origin, sex, and handicap and provides Equal Opportunity with respect to both education and employment.

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## **New Aquaculture Bill Filed**

Aquaculture legislation has been filed in Congress by Senator Daniel Akaka of Hawaii. The title is the National Aquaculture Development, Research, and Promotion Act of 1995. It will provide for the coordination and implementation of a national aquaculture policy for the private sector by the Secretary of Agriculture. The legislation calls for the establishment of a coordinated research and development program that will impact federal aquaculture programs and foster expansion of this important industry.

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## **Aquaculture Conference Coming To D.C.**

**By Don Webster, Eastern Shore Area Agent**

"Aquaculture In The Mid Atlantic", the largest aquaculture educational program in this area, is joining with "Aquaculture Expo VIII" this June for a special program, open to all persons, to showcase the aquaculture industry in a national forum. The Mid Atlantic program, begun by the University of Maryland as a one day shellfish workshop in 1979, has evolved into a major event, now sponsored by the Land Grant and Sea Grant Colleges of six Mid Atlantic states.

The 1995 program will be held at the Washington Hilton from June 24-27, 1995 and will feature a broad range of programs to help veteran growers and beginners alike. Growers will be coming from all over the US to participate in workshops designed to highlight the benefits of aquaculture production and to let decision makers become aware of the problems that they face as a developing industry.

On the 24th there will be a full day program, cosponsored by the Aquaculture Engineering Society,

on Technologies for Intensive Aquaculture Systems. This is an update on the previous session held several years ago at Cornell University in New York and is once again coordinated by Mike Timmons. Also on the 24th will be a special session on Biotechnology In Aquaculture, coordinated by Reggie Harrell of Maryland . He has put together an outstanding group of speakers who will cover the technical, legal, and ethical topics relating to the subject. The keynote speaker will be Dr. Rita Colwell, President of the Maryland Biotechnology Institute and President-elect of the American Association for the Advancement of Science. To further broaden the audience, George Flick and Tom Rippen of Virginia Tech will present a program on Issues in Processing Technology. George is a former Director of the Mid Atlantic conference and one of the leaders in food technology research. He and Tom will cover the increasingly important safety issues on seafood processing and handling.

Sunday, the 25th will see a full day special session on Effluent and Waste Management, coordinated by John Ewart of Delaware. The program will feature an international slate of speakers and will cover all aspects of the topic. For those who want to learn about production, Dan Terlizzi of Maryland will put on a half day program featuring the Culture of Ornamental Fish and Plants. Come find out why these products offer such an exciting opportunity. A program for teaching teachers about Aquaculture In The Classroom will be held. It is organized by Bob Keenan of the Maryland Education Center for Agriculture, Science, and Technology.

Monday's program will be packed with information. Jim McVey of the NOAA's National Office of Sea Grant has produced an outstanding program covering Offshore Technology-The Horizons of Aquaculture, looking towards the future where we may be producing fish and shellfish in coming years. Also during the morning session will be a program organized by Aggie Spicer of West Virginia, entitled The Realities of Aquaculture, where producers will tell you what the real world of aquaculture production is really like. The American Tilapia Association will weigh in with a program on that increasingly important species before the educational programs break for a General Session with an exciting keynote speaker. William Lord-Butcher, President of SeaPerfect Plc of London, one of the world's largest producers of clams and scallops, will address the assembly on "Investing in Aquaculture". During the afternoon, the National Aquaculture Association will conduct a special program on Aquaculture and the Political Process, letting you become aware of how your government operates and how you can affect decisions concerning your business.

On Tuesday, June 26, shellfish will take center stage with a program on Shellfish Aquaculture: Problems and Promise. Coordinator Don Meritt of Maryland has drawn on speakers from all regions of the country and both the public and private sectors to show how shellfish production has declined in some areas while expanding in others. Bill Daniels and Bernie Petrosky of Delaware State have produced an excellent program on Perspectives on Aquaculture Development, which will highlight the legal and regulatory constraints that retard the growth and development of the industry. Bill Sieling, Chief of Maryland's Seafood Marketing Office, has developed a program on the Realities of Marketing your product. If you can't successfully do that, you will never succeed in the industry. Experts will give you tips on what to look for and how to go about selling your product. The afternoon will feature another program which will follow up the topic of the Realities of Financing Your Operation. This is organized by Charles Coale and Pat Lacey of Virginia Tech who have put together some of the best programs that we've had in past years.

