

INDUSTRY TRAINING PROGRAMS

Background

The success of American agriculture was due in great measure to the integration of research, education, and extension services conducted with farmers themselves. Using this model, University of Maryland Cooperative Extension, through its Sea Grant Extension Program, began targeted programs to develop oyster aquaculture in 1978. Drawing on results of research from the first few years of the institution's Sea Grant Program, scientists and extension faculty began identifying leaseholders interested in adapting new ideas and working to demonstrate techniques. As part of that effort, it was decided to contact all growers in the state and organize a conference to discuss results of ongoing research and prioritize their problems for future directions. The meeting was entitled "Oyster Culture in Maryland '79" and was held in January of that year (see Section 5 - 1979 Leaseholder Survey for more complete information on the conference).

With the success of the first conference, the industry urged that regular programs be held. For the next several years, these meetings were organized annually and served as a means of sharing problems and ideas between growers and scientists. During the 1980s, Maryland and Virginia extension services joined to hold bi-state meetings. These met with such success that other states similarly joined the group, until by the end of that decade the programs were organized by a planning committee that represented five Mid Atlantic state. These formed the basis of "Aquaculture In The Mid Atlantic", a multi-day conference that addressed topics of interest to all forms of the industry. The program rotated between states and was held until 1995 when it was joined with a national program, "Aquaculture Expo" for a conference in Washington, D.C. After that, it was judged that the need for an annual conference in this region had waned and it was discontinued.

Westside Project

In 1980, an extension agent in Wicomico County organized a project to bring economic development to the western side of that county. This multi-faceted project was called the "Westside Project" and was centered in the Nanticoke area. Sea Grant Extension faculty were asked to participate, bringing their aquaculture expertise to it. The region was an anomaly in Maryland, having over a quarter of all leases in Maryland located there. This was principally because of the H.B. Kennerly Company, one of the largest shellfish houses in the United States, that was located there. The owners had made a concerted effort, at the passing of the 1906 Haman Oyster Culture Law, to urge watermen to obtain leases, which many did. These growers were provided shell from the shucking house to use as cultch to stabilize grounds and attract natural spat sets. These watermen/growers would harvest their leases after the public oyster season ended and before crab season began, providing much needed income that did not occur in many other areas of the Bay. The company benefitted by having a year-round supply of oysters, which they marketed throughout the U.S., and became successful through two generations.

Nanticoke was also home to the Flomax Hatchery, operated by Max and Florence



Figure 1. Flomax Hatchery beach hardening and nursery area near Nanticoke, 1981.

Chambers. Located in a small building on the edge of a tidal pond, the hatchery produced spat for sale to growers. The owners used some of the production to plant their own grounds. The facility had a sand beach as part of the rented property that it was on, which was used to harden and grow out the spat until it was sold or planted. The area was

one of few which was intertidal, helping to minimize biofouling without excessive labor.

The Westside Project brought together University of Maryland extension faculty with leaseholders in Nanticoke. The concept of the aquaculture portion of the project was to use the hatchery at Horn Point, at that time a relatively new facility, to aid demonstrations on increasing productivity on leased ground. The MDNR also had a small oyster hatchery located at Deal Island that produced spat in cooperation with HPL. The total output at Deal Island was only around 500,000 spat a year, but it was in a convenient location to provide support service to the Westside Project and spat from that facility was used in demonstration outplantings for several years.

A separate component of the project was to develop a 4-H program addressing oyster aquaculture. Six members were initially recruited and provided with trays of hatchery oyster seed which they placed in various locations around the county, keeping track of growth and survival of the seed to answer the question, "Where do oysters grow best in Wicomico County waters?"

After a year of startup problems, Horn Point hatchery manager Don Meritt was brought into the project as Sea Grant Extension's Shellfish Aquaculture Specialist. He helped organize growers and developed the criteria for participation in the Westside Project. This provided the foundation for expansion of the program in future years. To participate, growers had to:

- have prepared grounds with adequate cultch on the bottom
- provide the labor for seed movement
- allow UM faculty to monitoring survival and growth
- provide harvest data (that would be kept confidential) for analyzing results

Six participating growers were ultimately brought into the program. Each had leased bottom with a strong shell base. Hatchery seed from Deal Island was provided to them for planting at several densities to determine optimum rates.

