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# Oysters in the Pacific Northwest

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In the Pacific Northwest, oyster farming is essentially limited to the production of the Pacific oyster, *Crassostrea gigas*, a species introduced from Japan in the early 1940's. Since the mid-1950's, production of this species has fluctuated between 8 and 11 million pounds annually.

Oystermen usually obtain wild "seed" of Pacific oysters from Japan, Washington, or Canada. Seed is commonly spread on the bottoms of estuaries, and the oysters tended for 2-3 years until they attain marketable size. "Off-bottom culture" of oysters using rafts, trays, or "hanging cultches" is practiced by some oystermen; mortality and time required for maturity are reduced by off-bottom cultural methods.

Oysters feed on minute plants called phytoplankton that the animal filters from the water. The growth is frequently determined by the available phytoplankton. Only certain types of phytoplankton are suitable for food and oysters must compete with many other marine animals for food. The supply of phytoplankton is determined by the natural productivity of the water and the absence of environmental contaminants.

Human demands on the estuarine waters increase the potential of oyster mortalities. Recreational use, industrial development, shipping and a growing population near the sea decrease the probability that estuaries can remain suitable for the cultivation of a semi-domesticated oyster. In a complex environment, the oyster grower must have complete control over the entire life cycle of the oyster. In short, the oyster must be domesticated before the art of growing oysters can be turned into a highly productive and predictive aquaculture industry.

A start toward domestication of the oyster was made when oysters were artificially propagated in commercial hatcheries. Artificial propagation permits the genetic selection and the production of superior races adapted to various culture and harvest techniques. Work on selective breeding of oysters is in progress and is the important first step in the developing of a predictable oyster industry.

The second and probably most difficult step in completing the domestication of the oyster will be the development of a satisfactory artificial ration. Currently, culture of oysters depends entirely on the natural production of plankton in estuaries; to utilize the natural production requires much space for oyster beds, and subjects the oysters to pollutants and to unstable food supplies. While cornstarch and other materials have been used to fatten oysters, no artificial ration has been developed that will permit commercial production of oysters in a manner similar to the production of livestock in feed lots.

Let me speculate on a third step in the development of an oyster culture. After a suitable diet is developed for oysters, it will be possible and probably desirable to raise oysters under artificial conditions. I have termed this practice "out-bay culture." Oysters raised in large containers outside bays will permit the oyster grower to exercise greater control over oyster growth and mortality. Out-bay culture will provide a measure of protection against storms and environmental contaminants. Additionally, it will allow a grower to control salinity, water flow, food rations, and temperature.

The three steps I have outlined are major developments that must occur before the oyster culture can become a dependable and predictable industry. Even these major steps are not sufficient to stabilize the market for oysters. The oyster industry needs an oyster that can be marketed during the summer. This "summer oyster" would make oysters a food for all months of the year.

Research aimed at making oyster culture a highly predictable aquaculture practice will pay large dividends. Many of the techniques developed for oysters will probably be transferred to the culture of clams. However, the development of a predictable oyster culture cannot proceed at a leisurely pace. Estuaries are being developed at a rapid pace. Oyster culture must develop beyond the present status of a marginal industry to retain a share of the estuarine resource. The challenge and the opportunity exist to develop greater quantities of oysters and clams by increasing our knowledge of oysters.

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