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INSIDE THIS ISSUE:

Clam Industry Recovery	1
Disaster Relief Legislation	1
Disaster Assistance Pro-	2
USDA Farm Service Agency	2
FSA's NAP Program	3
Crop Insurance Program	3
What Else?	4
Clam Stock Genetic Diversity	5
Shell Recycling Program	6

Hurricane Recovery Efforts for the Clam Culture Industry

The onslaught of the 2004 hurricane season exacted an extensive toll on Florida's shellfish aquaculture industry. Hurricanes Charley, Frances and Jeanne passed directly over lease areas in southwest and east central Florida producing wind-driven wave surges that completely buried or displaced clam culture bags. In turn, coastal flooding due to heavy rainfall resulted in lowering of salinities in inshore waters and additional clam mortalities. The Suwannee River has just crested and crops along the north west coast may still be affected. Production has been adversely impacted by these storms in 8 out of the 9 clam-producing counties in the state. The Department of Agriculture and Consumer Services estimates \$15 million in shellfish production losses. The industry has suffered other blows. Over half of the seed suppliers in the state have sustained complete structural damage to greenhouses, buildings or docks. Many others received partial damage to their businesses.

Over the past month disaster assistance workshops were conducted in several areas of the state to provide current information to aquaculturists on emergency benefits available to them and their businesses. On page 2 of this newsletter is a summary of these emergency programs and contact information. This November 6th the Florida Aquaculture Association will host a special session on disaster assistance at their annual meeting in Tampa. Contact David Boozer with the FAA at 863-293-5710 or visit their website: www.flaa.org.

Financial assistance for clam crop losses is available through the Noninsured Crop Disaster Assistance Program (NAP) administered by USDA's Farm Service Agency and the pilot crop insurance program administered by USDA's Risk Management Agency. These programs are exclusive of each other and program specifics are detailed in this newsletter. In the aftermath of these storms, several issues—inability of growers in some counties to obtain field nursery coverage and to revise inventory reports—have come to the forefront. See pages 3-4 for discussion. The industry has reacted, but at this time there has been no resolve. On the other hand, positive things have occurred. A blanket loss adjustment was recently completed for growers in southwest Florida with complete crop losses. This eliminates the need for time-consuming individual assessments and will fast track NAP payments. Just released is news about disaster relief legislation that provides federal funding for additional financial assistance for crop losses as well as other assistance programs (see below).

Other recovery efforts being discussed include a clam seed loan program and development of community nurseries in an effort to help seed suppliers rebuild and growers acquire seed for replanting crops (see page 4). More on these efforts in the near future. Through these programs and the resolve of the industry, Florida's clam farmers can hopefully rebound from these hardships and renew production.

Disaster Relief Legislation to Provide Financial Assistance for Clam Crop Losses

Legislation recently passed by U.S. Congress will provide additional federal disaster relief for victims of this year's hurricane season. One of the programs fully funded under this appropriation is the **Crop Disaster Program**, or CDP, which will provide supplementary financial assistance for crop losses. Although the CDP covers all agricultural commodities eligible for crop insurance or the Noninsured Crop Disaster Assistance Program (NAP), the legislation specifically identifies clams, oysters and other shellfish. Under the CDP, losses can be for the 2003, 2004 or 2005 crop years (as elected by the producer), but limited to only one of the years. Qualifying crop losses for 2005 are limited to those caused by a 2004 hurricane. A provision allows producers who are not enrolled in current crop insurance or NAP programs to receive payments with a requirement to purchase coverage for the next 2 years. **Details of specific payment provisions and a sign-up date will be provided in upcoming weeks by the USDA Farm Service Agency (FSA).** Contact your county FSA office (see page 3) and get on their mailing list!

Disaster Assistance Programs



FEMA

Federal disaster financial assistance for homeowners, renters and non-farm business owners is available through the Federal Emergency Management Administration, or FEMA. By law, FEMA cannot assist with any losses that are privately insured, but may help pay for basic needs not covered under your insurance policy. To receive assistance, you must call FEMA at 1-800-621-3362 to register your claim. You will be required to provide your name, address, social security number, date of loss, annual family income, and other pertinent information. You should be persistent when calling, as their call volume is heavy. The deadline to register is 60 days after the event; however, this may be extended. Most applicants will be sent a Small Business Administration (SBA) loan package. Completion of a loan application is required to qualify for either a loan or a grant. Loan terms are for up to 30 years at 3.75%. Loans are for major home and business (non-farm) repair/replacement. So clam growers and seed suppliers would not qualify, but shellfish wholesalers and processors would be considered. Losses not reimbursed may be taken as a deduction on your income tax – check with your tax advisor.



