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AUGUST 2025

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Aquaculture innovation
The case for hatchery investment

Industry overview

New Zealand's Greenshell™ mussel industry is a key driver of the nation's aquaculture sector, achieving NZD 390 million in exports in 2024. As global demand for sustainable seafood continues to rise, New Zealand's expertise in hatchery production and selective breeding is reshaping the future of mussel farming – delivering faster growth, better yields, and greater climate resilience, helping New Zealand meet the world's rising demand for clean, traceable protein.

Unlocking measurable gains

Hatchery systems and breeding programmes have the potential to offer tangible benefits across two key areas: production performance and risk reduction.

Production performance

- **Faster growth:** Hatchery reared Greenshell™ mussel spat can grow up to 80% faster than wild spat, halving the farming cycle.
- **Year-round supply:** Hatchery spat ensures consistent availability, de-risking seasonality and wild spat shortages.
- **Improved meat yields:** Higher yields of edible meat-supporting premium product positioning and increasing revenue per crop.
- **Size and condition uniformity:** Enhances harvest efficiency, reduces processing costs, and improves presentation in value-added formats.
- **Enhanced nutritional profile:** Potential to breed for lipid content and omega-3 levels supports entry into high-value health and wellness markets.

Risk reduction

- **Climate resilience:** Hatchery mussels bred for warmer waters show increased survival in summer mortality events.
- **Disease resistance:** Both mussels and oysters could benefit from targeted resistance to pathogens, reducing stock losses and stabilising supply.
- **Improved retention and shell strength:** Breeding for durability reduces losses during storms and improves overall farm productivity.
- **Biosecurity assurance:** Hatchery control allows rapid response to biosecurity risks and supports traceable, export-ready supply chains.

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Case studies of success

Cawthron oyster breeding
Resilience in action

In 2010, New Zealand's Pacific oyster industry was hit by OsHV-1 (Oyster herpes virus), a viral disease causing up to 90% juvenile mortality. In response, the sector worked with Cawthron Institute to fast-track selective breeding for disease resistance. Within just two generations, survival and commercial confidence were restored. Key outcomes were:

- Juvenile survival improved from <10% to over 70%
- Hatchery spat uptake rose from 25% to 60% of national production
- Rapid breeding response helped protect industry viability across multiple growing regions
- Current breeding programmes are now expanding to include thermal tolerance, shell colour, and enhanced meat quality

These successes illustrate the transformative potential of structured breeding programmes for shellfish aquaculture in New Zealand.

SpatNZ
Hatchery mussels at commercial scale

SpatNZ is New Zealand's first Greenshell™ mussel hatchery established in 2012 through a partnership between the New Zealand Government and the mussel industry. SpatNZ is now owned by Sanford, one of New Zealand's largest mussel producers. Between 2012 and 2019, key outcomes were:

- **80% growth improvement:** Compared with wild sources.
- **Higher crop retention:** Reduced fouling and improved rope retention.
- **Greater yield per metre:** Up to 55% more net yield against traditional spat sources. Annual economic benefit estimated at $98.6m per annum compared with wild mussels.
- **Faster grow-out:** Halves the farming cycle, an invaluable advantage in capital-intensive marine farming.

These gains are driving wider adoption across the sector and enabling the next wave of innovation, from genomic selection tools to triploidy and nutraceutical product development.

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Expanding Value from Hatchery Infrastructure

New Zealand's hatchery systems are more than just a reliable source of spat, they're a platform for innovation. By integrating advanced breeding technologies, nutraceutical development, and optimised nursery practices, hatcheries can unlock new layers of commercial and sustainability value for the aquaculture sector.

1. Triploidy & Advanced Genomic Selection

- Triploid mussels offer the potential for faster growth and more stable meat condition throughout the reproductive cycle.
- Genomic selection tools enable targeted breeding for complex traits such as bioactive content, disease resistance and climate resilience — accelerating the development of future-fit stock.

2. Nutraceutical Potential

- Selective breeding for lipid and omega-3 content could support the creation of high-value mussels for health and wellness markets.
- Value-added products such as extracts, functional foods and supplements provide new commercial pathways beyond the half-shell.

3. Optimised Nursery Phases

- Early-life interventions within nursery systems can significantly improve spat survival and produce stronger, more resilient juveniles.
- Controlled environments support consistent growth, reduce early-stage mortality, and enhance overall farm performance.

Market Outlook and Global Opportunity

- **Global demand is rising:** Aquaculture production is expected to increase by 5.37% between 2024 and 2032, as consumers seek out healthier, more sustainable protein sources.
- **A premium product with global appeal:** Greenshell™ mussels command strong market prices, backed by their clean taste, nutritional value, and trusted sustainability story.
- **Well-positioned for global partnerships:** Buyers are increasingly prioritising year-round supply, transparency and environmental responsibility – making New Zealand a supplier of choice.

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Why Invest in New Zealand Greenshell Mussels?

New Zealand's aquaculture sector offers a unique investment opportunity – combining world-leading science, premium market positioning, and a deep commitment to sustainable growth. Our Greenshell™ mussel and Pacific oyster industries are globally recognised for their innovation, integrity and long-term potential.

- **World-leading expertise:** Decades of research and development in hatchery systems and selective breeding programmes have positioned New Zealand as a leader in aquaculture science.
- **Proven track record:** Hatchery programmes have delivered measurable gains in growth, survival, yield, and economic performance – with ongoing advances through genomic tools and selective breeding.
- **Sustainable production:** Our shellfish are farmed in pristine, nutrient-rich waters under rigorous environmental regulations – fully aligned with global ESG expectations.
- **Robust infrastructure and available space:** New Zealand is developing modern hatcheries, skilled aquaculture talent, and efficient logistics – underpinned by coastal space availability for the expansion of marine farms and further hatchery operations.
- **Strong market fundamentals:** With global seafood demand rising, Greenshell™ mussels and Pacific oysters command premium prices and are increasingly sought after for their quality, traceability and year-round availability.
- **Science-backed and future-ready:** Innovations like triploidy, nutraceutical development, and further climate-resilient breeding are unlocking the next wave of value from hatchery infrastructure.

Discover more and view the full report here

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