

SPATnz PGP Programme

QUARTERLY REPORT FOR Q2, YEAR 2, OCT - DEC 2013



The SPATnz PGP Programme will develop methods for hatchery production of juvenile mussels (spat) in commercial quantities. It will also develop improved strains of mussel using conventional selective breeding strengthened by the application of modern genetic techniques.

The New Zealand Greenshell mussel industry is large, producing about 90,000 t of shellfish per year and ranking in the top three NZ seafood export species, with export receipts of over \$200 M pa. While there is little to see above the water, the buoys of a mussel farm support kilometres of growing rope looped beneath them. Nationwide there are around 30,000 km of crop rope. To provide enough juvenile mussels to support that industry requires some serious numbers of shellfish.



Cawthron Institute diver inspects mussel lines. Photo: Cawthron Institute.

The numbers are made even more daunting by the naturally low survival of baby mussels. Humans, cows and sheep invest a huge amount of effort into very few offspring, ensuring that most of them survive. Mussels are at the opposite end of the parental care spectrum, playing a numbers game when it comes to reproduction. A female mussel releases 20 million eggs or more when she spawns, and she just pumps the eggs out into the sea, hoping that some may survive. In a natural population she may spawn around billion eggs in her lifetime and if the population is roughly stable, then on average only one or two of her billion eggs have survived.



A female mussel releasing millions of orange eggs

To deliver a step change to the mussel industry through selective breeding we need to produce mussel babies by the billion. Our target for the next 5 years is to develop hatchery methods capable of producing spat for about a third of present day mussel production. Through research over many

years we have managed to produce millions of spat at a time, but now need to step that up 50 to 100 fold. Our main focus for the next 12 months is to establish a mussel hatchery that allows us to develop commercial scale processes, and to demonstrate that the gains from selective breeding are achieved during commercial farming and processing. The new hatchery will be at the Cawthron Aquaculture Park in Nelson.

Activity this quarter was dominated by hatchery design and site works. Gibbons Construction was appointed as lead contractor for the buildings, and has rapidly progressed the final designs. Building consents are being staged to expedite the building process. Geotechnical ground preparation and site earthworks were completed and most of the underground services design was undertaken. We hope to be operating the hatchery by the end of 2014.

We continued to conduct experiments to refine all aspects of spat production from growing microalgae as larval food, rearing swimming mussel larvae, settling the larvae onto a substrate and transferring them to the sea. Incremental gains in these biological processes are helping us make spat production more reliable and efficient.



Cawthron Aquaculture Park with the SPATnz site (triangular) at top right. Photo: Cawthron Institute.