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Evaluation | Analytics | Insights

April 2024

Evaluating the financial feasibility of a Northland peanut industry

Final report

Executive summary

This report assesses the economic viability of establishing a peanut industry in Northland from the perspective of the potential customers, growers and processors.

Local customers set product prices which, in turn, sets the parameters for the economic feasibility. Some customers, like Pics, may be willing to pay a premium for domestic product compared to international pricing recognising that local production reduces supply risk and potential quality issues. However, the value of this premium is likely to be small - perhaps $500 per tonne above a reference price range of $2,000 - $3,000 per tonne for internationally-sourced, processed nuts.

Analysis of grower profitability shows a window of viability if yields are at the top end of the expected range, if growers receive a local price premium above international farm-gate pricing, and if the land planted does not have high value alternative uses. However, in a mid-case scenario for yield, farm-gate price, costs of production and alternative land-use options; peanuts will not be an economically attractive land-use for most landowners.

Executive summary (continued)

While the economics for growers are marginal at best, it is processing costs that appear the greatest challenge to establishing a viable industry in Northland. From what data is available, it is clear these are a significant proportion of the price paid by a customer – of the same order as farm gate pricing in large, efficient processing facilities. As production in Northland would be at a much smaller scale than overseas facilities, the dis-economies of scale would add significantly (indicatively $4,000 per tonne) to the cost of each tonne processed.

In summary, this analysis does not find that establishing a peanut industry in Northland will be economically viable. In the absence of a positive economic case, we have not ventured to make recommendations on the best structures within stages of the supply chain.

Scope of this work

Purpose

Northland Inc asked Scarlatti to "*to develop an industry case that defines the potential size of the market and assesses the viability of developing an industry in the Northland Region*".

Included activities

- **Review** – Examine previous work that outlines a potential industry structure and development plan and make any alterations.
- **Model** – Use cost and yield data from the proof-of-concept workstream and any other relevant findings to build a financial industry wide financial model for peanuts, including identifying how costs / benefits accrue across each component of the value chain and the investment required by those participating.
- **Assess** – Make a high-level assessment of the economic benefits of establishing an industry and how they will be accrued across the value chain.

About this document

The following document is split into three sections:

1. **An introduction to growing peanuts in New Zealand.** In this section, we provide some context on the business case for growing peanuts in Northland including an overview of what has been trialled in the region previously and the what a supply chain would require in terms of processes, components and stakeholders. This aims to 'set the scene' for this work and acknowledge previous work done in this space.

2. **Testing the feasibility of establishing a peanuts industry in Northland.** In this section, we test the economic feasibility of establishing a peanuts supply chain in Northland from the perspective of potential customers, growers and processors. For an industry to be considered feasible, it must be feasible for each of the supply chain's stakeholders individually. The criteria of feasibility varies by stakeholder – this section assesses the supply chain against these criteria. This section is not narrated, it rather presents findings from the analyses undertaken. Some context is included in speech bubbles throughout the slides.

3. **The stages of building a peanuts industry.** This section captures the key considerations, opportunities and challenges associated with establishing a peanuts industry at different scales to inform future implementation strategies (providing the industry is feasible).

1

An introduction to growing peanuts in New Zealand

In this section, we provide some context on the business case for growing peanuts in Northland including an overview of what has been trialled in the region previously and the what a supply chain would require in terms of processes, components and stakeholders. This aims to ‘set the scene’ for this work and acknowledge previous work done in this space.

About peanuts in New Zealand

Food products using peanuts are enjoyed by many New Zealanders. While many of these products are manufactured locally, the peanuts that go into them are currently all imported.

Some previous investigations of the viability of growing peanuts in New Zealand have been made. Peanuts have been grown by home gardeners in New Zealand since as early as the 1960's, with several studies taking place over this time to evaluate the commercial feasibility. These trials took place across New Zealand, with the northern areas of New Zealand being identified as the only suitable location for commercial peanut production due to the warmer climate. The primary restriction on commercialising these peanut systems was the availability of harvest equipment. The area required for a commercial crop was too large to be harvested by hand.

