

WORKSHOP ON OYSTER PRODUCTION
IN OREGON

Held at the Marine Science Center, Newport, November 27, 1967

Introduction

Oregon State University has been engaged with research on oysters and other bivalve molluscs since a small marine laboratory was established on Yaquina Bay in 1939. Until very recently the program of research has emphasized estuarine pollution from pulp mill effluents. Expansion of university facilities for applied fisheries research with completion of the Pacific Fisheries Laboratory in 1965 has allowed the University to intensify cooperative research with the Fish Commission of Oregon on the technology of rearing oyster spat in hatcheries. The University has proposed to enlarge the program on hatchery culture of oysters under National Science Foundation Sea Grant Programs.

Purposes of the workshop were to review present and planned programs of research with oysters in Oregon and to discuss problems of the oyster grower. This report summarizes the discussions at the Workshop. Representatives of government, industry, and education attended the workshop and participated in the informal discussions. The participants are requested to complete the attached questionnaire and return it to the Marine Science Center.

Welcome

Bill Wick, Coordinator of Extension Programs at the Marine Science Center, briefly described the facilities at the Center and their primary functions. He discussed programs of education in the public wing and programs of education and research in the Yaquina Marine Biology Laboratory and the Pacific Fisheries Laboratory. The complementary nature of the programs was emphasized. He pointed out that several University Departments (Oceanography, Fisheries and Wildlife, Engineering, Zoology, and Botany) participate directly in programs at the Center with State and Federal agencies (Fish Commission of Oregon, Oregon Game Commission, Federal Water Pollution Control Administration, Federal Environmental Sciences Administration, and U. S. Fish and Wildlife Service).

Oregon State University Sea Grant Program Planning

Bill McNeil, Pacific Fisheries Laboratory, discussed the Sea Grant College and Programs Act of 1966 and indicated that the purpose of the Act was to stimulate development and utilization of marine resources. The Act is administered through the National Science Foundation. Oregon State University has prepared a proposal for a Sea Grant Institutional Program in Oregon. The proposal was submitted in September 1967 to the National Science Foundation for evaluation.

If our proposal is approved and funded, the University will undertake expanded programs in marine fisheries, aquaculture, marine economics, seafood technology, oceanography, ocean engineering, ocean law, and marine technologist training. About 45 percent of the funds requested by OSU will be used for research, 45 percent for training, and 10 percent for extension services. Facilities at Corvallis, Eugene (University of Oregon School of Law), Astoria (OSU Seafood Laboratory and

Clatsop College), Netarts Bay (Aquiculture Research Reserve), Newport (Marine Science Center), and Port Orford (Marine Research Station) will be used to implement a Sea Grant Program in Oregon.

Proposed research in aquiculture will place emphasis on a technology for culturing oyster spat in hatcheries. Ultimately the program with oysters is scheduled to include studies of selective breeding and of improved methods of rearing oysters to a harvestable size.

The OSU Sea Grant Program proposal emphasizes cooperative work with government and industry. The research is intended to provide direct feed-back to the economy of coastal areas through the creation of Model Port Systems. Oyster culture could become an important element of Model Port Systems on Tillamook, Netarts, Yaquina, and Coos Bays.

History and Future of Oyster Culture Research at Oregon State University

Wilbur Breese, Pacific Fisheries Laboratory, described pioneering work on the western (Olympia or Yaquina) oyster initiated by Professor Dimick before the second world war. After the war, the biological studies on oysters emphasized pollution. Presently the program is shifting its emphasis to applied problems of hatchery culture of oyster spat.

University and Fish Commission biologists at the Pacific Fisheries Laboratory are spawning western, European, Pacific and Kumamoto oysters and rearing small numbers of their young through larval stages. The technology is largely adapted from that developed by the U.S. Bureau of Commercial Fisheries at Milford, Connecticut. Limited numbers of western, European, and Pacific oysters have been planted in Yaquina and Netarts Bays. Their growth and survival has been good.

The Botany Department at OSU is cooperating with workers at the Marine Science Center to raise algae as food for larval and juvenile oysters. One troublesome problem in developing a hatchery technology for producing spat is to provide adequate food of the proper type for oyster larvae. We presently culture two types of food algae which afford satisfactory diets for larval oysters but which are difficult to grow in large quantity. University botanists have successfully isolated other forms of algae from bay water which hold promise as food organisms for oyster larvae, and tests are planned on the use of these food organisms. Experiments are also underway to increase production of the two commonly used food organisms.

