



Research program to support Florida's clam aquaculture industry

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INSIDE THIS ISSUE:

New Research Program	1
State Clam Task Force	1
USDA Programs	2
Crop Diversification	2
2006 Clam Seed Suppliers	3
2006 Clam Bag Suppliers	4
Research Update	5
CLAMunications	6

Each year the U. S. Congress supports aquaculture industries throughout the nation by committing federal funds for farm programs which address many critical issues, such as marketing, financing, crop insurance, disaster payments (see page 2 of this newsletter for new programs to assist aquatic growers affected by the 2005 hurricane season), as well as research and development efforts. Congressional support is legitimized by the contribution aquaculture makes to the nation's economy in food produced and jobs created. That is why the 2005 aquaculture census being conducted by the National Agricultural Statistics Service is so important. Statistics derived from this census will be used by Congress in developing, evaluating and changing farm programs. If you have not received or completed the census report form, go to page 6 for details. Take a few minutes to make it known that aquaculture counts!

Typically over \$60 million in federal funds are allocated each year through the U.S. Department of Agriculture specifically for aquaculture research. In 2002 a special research grant was awarded to the University of Florida for aqua-

culture. Among the projects conducted through the research grant, several addressed the needs of the clam farming industry. Marketing results from one project which evaluated the potential of ark clams for crop diversification can be found on page 2, and a summary on a health assessment project for cultured clams is provided on pages 4-5 of this newsletter.

This year through the efforts of U.S. Representative Ginny Brown-Waite and the Cedar Key Aquaculture Association, funding was obtained to initiate a new research program for Florida's clam farming industry. The Florida Shellfish Aquaculture Development Program will be administered by the UF/IFAS Shellfish Aquaculture Extension. According to Rep. Brown-Waite, "While Florida has made remarkable advancements, increased investment is needed. These federal funds are vitally important to the long-term preservation and enhancement of our shellfish aquaculture industry." A steering committee made up of clam growers and researchers will help direct the efforts of this program to ensure projects are industry-driven and accountable. More to follow soon.

Statewide Clam Industry Task Force addresses research and educational needs

To improve and enhance communications between the clam farming industry and the Florida Department of Agriculture and Consumer Services' Division of Aquaculture, a statewide task force was created (see the November 2005 issue of the Division's *Florida Aquaculture* newsletter). The task force is made up of twelve industry members representing each of the state's growing areas. They are Rose Cantwell, Sue Colson, Ricky Cooke, Tony Heeb, Mike Hodges, Bill Lartz, Billy Leeming, Dan Leonard, Charlie Sembler, Chris Topping, Rick Viele and Joe Weissman. In addition, Dan Solano, the Aquaculture Review Council's shellfish representative, and Leslie Sturmer, the shellfish aquaculture extension agent, serve on the task force. This group also provides a great opportunity for the UF/IFAS Shellfish Aquaculture Extension Program to obtain statewide guidance. The task force held its first meeting in January at Cedar Key. Just after the DACS session, the group participated in a planning exercise to begin to identify and prioritize industry's research and educational needs.

Following is a summary of the task force's "shopping list."

- Develop a "Florida friendly" clam—one that is hardier, doesn't spawn in summer with improved summer survival,
- More efficient and effective predator control methods,
- Faster test than mouse bioassay for red tide monitoring,
- Mechanical harvesting devices for bottom plants,
- Identify real issues affecting interstate shipment of seed,
- Value added products,
- Marketing strategies to create a stable price structure,
- Youth education—train next generation of clam growers,
- Updated maps of resources and lease areas, and
- Informational brochures for public and boaters.

The product to be developed from this needs assessment will be used to better plan for funding initiatives (such as the new FL Shellfish Aquaculture Development Program) and educational activities. Please give some thought to what additional needs may be and inform your task force representative.