Unemployment Compensation

Unemployed workers who have lost their jobs or self-employed individuals who have had a loss of income as a direct result of the hurricanes may be eligible to receive unemployment compensation benefits or disaster unemployment assistance (DUA). Disaster unemployment benefits also cover owners of farms and farm workers, as well as commercial fishermen who are not normally covered by state unemployment compensation. You may apply either by Internet at <http://www.floridajobs.org> or by phone at 1-800-204-2418. When applying you need to have your social security number, name and address of last employer, or proof of self-employment (for example, W-2's, federal tax returns, bank records of accounts, Bank statements showing business accounts) for the past 2 years. Deadlines for filing under the DUA program have been extended and are currently as follows for each hurricane. Further extensions may occur.

Hurricane	Deadline to File	Eligible Counties*
Charley	November 14	B, C, D, IR, L, Le, SJ, V
Frances	November 6	B, C, D, IR, L, Le, SJ, V
Ivan	November 19	F
Jeanne	October 27	B, IR, V
Jeanne	November 3	C, D, Le, SJ

* B-Brevard, C-Charlotte, D-Dixie, F-Franklin, IR-Indian River, L-Lee, Le-Levy, SJ-St. Johns, V-Volusia

It may take several weeks to receive benefits. Benefits are approximately one-half of the weekly salary, or a maximum of \$275 weekly for up to 26 weeks. For information on temporary employment, contact the One Stop Workforce Connection by calling 1-800-434-JOBS (5627) or by Internet at www.clmworkforce.com.



Farm Service Agency's Programs

The USDA Farm Service Agency (FSA) offers programs for which the clam industry in disaster declared counties may qualify.

Emergency Loan Program

FSA makes and guarantees a variety of loan programs for new and experienced farmers, for youth in rural areas and for producers undergoing emergency situations. Clam farmers are eligible for low-interest emergency loans to help them recover from production and physical losses to their property due to the hurricanes. The loans may be used to restore or replace property, pay production and living expenses, reorganize the farming operation and refinance certain debts. FSA loan requirements are different from those of other lenders. Emergency loans may be made to farmers who have suffered at least a 30% loss in crop production or physical loss to real estate, have an acceptable credit history, are unable to receive credit from commercial sources, can provide collateral to secure the loans, and have repayment ability. Growers can borrow up to 100% of actual production or physical losses with repayment within 1 to 7 years. The current annual interest rate for emergency loans is 3.75%. Before saying no, consider discussing how a loan can assist you in your recovery efforts with one of FSA's loan officers.

County	Loan Officer	Phone Number
Brevard	Leon Bracht	1-352-343-2581
Charlotte-Lee	Elijah Hamilton	1-239-997-7331
Dixie-Levy	G. Bashford/J. Boyd	1-352-372-4668
Franklin	Cindy Yeager	1-850-526-2610
Indian River	Bob Brandenburg	1-561-683-2285
Martin-St. Lucie	Bob Brandenburg	1-561-683-2285
St. Johns-Volusia	Norm Baker	1-386-734-2535

Emergency Conservation Program

Funding for the Emergency Conservation Program (ECP) has been appropriated by Congress through the Disaster Relief Legislation. The ECP provides financial and technical assistance for farmers to rehabilitate farmland damaged by natural disasters. However, submerged land leases do not meet the definition of farmland according to the ECP statute. Further, debris removal associated with cleanup of a collapsed greenhouse or dock is ineligible. Since ECP eligibility is very specific, hatchery and nursery operators should check with their county FSA office to see if any assistance is available for damaged areas and structures.