Pilot production of four kinds of oyster spat (western, European, Pacific, and Kumamoto) will provide young oysters for experimental planting at all seasons. Already we have successfully planted European and western oysters in Oregon bays as early as March. Similar experiments are planned with Pacific and Kumamoto oysters.

Selection and testing of artificial cultch material is also planned. Preliminary tests are underway on a variety of synthetic materials which will be compared with oyster shell. We hope soon to provide Oregon oyster growers with small quantities of hatchery oysters for trial plantings.

The biggest problem now is financing. University support for these studies is very limited for the current biennium. The Fish Commission has enabled the

continuation of this research with money supplied by the Bureau of Commercial Fisheries. We hope that Sea Grant funds will be forthcoming to insure continuation of the program.

Following Professor Breese's presentation, there was much discussion about continued support for this program. It was pointed out to the oyster growers that commodity groups very often influence State Legislative support for University research programs. A request for funds adequate to support University oyster research for the 1967-69 biennium had no apparent support from a commodity group, and the budget request was greatly reduced. However, the Oregon Legislature did authorize \$500,000 of matching State money for Sea Grant Programs. If the National Science Foundation approves the OSU proposal, some of this state money could be made available for oyster research.

Fish Commission Oyster Culture Research and Management

Dale Snow, Fish Commission of Oregon, briefly outlined the responsibilities of the Commission in management and regulation of the oyster industry, and he described the cooperative program of research on oyster culture between the University and the Commission. The cooperative research is presently financed by the Commission with money made available under Public Law 88-309 through the Bureau of Commercial Fisheries. The research is intended to provide a technology for culturing young oysters and clams in hatcheries. Although the program involves Commission and University personnel, there is no duplication of work, since the research biologists work as one team.

Experiments are presently underway on Pacific and Kumamoto oysters. We have successfully cultured young of both varieties in small numbers, and we hope soon to engage in pilot production. We do not intend to become involved with production of oyster spat on a commercial scale. However, we are interested in assisting the oyster industry in developing a capability to produce oyster spat in hatcheries.

Oyster Hatcheries in New England

Bill Wick reported on his recent trip to New England where he visited the Bureau of Commercial Fisheries Shellfish Laboratory at Milford, Connecticut, and private hatcheries on Long Island Sound. Research on culture of oysters in hatcheries was initiated at Milford many years ago by Dr. Loosanoff, who has urged similar work on the west coast. Culture of spat of eastern oysters appears to be economically feasible. Life history of the eastern oyster is similar to that of the Pacific oyster, and there are many similarities between the technology being developed at the Pacific Fisheries Laboratory and that which was developed at Milford.

Commercial hatcheries on Long Island Sound occupy small buildings of about one thousand square feet. In some instances food for oyster larvae is obtained from "pure" cultures maintained in the laboratory, but more commonly food is obtained by natural growth of algae in centrifuged raw sea water. Plastic tiles, impregnated with oyster shell, are sometimes used to collect spat. The cost of producing spat is near \$7.00 per bushel.

Oyster Culture in Japan

Chester Wachsmuth of Oregon Oyster Company introduced Lee Wiegardt of Wiegardt Brothers, Inc. Lee showed a color movie on processing of oyster spat in Japan, and he discussed problems of obtaining an adequate supply of young oysters from Japan.

Production of oyster spat in Japan has been inadequate to supply the needs of Pacific Northwest oystermen in two of the past three years. There are indications that the problem of obtaining an adequate supply of young oysters is destined to become more critical. Oyster spat imported from Korea has thus far proven to be of inferior quality.

The oyster grower presently pays \$16 to \$17 per box of oyster spat delivered to Pacific Northwest ports. It is anticipated that the cost will increase. Pacific Northwest oyster growers presently import 40,000 to 50,000 cases of oyster spat annually. They also plant spat obtained from natural spawning in Puget Sound (Dabob Bay) and British Columbia (Pendrell Sound). Pacific Northwest production is normally less than 20,000 cases annually and is controlled largely by weather (there is little natural spawning in cold summers).

