



Australian Government

**Fisheries Research and
Development Corporation**

**People development program: Visiting expert pearl
technician- Increasing Akoya pearl production
profitability in NSW through improving seeding
technical skills**

FINAL REPORT

Project No: 2008/328.15

Broken Bay Pearls



FINAL REPORT (DEVELOPMENT AWARD)

AWARD CODE and TITLE

2008/328.15 People Development Program- Increasing Akoya pearl production profitability in NSW through improving seeding technical skills.

AWARD RECIPIENT: Broken Bay Pearls Pty Ltd

ADDRESS: Broken Bay Pearls

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DATE: 29th June 2012

ACTIVITY UNDERTAKEN

Working with international experienced pearl technicians to benchmark and develop pearl seeding technical skills in NSW.

OUTCOMES ACHIEVED TO DATE

Kazue Chiba, a pearl seeder with long standing international and local experience in seeding Akoya oysters visited Broken Bay Pearls (BBP) to work directly with our chief seeder, Rose Crisp, for the transfer of knowledge and techniques. During the course of the visit, over 8500 shell were seeded. Data relating to the seeder (Kazue or Rose), the size of the oysters, the seeding techniques used (double or single nuclei etc) and the farming methodology applied was collected.

One of the primary objectives of this project was to improve the quality of the pearls produced, which will increase value of the pearls. While we will not know the full outcome of this until the pearls are harvested in June 2013 we are confident that the seeding changes made this year under Kazue's tuition will result in technical improvements. Analysis of data to hand has demonstrated that refinement of seeding technique can both significantly improve both post-operative mortality and the percentage of pearls retained by the host oyster (reduced nuclei rejection). When pearl quality data is available comparisons with previous production data will occur. Comparisons will include colour ,size, shape and nacre thickness across the crop.

Beyond measurable improvement in pearl output and potentially quality, this program has served to establish linkages for future technological development at BBP. Plans are being made for further joint seeding exercises and the basis for skills developments in other farming practices are being investigated. Those plans will also seek to develop stronger collaborative ties with akoya farmers in other areas of Australia.

Acknowledgments

Our sincere thanks are extended to Kazue Chiba for her willingness to share her considerable knowledge. Thanks are also due to Pia Bsochetti and Murray Davidson of the Abrolhos Pearl Producers association for assistance in acquiring Kazue's services.

A big thanks go to Dr Wayne O'Connor from NSW Fisheries. His input continues to be a valuable asset to BBP's continued development.

Background

Investigations for the potential for pearl production at Broken Bay in NSW began in 1999. As a result of these investigations BBP was formed in 2003 and have progressively worked to increase production and improve pearl quality. BBP first seeded oysters in 2005/2006. Initially training in seeding operations was received from an ex Port Stephens Pearl technician and then during short term visits by Japanese technicians and BBP's lead technician has now been producing pearls for 5 years. Due to the unique conditions present in NSW, pearl quality has been high and extremely well received by the jewellery market, but those conditions also necessitate both adaptation of existing pearl production technology and the evolution of seeding techniques.

One of the key objectives for BBP is to increase the quality of pearls produced and the overall crop size. The Australian Pearl industry at the retail end is dominated by relatively small cheap imported pearls at the bottom end and at the top end dominated by large expensive pearls, so we recognise a potential market gap for high quality Australian grown pearls somewhere in the 7.5 mm to 10mm range. Also another key factor is the location of BBP, as the latitude in which we operate. (although in the traditional Australian pearl industry context we would be considered to be a long way south). This has proved to be very suitable for Akoya pearl production as we can produce high lustre and very good natural colours without the need to bleach and dye the pearls, this is an important market point as most if not all of the Akoya pearls currently imported undergo some sort of artificial treatment.

To lessen our risk in the winter BBP has been exploring a more oceanic site to move to for the winter months this is difficult to find on the NSW coast as it can get very rough seas in the winter, this is one project that will require considerable work and support from NSW Fisheries Department Of Primary Industries.

Need

BBP has invested heavily in an Akoya pearl farm in NSW, and this has been a high-risk venture. We see that our biggest challenges in the current economic climate are the maintenance of profitability in a depressed pearl market and the continued development of our workforce skill base. In comparison to other Australian pearl operations, BBP cost of pearl oyster production is low and so major opportunities for profitability increase lie in improvements in the percentage of saleable pearls and increased pearl quality. These factors are a function of the skill of the pearl technician. BBP's lead technician Rosanna Crisp was trained by an ex Port Stephens Pearl technician, and obtained further training from a visiting Japanese expert, but both experts recognised need for seeding protocols to adapt to NSW conditions. Rose has reached the point where further tuition and the opportunity to discuss potential modifications to techniques would be highly beneficial. Through benchmarking BBP seeding technology against that of international technician we hope to both quantify potential improvements in seeding success and work towards

realising those improvements. Rose would then be instrumental in the disseminating those skills and techniques to others within BBP.