U.S. Department of Agriculture (USDA) Programs assist Growers and Youth



NEW Hurricane Disaster Assistance Programs

On January 26, 2006, the USDA announced a multi-billion dollar effort to assist agricultural producers in eight states affected by the 2005 hurricane season. Federal funds will be distributed by way of several new programs. Florida clam producers in counties declared disaster areas in 2005 because of hurricanes may be eligible for two programs. These counties include Brevard, Charlotte, Collier, Dixie, Franklin, Indian River, Lee, Levy, Martin and St. Lucie.

Hurricane Indemnity Program (HIP) — HIP will provide payments to farmers who received crop insurance or Noninsured Crop Disaster Assistance (NAP) payments as a result of hurricanes. The payment will be 30% of the crop insurance indemnity or NAP payment and will be capped at 95% of the expected crop returns. HIP will be administered through USDA's Farm Service Agency. Stay in touch with your county FSA office regarding sign-up dates.

Aquaculture Grants — USDA will provide block grants to states adversely affected by hurricanes in 2005 for aquaculture losses. Aquaculture producers not covered by other disaster programs will be eligible for these funds. Application procedures for these funds will be made by governors or their designees. At this time it is uncertain the amount Florida will receive or how it is to be distributed. In preparation, DACS Division of Aquaculture staff have been contacting growers in eligible counties to develop an estimate of dollars spent or lost due to facility replacement/repair and cleanup/debris removal.

More information is available at USDA Service Centers and online at <http://www.usda.gov/HurricaneInfo.xml>.

Youth Loan Program

A unique program is offered to individual rural youths through USDA's Farm Service Agency (FSA). FSA makes loans to assist youth in establishing and operating income-producing projects of modest size in connection with their participation in 4-H clubs, Future Farmers of America, or similar organizations. Each year many young entrepreneurs take advantage of these loans and gain valuable business experience in the process.

To qualify for a loan, an applicant must:

- be a U.S citizen between 10 and 20 years old;
- live in a town of less than 10,000 people;
- be unable to obtain a loan from other sources; and,
- be capable of planning, managing and operating a modest-size project under an advisor's supervision.

These loans may be used to finance nearly any kind of project. During the 1990s, Dixie County youth participated in this program and grew their own crop of clams on their parents' lease. Nursing clam seed for sale could possible be another youth project. The maximum amount for FSA youth loans is \$5000. Loan recipients may use the money to buy livestock, equipment, and/or supplies; and pay operating expenses. Applicants must sign a promissory note and be responsible for repaying the loan. A cosigner may be required. Loan collateral normally consists of crops produced for sale, or items purchased with loan funds. The repayment schedule is worked out with payments tailored to the type of project for which the loan is made. For example, if the loan is to raise a crop, it would normally be paid when the product is sold. Contact your FSA county office for more information.

CROP DIVERSIFICATION: Evaluating Alternative Molluscan Shellfish Species for Culture

Blood and Ponderous Ark Clams

The blood and ponderous ark clams are native bivalve species found to naturally set and grow in hard clam bottom bags. A team of university researchers from Florida and Georgia assessed the culture and market potential of these ark clams during 2002-5 in a USDA-funded study. Results of the marketing assessment were recently released by the UF Agricultural Market Research Center. A nationwide survey of certified shellfish dealers was conducted to determine the current state of the market and sales for cultured ark clams. The consensus of responding firms was that both had limited appeal to traditional clam customers, but could be successfully marketed to ethnic consumers. Product attributes, nutritional analyses and shelf life in refrigerated storage were also determined. Two fact sheets summarizing these findings are available online at the website, <http://edls.ifas.ufl.edu>. To locate, type "ark clam" in the search box. The complete report can be found at www.agmarketing.ifas.ufl.edu, by clicking first on "Publications," then on "2000-present."