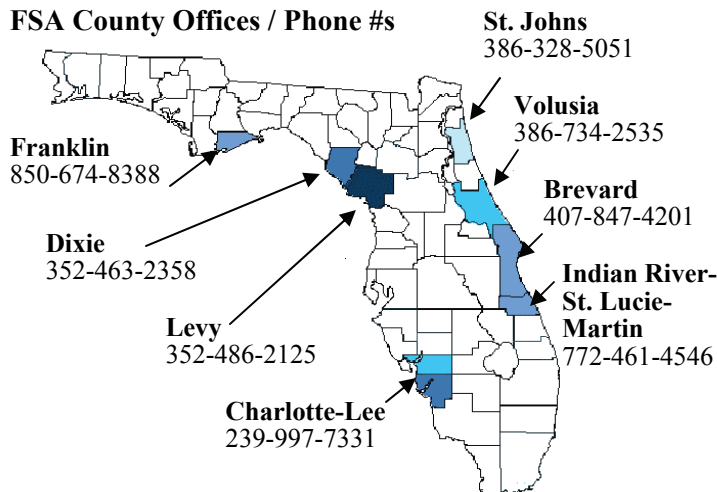


USDA FSA's Programs (continued)

Noninsured Crop Disaster Assistance Program (NAP)

This program provides financial assistance to growers of noninsurable crops for losses associated with natural disasters. An eligible grower must file an application annually with their county FSA office by the sales closing date which is September 1. The crop year coverage runs from October 1 through September 30 of the following year. Crop acreage and inventory information must also be reported. A service fee of \$100 is charged per eligible crop per county. NAP provides catastrophic coverage for up to 50% of the crop value at 55% of the market value. You must file notification of the crop loss within 15 days of the disaster or the date damage to the crop becomes apparent.

FSA County Offices / Phone #s



Eligibility for the NAP program has become somewhat confusing for the clam culture industry and is an issue for many growers this year. Refer to the table below to determine which program—FSA's NAP or the pilot crop insurance program—covers the different stages of your clam crop. When coverage of the field nursery stage was dropped by the crop insurance program for crop year 2004, growers in affected counties were not able to sign-up for NAP due to inconsistencies in deadlines between the two programs. The Risk Management Agency decided again this August not to cover field nursery for crop year 2005. Only a few days remained for growers to sign-up for NAP. Many could not. The Florida congressional delegation has requested USDA to address this issue. As of this writing there is no resolve.

Clam Crop or Stage	NAP Coverage	Crop Insurance Coverage
Hatchery	NO	NO
Land-based nursery	All counties	NO
Field nursery	All counties	NO
Growout— Inexperienced growers	All counties	NO
Growout— Experienced growers	Counties: Charlotte, Franklin, Lee, St. Johns, Volusia	Counties: Brevard, Dixie, Indian River, Levy

USDA Risk Management Agency's Program

Pilot Clam Crop Insurance Program

The pilot crop insurance program, administered by the USDA Risk Management Agency (RMA), is entering its sixth year of evaluation as a risk management program for the clam culture industry in selected counties (see previous table for eligibility) and states. Yet, the policy provisions of the pilot program remain difficult to grasp for the industry. Monumental changes implemented in crop year 2004 to make the program actuarially, or financially, sound have resulted in further confusion, lower crop values and higher premiums. According to RMA, 287 growers in the state enrolled in the 2004 program with total crop liabilities of \$5 million. In the previous year (2003), enrollment was at 400 growers with crop liabilities of over \$20 million. Not only did 28% less growers participate this year, but many did not elect to buy up at the higher coverage levels. About 10% chose catastrophic coverage (50/55), the same level of protection the NAP program provides. With such an active hurricane season this year, the program, which was developed to financially protect the industry against such events, may not.

The crop insurance program for aquaculture is a **value loss program** modeled after the nursery plant industry. These two industries are similar in that crops are continually being planted and harvested. There is no defined crop season like there is for citrus, watermelons, peanuts or other row crops. At the start of the insurance crop year, the insured grower must submit an inventory value report for his or her farm. This is done by estimating the number of clams currently on the lease or projecting the number to be on the lease during the year. These numbers are then multiplied by the value of the clam stage as assigned in the policy's actuarial tables for the year. If an insured loss occurs during the year, a crop adjuster then assesses the value of the clam inventory on the lease after the event. An indemnity payment is made to the grower if the loss in value is greater than the deductible. Once the basic concept of this program is grasped then the specifics are better understood. Read on below for details on pertinent components of the program and for revisions to be implemented in crop year 2005.

