

# THE BIVALVE BULLETIN

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## INSIDE THIS ISSUE:

Business Preparedness	1
2005 State Legislation	1
Crop Disaster Programs	2
Pilot Crop Insurance	2
Cownose Ray Predation	3
Comments on Net Dips	4
Net Coating Bulletin	4
Approved Net Dips	4
<i>Vibrio</i> Bacteria Facts	5
CLAMMRS Annual Data	5
CLAMunications	6

## How to be better prepared for your clam farming business?

With the severity of the 2004 hurricane season and predictions for increased storms in 2005, more and more information is being made available to advise businesses on how to be better prepared. In the clam farming business, the risks associated with a hurricane or storm event are hard to plan for. Obvious things may not always be practical in this business, such as curtail planting or breaking up of nursery seed during vulnerable months (bags which have not had a chance to bury are more vulnerable to storm surges), or shut down land-based nurseries during the months of August to October. Yet, some precautionary measures can be made in advance, such as having rock salt on hand to increase salinity in tanks and a generator in the advent of a power outage. It is most important to sign-up for crop disaster assistance programs and to keep up obligations with these programs (ie. maps, seed invoices, or acreage reports). A review of two programs available to clam businesses is provided on page 2 of this newsletter. There are many other risks in clam farming that are not weather-related, some of which are addressed in this issue with the emphasis on how to be prepared through better planning.

Predation is one of the biggest threats to clam production and the cownose ray has become an increasing problem on the Gulf coast (see page 3). Growers have modified the bag to reduce mortalities and a workshop was recently held to introduce several net coatings. Page 4 contains a workshop summary and list of "approved" dips. Water quality information compiled from the CLAMMRS project over the past few years will allow growers to better understand annual environmental risks and refine practices (see page 5).

Other threats cannot be met successfully on an individual basis, but must be faced through a unified industry approach. For example, several land-based nurseries were on hold for a year or so due to regulatory issues associated with siting them on docks. The Cedar Key Aquaculture Association took the lead in bringing this to the attention of their state legislative delegation and a solution came in this year's session (see below). Another industry organization, the East Coast Shellfish Growers Association, reacted to potential bad press associated with a CDC report. Their *Vibrio* fact sheet on page 5 allows shellfish growers and wholesalers to be better prepared to answer questions from customers and consumers.

## 2005 State Legislation Session: Changes of interest to clam farmers

Several bills passed by the Florida State Legislature in the 2005 session and signed into law by Governor Bush are beneficial to the clam farming industry.

**Sales Tax Exemption**—The sale, rental, lease, use or storage of powered equipment used on the farm to produce crops is now fully exempt from state sales tax. Previously, farm equipment was partially exempt at a rate of 2.5%. The Department of Revenue specifically identifies boats or boat motors that are used exclusively for aquacultural purposes. A sample exemption certificate, which may be requested by a seller or vendor, can be found at <http://taxlaw.state.fl.us>, under rule number 12A-1.087. This law became effective on July 1.

**Authorization for Aquaculture Docks**—Prior to this session, the regulatory authority of the Department of Agriculture and Consumer Services (DACS) for managing state-owned submerged lands was limited to aquaculture leases. However, hatchery and nursery systems, docks for off-loading clams, and slips for workskiffs require the use of or access to submerged lands. Inconsistency in existing laws governing aquaculture restricted DACS from overseeing authorization for these support activities. In the past few years, the Department of Environmental Protection expressed concerns and questioned the lack of specific rules with which to regulate these activities. The solution to amend the law (Chapter 253, F.S.) to recognize DACS's responsibilities was spearheaded by industry. Language attached to a waterfront property bill passed. DACS can now initiate rulemaking for aquaculture docks. Thanks to Rep. Will Kendrick and Sen. Nancy Argenziano for sponsoring this legislation and their support of clam farming.



