



Enhancing bivalve production in northern Vietnam & Australia

Overview

The aim of this project is to increase hatchery-based bivalve mollusc production in Vietnam and Australia and expand opportunities for coastal communities to rear molluscs.

Building on the success of earlier ACIAR programs, the oyster industry in Vietnam continues to grow and expand. Farming is now spread across 28 provinces and production has been estimated at 15,000 tonnes/annum. Community involvement is increasing and the processing and marketing sectors are expanding. To further industry development we have confirmed the key species produced is the Portuguese oyster (not the Pacific oyster) and that the stock currently present within Vietnam are sufficiently genetically diverse to form the basis of a breeding program. The first 100 oyster families have been bred and have been assessed for key performance traits including growth and survival. The best performing families are currently being used to produce seed for evaluation by commercial partners.

A water quality monitoring program has begun in Vietnam to collect environmental data on farms that includes nutrients, metals and phytoplankton diversity. Oyster health is being monitored through routine collection and archiving of samples. Emerging challenges, such as low overall oyster survival, attributed to flatworm and mudworm infestations, are being addressed through research to identify the pest species and to establish management/controls.

Within Australia, the development of the improved molecular tools for the assessment of genetic diversity in Sydney rock oysters has led to significant changes in the Sydney rock oyster (SRO) breeding program. An archive of flat oyster samples collected from across NSW has now been processed to provide greater insight into reproductive behaviour in the species, while routine monitoring of pipi populations has discovered a hitherto unknown parasite (fish blood fluke) in the gonad and has prompted work to quantify the prevalence of the parasite and gain an understanding of its potential impact on pipi ecology.

ACIAR project number	FIS 2010/100
Start date and duration (years)	01/07/2013 (5 years)
Location	Vietnam
Budget	\$1,491,180

Project leader(s) and Commissioned Organisation

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Partner country project leaders and their institutions

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Research

Objectives:

1. Improve hatchery reliability (algal and larval systems in government and private facilities) for the production of oysters and clams to increase seed outputs.
2. Improve oyster broodstock management and establish the basis for bivalve breeding programs to improve seed quality.
3. Develop the basis for cultivation systems designed to increase oyster marketability.
4. Develop a bivalve health and environmental management program.
5. Develop the capacity for researchers, technicians, managers and farmers to safely and sustainably regulate the development of the bivalve industry.
6. Extend the scientific, social and economic benefits of improved bivalve culture technology to other areas of Vietnam.
7. Investigate three species (flat oysters, pipis and razor clams) that show potential for successful aquaculture in Australia.

Achievements

Oyster production continues to grow in Vietnam, community involvement is increasing and the processing and marketing sector is expanding. Farming is now spread across 28 provinces and production has been estimated to have reached 15,000 tonnes/year.

- » Questions regarding the species under production have been resolved and it has been confirmed, through molecular technology developed by program participants, that the species is the Portuguese oyster, *Crassostrea angulata*.
- » We have identified broodstock populations and quantified their genetic variability to permit the establishment of a breeding program.
- » The replicated rearing systems necessary for family line breeding have been constructed and the first 100 families have been produced for evaluation. Performance assessments of these families have been completed and the most promising families have been selected for seed production for distribution to commercial partners for large scale evaluation. A second generation of families will be produced this year.
- » Disease identification workshops that trained RIA1 staff in histopathology and electron microscopy have been conducted. Increasingly knowledge is now being shared with researchers at other government institutions and universities in Vietnam.

- » We have compiled observations of flat oyster reproductive condition across four estuaries in NSW to inform hatchery production schedules.
- » A previously unknown parasite affecting reproduction in the pipi (*Donax deltoides*) has been identified.

Impact story

Mr Vu Van In is a John Allwright Fellow studying genetics and reproduction at the University of the Sunshine Coast, Queensland. According to Mr In, “being involved in the oyster breeding program in Vietnam is the most exciting part of the PhD, where I can apply what I have learned in practice.” Breeding oysters was no longer a problem for the RIA1 staff, who had become familiar with it through a previous ACIAR project. However, producing a large number of single family lines in separate batches was a new challenge. As the saying goes - the first step is always the hardest.

“After two initial failures, refinement of the systems and technical advice from our partners at NSW Department of Primary Industries, finally there was light at the end of the tunnel”.

Now the staff at the RIA1 National Marine Broodstock Center at Cat Ba are managing 100 healthy oyster families that are being reared at commercial grow-out sites (Van Don and Cat Ba, Vietnam).

“It’s a promising start for the oyster breeding program in Vietnam.”



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