

RCC

**Aquaculture Training Needs Assessment and Program Development
Virginia Fisheries Resource Grant Program Project #FRGP 2006-06
Final Report – 4 June, 2007**

Introduction

Commercial shellfish aquaculture operations in Virginia have grown in size and number over the past several years, creating both a need and an opportunity for individuals skilled in modern aquaculture practices. Additionally, reduced wild oyster harvests over the past several years have prompted commercial watermen to examine the possibility of supplementing their income by culturing shellfish. However, to date, there is no formal education program in place to train perspective employees, entrepreneurs, or displaced watermen in the Commonwealth. In fact, while the Virginia shellfish culture industry is the largest on the East Coast, the nearest shellfish aquaculture programs are at Carteret Community College (CCC) in Morehead City, NC, and Delaware Technical Institute in Georgetown, DE.

Rappahannock Community College (RCC) is ideally situated to provide a marine aquaculture program in Virginia. Located on the Middle Peninsula and Northern Neck of Virginia, its student base comes largely from communities and families with a tradition of earning their living from working on Chesapeake Bay. Many of these potential students are looking for ways to preserve those traditions in a changing environment. RCC has already acknowledged that desire by implementing the Marine Trades program, and the College sees an aquaculture-training program as simply an extension of the philosophy that educational programs should be geared towards the needs of the students. With that philosophy in mind, RCC has begun exploring the possibility of establishing a formal shellfish aquaculture-training program.

Prior to implementing any program, it is important to determine exactly what type of training is warranted, and what method for offering that training is preferred. Typical aquaculture training topics include basic skills, algae culture, hatchery management and field techniques. Potential programs may range from simple seminars, similar to the Master Oyster Gardener (MOG) course co-sponsored by VIMS and the Tidewater Oyster Gardeners Association (TOGA), to longer three to six-week sessions, such as those sponsored by Harbor Branch Oceanographic Institute, to full certificate or programs like those at CCC or Delaware Tech. The goal of this project is to determine what sort of training program best meets the needs of concerned stakeholders in the state, and then to outline the development of such a program, with the intent of that program eventually being introduced into the RCC academic plan.

Objectives

Objective 1. Determine what type of training program best meets the needs of potential employers, entrepreneurs, and watermen in Virginia.

Objective 2. Based on results of Objective 1, develop appropriate training programs to meet needs of current aquaculture operators, train potential entrepreneurs, and re-train watermen.

Methods

Objective 1. A survey was sent out to approximately 120 commercial shellfish growers, processors, and members of state agencies asking for their suggestions and comments concerning an aquaculture training program in Virginia (see appendix A).

Directors of aquaculture-training programs in Massachusetts, Delaware, and North Carolina were interviewed. Additionally, on-site visits were made to two programs in North Carolina.

Informal surveys were conducted of first-year general biology students at RCC.

Objective 2. Based on findings in Objective 1, an interim report was submitted in August 2006 to Tom Murray of VIMS, Director of VFRGP, Dr. Stan Allen of VIMS, Director of Aquaculture Genetics and Breeding Technology Center, Mike Oesterling, VIMS Commercial Fisheries Specialist, and Dr. Maureen Murphy, Vice-President, Rappahannock Community College (RCC). That report contained results of survey responses to that time, as well as a summary of interviews and site visits made to existing training program. Additionally, recommendations were made for developing a training program based on those responses and interviews. In addition to having updated survey information, this current report is a revised training program plan based upon comments received concerning the August 2006 report.

Results

Industry Survey. Industry response was moderate and representative of the industry. Of the estimated fifty to sixty total industry members, twenty-two returned survey forms. Respondents were located on both sides of Chesapeake Bay and were evenly divided between oyster and clam culture. Operation sizes ranged from small, single-person operations to the largest clam and oyster producers in the state, as well as the largest commercial shellfish hatchery in Virginia. Of the twenty-two survey responses, fourteen indicated that they believed that some sort of training program was needed in Virginia. Four said that such a program was not needed, and four said they did not know.

For analyzing which jobs respondents felt required training, a five-point scale was devised, with five points going to a respondent's first choice, four to their second, etc., and then averaging the scores for all respondents. They ranked algae culture technician first with a score of 3.4. Nursery technician (3.2), and hatchery manager (3.1) followed closely, and basic field crew 2.7 was also highly rated by most respondents. One respondent indicated that equipment construction and maintenance was an area of need for instruction.

Sixteen respondents (73%) said that basic aquaculture skills for new workers were needed. Three stated that improvement of skills for existing was needed. Three did not state a need or stated that there was no need. There were also specific training needs listed, which included hatchery training, and Bio-security, food safety and packing house labor training.

The preferred method of instruction varied greatly, with respondents choosing all modes of instruction. Fifty percent indicated that on- or off-site training were their first preferences, Fifty

rated classroom seminars as their first or second choice, and twenty-five percent asked that publications and A/V materials be provided. Ten percent said they preferred on-the-job-training.

Fifteen respondents (75%) stated that they would be willing to send employees for training, with eighty percent of those saying that they would be willing to pay for the training.