Workshop held in Cedar Key in May to look at net coatings for clam bottom bags (see page 4)

## Disaster Financial Assistance Programs for Clam Crops

There are two financial assistance programs available to the Florida clam culture industry in the event of crop losses associated with natural disasters. The first is the Noninsured Crop Disaster Assistance Program, or NAP, which provides catastrophic coverage to producers of noninsurable crops. The second is the pilot crop insurance program which is a multi-peril program under evaluation since 2000 in selected counties. These are exclusive of each other—a grower is not eligible for both. Because the various provisions and requirements associated with these programs can be confusing, the following table is an effort to provide a “quick” reference guide for the industry. This may help industry members better understand the programs to determine which can provide the financial protection they need. Another program, which recently provided additional relief to clam farmers affected by the 2004 hurricanes, is the Crop Disaster Program, or CDP. Authorized by U.S. Congress on an emergency basis, this special federal program serves as a supplement to NAP or crop insurance and will not be reviewed here.

Program	Noninsured Crop Disaster Assistance, NAP	Pilot Crop Insurance
<b>Eligibility</b>	<ul style="list-style-type: none"> <li>Land-based nursery—all counties</li> <li>Field nursery—all counties</li> <li>Growout—Charlotte, Collier, Franklin, Lee, Manatee, St. Johns and Volusia Counties</li> </ul>	<ul style="list-style-type: none"> <li>Land-based nursery—not available</li> <li>Field nursery—not available</li> <li>Growout—Brevard, Dixie, Indian River and Levy Counties (experienced growers)</li> </ul>
<b>Administered by</b>	USDA Farm Service Agency (FSA)	USDA Risk Management Agency (RMA)
<b>Serviced by</b>	FSA county or local offices	Independent insurance agents and private reinsured companies
<b>Crop Year</b>	October 1 — September 30	December 1 — November 30
<b>Sign-up Deadline</b>	September 1	November 30
<b>Insurance Plan</b>	Inventory value loss	Inventory value loss, or dollar plan
<b>Coverage</b>	Up to 50% of the inventory value of the crop at 55% of the average market price, or 50/55	<u>Catastrophic level:</u> 50/55 <u>Buy-up levels:</u> from 50/100 up to 75/100
<b>Cost</b>	Service fee of \$100 per crop per county, Payment for upcoming crop year due by September 1	<u>Catastrophic level:</u> \$100 administrative fee <u>Buy-up levels:</u> premium dependent on coverage level selected and crop inventory value, Payment for current crop year due October 31
<b>Covered Causes of Loss</b>	Damaging weather, adverse natural occurrence, or a condition related to damaging weather or an adverse natural occurrence (ie. heat, disease)	Oxygen depletion, disease, freeze, hurricane, decrease in salinity associated with weather event, tidal wave, storm surge, ice floe
<b>Loss notification</b>	Report loss to local FSA office, loss adjusted	Report loss to insurance agent, loss adjusted
<b>Other requirements</b>	Crop acreage report	Grower experience, crop inventory report, tagging of bags, quarterly maps, seed invoices
<b>Web site</b>	<a href="http://www.fsa.usda.gov">www.fsa.usda.gov</a>	<a href="http://www.rma.usda.gov">www.rma.usda.gov</a>

## Pilot Crop Insurance Program to continue through 2007

The pilot insurance program for cultivated clams will continue for selected counties in Florida, as well as South Carolina, Virginia and Massachusetts, through crop year 2007. This announcement was recently made by the USDA Risk Management Agency (RMA), which administers federally subsidized insurance programs for agricultural crops. In 2004 policy provisions underwent significant changes in an effort to make the clam insurance program more actuarially, or financially, sound. Some of these changes include staging of clams in growout bags by amount of culture time, tagging of bags, requiring quarterly maps and seed invoices, increased premiums, and clear definition of lease division. Of course in that crop year, Florida clam growers were hit by 4 hurricanes. Even so, the loss ratio (amount of loss payments divided by program premiums) was 2.0—lower than those ratios calculated for Florida during 2000-2—with a national loss ratio of 2.2 for clams in 2004. By extending the program through 2007, RMA will have 3 years to evaluate and determine the status of this program. There are no changes to the policy proposed for crop year 2006. Actuarial prices for clams may be adjusted to \$0.10 for stage 4, \$0.08 for stage 3, and \$0.06 for stage 2. Contract changes will be posted by August 31. The Shellfish Aquaculture Extension Program is working with RMA to acquire funding to maintain the CLAMMRS water quality monitoring stations used in documenting crop losses.