The 28th will feature four great tours organized by Brad Powers and the staff of Maryland's Office of Aquaculture. There will be trips to highlight Eastern Shore Aquaculture; Cold Water (Trout) Production; Plants and Ornamentals; and one to High Technology and Biotechnology facilities. These will fill early and space is limited to one bus per trip so be sure to sign up soon.

For further information on the conference, a brochure and registration [contact your local Area Agent](#) or visit [Aquaculture Expo VIII](#).

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## **Aquaculture And World Carrying Capacity**

**By Doug Lipton, Resource Economics Specialist**

A new study released by the Worldwatch Institute entitled "Full House" Reassessing the Earth's Population Carrying Capacity" (L.R. Brown and H. Kane, W.W. Norton and Company, New York, 1994) makes for interesting reading regarding the role of aquaculture in meeting world demand for

food. For example, the study points out that between 1950 and 1988, world seafood production per person increased 126 percent. However, between 1988 and 1993, seafood production per person declined 9 percent. Not even recent increases in aquaculture production have been able to keep pace with world population increase and the decline in wild fisheries in the past few years.

At first glance, this would appear to be good news for the future of aquaculture. Population is going to continue to increase at a rapid rate, with the author's projecting 3.6 billion people added between the period 1990 and 2030. Seafood will become more scarce relative to the size of the world population, and prices will increase, making aquaculture a more attractive investment.

A more thorough analysis reveals, however, that aquaculture production will have to compete for grain in other uses such as direct consumption and for production of poultry, meat, and dairy products. This is going to make aquaculture feed more costly, countering the gains from increased demand due to population growth. In projecting world food production to the year 2030, the authors do not envision aquaculture contributing significantly more than is currently being produced.

While one can argue about some of the assumptions used to make these projections, the trends are generally well accepted. What the authors fail to realize, though, is that aquaculture is still in its technological infancy relative to production of other agricultural products. Therefore, the potential for technological advances in aquaculture that result in significant cost lowering increases in efficiency is very high at this time. The implication for practicing aquaculturists is that even profitable technology today may not be profitable in the future. We must continue to innovate and improve the production process in a changing world.

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## **Bay Aquaculture Permits Available**

**By Rich Bohn, Southern Maryland Area Agent**

The question of whether fish or shellfish culture in Chesapeake Bay may be feasible could be addressed soon. The State of Maryland has developed regulations for experimental permits to be made available to aquaculturists. A tidal wetlands permit, a joint state and federal regulatory pathway through the US Army Corps of Engineers (ACE), will be used to issue permission. While the regulatory requirements of federal agencies have not been clearly defined, the Maryland Department of Natural Resources has outlined the information required in applying for these permits.

The experimental permits will be used to demonstrate the feasibility of aquaculture in Chesapeake Bay, and business plans are a required part of the permit application. The production system must adequately address safeguards to prevent escapement of stocks and avoid being a hazard to navigation. The plan must also include monitoring of environmental conditions to assess impacts on the Bay. The systems should minimize environmental effects, protect wild resources, and not interfere with current recreational or commercial fisheries at the site.

Ten permits will be made available for culturing finfish, and two have already been granted. Net cages are the preferred production method, and the fish must be native to the Chesapeake, minimizing adverse effects of unintentional release. The sites must encompass one half acre or less of surface, and must be above "barren bottom" or those with low or absent numbers of commercial shellfish. Permits will run for five years, with renewal probably available thereafter.

Ten sites are also to be made available for shellfish culture. Due to interest in oyster aquaculture, the Department is willing to allow two aquaculturists to share a single lease, each half not to exceed five acres in size. Racks or floating systems are permissible, and oyster seed must be approved for culture in Chesapeake Bay. Barren bottom conditions are also required at these sites. The permits will be issued for five years, with renewal an option.

In both cases, permits will be open to comment from involved agencies and organizations, including state fisheries staff, tidal advisory committee, and sport and commercial fishing groups. A public hearing is required, and under some circumstances a lease may also be needed from the Maryland Board of Public Works.