Remote Setting Introduced

In 1981, Meritt came back from a trip to the Pacific Northwest where he had visited a series of large and small oyster companies. He brought back the concept of "remote setting" which had recently been developed for and with the industry. After discussions with participating Maryland growers, it was decided to try remote setting as part of the Westside Project.

Two tanks, of approximately 500 and 700 gallons capacity, were moved to Nanticoke Harbor and set up on the shoreline at the H. B. Kennerly Company, which supported the project by providing electricity and space. A pump was provided to fill the tanks with ambient water and a blower was installed to provide air to keep the larvae in



Figure 2. First remote setting experiment

circulation. Participating growers cleaned the shell used for the project. To get

away from the problem of using shell bags, plastic containers were purchased and used to hold the shell.



Figure 3. Larger setting tanks, Nanticoke

It was quickly found that as part of the educational process, growers had to learn the concept of shell clean enough for remote setting. After having them re-clean the shell twice for the initial

remote setting run, it was decided to proceed. Within 24 hours all larvae were dead. This provided a vivid demonstration to the growers on the need to remove all organic matter from shells prior to setting. It was found that this type of demonstration was necessary in other locations as the program later expanded.

While the tanks used in the early years of the project were sufficient for small demonstrations, it became apparent that more capacity would be needed as the project grew. In 1983, one of the growers located large tanks that were actually discarded concrete forms from a state highway project. These were moved to Nanticoke and installed in an abandoned marine railway. The tanks were given a coat of fiberglass on the inside and used for remote setting for two more years.

The concept for the Westside Project was to keep it low key and to purposely avoid publicity. It was determined that the best way to make progress with the industry was to work with a few individuals and get them to the point where they were earning money from oyster aquaculture. Others would then become interested in participating and learning new ways to produce oysters and make money. This is an age old extension concept.

Expanding Education

As the program proceeded, on-site workshops were held and growers from other areas were invited to participate. These extension workshops used University faculty and growers to teach remote setting and grounds management. Once the Nanticoke growers had upgraded their tanks, and with interest growing from other areas, it was decided to move the University



Figure 4. "Spat-Mobile" ready to be moved to setting location

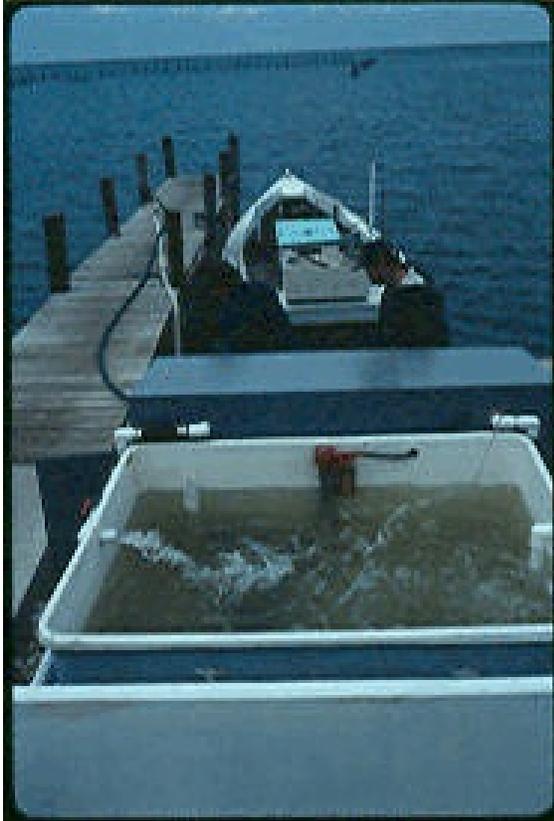


Figure 5. Spat production with the "Spat-Mobile" at Crisfield. Intake and discharge lines run along dock

equipment to other locations and continue the educational process. After finding interest in several counties widely dispersed in the Bay area, it was decided that a simpler method of moving remote setting tanks and equipment was needed. Maryland Cooperative Extension provided funds to purchase a trailer. The setting tanks and equipment were installed on the trailer which was easily moved to setting locations. The vehicle was known as the "Spat-Mobile" and was used for several years.

Cooperative projects demonstrating remote setting were carried out with growers in Wicomico, Worcester, Talbot, Dorchester, and Queen Anne's counties. In addition, projects to look at innovative methods of

stabilizing grounds were investigated at sites as far up as Kent County. In one, the use of geotextile was investigated to plant grounds that would not otherwise have been usable. This provided successful in creating habitat on sand bottom next to a control area that was barren at the end of the experiment. The spread of interest in oyster culture techniques was a natural outgrowth of growers attending workshops and requesting to participate using their grounds.