## Predation Threat to Hard Clam Production: The Cownose Ray

The list of predators known to feed on hard clams is quite large and rates of predation are high enough to cause severe reduction in clam production. A more recent predator concern for shellfish growers is the cownose ray, which has become a major shellfish menace over a wide range of the Atlantic and Gulf coasts. Another concern is that cownose ray populations have become increasingly abundant over the past few decades, possible due to declines in commercial fishing industries.

According to a shellfish resource manager in New Jersey, several years ago large schools of cownose rays ate nearly all the clams fishermen had relayed onto their leases from Raritan Bay. A great deal of work was involved. After the loss, many fishermen gave up relaying. Along the North Carolina coast, cownose rays have been entering the inlets and eating nearly all the bay scallops in Core and Bogue Sounds. The scallop fishery that had been regular every year has just about ended as a result, leaving many people unemployed. Fishermen found crushed scallops and shells in the rays' stomachs when they caught them. Cownose rays are also destructive to submerged aquatic vegetation, clearly destroying them in their search for shellfish.

Traditional, on-bottom oyster growers started having problems in Virginia during the late 1970s with cownose rays. Substantial losses to oyster seed and harvestable beds were reported. One grower noted a loss of over 60,000 oysters in one day. Later clam farmers began experiencing similar problems both at a small clam size and at market size. One farm manager on the Eastern Shore related how these rays actually got between the crew harvesting a bed with bull-rakes and the rake head to try and eat the clams. One year it was so bad they put up nets around beds just to harvest.

These industry issues initiated studies at the Virginia Institute of Marine Sciences (VIMS) and N.C. State University in an effort to control or use cownose rays and to develop new fisheries and markets. Researchers also looked at using rays as chum or cut bait with Florida as a target market. Harvesting and processing technological issues (ie. gumming up

catfish skinning machines) have delayed commercialization of the cownose ray. Further, rays are vulnerable to overfishing since they mature late and have low levels of reproduction. Nothing to date has been particularly effective.

Management practices have been the best approach for the Virginia culture industry—planting at a tide cycle when the rays can't access the bed or later in the season as water temperatures drop and rays exit Chesapeake Bay. Bottom nets are used as predator exclusion devices. Also heavy sandbags or steel rebar buried along the edge of the nets are used to keep them secured over the clam beds. Even without getting under these cover nets, cownose rays can cause damage to newly planted beds by sitting on the nets, "liquefying" the bottom under the nets by blowing water on the sediment, and then "sucking" the seed to the net to be crushed and eaten right through the mesh.

In Florida where planting of clam seed goes on almost continuously in order to provide marketable product year-round, a seasonal approach to planting may be impractical. Further, schools of cownose rays appear to remain along the Gulf coast area from around April through late fall, or more than half the year. Although chicken wire has been successfully used in the past as a cover netting for bottom bags, there have been recent problems. First, the cost of wire has increased. Second, wire from several manufacturers (especially that from China) does not last long in a saltwater, corrosive environment. Wire on clam bags planted in early spring may "rust out" prior to the fall. Perceptive clam farmers began experimenting with another layer of predator protection to their bags—applying net coating to stiffen the mesh. In doing so, they claim rays cannot grasp the stiffer polyester material into their mouths.

Although there are many unanswered questions about the use of net coatings on clam bags in various lease environments (see next article for further discussion), it is certain that cownose rays are an increasing threat to production that clam farmers must address.

