

RECENT DEVELOPMENTS IN THE NEW ZEALAND ROCK OYSTER
FARMING INDUSTRY (1970-72) AND PROBLEMS REGARDING AQUATIC POLLUTION

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Abstract

Recent developments in the New Zealand rock oyster farming industry are reviewed and problems regarding pollution, leasing of suitable waters and conflicts with recreational uses of coastal areas are considered in relation to the future development of the industry.

Lack of prescribed standards for determining the quality of cultured oysters and the resulting interpretations by various concerned agencies of the methods used for this purpose has become a major problem for the industry. A possible change of the present concept of determining oyster quality by examination of the meat to one based on water quality is of serious concern to farmers in view of the high standards set for waters of SA quality.

Recommendations for suitable water quality standards, control of coastal pollution and multiple use of coastal areas are given.

1 INTRODUCTION

The industry is generally making steady progress, with cultivation changing from tray maturing of natural oysters to the catching and maturing of oyster spat on sticks. Our biggest setback has been the catch of an Ostrea species on the sticks at Mahurangi River. All such sticks supplied to farmers are being replaced by the Fisheries Division. This coming season will see the final replacement, bringing the total to 150 000. The magnitude of oyster production in New Zealand is shown in Table I.

2 SPAT CATCHING

The settlement of this Ostrea species on our main commercial field was an unfortunate occurrence. It was not in evidence last season to any extent. To overcome the problem our catching racks were raised to two higher levels. They are now 23 cm and 46 cm above the original level. We feel it is better to catch at these higher levels, perhaps accepting fewer Crassostrea, than to risk a heavy settlement of Ostrea lower down.

Two harbours just north of Mahurangi River (Whangateau and Mangawhai) have shown good prospects for development as spat catching areas. Settlement has been heavy enough for commercial purposes and remarkably free of competitors. The bottom is hard sand, easily worked, and easy access is provided.

We have abandoned attempts to establish a major spat catching area on the West Coast. Apart from having no catch at Kaipara for three years, the soft bottom and strong run of tide coupled with the area's inaccessibility make it unsuitable for major development. The only benefit to come from our attempts at spat catching here has been the good settlement of the green mussel Perna canaliculus on collectors at lower levels.

A reinforced-concrete stick (2.5 cm x 2.5 cm x 112 cm) has been developed for use in exposed growing areas and has proved suitable. Tarred hardwood sticks have proved satisfactory and are far cheaper than other materials. Problems inherent in their use are the need to import materials and the barnacle problem in growing areas. Aluminium and acrylonitrile-butadiene-styrene have also proved satisfactory for catching materials apart from cost.

3 GROWING AREAS

Growers have become aware of the need to produce an oyster in prime condition. It is now normal practice for oysters matured on the West Coast to be taken to harbours on the East Coast for fattening before sale. Harbours north of Bay of Islands show very good prospects for successful cultivation. One possible major problem that has shown up in the lower reaches of these harbours is the heavy mortality over the winter months at levels just below the optimum growing height. Whether this will extend to higher levels in dry winter seasons is not known.

It is now apparent that unless an economic method of overcoming the Modiolus fluviatilis problem in Kaipara is devised, cultivation there by modern methods will not be possible. However, it is possible to develop the vast areas of hard shore in rock cultivation to provide stock for trays on the East Coast. Recently, Government rock beds some 40 years old have been relaid in orderly pattern with excellent results. These rocks provide the bulk of natural oysters supplied to farmers today.

4 NEW EQUIPMENT

The past two years have seen the introduction of small pneumatic hand tools for use in culling oysters singly for sale. Undoubtedly, as far as the oyster farmer is concerned, this is the greatest invention since the wheel. The monotonous, time-consuming task of culling by hand chisel has been overcome. Two types of tool are in use: a Gardner Denver pin riveter for light culling of stick oysters and a Broomwade BX78A chipper for heavy work. Installation is inexpensive, both operating off an air supply of 0.3 m³/min at 5.6 kg/cm².

5 FINANCIAL ASSISTANCE TO INDUSTRY

Government finance has been made available for establishing oyster farms in approved areas. Generally loans meet half the development costs with a maximum limit of \$10 000. The oyster farm is accepted as security and the lessee must provide the other half of the capital required. Repayments are deferred until the farm has been producing for two years.

6 LEASING

Practically all areas suitable for the methods of cultivation now employed have been leased or applied for. Public opinion is strongly against the leasing of the few deep-water bays suitable for raft culture. There are few areas of suitable bottom available for dredge beds even if this could be shown to be economic. Any major expansion will have to be in enclosed pond culture for which many large areas are available. The first requirement is, of course, to develop the necessary techniques.

7 PROBLEMS REGARDING POLLUTION

Bacteriological pollution, or more specifically, the interpretation by various Government agencies of the methods for determining when an oyster is bacteriologically polluted, has suddenly become a major problem for the industry.

There are no prescribed standards under New Zealand legislation for determining whether an oyster is to be regarded as wholesome or not. However, it is customary for the authorities to regard shellfish showing less than 230 faecal coliform/100 g meat as being satisfactory. This corresponds with the United States National Shellfish Sanitation Programme standard for shucked oysters at the wholesale level. It also conforms with the British Standard where it is expected that regular samples of shellfish from a particular source should contain not more than 2 *E. coli*/ml with only occasional samples yielding five or more. Shellfish meeting this standard are regarded as offering no risk to the consumer.

There is a growing concern among the majority of farmers that Government Agencies (possibly influenced by representations made by a small minority of growers who mistakenly believe a fortune awaits them on the U.S. market) may alter the present concept of determining oyster quality by an examination of the meats to one based on water quality.