Sunray Venus Clam

The sunray venus clam is an attractive venerid clam distributed from South Carolina to Florida and the Gulf states. Commercial fishermen targeted the sunray venus clam in the late 1960s in several shallow water areas off the northwest Florida coast. Even though the large 4-7 inch clams were shucked and processed for the chowder market, commercial harvesting was halted due to the limited size of the fishing grounds. However, growth experiments suggested that these popular clams attain a length of 3 inches within 12 months, similar in time to hard clams. The prior fishery, market and potential growth rate of the sunray venus clam, along with being a native species, makes it a logical choice as a new species to diversify and expand Florida's shellfish farming industry. With funding obtained through Florida Sea Grant, UF and Harbor Branch Oceanographic Institution researchers will begin this year to develop, test and demonstrate biological and technical methods to spawn and culture the sunray venus.



2006 Clam Seed Suppliers

These hatchery and nursery operations are supplying hard clam, *Mercenaria mercenaria*, seed to Florida growers this year.* Contact suppliers for information on seed sizes, price, color variation and availability.

Atlantis Clam Farm - H, N

465 Milford Point Road
Merritt Island, FL 32952
Contact: Barry Moore
(321) 453-2685
watrwrzrd1@aol.com

Bay Shellfish Co. - H, N

P.O. Box 289
Terra Ceia, FL 34250
Contact: Curt Hemmel
(941) 721-3887 or 722-1346 (Fax)
bayshellfish@earthlink.net

Brewer's Clams - H, N

4225 Indian River Drive
Cocoa, FL 32927
Contact: Gray Brewer
(321) 632-4920 or 794-3746 (cell)

Cedar Creek Shellfish Farms - H, N

859A Pompano Avenue
New Smyrna Beach, FL 32169
Contact: Mike Sullivan
(386) 426-0113 or 847-3202 (cell)

Clams R' Us - N

705 27th Avenue SW #5
Vero Beach, FL 32968
Contact: Joe Weissman
(772) 538-1051
Weissm_J@bellsouth.net

Cole's Clam Nursery - N

P.O. Box 82
Placida, FL 33946
Contact: Dot Cole
(941) 697-3181



* This list is provided as a service of the UF/IFAS Shellfish Aquaculture Extension. We do not sponsor or endorse any of these suppliers over any others.

David Grudin - N

325 E. Hall Road
Merritt Island, FL 32953
Contact: David Grudin
(352) 250-0667
dgrud@yahoo.com

Harbor Branch - H

5600 U.S. 1 North
Fort Pierce, FL 34946
Contact: Joe Weisman
(772) 538-1051
Weissm_J@bellsouth.net

Kibbe & Company - N

P.O. Box 629
St. James City, FL 33956
Contact: Roy Kibbe
(239) 283-1448

Kona Bay Marine - H, N

3465 Waialae Avenue, Suite 240
Honolulu, HI 96816
Contact: Brain Goldstein
(877) 526-2746 / (808)356-0203 (Fax)
sales@konabaymarine.com

Ewan Leighton - N

270 Sea Dunes Drive
Melbourne Beach, FL 32951
Contact: Ewan Leighton
(321) 288-8201
sleighton1@cfl.rr.com

Dan Leonard - N

7228 Sunnybrook Boulevard
Englewood, FL 34224
Contact: Dan Leonard
(941) 473-3292 or 270-2032 (cell)
clams@sunline.net

Orchid Island Shellfish Co. - N

633 Old Dixie Highway
Sebastian, FL 32958
Contact: Ed Mangano
(772) 589-1600

Pelican Inlet Aquafarms - H, N

5787 SW 9th Court
Cape Coral, FL 33914
Contact: Edwin Connery
(239) 549-8014
highimage@aol.com

Research Aquaculture - H, N

3663 SE Old St. Lucie Boulevard
Stuart, FL 34996
Contact: Tom McCrudden
(561) 702-8159
or) Andy Arnold, Alligator Harbor
(850) 510-3866

SeaPerfect - H, N

P.O. Box 12139
Charleston, SC 29422
Contact: Knox Grant
(843) 514-4232 (cell)
knox@knology.net

Southern Cross Seafarms - H, N

12170 State Road 24
Cedar Key, FL 32625
Contact: Bill Leeming
(352) 543-5980

In addition, check the: East Coast Shellfish Hatchery and Nursery List 2005

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Rutgers Cooperative Extension
1623 Whitesville Road
Toms River, NJ 08755
(732) 349-1152

flimlin@aesop.rutgers.edu

Note: Clam seed obtained from out-of-state suppliers must meet best management practices pertaining to both disease prevention and genetic protection. View the BMPs Manual at www.FloridaAquaculture.com or contact Mark Berrigan, DACS Division of Aquaculture, at (850) 488-4033.