Causes of Loss—Insured causes of clam losses include oxygen depletion, decrease in salinity, disease, freeze, hurricane, tidal wave and storm surge. Definitions of certain insurable causes of loss such as decrease in salinity and storm surge must now be associated with a verified weather event.

Clam Stages—In crop year 2004, the policy divided clams into different stages based on sizes. Prior to that, the policy recognized and valued the clam crop on the culture practices employed by the industry—field nursery and growout. For crop year 2005, stages will be based on the amount of time in the culture unit not size. For example, a Stage 2 clam is now defined as being in the growout culture unit for up to 6 months, a Stage 3 clam is greater than 6 months but less than 12 months, and a Stage 4 clam is greater than 12 months but less than 30 months. Crop inventory values and loss



USDA RMA's Pilot Clam Crop Insurance Program (continued)

payments are based on these different stages. Note that clams which are harvested but not marketable are no longer insurable when replanted back onto the lease.

Field Nursery Not Covered—Since Florida growers routinely plant nursery bags on their leases, coverage of the field nursery was included in the policy from the start. However, in crop year 2004 the program discontinued coverage of this clam stage. This will remain the same in crop year 2005. Consequently, the field nursery should be eligible for catastrophic coverage through the USDA Farm Service Agency's Noninsured Crop Disaster Assistance Program (NAP). Refer to page 3 for problems encountered.

Inventory Value Report—Given the difficulty in estimating the clam inventory at the start of the crop year when buying or renewing the insurance policy, a policy provision allowed growers to revise their inventory during the year. (The additional premium for the increased crop value was due within 30 days; whereas, the premium for the initial crop insured is not billed until late in the crop year—see table on this page). This provision was not included in the 2004 contract. Many confused the new mapping requirement (see below) with inventory revision. Although corrected for crop year 2005, this omission may result in under-reporting as well as lowered indemnity payments for growers with hurricane losses. A request made to RMA to reinstate this provision is currently under evaluation. Note the premium will be prorated in 2005 if there is an inventory increase.

Reporting Requirements—Insured growers must report all clams on their lease, even those belonging to another grower, subleaseholder or authorized user. The insured must also provide a map of their lease detailing where clam plants are located. This is to be provided to the insurance agent at the first of the crop year with an inventory report. The map must be revised and submitted quarterly. Note the map is not an inventory report. Copies of all sales receipts for seed must also be provided to the agent within 10 days of purchase.

Tagging Requirements—Growout bags must be tagged with the owner's name and aquaculture certification (AQ) number. This requirement assists the loss adjusters in properly identifying the insured's crop. The tag must be able to last with legible information for the duration the bag is on the lease. For tag suggestions, contact the Shellfish Aquaculture Extension Office or check in the suppliers lists posted at the website: <http://shellfish.ifas.ufl.edu>.

Grower Experience—To be eligible for coverage, growers must have prior experience. Specifically, a grower must have commercially grown clams in at least 3 out of the 5 previous years. New growers are eligible for NAP coverage provided through the USDA Farm Service Agency (see page 3).

Lease Division—Leases must be located in different high density lease areas within a county to be considered non-contiguous. If so, a grower may elect to have separate coverage at an added cost. The leases then stand on their own for loss adjustment purposes (ie. the value of undamaged crops in one area would not affect damaged crops in another area).

Important Crop Insurance Program Dates

August 31	RMA completes contractual changes to policy provisions and sets actuarials for new crop year
October 31	Premium payment for current crop year is due
November 30	Crop year ends Last day to buy, make changes or cancel policy for new crop year / Crop inventory report and first quarterly map for new crop year is due
December 1	Crop year begins

Survival Rates for Stage 2, 3 and 4 clams are 70%, the same as they have been for clams in growout units since the program began. If clams are stocked in growout bags at a density greater than 75 per square foot (1200 per 16 ft² bag), rates drop to 50%. Growers' production records maintained for at least 3 years may also be used to determine survival. However, this must be done at the time of the inventory report so as to eliminate under-reporting.