Support Material

Along with the hands-on demonstration projects, a series of publications were produced addressing topics identified by industry (copies included at end of this chapter). One dealt with stabilization of oyster ground. Leases were often on barren bottom and required shell as cultch prior to seed planting. Shell, whether

dredged from upper Bay deposits or gotten from shucking houses, was often costly by the time it was in place. The publication "Stabilizing Oyster Ground" provided references on the amount of shell required for different areas. Another publication, "Purchasing Seed Oysters", sought to explain the cost of seed when comparing that produced by hatcheries to that traditionally available from the James River. A third publication, "Producing Oyster Seed by Remote Setting", was a manual on equipment methods and procedures. This document was deemed important enough to the industry in the northeast United States to be published by the Northeastern Regional Aquaculture Center (NRAC) and distributed nationally. Another publication on the production of phytoplankton for hatcheries was published and distributed by NRAC as well.

With the remote setting programs, short courses were organized at the Horn Point hatchery in each of two years. These were week-long programs that provided attendees an opportunity to engage in hands-on activities through the production cycle of a hatchery. It included: broodstock acquisition, conditioning and management; spawning techniques; larval care; phytoplankton production; setting system operation and management; nursery techniques; grounds management, outplanting and monitoring; and disease monitoring. These programs were open to anyone in the United States and attended by industry as well as extension faculty from other areas. The short courses were funded through the NRAC Regional Extension Project.

Remote setting workshops followed a standard procedure. Growers expressing interest in attending would be contacted and



Figure 6. Don Meritt shows growers oyster larvae at remote setting workshop

advised of time and date. Microscopes would be brought to the site so they could see the eyed larvae as well as newly set spat on shell. Tanks would be loaded with washed, containerized shell, larvae would be introduced into the water, and phytoplankton would be added for food. Prior set spat would be available for growers to examine. The participating grower would speak about his experience and pass on tips he had learned through the program.

In the Westside Project, the 4-H club had a member whose project information was considered so good that she was awarded a trip to the national 4-H meeting one summer. As interest in the project grew, a local state Senator got a bill passed authorizing 4-H clubs to obtain up to ten (10) acres of barren bottom as a lease for oyster culture studies. This followed a one that had existed for many years authorizing public high schools to obtain up to five (5) acres for similar studies.

Program Modification

In the mid-1980s however, the program ran into the disease epizootics that were ranging throughout the Bay. Most of the oysters that had been produced through the program died because of their placement in high salinity regions. When it became apparent that disease and its movement throughout the upper portion of the Chesapeake Bay was going to be the dominant problem for the future, the program was curtailed. Growers continued to be interested in using grounds only if it could be assured that their investment would survive to harvest. In most cases, this was not possible.

The oyster aquaculture education program shifted focus during the 1990s and into the new century. Projects such as the Chesapeake Bay Foundation's Citizen Oyster Gardening program was supported with educational programs. These included an annual Oyster Forum for updates and sharing of information on oyster culture for restoration with the large corps of citizens producing spat near their docks for incorporation into sanctuaries being developed.



Figure 7. Setting tanks at Horn Point hatchery for ORP projects

At the conclusion of the Maryland Oyster Roundtable, the development of the Oyster Recovery Partnership (ORP) provided new opportunities to advance oyster culture. Remote setting using hatchery produced, disease free oyster seed became industrialized. Large-scale methods of cultch handling had to be developed to address the planting needs of managed reserves and sanctuaries that were being

developed in a massive effort to restore the oyster resource of the Bay.

Mechanization of cultch handling, setting, and deployment of spat was developed in cooperation with ORP. From the use of shell bags, the development of stainless steel cages allowed more rapid cycling of material. Construction of the Aquaculture and Restoration Ecology Lab (AREL) at Horn Point vastly increased production of more larvae for projects.



Figure 8. Large-scale deployment of oyster spat as part of restoration

With the development of selected lines of oysters and the potential for triploids being able to reach market, even in areas of high disease pressure, the need for industry education is again growing. To develop an industry that has fallen into almost total non-production it will be necessary to integrate research and demonstration projects into the effort to rebuild the oyster industry.

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