Source: Coriolis demand research

Feasibility of growing peanuts in Northland

In 2020/21, Picot Productions (Pics) secured partnership funding through the SFFF to undertake a range of small-scale trials in the Kaipara District over two years to test the feasibility of growing hi-oleic peanuts in Northland on a large scale. The outcomes from these trials were positive. These trials were delivered in partnership with Plant & Food Research and Manaaki Whenua- Landcare Research.

Northland Inc has since taken over responsibility for delivering the project and is currently overseeing the trial's second growing season. Pics, Plant & Food Research and Manaaki Whenua Landcare Research all remain involved in the project.

In parallel to field trials to better understand potential yields, growing costs etc., the project has included work to test customer demand and the overall economic case. This document contributes towards the understanding of the later.

Source: Coriolis demand research

Peanuts supply chain

We characterise the peanuts supply chain with consideration to:

1. The **locations** in the supply chain that peanuts move through on their way from farm to consumer,
2. The **activities** that are undertaken at each location,
3. The **resources** required for each activity (e.g. capital, machinery and labour)
4. The **stakeholders** who are involved across the supply chain (e.g. growers, processors and consumers).

The diagram on the following page visualises the relationships between these four considerations. This diagram was used as context when conceptualising the stakeholder feasibility analyses later in this report (e.g. what activities do stakeholders undertake in the supply chain?).

Peanuts supply chain – locations & activities

Growers
- Planting
- Crop maintenance
- Harvesting
- Curing
- Packaging for transport

Supplied as unshelled peanuts

Processing plant (unshelled)*
- Storage
- Drying
- Cleaning
- Sorting and grading
- Packaging for transport

Food product producers
- Receive peanuts
- Storage
- Screening
- Processing/value adding
- Packaging for transport

Supplied as shelled peanuts

Processing plant (shelled)*
- Storage
- Drying
- Screening
- Roll crushing
- Sorting and grading
- Roasting
- Blanching
- Packaging for transport

Retailer and consumer
- Stage product for sale
- Consumer purchase
- Consumption

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Peanuts supply chain – stakeholder involvement

Growers

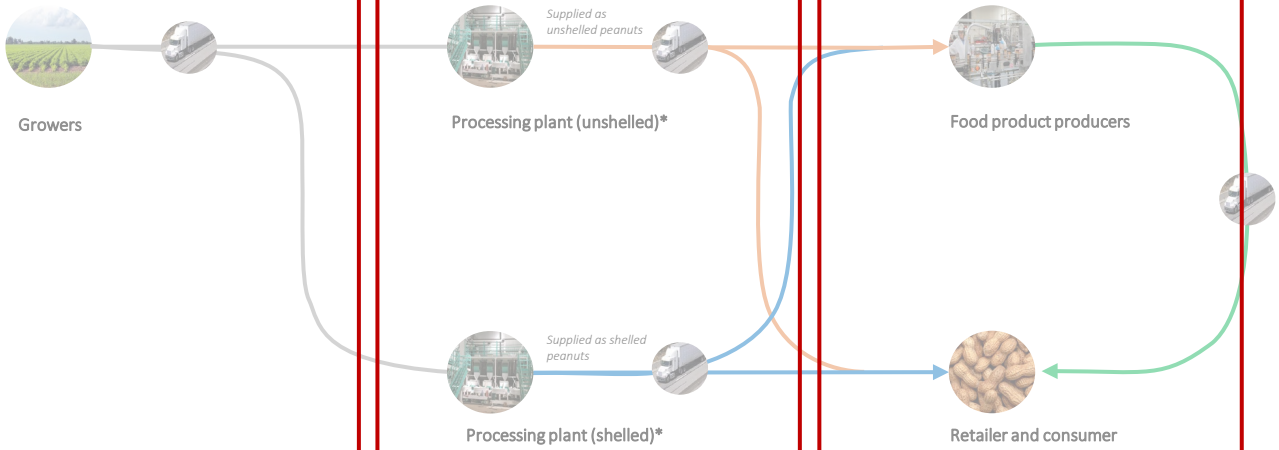
Growers will be undertaking the processes required to grow peanuts on farm. They will also be responsible for all costs and risks during this stage and will receive revenue in return.