Under such a system farmers fear they may be required to depurate or at even greater expense, relay their crops unnecessarily. A system whereby it is prohibited to harvest oysters from waters of a lesser quality than, say, that prescribed for an approved area under the USNSSP, will ensure that such oysters are wholesome. However, it certainly does not follow that oysters taken from waters of lesser quality are unwholesome.

Therefore an examination of water quality alone will not show that the shellfish are polluted unless the precise relationship between faecal coli in the water and pathogens in the shellfish are known. This relationship is a complex matter depending on many variables. No research has been carried out in New Zealand waters concerning the species being farmed.

The adaption of a system of restricted harvesting based on water quality alone would seem to be in complete contradiction to the legislation under which people have been encouraged to take up leases and invest their capital. This Act requires that it be reasonably shown that shellfish are polluted or are likely to become polluted before the lessee is directed to take certain steps to remedy the situation, or the area closed.

It is felt by most growers, including this author, that this requirement of suspecting the oysters to be contaminated or of being likely to become contaminated can only be met, in the light of present knowledge, by a regular bacteriological examination of the meats.

8 CLASSIFICATION OF WATERS IN NEW ZEALAND

Recent legislation provides for the classification of all waters, fresh and salt, in New Zealand. This limits the discharges into them to ensure that they are not reduced to a quality below that prescribed for each particular area.

This is an admirable concept but its application has proved a disappointment to the oyster farming industry. The main concern is the unrealistically high standard set for waters of SA quality. This is the highest quality of seawater and, in theory, is to be maintained over shellfish areas. This standard, among other requirements, prescribes a median value of 70 total coliform bacteria for 100 ml water. It is difficult to understand why such a standard was imposed. While it is desirable to be aware of the total coliform count of the water it is only the faecal coliforms that are of any significance as an indicator of pathogenic organisms. Even the USNSSP recognizes this fact; its standards are expressed in coliforms but it carries the rider that they are to be disregarded if they are not of faecal origin.

It is felt that if a more realistic faecal coliform standard were to be adopted for SA waters, areas so classified could be extended to cover a larger proportion of the major shellfish producing harbours. The present system of classifying small pockets of water SA and then permitting the large surrounding body of water to be polluted to a lower level provides no comfort for the shellfish farmer.

One final cause for concern is the constitution of the Water Resources Council under the recent amendment to the Water and Soil Conservation Act. It is a great disappointment to the industry that no biologist from either Fisheries Division nor any representative of the Fishery Industry Board has a place on the Council although the polluters (actual and potential) are well represented.

9 RECREATIONAL CONFLICTS

There are some who feel that oyster farming and recreational uses of water are incompatible. However, careful consideration of the matter reveals that this is not the case at all. The current practice of farming inter-tidal lands, given certain safeguards, should cause little, if any, conflict with recreational users. This is particularly true if it is realized that areas suitable for farming are very limited and comprise a small percentage of the total area of any harbour. Areas suitable for recreation - deep water, open spaces, sandy beaches - are not attractive to the oyster farmer.

Areas used regularly for swimming, boating, fishing or shellfish gathering, have been regarded as not available for leasing. With the recent passing of the Marine Farming Act they can now be legally defined as such. Leases are granted on the long flats of shallow bays with inner boundaries no closer to shore than where there is 0.3 m of water at low water neaps. Outer boundaries generally extend no further seaward than where there is 0.5 m at low water springs. Swimming in such shallow bays takes place two hours either side of high tide, inshore from the leases. Similarly boating has caused little interference. The areas are too shallow for anchorage and access is always provided to gain the shore at high tide. The construction of an oyster farm need not adversely affect net fishermen although they will be inconvenienced by the necessity to set nets more carefully. Along with the inconveniences there are some advantages in that the community of marine life built up around a farm can improve the fishing in the immediate area.

Apart from recreational users, further conflicts arise from three broad groups of people. The first group comprises those with interests ashore concerned with the tourist industry. They object on the premise that oyster farms hamper the tourist trade. There seems to be no evidence to substantiate this view. The second group comprises those who feel that oyster farms will detract from the value of their on-shore property. Into the third group fall those presently polluting the waters who fear that the establishment of farms and subsequent classification of the waters will bring about strict waste disposal regulations. Both oyster farmers and recreational users should find common ground for agreement here.

In conclusion it should be recognized that in some cases oyster farmers are responsible for the conflicts that arise. The average New Zealander appreciates his surroundings and takes pride in the neatness of the countryside, his home and his possessions. It is against this sense of neatness and orderliness that some oyster farmers offend. One cannot define what is aesthetically correct but the difference between neatness and untidiness is apparent to everyone. Legislation should be strictly enforced to ensure that all farms are erected correctly with rows of oysters evenly spaced, straight and level. No posts should protrude unevenly above the racks and all marker posts should be erected level. Shore installations should conform to the building standards of the area. If this is done it will facilitate the recognition of oyster farming as a legitimate use of coastal waters.

Table I Oyster Production (in Sacks)

1 sack = 1 000 oysters approximately

Natural oysters picked from foreshores for maturing	1969	1970	1971	1972 (to July)
Bay of Islands		2 625	1 407	596
Kaipara		4 365	3 285	2 564
Coromandel		1 042	154	15
Hauraki Gulf		743	295	193
TOTALS	9 395	8 975	5 141	3 368

Production from farms of matured oysters: all areas	1969	1970	1971	1972 (to July)
Government farms	1 824	452	1 467	366
Private farms	3 275	4 459	4 906	2 317
TOTALS	5 099	4 911	6 373	2 683