Additional comments were few, but insightful. One respondent stated a need for more industry organization, and state cooperation on leasing and marking leases.

In addition to conducting this survey of Virginia industry members, I have also been approached by a number of Maryland growers who are interested in participating in a training program, even one based in Virginia.

Student Survey. Informal questioning of nearly 200 students indicates interest for such a program. Several students have approached me about working at local oyster farms, or about the potential for entering into the industry independently.

Existing Programs - The NC schools offered a choice of a Certificate (two 3-hour courses and associated practical labs), Diploma (four courses and associated labs), and Associates degree (eight specific aquaculture courses and associated labs as well as general education courses). The Delaware Tech offered a three or four course certificate program, while the Massachusetts program consisted of a series of short courses.

All programs shared common curricula, even though they were developed independently. The curricula are also similar to degree programs offered by Indian River and Hillsborough Community Colleges in Florida, and resemble the aquaculture specific courses in bachelor's degree programs offered by Florida Atlantic Univ. and The Florida Institute of Technology, in conjunction with Harbor Branch. All curricula cover basic aquaculture practices as well as algae culture and hatchery management.

Two of the programs (Massachusetts and Delaware) are defunct or are being phased out. The Massachusetts courses had about 20-30 participants per course initially, but had declined in enrollment and were phased out a couple of years ago. The Delaware Tech program also had initially about 20 students, but only five were currently enrolled. The other two (in North Carolina) are currently stable in terms of enrollment and there are plans for expansion of both programs. Enrollment at the two NC schools was consistent at about 18-25 students in the two-year program (9-12 per year). NC programs drew students from a variety of areas, with approximately one-third coming from the local area, one-third coming from elsewhere in the state, and one-third from other states, including Florida, Nebraska, and Pennsylvania among others. Because they were still operational, I visited the two NC programs.

The BCC program was geared towards freshwater finfish culture, and grow-out was based on a number of on-campus ponds ranging in size from 0.5 to 10 acres. The CCC program was directed at marine culture, and included both shellfish and finfish culture, and grow-out was mainly in small (50-250 gall. tanks) in in-door labs. Oysters spawned and nursed at the facility were used for oyster reef restoration efforts in the state. In addition to on-campus courses, labs,

and individual research, the program also requires that students participate in an internship with a cooperating industry partner, which ranged from Biotech firms to commercial growers to state aquaria. These internships often led to employment at the conclusion of the program. The most appealing aspect of the NC programs was that student projects in the lab courses were self-directed, allowing students to grow species of their interest. In the CCC program, students raised species ranging from alligator to zebra mussel, with a wide variety in between.

Funding for the Massachusetts program was a combination of federal and state grants. In the NC programs, initial facilities were built with large grants from the state tobacco settlement and federal oyster restoration funds. Instructors and staff were part of the college faculty, and paid as such. Operations funding was low (~\$5000 per school), but was supplemented by research grants and contributions, as well as the sale of products grown by the program. Industry partners also contributed equipment needed for students to complete related study projects.

Conclusions and Suggestions:

Increased Outreach, Cooperation, and Extension: A number of state agencies such as Marine Advisory Services and the Aquaculture Genetics Breeding and Technology Center at VIMS, VMRC and the Division of Shellfish of Virginia Department of Health, Sanitation have all been actively involved in outreach. These agencies have worked with the industry and the public in promoting aquaculture, hosting seminars, and promoting the transfer of new technologies from research to commercial application. Yet there is still a need for increased efforts. In recognition of this need, VIMS and Virginia Tech, among others, have begun planning the first Virginia Aquaculture Conference, set for late 2007. The conference should provide industry members with an opportunity to gain additional knowledge and information about shellfish culture, but will offer little training for employees or new industry members.

In addition to increased agency efforts, there has been a general consensus that there should be increased cooperation among industry members. The formation of a shellfish growers' association in Virginia would allow for greater cooperation between existing agencies and the industry, as well as serve as a conduit for industry needs to be expressed to those agencies. Further, an association could be responsible for hosting its own seminars, meetings and trade shows, thus alleviating the burden placed on state resources. Further still, such an association would provide forums for cooperation among growers, allowing them to serve as extension and consultants for others in the industry. At the April 2007 Shellfish Growers Seminar, hosted by VIMS in Wachapreague, Virginia, the industry as a whole voted to proceed with the organizing of an association. The goal is to have that organization hold its first meeting at the Virginia Aquaculture Conference.

To date, there are only two extension courses offered in Virginia. One is the Federal HAACP course for seafood safety, provided in part through Virginia Tech. The second is the previously mentioned MOG course, co-sponsored by VIMS and TOGA. While the MOG course is an excellent program, it is geared strictly for non-commercial oyster-gardeners, not industry members, and does not offer the scope or depth that an industry program requires.

Mini-Courses. The scope and depth required to meet industry needs could be realized through a series of mini-courses. Nearly all respondents to the training survey indicated a need for technicians trained in hatchery management, algal culture, and basic aquaculture skills. One- to three-week courses could be offered in the off-season in each of these content areas. Companies could send a number of employees for each course without causing major interruption to their work schedule. In addition to providing additional training for current employees, mini-courses would enhance industry growth by providing training for potential industry entrants.