**Sources of Information:** Clyde MacKenzie, NOAA National Marine Fisheries Service; Mike Oesterling, VIMS Virginia Sea Grant



### Cownose Ray *Rhinoptera bonasus*

**Distribution:** From New England to northern Florida, migrating south in the fall to Trinidad, Venezuela and Brazil. Population in Gulf of Mexico migrates clockwise, schools of up to 10,000 rays leave the west coast of Florida for Yucatan, Mexico in fall.

**Habitat:** Benthopelagic, oceanodromous, inshore waters, brackish and marine.

**Description:** Broad wings and long tail, with one or two tail spines, characteristic of rays. A deep groove around front of head below eyes, with indented forehead, looks somewhat like a cow muzzle. Coloration is light to dark brown above, with no spots or marks. Lower surface is white or yellowish. Eyes and spiracles located on upper body with mouth on undersurface of body.

**Size:** When mature, a 45-inch width; up to 7 feet from wingtip to wingtip.

**Biology:** Cartilaginous fish, like sharks and skates. Gives birth to live young. Reproductive capacity low with minimum population doubling time of 4.5-14 years. Acute sense of hearing and other sensory systems.

**Food Habits:** Voracious feeder, feeds in groups. Diet consists of bivalve molluscs. Shells are crushed between tooth plates, consisting of 7 series of teeth. Specialized fibers in the mouth aid in sorting shell fragments from meats. Food is located on or in the bottom through mechanical or electroreceptive detection. If prey is suspected, a combination of stirring motions of the pectoral fins is employed while sucking and ventilating the water and sediment out through the gills and away from the area to create a central deep-sided cavity depression. Food is seized and drawn into the mouth.

**Predators:** Few, cobia and sharks.



## Use of Net Coatings or Dips in Clam Culture: Industry Comments

To better understand requirements associated with clam culture equipment and to introduce "environmentally friendly" net dips to the industry, the Cedar Key Aquaculture Association, in conjunction with the Shellfish Aquaculture Extension Program, sponsored a workshop for growers in May. Best management practices and special lease provisions which farmers must abide by in growing clams were provided by Mark Berrigan with the DACS Division of Aquaculture. To review, clam culture materials and supplies, such as coatings, that release pollutants in waters of the state, especially petroleum-based products, such as creosote, oils, or tars, are prohibited. Coatings that do not release pollutants when fully cured are acceptable. Several net coatings were showcased by suppliers at this workshop, allowing for discussion among growers about the pros and cons of these products. Here's a summary of what was discussed.

**Types of coatings:** A variety of net dips are being evaluated by the industry. These include acrylics (water-based resins), alkyds (synthetic resins), latex paints (water-based emulsions), and various polymers. Each coating has properties that can be considered advantageous or disadvantageous by industry members. Points of agreement are that the coatings must be easy to apply and cost-effective.

**Thinners:** To thin or not to thin a net coating is certainly debatable, with many growers stating if reduced it will no longer be effective as a predator deterrent. However, if applied too thick, many expressed concerns that the bag may become so stiff as to "attract" fouling organisms, in particular oyster spat. Also mesh openings can become clogged.

Another consideration is the number of bags which can be coated per 55-gallon drum of net dip. If thinned by 25-50% over 400 bags can be coated as opposed to around 200 bags if not. Some products must be thinned. Remember only solvents recommended by the manufacturer should be used. For example, mineral spirits and xylene, as opposed to gasoline which is flammable, are to be used with alkyd resins.

**Curing:** Air curing is a method by which liquid coatings cure to a dry film. Oxygen from the air enters the film and cross-links the resin molecules. The amount of cure time is important to a coating becoming "inert." The Division is requiring at least 5 days to ensure the coating is not a detriment to the clams or environment. Growers suggest more, up to 10 days.

**Coverage:** Some farmers are coating just the top of their bags allowing the bottom mesh to remain flexible so clams can more easily bury into the sediments. This may be advantageous if the bottom substrate is sandy or contains shell hash. This can be accomplished during the dipping process by hooking or tying up one side of the bag to keep it out of the dip. Also more bags per drum can be coated that way.