2006 Clam Bag Suppliers

The Bag Lady

P.O. Box 1413
Bronson, FL 32621
Contact: Dennis or Annie Voyles
(352) 486-3763
akvoyles@aol.com

Island Bags

16710 SW 121 Lane / P.O. Box 86
Cedar Key, FL 32625
Contact: Carla and Ray Ermel
(352) 543-5231
ilbags@atlantic.net

Southern Belle Clam Bags

423 NE 833rd Street
Old Town, FL 32680
Contact: Faith van Orden
(352) 542-2508

Playing Hooky Enterprises

1203 Alligator Drive
Alligator Point, FL 32346
Contact: Ed Bradley
(850) 349-2854
capted@clambags.com
www.clambags.com

Thread Supplier:

Alliance Thread & Sewing Supply

40 Ash Circle
Warminster, PA 18974
Contact: David Weitz
(215) 441-9300

Fabric Suppliers:

Bayeux Cortina Fabrics

187A North Church Street
Spartanburg, SC 29306
Contact: Tom Howell
(800) 446-9611

Fablok Mills

149 Spring Street
Murray Hill, NJ 08818
Contact: Sylvia, Julie, Joe or Jim
(908) 464-1950

Jason Mills, Inc.

220 Kinderkamack Road
Westwood, NJ 07675
Contact: Tom Cosgriff, Jr.
(201) 358-6500

Health Assessment (cont'd. from page 5): Are pathogens of concern present in Florida clams?

adjacent gill inflammation was infrequently observed. It is unclear if the RLO are a significant problem for clams. No CLO were observed in any clam samples.

Non-granulomatous inflammation occurs when an animal responds to non-specific injury. An inflammatory response is typically classified as acute or chronic, but this was not determined in the group of clams examined. Non-granulomatous inflammation was observed in 66% of the winter clams from the SW Florida area, with much less observed in clams from other sampling sites. The source(s) of the non-granulomatous inflammation was not determined.

A concretion is a stone or inorganic mass in a natural cavity or tissue. Concretions were observed in the kidneys of clams from all collection sites except for the winter clams from SW Florida, however the overall number of affected animals was low.

Although clams do not develop disease from *Perkinsus*, or Dermo, they can serve as a source for the parasite which means that infected clams have the potential to move *Perkinsus* from one geographic area to another. In Florida, live shellfish can only be relayed within specific geographic regions. Oysters are susceptible to *Perkinsus marinus* infection. When *Perkinsus* is seen in clams, it is indicative of an adjacent population of infected oysters. *Perkinsus* was identified in clams from all three study sites tested during this study. With the exception of one animal collected in SW Florida, all *Perkinsus* positive clams were collected during the summer sampling period only (see Table 1). Studies in FL and other coastal regions have documented an increased incidence of *Perkinsus* in oysters in late summer. This study confirms the seasonal incidence of *Perkinsus* in clams.

Summary: The most important pathogen of clams is QPX, or Quahog Pathogen Unknown. QPX has had a devastating effect on cultured clams in the northeastern United States. QPX is caused by a single-cell parasite that possesses characteristics of both a fungus and an animal. QPX is thought to be a species-specific disease where it is only infectious and fatal to the hard clam. It is not thought to be a threat to other shellfish, nor is it a threat to human health. QPX was first reported in wild and hatchery stocks of clams in eastern Canada. It now ranges from Canada to Virginia and has resulted in as much as 95% mortality of cultured clams in affected sites. The origin of QPX in waters is currently the subject of scientific debate. At present the life history of QPX is not known. While it has never been identified in Florida clams, there is concern that it may be introduced. Consequently, imported clam seed are tested and proven free of the QPX agent before entry into the state. Infection with QPX results in an inflammatory response in the clam. This is manifested by nodule formation in the clam mantle that can prevent closure of the valves, and disruption of connective tissue throughout the infected clam. There was no histological or pathological evidence of QPX in cultured clams from the three Florida sites tested in this study.