One of the main obstacles to starting any kind of training program, particularly an industrial training program is the lack of adequate facilities and equipment. However, by working with an existing culture operation, RCC could lease the necessary space and equipment, with minimal investment, and without a long-term commitment. With instructors provided by RCC, the first series of mini-courses could be offered realistically as early as winter 2008, provided suitable industry partner could be located.

Typically, funding such a program is another obstacle. However, as mentioned in the discussion concerning the industry survey, eighty percent of the respondents who were willing to send their employees for training, were also willing to pay for that training, so tuition will offset some of the costs. Additionally, in recent discussions, Don Webster of the University of Maryland Wye Research and Education Center has reported that there has been a call for increased support for the industry and more training in Maryland. He also expressed interest working with RCC in developing and conducting a training program, and indicated that a single regional program for the entire Chesapeake Bay would be more efficient than a number of smaller separate programs. He even indicated a willingness to share resources, including funds, to help support a joint training program to be offered at RCC. Beyond these two funding sources, there is also the potential for receiving state and federal grant funds for aquaculture education.

In summary, while the industry survey of this study does not at present indicate a strong need to implement a full-scale academic training program, there is a need for increased training in Virginia. Increased outreach and industry cooperation can fulfill some of that need, but not all of it. A series of mini-courses is required to provide the depth and scope of training needed to strengthen and grow the current industry. RCC is an ideal vehicle for providing those courses, and could do so as soon as early 2008. Not only would these courses provide needed training for the industry now, but they could also serve as the basis for a full-scale academic training program in the future as industry growth demands it.

Appendix A: Industry Survey Letter and Form (format modified to reduce form length)

Aquaculture Training Program Needs Assessment Survey

Dear Commercial Shellfish Grower:

Commercial shellfish aquaculture operations in Virginia have grown in both size and number over the past several years. This growth has created both a need and an opportunity to develop an aquaculture training program in Virginia to offer additional skills and knowledge to current culturists, provide qualified employees for the industry, and re-train displaced watermen. Currently, the nearest shellfish aquaculture programs are at Carteret Comm. College in Morehead City, NC, and at Delaware Tech in Georgetown, DE. Before we can implement such a program it is important to determine what type of program is warranted.

Typically, courses may range from simple 2-3 day seminars similar to the Master Oyster Gardener (MOG) course, to 2-6 weeklong courses. Programs may also extend to full certificate or associates degree programs offered by community colleges. The purpose of this questionnaire is to provide an overall picture of the type of training program that best meets the needs of potential employers, entrepreneurs, and watermen in the commonwealth.

We appreciate you taking the time to answer the following questions. Also, feel free make any additional comments as you wish. Your responses will be kept confidential, and will only be used in helping us develop this program.

The survey should take about 5-10 minutes to complete. Please return the survey in the enclosed postage-paid envelope, or fax the survey using the number below. If you would prefer, you may e-mail Shawn Stickler at sstickler@rcc.vccs.edu to request an electronic copy of the survey. Also, for questions about the survey please contact me using the information below.

Thank you,

Shawn Stickler, Ph.D.
Rappahannock Community College
52 Campus Drive
Warsaw, Virginia, 22572
Fax: 804-333-0106
Email: sstickler@rcc.vccs.edu
Phone: 804-436-5200

Virginia Aquaculture Industries Work Force Training Survey 2006

1. What type of aquaculture business are you in or considering? (Check all that apply.)
 oyster aquaculture clam aquaculture finfish aquaculture aquaculture services & supplies other Please indicate: _____
2. How many full-time workers do you or your company currently employ? _____
3. How many part-time workers do you or your company currently employ? _____
4. How many open positions are you currently trying to fill? _____
5. Do you believe the industry should support aquaculture training in order to grow in the future? Yes No Don't Know
6. For which of the following jobs do you believe training needs to be offered? (Please rank in order with number 1 being top priority.)
 - a. Hatchery Manager
 - b. Field Crew
 - c. Algae Culture
 - d. Nursery Technician
 - e. Processing/Packing Labor
 - f. Other (Please rank and specify below): _____
 - g. _____
 - h. _____
 - i. _____
7. What type(s) of training do you or your company need?
 - a. improvement of skills for existing workers
 - b. basic aquaculture skills for new workers
 - c. other (please indicate): _____
8. What THREE ways do you think would be the best way to receive such training? (Please indicate the top three with number 1 being most preferred.)
 - a. Cable or Satellite TV
 - b. Classroom Seminars
 - c. Customized off-site training
 - d. Customized on-site training
 - e. Internet
 - f. Self-study printed materials
 - g. Videos or CD-ROM
 - h. Other, please describe: _____
9. Would you be willing to send employees to another location for training?
Yes No Comment _____
10. Would you be willing to pay to enroll and pay for travel and lodging for an employee to obtain aquaculture training at a location in central coastal Virginia?
Yes No Comment _____
11. Any other comments or ideas? _____

Please fill in the following information about your company.

Company Name: _____

Your Name: _____

Address: _____

Phone: _____ Fax: _____ Email: _____

Thank you for taking the time to complete this survey!