**Color:** Green versus black? Again, a matter of preference by the grower, but many believe that a darker color which blends with the bottom sediment is certainly preferable.

**Cover Netting:** Do you still have to use cover netting (chicken wire or plastic) once bags are dipped? Some feel the net coating is effective used solely, others not. Of course, using cover netting increases the cost of predator protection.

**Other discussion topics:** coating of used bags, coating of nursery bags and mesh clogging, product availability, longevity, and lease site suitability or variability

## Approved Net Dips for Clam Culture

The following net coatings or dips have been approved by the DACS Division of Aquaculture for specific use on clam nursery and growout bags or cover netting. In order to receive approval, manufacturers submitted a written request to the Division, including information on the equipment to be coated; a product label; handling, application, and curing instructions; and, a statement verifying that properly applied and fully cured coatings do not release pollutants to state waters. A copy of the Division's certification letter as well as specific documentation must accompany sales of approved products. Approval should not be construed or employed as an endorsement of the product, manufacturer or suppliers.

### Acrylic Polymer, or "Bat Stopper Blend"

Cascade Columbia Distribution Co., Seattle, Washington  
Phone: 800-533-6334 Contact: John Halpin

**Alkyd: CX1713-black, CX1715-green, CX1719-blue**  
**Latex: CX1720-green, CX 1721-black**

Lee Fisher International, Tampa  
Phone: 813-875-6296 Contact: Lee or Eric  
RMS Marine Supply, Crawfordville  
Phone: 800-726-3104 Contact: Marshall, Angie or Josh

**"GRAS" Alkyd: green (22G022647), black (22B034465)**  
Delta Laboratories, Ocala  
Phone: 800-741-3582 Contact: Kurt Gratzol



## DACS Technical Bulletin on Net Dips Available

Since new shellfish production equipment must be approved by the Department of Agriculture and Consumer Services (DACS), a technical bulletin was recently compiled by the DACS Division of Aquaculture on the use of net coatings or dips for clam bottom bags and cover netting. The bulletin thoroughly reviews how to request net coating approval from the Division. Once a product has been placed on an "approved list," then a farmer does not have to request approval to use the product. Tips on how to apply, handle, and cure coatings safely are also provided. For a copy of Technical Bulletin 4, contact the Division at 850-488-4033 or the Shellfish Aquaculture Extension Office at 352-543-5057.

## The Facts about *Vibrio* Bacteria compiled by the East Coast Shellfish Growers Association



Earlier this year the Center for Disease Control (CDC) came out with a report describing decreases in certain food-borne illnesses in the nation. Comparing 1996-8 with 2004, the estimated incidence of several infections declined significantly—40% in *Cryptosporidium*, 40% in *Listeria*, and 8% in *Salmonella*. The report also highlighted that *Vibrio*-related food-borne illness has increased by 47% in the past five years. In anticipation of negative press associated with the release of this report, the East Coast Shellfish Growers Association (ECSGA), along with the Pacific Coast Shellfish Growers Association and the Gulf Oyster Industry Council, developed a fact sheet. These facts allow shellfish growers and wholesalers to be better prepared to answer questions from customers, consumers or the press.

- *Vibrio* bacteria are common and occur naturally in many marine environments. They are not related to pollution! Most *Vibrio* bacteria are benign, however two species *Vibrio parahaemolyticus* (*V.p.*) and *Vibrio vulnificus* (*V.v.*) have been associated with human illness. According to the latest statistics, less than 1% of food-borne illness is related to *Vibrio*, and the vast majority of illnesses are associated with chicken and meat products.

- Shellfish, which are filter feeders, can accumulate *Vibrio* bacteria and if enough of the bacteria are consumed by humans, illness can result. The most common symptoms are mild flu-like gastroenteritis that typically passes in 2-3 days.