Prices defined in the 2005 actuarial table did not change from the previous year. The prices are based on the various stages with Stage 2 clams valued at 4.5 cents, Stage 3 clams at 6.4 cents and Stage 4 at 7.5 cents.

Insurance Agents—For a list of private crop insurance agents who intend on selling the clam policy for crop year 2005, check with the Shellfish Extension Office. Remember these independent agents all sell the same policy. The RMA also maintains a list of insurance providers at their website: www.rma.usda.gov/ in their "Agent Locator" section.



What Else?

In times of adversity, opportunity arises. This is the time to evaluate what else can be done to assist the industry in its recovery efforts. Here's a few things that have been discussed and may be considered dependent on funding sources.

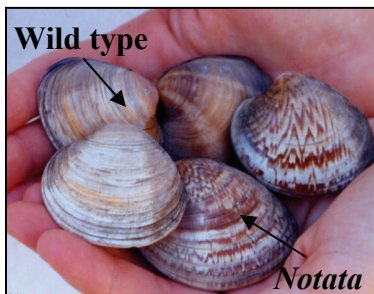
Clam seed loan program—State revolving loan funds may be applicable for rural-designated counties in setting up a low-interest seed loan program, as was done after the El Niño event in 1998 for north central Florida. Advanced seed payments could assist hatcheries in their rebuilding efforts.

Community land-based nurseries—Possibly using community block development grants, a community approach could assist in siting and rebuilding land-based nurseries. A variety of operating methods could be considered. A similar project was done in Dixie County using an obsolete public boat ramp for the site and grant funds for construction. A local growers association oversees the multi-user facility.

Lease clean-up—Federal or state funds earmarked for shellfish restoration may complement lease clean-up efforts as an abundance of clam shell would be made available. Contact Mark Berrigan with the DACS Division of Aquaculture at 850-488-4033 for further discussion.

RESEARCH UPDATE: Genetic Issues in Hard Clam Aquaculture - Stock Diversity

Background: The genetic variation of wild and cultured stocks of the Florida hard clam (*Mercentaria mercenaria*) was quantified and compared in response to both industry and scientific concerns regarding genetic health of this important commercial aquaculture species. The hatchery-based hard clam aquaculture industry, while rapidly growing, is in its infancy in terms of stock management and genetic improvement. Hatchery stocks are often selected for the *notata* strain, a shell color variation (shown in the picture to the right) with no other known performance advantages. Aquaculture



geneticists were concerned that selective breeding for one trait, such as shell color, could have unintended side effects. Among the major concerns is the loss of useful genetic diversity through unintentional inbreeding. Specifically, long-term selective breeding could reduce genetic variability of hatchery stocks. Genetic diversity is believed to be critical when clams are exposed to variable environmental conditions or diseases. Successful analysis of within-stock genetic diversity can also provide the basis for future research on heterozygosity (within-individual genetic diversity), stock identification via molecular techniques, and correlation of stock performance (particularly growth, survival, and reproduction) with genetic parameters which can be used to guide breeding and stock improvement programs.

Objectives: This study has two main emphases: 1) To determine whether loss of genetic diversity has occurred in cultured clam stocks, and 2) To assess the possibility that depletion of genetic diversity has affected the performance of captive stocks under aquacultural conditions.

Results: Descriptive molecular genetic techniques were used to examine the issue of stock diversity. Specifically, mitochondrial DNA (mtDNA) and micro-satellites were used to quantify genetic diversity. The genetic diversity in captive strains from six Florida hatchery stocks and in clams escaped from an aquaculture lease area in west Florida was compared to wild stocks from east Florida, Georgia and New York. The southern quahog (*Mercentaria campechiensis*), a morphologically similar clam species, sometimes occurred in samples. However, this species showed distinct genetic distance from the hard clam and was removed prior to analysis. An index of clam stock health in terms of genetic diversity was developed (see table).

Haplotype diversity ranges from 0 to 1, with anything over about 0.5 being considered healthy. As can be seen from the table, wild stocks typically have higher haplotype diversity than hatchery stocks, but some wild stocks may also have reduced genetic diversity due to pollution, disease, or other factors. High haplotype diversity was found in genetic

sequences for all wild populations and most hatchery stocks. Several of the commercial hard clam hatcheries had significantly reduced – but still healthy – levels of haplotype diversity. Two of the hatcheries also had apparent contamination with the southern quahog.

