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SEED SUPPLY OF THE PACIFIC OYSTER, Crassostrea gigas
IN BRITISH COLUMBIA:
PAST, PRESENT AND FUTURE



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The first attempts to establish an oyster culture industry in British Columbia were based on importation of Crassostrea virginica around 1903. High mortalities and limited breeding precluded expansion of these efforts although small populations still remain in the Boundary Bay area south of Vancouver.

About 1912, the first small importations of Crassostrea gigas seed from Japan via Washington State were outplanted at two south coast locations. In 1925, limited natural spatfalls were observed in Ladysmith Harbour; concurrently, seed importations increased both from Washington and directly from Japan (15,000 2-3 yr. olds, 2,000 cases respectively).

By the 1930's, seed was being planted at a number of sites in the Strait of Georgia. These stocks experienced a general spawning in the summer of 1942, with the resultant seed in part replacing Japanese seed, unavailable during the war.

After World War II, seed imports from Japan were reinstated and remained the mainstay of supply for the B.C. industry until the early 1960's. Three factors led to the decline and eventual cessation of Japanese seed imports by the 1970's:

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1. 10-fold increase in Japanese seed price and reduced quality;
2. A general spawning producing very large populations of wild stock;
3. Recognition of Pendrell Sound as seed area.

(1) The first of these involved another general spawning of oysters in 1958, which heavily seeded beaches throughout the strait. As this stock matured in the early 60's, the industry switched from a culture based operation to an increasing reliance on harvesting of wild stock throughout the 1960's and early 70's.

(2) Secondly, in the late 1940's and early 1950's, Pendrell Sound, approximately 140 km N.E. of Vancouver, was identified as a potential oyster breeding area. Yearly monitoring by Fisheries Research Board Staff showed, in fact, successful annual commercial recruitment ($> 10-15/\text{shell}$) from 1948 to 1972, with sets sometimes exceeding 1000 spat/shell. 1973 produced the first commercial spatfall failure. At the peak of utilization, over 300,000 strings were hung in Pendrell Sound with a value 1985 of 1.2 million (1985) dollars. It is interesting to note, however, that the majority of seed collected in Pendrell Sound in this period was exported to Washington and California, with little finding its way onto local beds.

In the late 70's, extensive harvesting of wild stocks and lack of further broad scale recruitment created a continuing decline in availability of natural populations. This led to a resurgence of interest in seed collection by local growers, particularly many of the new growers who had entered the industry about this period. These efforts were for the most part, poorly managed and/or of insufficient scale to justify the effort. As well, rapidly increasing fuel prices were making the cost of seed a prohibitive 25-30% of final product cost. Despite collection efforts, lack of management experience, combined with an increasing inconsistency of Pendrell Sound spatfalls, has done little to solve the industry's chronic seed shortage.

It became obvious that some alternate form of seed procurement was needed to stabilize the industry and reduce costs. In light of this, a study was funded, in 1981, to look at the remote setting techniques used by growers in Washington, Oregon and California. These techniques were then setting the equivalent of 50,000 cases of seed/year (1 case 100 shells or 12,-20,000 oysters).

The remote setting procedure entails the transfer of oyster larvae, which has reached the presettlement eyed stage, from the hatchery to a remote facility and the setting of that larvae onto suitable cultch. A number of requirements are necessary for successful remote setting including:

- (1) healthy, large (>300u) eyed larvae;
- (2) proper temperature control during transport;
- (3) suitable tank facilities;
- (4) suitable water quality (salinity, non-polluted);
- (5) suitable cultch (clean shell, well leached plastic materials);
- (6) temperature control during settlement;
- (7) aeration for larval dispersal;
- (8) 1-2 years experience.

From an industry perspective, remote setting techniques can:

- Decrease seed costs through the reduction of cultch and equipment transportation costs usually associated with collection of natural seed in areas such as Pendrell;
- Increase efficiency and reliability of seed production;
- Produce all of the cultchless seed required by the British Columbia halfshell industry;

- allow for early sets and increase first year growth and subsequently decrease overall production time from seed to market.

To date, the B.C. shellfish industry has been quick to adopt these new remote setting techniques. There are currently 13 remote setting sites in B.C. utilizing 25 tanks, compared to 1 site and 2 tanks in 1981. Industry surveys in the spring of 1984 indicated planned setting of 850 million Pacific larvae. While figures are not complete for 1984 the numbers will probably be considerably lower. One reason for this was the difficulty some operators had in obtaining high quality larvae.

The industry is currently setting approximately 30-40% of seed totals utilizing remote setting. A number of factors will likely see the local shellfish mariculture industry swing more and more to remote setting. Among the most prominent of these are:

- (1) the impending introduction of large scale (10\$) investment in shellfish mariculture; large volume, vertically integrated companies will need the reliability of remote setting;
- (2) the success of present remote systems operators in terms of production and economics, will inevitably draw in more industry members;
- (3) the development of new hatcheries in British Columbia (2 proposed) and recent existing bivalve of the existing facility will provide better assurances of large volumes of high quality larvae;
- (4) requirement by the regulatory agencies that leased foreshore be utilized to minimum standards, thus forcing industry members to collect and spread or hang more seed;
- (5) introduction of new cultured species such as scallops and clams which will require hatchery produced seed.