- *V.p.* outbreaks are typically associated with shellfish harvested in warmer waters and are common in Japan. They are also occasionally found on the Pacific and Gulf Coasts, and one outbreak has been reported on the East Coast.

- *V.v.* infections have also come from swimming in Gulf Coast waters by those with cuts, abrasions or open wounds. Individuals who are immune compromised (from liver

disease, immuno-suppressant drugs) can have more severe reactions to *V.v.* including blood disorders, and in rare cases death. These high-risk individuals should be wary of eating raw shellfish or any raw proteins, but can safely enjoy thoroughly cooked seafoods.

- To ensure the safety of shellfish, the U.S. Food and Drug Administration in cooperation with state health departments carefully regulates shellfish growing areas and the care and handling of shellfish. The National Shellfish Sanitation Program requires harvesters and dealers to be licensed, inspected and certified. Our nation's shellfish suppliers are heavily regulated.

- Consumers can avoid *Vibrio*-related illness by following current health advisories and using proper handling, such as

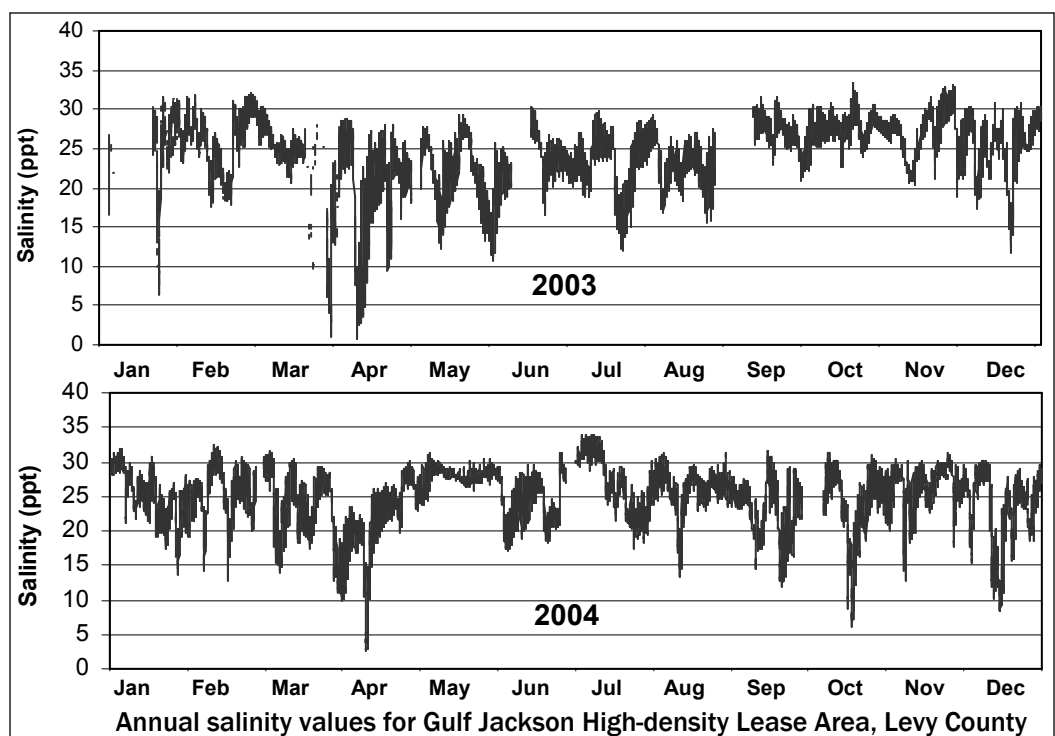
- Only purchase shellfish from certified dealers and retailers,
- Verify that shellfish is fresh and harvested from an approved area,
- Make sure shellfish is stored under proper refrigeration,
- At-risk consumers should enjoy their shellfish cooked and avoid all raw animal proteins.

