



Envisaging low emissions future farm systems in Aotearoa

EXPANDING CHESTNUT PRODUCTION IN NZ

Expanding the commercial production of chestnuts in Aotearoa, New Zealand has potential benefits for farm businesses, including diversification of income from farm system integration, a low intensity system for the environment and carbon sequestration from chestnut trees. However, to sustain a viable export industry, several key significant challenges need to be addressed.

This summary document covers the key, high-level findings of “**Scale-up or continued stagnation? An analysis into the opportunity for the commercial expansion of chestnut production in New Zealand**”, one of a series of reports prepared for the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC).

These reports examine potentially viable diverse land uses in New Zealand that could provide alternatives to the largely monoculture and ruminant-dominated pastoral agriculture systems across our landscapes at a more expansive farm systems perspective.

Current NZ chestnut production is very low

Production is primarily hobby farmers selling raw chestnuts or processed chestnut to the local domestic market. Historically there have been some exports to New Caledonia and negligible exports to Cook Islands, with no exports from 2020.

While reported/projected status quo returns from chestnut production at \$2,700/ha/year appear competitive with some other land uses, domestic demand for fresh chestnuts (on which these returns are based) seems unable to accommodate any significant increase in supply.

Potential carbon sequestration benefits

At commercial planting densities chestnuts could be incorporated into an existing livestock system without the complete loss of pasture from those areas while still sequestering say 72.3 t CO₂ ha⁻¹ over a 12 year period.

If the eligibility of chestnut orchards for inclusion into the ETS was changed, then this carbon could have a cumulative value of between \$5,400 and

as much as \$24,000 per hectare over their first 12 years of establishment at a \$75/t NZU price, depending on

Despite this, expansion in the areas of chestnuts planted seems unlikely to occur at a sufficient scale to be able to have a regionally significant impact on land use change and greenhouse gas emissions reduction. Unless the challenges outlined below can be overcome.

Short shelf-life implications

Fresh chestnuts have a short, two to three week shelf-life which prevents the export of the product in a fresh form to all but very close and very small Pacific Island markets. This makes the post-harvest processing of chestnuts all but a pre-requisite for any significant commercial expansion.

Unfortunately, the existing (but limited) processing infrastructure in New Zealand for peeling and processing is not well suited to the predominant varieties of chestnuts grown here, with their hard pellicle affecting the attributes of the processed chestnuts and limiting market demand.

The small seven to nine week window within which chestnuts must therefore be processed makes investment in processing equipment suitable for use by individual growers (behind the farm gate) almost impossible to justify.

Larger scale, post-farm gate processing is certainly more capital efficient, but the amount of capital required to be invested in specialist machinery for such a short seasonal processing window erodes the available returns and ultimately requires a very high value product to justify.

Development of a suitable co-operative with pooled capital or joint venture relationships could be a viable model for the industry to increase machinery utilisation and spread capital costs (and the low returns on this deployed capital).

Building a viable chestnut industry in NZ

To sustain a viable export industry, the chestnut supply chain ideally needs:

- Improved scalable processing technology that aligns with New Zealand chestnut characteristics or to produce an alternative species of chestnut that is suited to both overseas consumer preferences and the existing processing technology. The development of innovative and low cost storage technology, that allows for extended processing or freight windows of the fresh nuts would probably be transformative.
- A market or, ideally, markets that are sufficiently stable and high value to justify the scale required and capital investment a chestnut farmer needs to make into the farm and equipment, either on farm or further along the supply chain, to support production.
- To explore production of high value-added chestnut products, particularly focusing on health products, which could provide better returns from the necessity of post-harvest processing and our distance to market.
- Recognition of the carbon sequestration potential of new chestnut orchards. While carbon revenue streams may not be reliable in the medium to longer term, they provide an opportunity to help with the transition to chestnuts as land use, either with on-farm investment, buffering uncertain chestnut revenue or helping fund the post-harvest processing that sector requires.

Potential production innovations that might accelerate early year yields or develop markets for by-products have potential value to the sector but will be irrelevant in the absence of a sustainable and profitable market for the chestnuts New Zealand currently produces, let alone additional production.

Summary

The observed supply chain challenges in the chestnut industry are not new and have plagued the scale-up of chestnuts in New Zealand for decades.

The current environment for the industry is at a cross-roads. Stagnant and unchanging, left as is the industry will likely continue on its trajectory of decline with risk of fading out entirely.

Sufficient investment and innovation would be required to shift the industry into the value-added product market for domestic and international production.

Overcoming the current inability to reduce or eliminate the constrained processing window seems critical to future success, particularly with regards to improving capital efficiency and investment returns.

Ultimately identifying how the industry can ensure a reliable supply of chestnut products into the overseas market, considerate of export distance, seasonal supply and a perishable crop, will determine the fundamental future success, capacity for growth and ultimate longevity of the chestnut industry in New Zealand.

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