Permits will track concurrently through the federal system, via the ACE Navigable Water permit, and be open to comment by other federal agencies. The state permit requires approval by the

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## Monitoring Open Water Sites

The first two open water permits were issued to Bill Voorhies of Wittman and Pintail Point Farm, located in Queenstown. Bill has spent his first production season raising striped bass in cages off his pier in Harris Creek and has been successful in selling his entire production. He plans to continue and expand to the limit of his permit and his observations on the natural activity in the vicinity of his cages has been very interesting with many other fish and shellfish inhabiting the area.

Pintail Point has raised striped bass in net pens in two locations while they pursue the issuance of a permit for a 300 foot long pier from which to moor their pens in future. In order to find out what the environmental impacts would be from their operation, a cooperative group study was organized last year. The group consisted of representatives from Pintail Point Farm; the University of Maryland's Agricultural Experiment Station, Sea Grant Extension Program, and Horn Point Environmental Lab; the Maryland Department of Natural Resources; and the Maryland Department of Agriculture's Office of Aquaculture.

Benthic community structures were analyzed before the pens were used and will be continued for some time after they cease to be used. Monitors were emplaced around the grow out areas to record ambient conditions throughout the day. Farm managers took daily water quality measurements and delivered weekly samples to the University lab at the nearby Wye Research and Education Center for analysis, while others went to the Horn Point Lab. The DNR did a monthly screening of fish health. The objectives were not only to assess the impacts of open water fish culture on local waters but to be able to develop criteria for siting future production facilities and to minimize the monitoring to those critical factors necessary for accurate judgements.

The first year program went very well and yielded useful information, much of which came as no surprise to those in aquaculture.

1. Background nutrient loads from waterfowl in the area were high enough to mask most of the measurements from the fish culture operation. This should change in 1995 when the pens are moved to the proposed pier site, away from the cove that is currently being used.
2. Fouling on the pens was very heavy. This came as no surprise to those used to dealing with Bay waters during the summer months. Better methods of retarding fouling through modification of pen design and cleaning schedules are being looked at.
3. Pintail Point is continuing to hold the fish for another growing season to look at the feasibility and economics of producing two and a half to three pound animals. The market continues to look promising for larger fish.
4. Fish health screening turned up fewer problems on the farmed fish than they usually find in wild populations. The scientist involved in this part of the study is looking at an interesting phenomenon in the liver which may be related to winter kill in catfish and could result in management techniques to mitigate it.

This cooperative project has combined many groups and agencies that are actively interested in promoting the wise use of the Chesapeake Bay for enhanced production of fish and shellfish. By working together to gather meaningful information we can be assured that the industry will be able to grow while protecting the natural waters of the state for the benefit of all for many years to come.

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## And Those Wooden Shoes Really Hurt!

A supermarket in the Netherlands had to stop a Christmas promotion after giving away five hundred goldfish. Animal rights activists protested that some of the children used the plastic fish bags as water bombs by throwing them against walls and then stomping on the fish. (Water

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## Chili Today, Hot Tamale

Although anti-fouling paints have been great for boaters, they can be harmful to the marine environment. These paints work by releasing toxins into the surrounding water to discourage the growth of barnacles, algae, and other sea life. Copper-based paints have been used for decades, and in general contain fewer metallic compounds. In 1988, the use of newer, more toxic organotin anti-fouling paints was restricted. In many states, only boat yards with special licenses can purchase and apply tributyltin (TBT) based anti-fouling paints.

A new alternative paint currently being tested uses a unique, non-toxic ingredient: hot pepper! It is reported that inventor Ken Fischer thought of the idea as he ate a deviled egg laced with hot sauce and mullied over a \$1200 bill for painting the hull of his sailboat. A Maryland based spice company is supplying the hot peppers for the paint, which is hoped to be on the market within a year. (Atlantic State Marine Fisheries Commission newsletter)

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## USDA Reorganization

As part of the US Department of Agriculture's reorganization, the former Cooperative State Research Service and Extension Service have merged to form a new agency, *Cooperative State Research, Education, and Extension Service (CSREES)*. New divisions have also been created within the new agency. The aquaculture program is associated with the Plant and Animal Production, Protection and Processing (PAPP) division headed by Dr. Edward (Ted) Wilson, and is within the Animal Production and Protection unit headed by William (Bill) Wagner.

For the first time, the USDA/CSREES aquaculture team is located together in the same office area. The team consists of Meryl Broussard, Principal Aquaculture Scientist; Gary Jensen, National Program Leader for Aquaculture Extension; and Henry (Hank) Parker, Aquaculture Program Coordinator.