The technician to be employed works regularly in WA and we hope that experience gained in NSW would then in return be available to Abrolhos farmers. BBP looks forward to maintaining close links with WA pearl producers.

Objectives

The objectives of this program are:

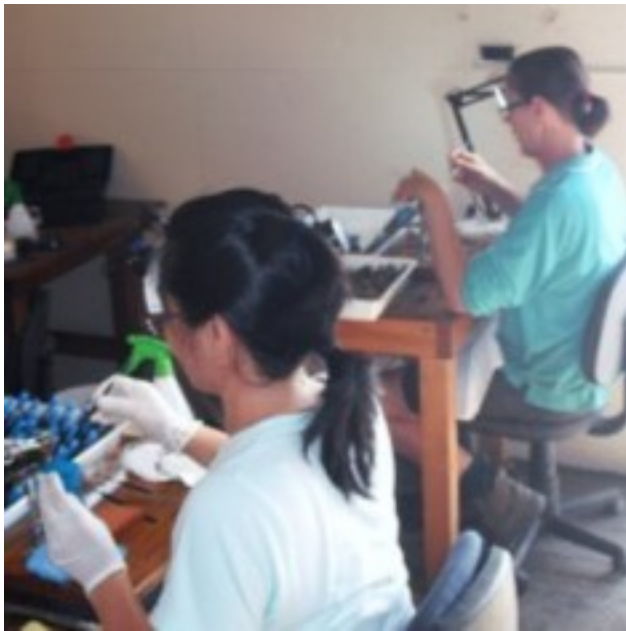
- to increase profitability through increased pearl quality,
- to benchmark current technical skills against international best practice,
- to reduce post operative losses,
- to increase nuclei retention rates, and
- to increase the percentage of saleable pearls per crop.

Methods

The program began with the discussions with other pearl producers to access the services of a suitably experienced pearl seeding technician. Kazue Chiba was contracted because of her extensive experience in seeding pearl oysters.

Kazue has experience in seeding akoya, blacklip and silver lip pearl oysters in Australia, Cook Islands and Tahiti. Kazue was trained to seed akoya by a Japanese technician Zenichero Yamashita who has 60 years experience in seeding akoya in Japan. Kazue is fluent in English and this was seen as a great advantage to be able to communicate and discuss issues without hinderance.

The project involves stages over 3 weeks in which Rose and Kazue worked side by side operating commercial stock.



Kazue and Rose seeding

- 1) A comparison (benchmarking) of BBP seeding technology was made against international practice, including 'saibo' (implanted tissue) preparation and pearl seeding operations.
- 2) A period of collaborative seeding was undertaken in which advice was sought to modify/improve BBP techniques.
- 3) The two seeders then tested potential modifications to techniques that arose from discussion during the earlier seeding exercises.

The outcomes of each stage will be evaluated using BBP's system for evaluating pearl seeding data. This system records critical data including; initial host oyster condition, nuclei size, post operative survival, pearl retention rates and pearl quality (size, shape, surface, colour, lustre). Seeders were capable of operating in the vicinity of 350-400 oysters per day and thus sufficient pearls (>1000) are expected to be retrieved to effectively compare performance during each comparison. On each occasion, technicians used common stocks of similar size and age to prevent any initial bias. BBP will have the various batches of pearls produced professionally valued through their current commercial contacts.

Results/Discussion

Improving seeded Shell stock management to improve pearl quality

Discussions with Kazue looked to improve our management of the seeded stock in the second year, particularly coming out of winter and before it is placed in the deep water finishing lease.

Kazue expressed very firmly the view that improving shellstock management throughout the entire shell production cycle should improve results, this does however increase production costs so BBP will need to assess each step and make decisions based on any significant changes.

Reducing rejection rates by better saibo selection

The changes Kazue introduced focussed largely on refining the selection process and preparation of the saibo tissue and increased precision in the placement of the saibo tissue within the host oysters. Selection of the tissue is a very important step and one that is increasingly being focused on in other pearl producing sectors.

At the end of Week 1, Kazue and Rose concentrated on the differences in saibo size, and it was agreed that Rose was cutting her saibo approx. 50% smaller than Kazue, and that Rose should move to cutting larger saibo implants. This may certainly improve post operative rejection rates, the data in appendice 1 may indicate this as the rejection rates for Rose certainly improved in weeks 2 and 3.

One thing we can do leading into the 2012/2013 season is to focus on the preparation of saibo shellstock at the same time we prepare host/mother stock for seeding as this would enable us to produce saibo stock that is more consistant in health and condition and is therefore more likely to have a more consistent and fuller saibo mantle tissue .