Processors

Processors will take the peanuts harvested on farm and prepare them for further value addition or consumption

Customers

Customers will either be businesses who produce a value-added product for consumption (e.g. peanut butter) or consumers who eat raw peanuts



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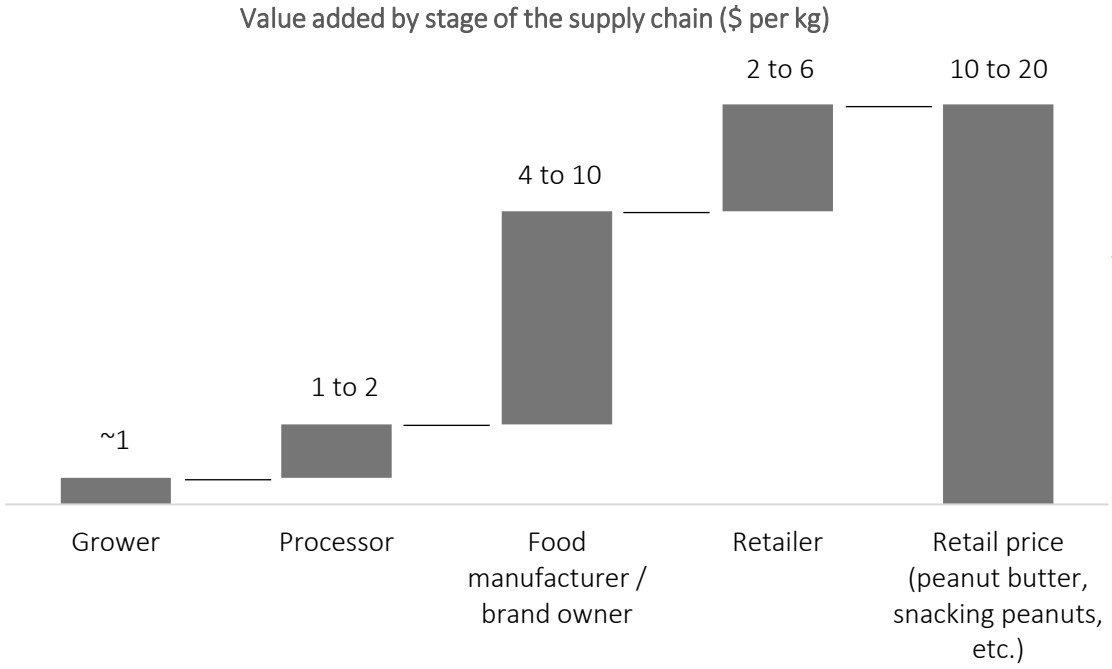
Value added by stage of the supply chain



Most of the value added is at the food product manufacturing, branding and retailing stages

Source: Scarlatti analysis

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2

Testing the feasibility of establishing a peanuts industry in Northland

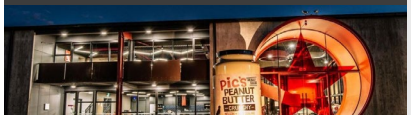
In this section, we test the economic feasibility of establishing a peanuts supply chain in Northland from the perspective of potential customers, growers and processors. For an industry to be considered feasible, it must be feasible for each of the supply chain's stakeholders individually. The criteria of feasibility varies by stakeholder – this section assesses the supply chain against these criteria.

This section is not fully narrated, it rather presents findings from the analyses undertaken. Some context is included in speech bubbles throughout the slides.

Criteria of industry feasibility

In order for a Northland peanuts industry to be considered feasible, it must be feasible for growers, processors and customers individually. The criteria of feasibility for each stakeholder considered in the following analyses are presented below – these will be analysed in the following slides.

Customer



- Consistent supply
- High quality peanuts
- Economically viable

Growers

- Profitable
- Low opportunity cost

Processors

- Consistent supply
- Profitable

?

