Spat losses on Greenshell™ farms: problem or opportunity?

The early stages of Greenshell™ farming can be extremely inefficient, with the majority of spat seeded out often lost from production. While we know spat losses can reach as high as 99% on an individual farm level, until recently, we had little understanding of how bad spat losses are across the industry as a whole.

To begin to shed light on industry-wide spat losses, we combined data on Kaitaia spat landings on Ninety Mile Beach from MPI with data on spat counts from the CMFA and data on adult mussel production from AQNZ and investigated the trends.

The results were sobering. Despite substantial increases in the harvesting of wild spat over the past 10 years (Fig. 1), Greenshell™ production has not increased concordantly, and has remained largely static at 90,000 tonnes, or approximately 1.78 billion adults. From 2015 to 2020, on average, 344 billion spat were harvested from Ninety Mile Beach alone, yet less than 1% of these were retained on farms from seeding through to final harvest. When considering other spat sources (i.e., line caught and hatchery spat), the numbers get even worse.

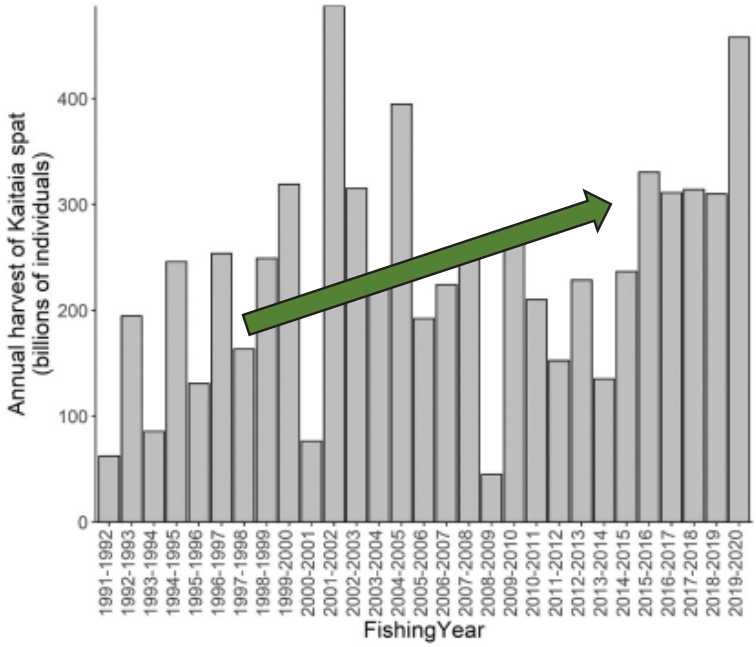

Fig. 1. Annual harvests of Kaitaia spat (billions of individuals) from 1991 to 2020 showing a steady increase in spat harvests.

Although these numbers are depressing, they also begin to give us an idea of the potential of the Greenshell™ industry. If the industry were to grow the spat lost from farms each year to a harvestable size, it would produce an additional 12.1 million tonnes of crop, which would be more than five times the total global aquaculture production for all mussels. On this basis,

if the Greenshell™ industry was to improve spat retention by 25%, it would increase the size of the industry to 3 million tonnes, worth over $4 billion USD annually, and make New Zealand the largest mussel producer in the world. Furthermore, a 25% improvement in spat retention appears to be possible with the integration of land- or sea-based nursey systems such as floating upwelling systems (FLUPSY) to the Greenshell™ production cycle. The Greenshell™ industry is well placed for this level of expansion, given that it is currently using only around a third of the ~15,000 ha of space approved for mussel aquaculture, with spat supply being a major constraint for industry expansion into this farm space.

So while spat losses may be a major problem today, with some further research and improvements to production efficiency, they represent a major opportunity for the future.

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