There is no serious problem in marketing Pacific Northwest oysters. If more oyster spat were to be made available, additional production could be sold through Midwest markets such as Chicago. Clearly, the production of oyster spat is a high priority problem which requires solution if the Northwest oyster industry is to expand.

Problems and Opportunities for the Oysterman

on the North Coast of Oregon

Sam Hayes of Hayes Oyster Company reported on oyster production in Tillamook Bay. About 3200 acres of Tillamook Bay has been designated as oyster lands by the State of Oregon, but not all of this area is presently useable for growing oysters. Production is presently limited to about 500 acres.

There have been many ecological changes in Tillamook Bay over the past 30 years which have made much of the bay unsuitable for oyster culture. Many of the original deep-water channels have been filled with mud from logged and burned watersheds, restricting access to many oyster grounds. Construction of highways has reduced the acreage of oyster grounds, "ghost shrimp" have infested many oyster grounds, and pollution from domestic sources and barn yards has created additional problems.

There is concern that deposition of spoils from planned channel dredging will result in the further removal of tidelands from oyster production. However, should the Port Commissions and the Corps of Engineers consider the requirements of the oysterman, dredging could be beneficial to all interests.

Marketing is not a problem, since the supply of oysters is inadequate to satisfy the demand. It would be helpful if a new type of cultch could be developed to satisfy three criteria: (1) easy shipment, (2) no nesting, and (3) no flotation.

Because of the sedimentation problem in Tillamook Bay, it would be helpful to determine the proper age or size of spat before it is distributed on the ground.

Floating culture could be used in Tillamook Bay only if deep water channels were to be provided. However, high winds may create serious problems for anchoring rafts, and the cost of creating channels for raft cultures might be prohibitive.

Problems and Opportunities for the Oysterman
on the South Coast of Oregon

Larry Qualman of Qualman Oyster Farms pointed out that the oysterman in Coos Bay has little assurance that he possesses control over the use of oyster grounds. There appears to be no legal means whereby the oysterman is guaranteed protection against other uses of tidelands, and there is a need for some type of guarantee for continued use of tidelands for oyster farming in most Oregon coastal bays if the industry is to expand in Oregon. This is not a problem in Tillamook Bay where state statutes set aside certain areas as oyster grounds.

Difficulty in obtaining oyster spat is another serious problem. There are areas of Coos Bay which could be used for growing oysters provided there were adequate young oysters available for planting. Opportunities for raft culture of oysters are limited in Coos Bay to a few deeper sloughs. The County owns tidelands suitable for oyster culture, but the Commissioners have not released these tidelands for this use.

"Ghost shrimp" are a serious problem in Coos Bay. These pests could be controlled through the application of insecticides, but the application of insecticides is prohibited because of potential danger to other marine biota and to the health of the public.

University Extension and the Oysterman

Robert Jacobson, OSU Fishery Extension Specialist, outlined three types of fishery extension programs which are presently practiced in Oregon:

- (1) Extension work by the research biologist which is incidental to his primary assignment.
- (2) Extension programs sponsored by producer-cooperatives.
- (3) Extension programs sponsored by universities and agencies of government which utilize professionally-trained personnel.

The OSU Extension Service presently has one full-time fishery specialist headquartered in the Lincoln County Courthouse, Newport. The areas of activity of the agent encompass the entire Oregon coast and all elements of the commercial fishery. The number of fishery extension specialists will be increased as soon as financing can be obtained through Sea Grant College Programs or from other sources. Major functions of a fishery extension specialist are to facilitate the dissemination of knowledge to the industry and to coordinate group actions which will help to insure that the industry will receive the assistance that it requires.

Conclusions

The workshop served to focus attention on two questions of critical importance to the oyster industry in Oregon. First, there is a need for the industry to establish its identity and to make its needs known to Federal, State, and local government. Second, there appears to be little opportunity for the industry to expand unless it is able to develop new sources of young oysters for transplanting. The development of a technology to grow oyster spat in hatcheries is timely, and the oyster growers should consider seriously the possibility of supporting the construction and operation of an oyster hatchery. It was suggested that the Lincoln Development Corporation could arrange financing for a hatchery through the Small Business Administration whenever the technology for a hatchery was sufficiently well advanced to warrant investment of private capital in such an enterprise.

List of participants

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