This research was conducted during 2003-4 by aquatic veterinarians at the University of Florida. For more information, contact Dr. Denise Petty with the UF Department of Fisheries and Aquatic Sciences at (352) 392-9617, extension 229. Funding was obtained by the USDA Cooperative State Research, Education, and Extension Service.



RESEARCH UPDATE: Preliminary Health Assessment of Cultured Clams in Florida

Background: Shellfish farming in Florida is currently dependent on monoculture of one species — hard clams. One of the risks of monoculture is the potential for large losses following the appearance of a disease-causing agent. At present disease does not seem to be an issue for Florida clam growers. However, it is prudent to initiate a program in shellfish pathology and develop diagnostic expertise in the state.

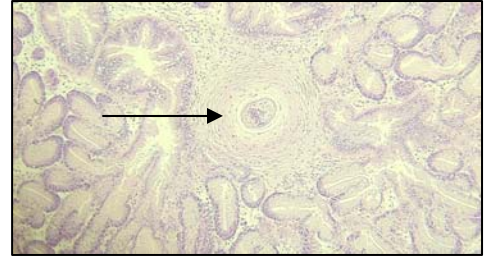
Objective: To establish a health monitoring program for cultured clams in Florida to serve as a preliminary baseline for pathological changes in *Mercenaria mercenaria*.

Sample sites and dates: Three growing sites in the state were selected for monitoring clams. Sites included the north-west Gulf of Mexico coast (Gulf Jackson High-density Lease Area in the Gulf of Mexico near Cedar Key), central east Atlantic coast (Indian River Aquaculture Use Zone in the Indian River near Sebastian), and the southwest Gulf of Mexico coast (winter collection: Sandfly Key High-density Lease Area in Charlotte Harbor near Placida; summer collection: South Pine Island High-density Lease Area in Pine Island Sound near St. James City). Samples from all sites were collected seasonally, winter and summer, for one year. The winter collection samples were taken in February 2003 and summer collections in August 2003. All clams tested were market size animals – 1” shell width, or thick.

Testing protocols: Sixty representative clams were collected from the three sites during each of the two sampling periods. Live clams were packaged in insulated shipping boxes with gel packs and shipped overnight to the University of Florida. On arrival the clams were measured and numbered. Half the clams from each collection site were shucked and placed whole into 10% buffered formalin with seawater for preparation for histological evaluation. The other half were shucked and sections of mantle and digestive gland were placed in Ray’s fluid thioglycollate media and incubated for culture of *Perkinsus* species.

Results: Clams have relatively few recognized or significant diseases as compared to other bivalve mollusks. QPX is the only disease known at this time that is infectious for clams only. However, clams are susceptible to bacterial diseases, and to parasites such as copepods, trematodes, nemertean, and cestodes. Protozoans have been implicated as a cause of disease in cultured clams, and appear to be secondary to stressors such as high stocking density

and poor water quality. Some of these may be considered incidental findings. In the group of clams examined, granulomas were the most frequently observed abnormalities, followed by Rickettsiales like organisms, non-granulomatous inflammation, metazoans and concretions in the kidney. A summary of the histopathological findings of all clams from all sites can be found in the table below.



Trematode (arrow) in a granuloma in clam digestive gland. Photomicrograph, 100X.

Granulomas occur when the clam responds to a foreign body with chronic inflammation. Frequently the source of the inflammation is a trematode (flatworm), or other metazoan parasite. The SW Florida clams, regardless of season, were more affected than clams from other collection sites. However clams from all sites and seasons were affected. Metazoan parasites were observed in some granulomas.