- Seafood is an essential part of a healthy lifestyle. In its 2005 Dietary Guidelines, the U.S. government prominently featured recommendations for Americans to maintain a healthy weekly serving of seafood in their diets. Proteins, vitamins and fatty acids found in seafood contribute to improved cardiovascular and neurological health as well as healthy physical development in children.

The ECSGA was created in 2002 to facilitate the growth of the shellfish culture industry on the Eastern Seaboard. Visit their website, [www.ecsga.org](http://www.ecsga.org), to learn more about their activities and promotions, or to join.

## CLAMMRS Annual Water Quality Graphs

The CLAMMRS water quality monitoring stations located in 7 clam-producing counties have been providing information to growers since 2002. Now archived data, which has gone through a quality assurance/quality control process, can be viewed to determine the effects of environmental conditions on annual clam production, growth and survival. Available from the Shellfish Aquaculture Extension Program office or at the website <http://shellfish.ifas.ufl.edu> (click on Pubs and Tools in left-hand menu) are graphs of water temperature, salinity and other parameters from 2002-2004 for selected lease areas in Florida.





# CLAMunications



## New clam farmers in Collier County

The newest clam farmers in Florida are to be found along the southwest coast of the state in Collier County. In November, the Board of Trustees authorized the use of 64 acres in 2 aquaculture use areas for 17 applicants. The leases are located in the Ten Thousand Islands and represent the southernmost site in the U.S. for commercial production of hard clams. In the early 1900s this area supported a large commercial fishery for its cousin—the southern quahog.

## A look at the Virginia clam culture industry

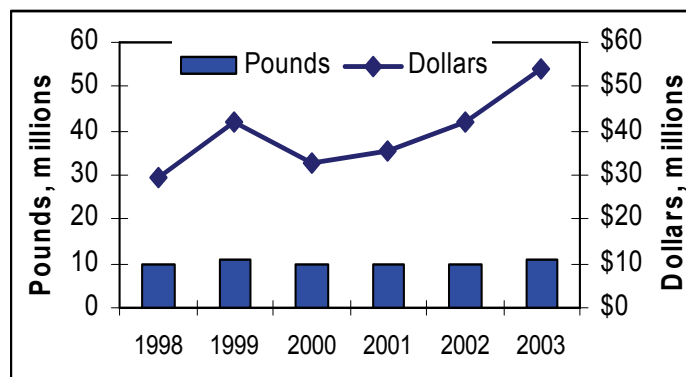
Findings from a study to assess the current state of the clam culture industry in Virginia and to estimate the economic activity associated with the industry were just published by Virginia Sea Grant. In 2004, Eastern Shore clam farms sold 150 million market clams valued (farmgate) at \$23.9 million at an average price of \$0.16 per clam. Virginia hatcheries produced an additional 72.5 million clam seed with a sales value of \$1.5 million. The economic impacts of this industry resulted in an output of \$48.8 million, making clams the second most valuable crop grown in that area. In comparison, the Florida Sea Grant study conducted in 1999 reported 143 million clams, with a wholesale value in sales of \$21.8 million, were produced by Florida growers in that year. The Florida economic impact was assessed to be \$33.9 million.

-Tom Murray and Jim Kirkley, Virginia Sea Grant 05-04, July 2005

## U.S. Clam Aquaculture Production

The latest information on U.S. aquaculture production has been released by the National Oceanographic Atmospheric Administration (NOAA), National Marine Fisheries Service. From 1998 through 2003, reported clam production has remained steady averaging around 10 million pounds of meat weights per year. Value of sales, however, has increased by over 80% during the same 6-year period. NOAA's website also provides links to the latest information on clam imports (totaling 7.9 million pounds in 2004) and exports (increasing to 5.8 million pounds in 2004, up 44% from the previous year, with a value of \$10.9 million) as well as other relevant information.

- <http://www.nmfs.noaa.gov>



**Remember the last day to sign-up for the USDA Farm Service Agency is September 1.**  
**Program for 2005-6 coverage with the USDA Farm Service Agency is September 1.**

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