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Testing the feasibility of establishing a peanuts industry in Northland

For customers

Customer

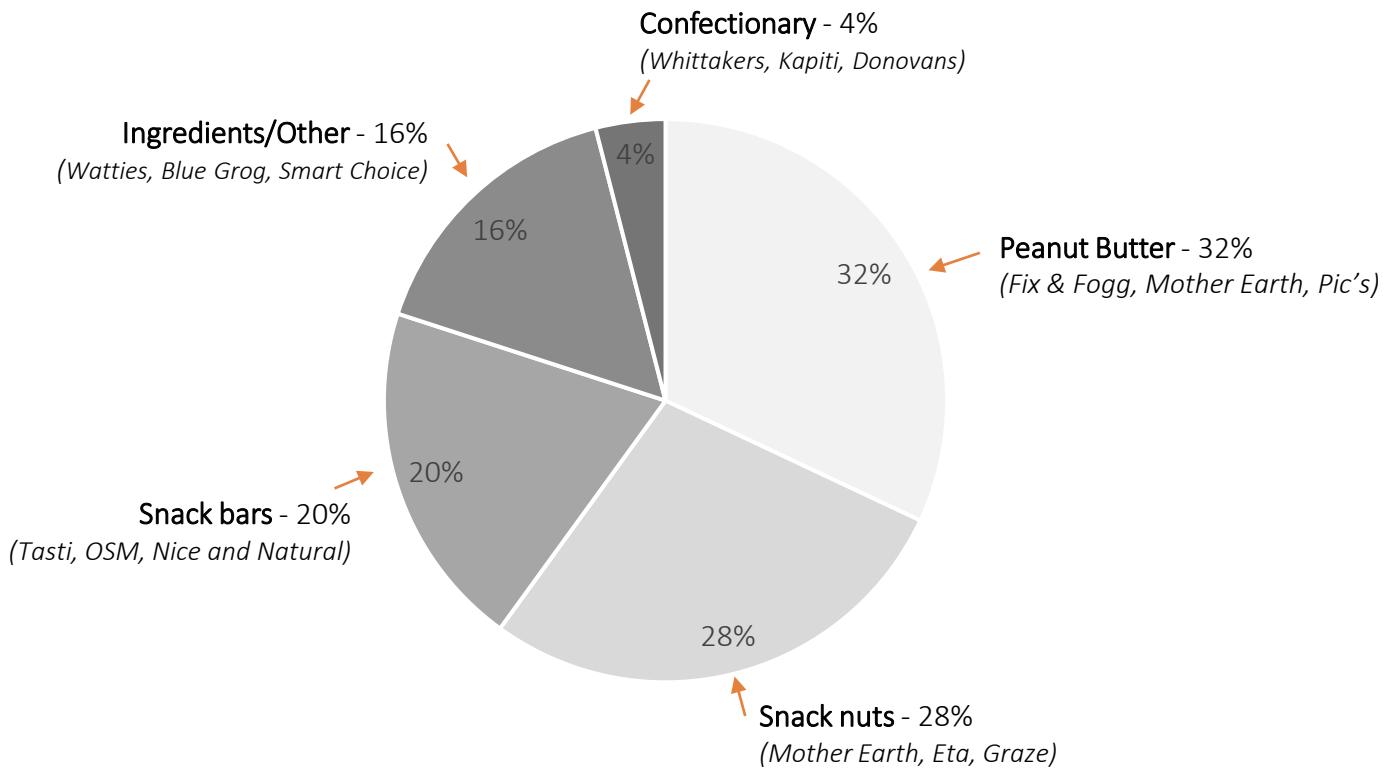
- Consistent supply
- High quality peanuts
- Economically viable

In this section, we draw on a combination of insights from the work undertaken by Coriolis prior to this analysis on the demand for New Zealand grown peanuts, and insights from discussions with Pic's. In the context of the wider analysis, we consider Pic's to be the primary customer of New Zealand grown peanuts given their role in establishing the peanut growing trials in Northland. That said, we acknowledge there are other markets for New Zealand grown peanuts such as the raw nuts market.

In the following slides, we assess the feasibility of a New Zealand peanut industry from the perspective of Pic's with consideration to the following criteria – for Pic's, the domestic industry must:

- Produce a consistent supply of peanuts
- Produce peanuts of a high quality comparable to international producers
- Supply peanuts at a cost that is economically viable for their production model

The New Zealand peanuts market



Source: Coriolis report

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What does Pic's value in domestically grown peanuts?