Rickettsia and Chlamydia are bacteria that can only live inside cells. They may either be harmless or agents of disease. Rickettsiales like organisms (RLO) and Chlamydiales like organisms (CLO) are not uncommon findings in bivalve mollusks. RLO are typically found in the gills and CLO are usually found in the digestive gland. Their presence has infrequently been associated with mortality and primarily in culture situations (high density, crowding, etc.). RLO were observed in the gills of the winter clams from all sites. Only summer clams from the Indian River had RLO in the gills. Where RLO were present in clams, **Continued on page 4**

Table 1. Number and percentage of affected clams from seasonal collection sites.

Growing Site	Season (2003)	Granulomas		Metazoans		Rickettsia (RLO)		Non-granulomatous inflammation		Kidney concretions		Perkinsus zoospores	
		Number	% Clams Affected	Number	% Clams Affected	Number	% Clams Affected	Number	% Clams Affected	Number	% Clams Affected	Number	% Clams Affected
NW FL	Winter	4	13	0	0	18	60	6	20	1	3	0	0
	Summer	12	40	2	7	0	0	2	7	5	17	15	23
East FL	Winter	9	30	5	17	14	47	0	0	3	10	0	0
	Summer	6	20	7	23	4	13	1	3	1	3	12	7
SW FL	Winter	12	40	8	27	10	33	20	67	0	0	1	3
	Summer	16	53	0	0	0	0	3	10	4	13	396	67



CLAMunications



Cownose Ray stirs up regional interest

It seems Florida is not the only state with increasing shellfish production problems due to cownose ray predation (see the August 2005 issue of *The Bivalve Bulletin*). Virginia Sea Grant is planning a regional workshop to address issues associated with cownose rays from the Chesapeake Bay to Florida's Gulf coast. While still in the planning phase, potential workshop topics include overview of the problem; biology and population dynamics; threat to aquaculture development and shellfish restoration; mitigation efforts; harvesting handling, processing and marketing; and, developing a responsible cownose ray fishery. In preparation for this workshop, please share information about your experiences with the cownose ray to the Shellfish Aquaculture Extension Office. Contact information can be found on this page.

Congressional Shellfish Caucus

The formation of a shellfish caucus during last year's congressional session has resulted in a group of like-minded Senators and Representatives who have agreed to support shellfish-related issues. The bipartisan team representing all three coasts provides a platform in Congress for molluscan shellfish interests. A reception in honor of the caucus was held this month in Washington DC. Varieties of oysters and clams from several growing areas in the U.S. were featured, including farm raised clams from Florida.

2005 Census of Aquaculture

The first ever national census of aquaculture was conducted in 1998 by the USDA National Agricultural Statistics Service. In that year, total U.S. aquaculture sales were valued at \$978 million of which mollusks (oysters, clams, mussels) accounted for \$89 million, making shellfish the second highest valued aquaculture product sold by category. Clam (hard and manila) production was valued at \$50 million with 360 farms counted nationwide. Florida ranked third in U.S. clam sales, following Washington and Virginia, with \$9.5 million reported. However, Florida ranked first in hard clam production with 76 million reported by 206 farmers. **It is this data that supports Florida's claim of being "the nation's leading producer of farm-raised hard clams."**

Report forms for a second census were mailed out by NASS to aquaculture farmers in December to help provide an accurate picture of the nation's industry for 2005. If you have not completed and returned the form yet, do so now. It only takes a few minutes. **If you did not receive a report form or it was misplaced, call 1-888-424-7828.** Information provided by producers will help the aquaculture industry, national and local legislators, as well as federal and state governmental agencies make informed decisions on critical issues, such as market pricing, legislation, insurance, financing, disaster payments, research and more. Individual producer responses are kept confidential. Responses are not provided to the IRS.

NEW disaster assistance programs available for Florida clam growers affected by the 2005 hurricane season (see page 2 for details).

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