Recovery methods

BBP employs the traditional Japanese recovery technique and this has proved to work very well ,as a result we are able to collect accurate recovery data.



Oysters in recovery box.

Improving quality through improved shell selection and management

Another observation that was made during the seeding time was the obvious colour difference in the saibo stock that was moved earlier up the estuary compared to that from down the estuary .

Clearly another key point in the pre seeding shell management is the conditioning of the shell stock, this is an area were BBP has spent considerable time and experimentation, we believe we are getting close to a good formula for reliable and consistent conditioning. However we recognise that we still need to fully understand the process and make improvements where possible. Kazue believes that additional bisus break

approx. two weeks before seeding may be very beneficial in weaking the oysters,also try to prepare the oysters prior to going into the boxes earlier so that we may have a more even gonad condition in the oysters .

For the 2012 /2013 season BBP will introduce these steps into our program.

Improving pearl quality through increased rigor in donor shell selection

Kazue introduced a much more detailed look at the lustre in the donor shell stock before it was used for siabo tissue. BBP had previously selected on colour only and as a result Kazue felt that we would increase pearl quality by being more selective with the lustre of the shell. The down side of this adoption is that you need significantly more donor shells to chose from, although this should not be a problem as long as we plan for this well before the stock is needed.

Reducing rejection through increased seeding hygiene

We also introduced an improved seeding tool hygiene management into the seeding shed, although only a small change it may result in less infection in the shell and is more along the lines of excepted standard in other pearl sectors.

This was basically using alchol as a sterilsing agent in the past we only used boiling water.

General comments from Kazue Chiba Appendix 2

BBP Business and Career Development

As the project manager I am pleased with the outcome from the project. Very early on in the project Rose and Kazue formed a very good working relationship and this allowed for a very productive transferr of ideas and knowledge from both seeders. As Rose has had number of years seeding for BBP the concern was that Rose has not had the advantage of an existing pearl industry in NSW to call upon.

A thorough inspection of key aspects of the seeding process was undertaken over a three week period with particular attention to saibo placement and selection as well as nuclei placement. In addition, a broad but quite detailed look at all of the farming procces was discussed, this has led to a number of shellstock management practices to be introduced or altered.

As a result of this project Rose has since been invited to WA to assist in Akoya pearl seeding, clearly a good outcome for establishing close links with WA Akoya pearl producers and one we will capitalise on in the coming years.

Zenicherio Yamashita, (Japanese seeder with 60 years experience) has also indicated that he would be interested in coming over to assist us in the next season or two.

The rejection rates, the number of oysters seeded, the % of dead oysters, the % of rejected beads, the panel net numbers and colour codes for each seeder are recorded in Appendix 1.

Benefits and Adoption

The primary beneficiary of this project is BBP, who through increased staff skills expects to increase pearl numbers and pearl quality. Improved technician skills can decrease post operative stock loss, increase pearl retention rates and improve overall pearl quality. Collectively we hope to realise a 10% increase in crop value through increased pearl retention and increased pearl quality. While the full extent of the changes to current operating procedures will require the completion of this trial, a number of changes to practices (ie: increased hygiene) have already been adopted.

As a result of this project and the relationship developed with Kazue we are confident that we will be able to employ Kazue and possibly other WA pearl technicians. This could benefit both NSW and WA. In NSW our seeding occurs in the summer months opposed to WA that seeds in the winter months so this creates an opportunity for WA seeders to pick up extra seeding work through summer. This could serve to increase interest among seeders in servicing the developing akoya industry in Australia, providing a fundamental resource need for industry growth. versa.

BBP will prepare a brief report on the outcomes of these trials and it will make the report available (in confidence) to the Abrolhos pearl producers association.

Further Development

Two primary opportunities for further development were evident during this project.

1) Improved conditioning protocols for oysters prior to seeding is an area that continues to be a challenge. One of the advantages of Brisbane Waters for pearl production is the very high levels of plankton and nutrients, that while great for overall pearl and shell production, pose challenges for conditioning, which seeks to reduce the general physiological condition of the oysters . This is particularly so when a primary period for conditioning occurs in spring, which coincides with a rising water temperatures and the oysters starting to recover and grow from the cooler winter water temps. While we believe we have a reasonably effective conditioning protocol, there are certainly variables and unknowns in this process that would benefit from further research.



Oysters in conditioning box.

2) Clear benefits, not only to BBP were evident in this study. Kazue was exposed to a unique set of environmental and operational conditions that will expand her knowledge and experience. While we plan to continue this relationship, it is clear that reciprocal staff exchanges between NSW and the Abrolhos at many levels, from oyster husbandry to marketing, would also be beneficial.

Appendices

Appendix 1 Kazue Recovery results

Appendix 1 Rose Recovery results

Appendix 2 Kazue comments

Removed by FRDC for reasons of commercial confidentiality