Conclusions: These findings indicate that some hatcheries show an effect by selective breeding on overall diversity, but

that genetic diversity has not yet been reduced to levels at which problems are likely to arise. Further surveys with microsatellite DNA are mandated to assess inbreeding and the comparative performance of breeding stocks. These efforts represent the first at looking at stock management and improvement for the clam aquaculture industry in Florida and provide a basis for further genetic studies.

The next phase of this research will be to compare the performance of multiple Florida strains of hard clams under aquacultural conditions, and to correlate this performance with genetic diversity, using mitochondrial DNA and microsatellite loci in the nuclear genome. Multiple clam strains obtained from participating Florida clam hatcheries with stocks of known parentage are being assessed and cultured simultaneously during 2004 at the UF Shellfish Aquaculture Research and Education Facility in Cedar Key. Proprietary information for hatcheries will be protected. Clam performance will be indexed using survival, growth and within-strain growth variability. Mitochondrial DNA and microsatellites will be used to quantify genetic diversity in clam strains for which diversity is not known from prior research. Correlation analysis will be used to compare indices of genetic diversity to clam stock performance.

For more information about this research, contact Dr. Patrick Baker with the UF Department of Fisheries and Aquatic Sciences at (352) 392-9617, extension 281. This research is being conducted in collaboration with Dr. Brian Bowen of the University of Hawaii and is funded through a special research grant by the U.S. Department of Agriculture, Cooperative State Research, Education, and Extension Service in support of the shellfish aquaculture industry in

Clam Stock / Locality	Haplotype Diversity
Hatchery I	0.82
Hatchery II	0.79
Hatchery III	0.74
Hatchery IV	0.65
Hatchery V	0.63
Hatchery VI	0.87
SE FL Wild	0.81
NE FL Wild	0.83
NW FL Culture	0.89
GA Wild	0.85
NY Wild	0.80



Oyster and Clam Shell Recovery and Recycling Project

A unique project was launched early this fall with the opening of oyster harvesting season in Levy and Dixie Counties. Oyster landings have been in decline for several years in the Big Bend area. The recent hurricanes have also affected oyster populations through deposition of silt and sediment. The Oyster and Clam Shell Recovery and Recycling Project is an effort to enhance and restore the local oyster reefs. This project may have application in other shellfish restoration efforts. An abundance of clam shell will become available as growers begin cleaning up their leases.

So how will this project work? During the summer months, adult oysters release millions of fertilized eggs into the inshore coastal waters. During their 2 to 3 week development, oyster larvae may be carried great distances from where they were spawned. When development is complete, larvae must attach to a hard substrate, ideally another shell. If no substrate exists, the larva dies. Juvenile oysters (spat) reach harvest size in 12 to 18 months, but they spawn within a year, completing the life cycle. Harvesting adult oysters removes shells from the oyster reef. Replanting shell is an important way of insuring future generations of oysters.



The State has maintained for a number of years an effective shell collection and planting program for rebuilding the public oyster reefs in the

Florida Panhandle. However, expansion of restoration efforts to other areas has been hampered by a critical shortage of oyster shell. To properly manage the oyster resource, the shell that is removed from the reefs must be replaced. This can be done by recycling oyster shell. In addition, the Cedar Key area supports a number of clam processing plants. Clam shells are a byproduct of the tumbling and washing activities. These shells can also be recovered and used as oyster substrate. Clam shell makes an excellent cultch material. (Many clam growers can attest to that.) So clam growers, shellfish wholesalers and citizens are being encouraged to bring their oyster and clam shell to a recycling station which is conveniently located at a public access site. Shell will be held there until the following summer when the Oystermen's Association with the state resource managers will use to rebuild oyster reefs.

This project is being conducted by the Cedar Key Oystermen's Association in cooperation with the Cedar Key Aquaculture Association, Cedar Key Water and Sewage District, DACS Division of Aquaculture, and UF Shellfish Aquaculture Extension Program.



Donate by calling 1-800-FL-HELP-1



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