

Going with the flow – optimising husbandry conditions for Greenshell™ nursery culture

The implementation of a dedicated nursery culture system and stage into the Greenshell™ production cycle would help alleviate heavy losses seen on commercial farms. The process involves growing spat to larger sizes before seeding, which makes them much more resilient to open-ocean conditions.

However, many unknown husbandry factors need to be addressed before they can be applied commercially.

For instance, the rate of water flow within nursery systems is crucial to their success; it controls food delivery, feeding efficiency, oxygen replenishment, and waste removal. However, we do not currently know what flow rates are optimal for Greenshell™ mussel spat.

If flow rates are too high, spat feeding will be inhibited; on the other hand, if flow rates are too low, spat will not receive enough food for growth and development. As such, before we can scale nursery systems for commercial use, we need to build strong foundational knowledge to better understand the best husbandry practices for spat.



Figure 1. Photograph of spat reared in the nursery system with dark spots indicating a full gut.

To address this, our research focused on assessing the impact of different flow rates on mussel spat held in an experimental upwelling nursery system.

Upweller systems were selected for this experiment because they are widely used for oysters and clams and have great potential to utilise both available space and water flow for optimal spat performance.

The results from this study have been promising; upweller systems seem suitable for Greenshell™ nursery culture. Higher flow rates increased growth in medium spat (~ 3 mm), but increasing flow rates had no effect on small (~ 1.7 mm) and large (~ 7 mm) spat (Figure. 2).

The difference in the way different sized spat responded to increasingly flow is crucial; it suggests that for commercial use, an adaptive management style for flow rates is best, where flow rates should be adjusted depending on the size of spat to be grown in nursery systems.

Further refinement of both the upweller nursery and the flow rates is likely to yield additional benefits for mussel spat.

Overall, the use and implementation of nursery systems appear to be a suitable method for growing spat to larger sizes prior to seeding, which will significantly help to address the large-scale losses of spat currently experienced by farms.

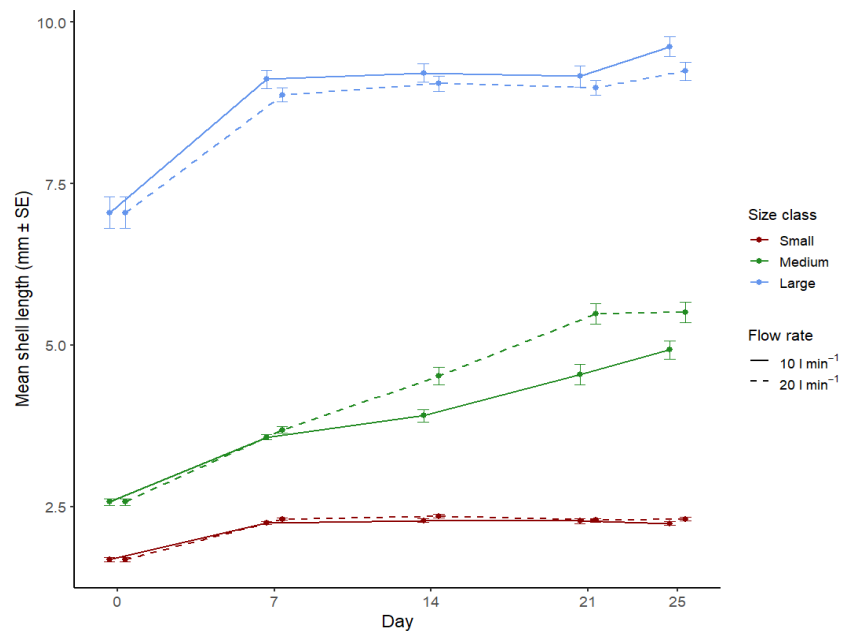


Figure 2. Change in shell length of spat from each size class reared under two flow rates throughout the experiment.

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