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## FDA Seafood Inspection Regulations

The US Food and Drug Administration (FDA) has announced at various meetings that the mandatory seafood inspection regulation will likely not be released until sometime this Fall. The previous release date was June, 1995. There are also elements within Congress who are initiating legislation to reduce Federal government regulatory influences on the private sector. In particular, the proposed USDA/FSIS stricter regulations for the meat and poultry inspection program has been targeted.

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## Sales And Use Tax Exemptions

Several years ago, Louis Goldstein, Maryland's long time Comptroller of the Treasury, issued a ruling stating that aquaculture was to be considered agriculture for the purposes of sales and use taxes. Mr. Goldstein has long been a supporter of both agriculture and aquaculture and his ruling was meant to reflect the fact that farmers should be treated equally, whether their crops were on land or under water. We offer some questions and answers about the exemptions for use of the industry.

### *Are sales of agricultural equipment exempt from tax?*

The sales and use tax does not apply to sales, including rental, to a farmer of farm equipment used

to raised livestock and poultry, prepare, irrigate or tend the soil, plant, service, harvest, store, clean, dry or transport seeds or crops. Farm equipment is treated as personal property entitled to sales and use tax exemption even if attached to real property.

***What else is included in this exemption?***

Both replacement parts and components, including hydraulic oil, are also exempt.

***What about farm vehicles?***

The sale to a farmer of a vehicle used only in the farming business and about the farmer's home is exempt. Replacement parts and additional equipment for these vehicles are also tax exempt. A farm vehicle is the one that qualifies for a registration plate containing the word "farm" if titled and registered in Maryland. Vehicles used to haul products for resale or to haul farm products for another person who is not a farmer do not qualify.

***Is aquaculture given the same treatment as agriculture?***

Yes. Commercial aquaculture and agriculture are treated the same way for sales and use tax purposes.

***Are there any exemptions for food processing?***

Yes. If a farmer is engaged in processing food for sale, there are exemptions available for purchases of capitalized equipment and consumables. These exemptions are explained in business tax tip #9, Sales and use tax exemptions for production activities.

***Does the tax apply to sales of livestock?***

No. Sales, for agricultural purposes, of livestock including poultry, are not taxable. Also exempt are sales of feed or bedding for livestock. The raising of horses for breeding purposes is an agricultural purpose, but the maintenance or sale of riding, show or race horses is not. The raising of livestock by members of 4-H or similar organizations for agricultural educational purposes qualifies for tax exemption, but the maintenance and sale of pets, dogs for breeding purposes and animals for testing purposes does not.

***Are there any exemptions for agricultural supplies?***

Yes, When sold for agricultural purposes, seeds (including plants and seedlings), fertilizer, lime, fungicide, herbicide and insecticide are exempt. These items are exempt when used for raising vegetable at home but are not exempt when used to maintain a flower or other decorative garden or lawn. The tax does not apply to sales of containers used by a farmer to transport farm products to the market or to sales of baler twine or wire. Fuel for use in farm equipment or a farm tractor is also exempt.

***Are tax numbers needed to claim agricultural exemptions?***

No. It is not necessary for purchasers to register with the Comptroller's Office in order to claim agricultural exemptions.

***What records of sales should vendors who sell agricultural equipment and supplies maintain?***

When the record of sale does not clearly include all elements necessary to justify exemption, a vendor may ask for a signed statement to indicate that the customer is a farmer or that the purchases will be used only for agricultural purposes. Even if a certification is provided, a vendor must, however, collect the tax if he or she knows that the purchase does not qualify for exemption.

***What kinds of items are not exempt?***

Only those items sold under the specific conditions described in publication #9 (referenced above) are exempt. Sales of hand tools, carpentry, cleaning and maintenance supplies, materials to be

incorporated into realty and items for personal use are taxable.

***Are there any special provisions for sales by farmers?***

Yes, The tax does not apply to the sale of an agricultural product by a farmer. Sales of flowers, sod, decorative trees, shrubs and any other product usually sold by a nursery or horticulturist do not qualify for this exemption.

In case you need answers to specific questions to the sales and use tax exemption for aquaculture, your local Sea Grant Area Agent can be contacted for further reference to the Maryland Treasury Department's Taxpayer Services offices.

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