



## REPROSEED

**Research to improve Production of Seed of established and emerging bivalve species in European hatcheries**

### The Challenge

The need for hatcheries is growing in Europe due to demands from the shellfish industry for quality juveniles and concerns about wild seed due to inconsistent spatfall or environmental harm caused by seed collection of some species.

Production of bivalve seed in hatcheries and nurseries is a relatively new industry for which most methods have been developed using empirical approaches, adapting methods across species and measuring the resulting effect in terms of growth and survival.

Applied research on biochemistry and physiology have provided a better understanding of the effect of biotic and abiotic factors, but most of these studies have only had a limited impact on the industry.

To date, a few bivalve species of major aquacultural importance in Europe have benefited from newly developed genomic resources and approaches (e.g. microarrays for gene expression studies and 2D-DIGE for proteomics) and from technological innovations (e.g. flow-through rearing, automated monitoring, etc.).

The main concept of REPROSEED is to link pure and applied approaches to examine complex biological processes and provide innovative technology in order to improve bivalve seed production in Europe

### Project Objective

Secure and stabilised hatchery production of bivalve seed.

Development of innovative new methods will lead to high quality seed of guaranteed physiological health, sanitary status and genetic diversity. By considering the biology of bivalve life stages and the trophic and microbial environment of rearing conditions REPROSEED researches ways of controlling key processes, like reproduction, larval rearing and metamorphosis. New technological advances, like recirculation systems and outdoor algal culture, will provide ways to reduce costs.

### Key Points

- REPROSEED investigates the physiological basis of early sexual maturation, gamete competency, immunity and metamorphosis, at cellular and molecular levels, including genomics and proteomics.
- Application of these results and dedicated studies will be made on practical aspects of controlled bivalve reproduction, nutritional needs for broodstock conditioning larval growth and metamorpho-



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### EATiP Thematic Area of Relevance

**TA1:** Product Quality, Consumer Safety and Health

**TA2:** Technology and Systems

**TA3:** Managing the Biological Lifecycle

**TA4:** Sustainable Feed Production

**TA5:** Integration with the Environment

**TA6:** Knowledge Management

**TA7:** Aquatic Animal Health and Welfare

**TA8:** Socio-Economics and Management

### Key Words

Bivalve, molluscs, hatcheries, culture methods

### Project Information

**Contract number:**  
245119

**Contract type:**  
Small or medium-scale focused research project

**Research area:**  
KBBE - Improving mollusc spat production in hatcheries

**Duration:**  
48 months (01/04/2010 – 31/03/2014)

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Home-page



sis (including testing of mutant yeasts and lipid microcapsules these aspects were removed during the negotiation) and the **benefits of probiotics** (this part will be very reduced) Advances will be shared with end-users throughout the project

## Key New Knowledge Expected

- Improved methodologies
- Developed and optimised new production processes.

## Potential Impacts



### RTD

- The comparative approach of “emerging species” and “established species” key traits will directly contribute to a better understanding of their physiological basis at both the cellular and molecular levels.
- The optimisation of new technologies (e.g. controlled re-circulating systems) could allow hatcheries to use rearing methods that better fulfil the biological requirements of bivalves at early life stages than traditional methods



### SME

- Innovative new methods could contribute to reliable production of better quality seed at lower cost.



### Knowledge Transfer

- It's very important that the technological improvement and advancement of knowledge (common needs generic to bivalve species) are communicated directly to the bivalve shellfish industry to allow a better management of hatchery practices,
  - Firstly the end–users will be regularly informed through common meetings by different publish brochures and the web site
  - Secondly an enquiry directed by the SYSAAF is already launched on the state of art in commercial bivalve hatcheries in Europe .,
  - Thirdly applications of new systems including mass algal production in continu systems and larval production in Recycling System are planned in some hatcheries during the last year of the project. (see WP1)
  - Finally the end-users are closely associated with the project since they will represent by two hatcheries as full partners and two other as third party.

## Related Publications/Projects

SETTLE (<http://settleproject.com/>)

- The SETTLE project will focus on key events during hatchery production of flat oyster (*Ostrea edulis*) and great scallop (*Pecten maximus*) which are species native to Europe. Flat oyster and great scallop are both highly valued and sought-after products on the European seafood market, but insufficient numbers of high quality seed severely hamper aquaculture development of this sector.
- The overall objective of the SETTLE project is to foster predictable production of spat in hatcheries by controlling gonad development and maximising larval metamorphosis and settlement. Hatchery production of bivalves during autumn and winter (outside the natural spawning season) is a challenge, but necessary to keep market shares and ensure sufficient seed supply to European growers on a year-round basis.