Understanding what drives the procurement decisions of a customer, like Pic's, provides a perspective of the value they place on sourcing domestically grown peanuts. From conversations with Pic's, we identified the following motivations driving their interest in supporting the establishment of a domestic industry in Northland – for Pic's, sourcing domestically grown peanuts would mean:

1. Reducing their risk that offshore supply chain issues causing disruptions in their supply of peanuts
2. Introducing a new opportunity to store peanuts inshell locally to increase the quality of the nut by the time it is processed and to reduce the risk of pests and disease
3. Reducing transport costs in moving the nuts from Northland to Nelson compared to the nuts coming from Australia, North America, or South America.

However, it is critical that domestically produced peanuts can be supplied consistently, of a comparable quality and an economically feasible rate. Providing these criteria are achieved, Pic's may be willing to pay a premium for domestically produced peanuts. Note that the value placed on domestically grown peanuts will vary by customer.

Source: Discussions with Pics

Can Pic's feasibility criteria be met?

In conversations with Pic's, we have collected the following information to be used in the assessment of the feasibility criteria for Pic's.

1. Produce a consistent supply of peanuts

Pic's purchase ~2,500 tonnes of peanuts every year to produce its peanut butter. At an average yield of 3.5 tonnes per hectare for New Zealand produced peanuts (see Grower's feasibility analysis below) and a shell weight of 25%, this would mean the domestic industry would need to have approximately 1,000 hectares planted in peanuts to supply 100% of Pic's supply. By comparison, supplying 10% of Pic's requirements would require approximately 100 hectares of peanut plants. We use this range of 100 – 1,000 hectares as a reference of potential industry scale in the following analyses.

2. Produce peanuts of a high quality comparable to international producers

As the current trial crop of peanuts are yet to be harvested, it is unclear whether this criteria can be achieved at this stage. We would expect clarity on this point following a crop assessment post-harvest.

3. Supply peanuts at a cost that is economically viable for their production model

Pic's have indicated they have historically paid between $2,000 to $3,000 for a tonne of peanuts delivered to their factory in Nelson from their various suppliers. The domestic market would need to therefore produce peanuts at a comparable cost to this for the supply chain to be considered feasible for them. We use the upper end of this range as an indication of what processors could expect to receive for supplying processing peanuts to Pic's.

Source: Discussions with Pics

What do other customers think?

Coriolis Identified the following six key takeaways from their analyses of New Zealand peanut buyers (i.e. customers).

1. There is no "one-size-fits-all" solution.

Different New Zealand peanut buyers have different needs depending on what they produce. In addition, many large buyers (e.g. Tasti) have different needs within one organisation. New Zealand grown peanuts will need to be tailored to the needs of specific customers.

2. Current suppliers do a good job.

New Zealand peanut buyers are satisfied with their existing suppliers. There is no “burning platform” or clear gap in the market in the New Zealand market crying out for a new supplier.

3. Peanuts are a global commodity.

New Zealand grown peanuts would be entering a mature global commodity industry with well understood prices and limited willingness to pay a premium. New Zealand grown peanuts will price off the world price, which is set by Argentina for high quality, hi-oleic peanuts.

4. New Zealand peanuts would need to meet existing standards and follow the ‘rules of the game’.

New Zealand peanut buyers expect high quality, consistent and reliable product. Quality is not an optional extra, it is the entry ticket to the game.

Source: Coriolis report

What do other customers think? (cont.)

5. New Zealand grown peanuts would help some firms differentiate their products.

There is tentative demand for New Zealand grown peanuts from some buyers as these would assist domestic peanut buyers both differentiate their products through marketing and reduce some risks. There was tentative demand from some premium customer and strong interest in trial quantities for testing.

6. There would be risks for potential buyers.

Numerous interviewees from all stages in the supply chain and all product categories highlighted that buying New Zealand grown peanuts was seen as risky, particularly around surety of supply and in the early days.

Coriolis concluded that “there is no burning platform or clear gap in the market” to provide a competitive advantage for domestically grown product. Growers will have to at least meet existing standards and costs to be competitive. For example, if product prices were within 10% of the Argentinian price, and of the same quality, still less than 50% of current buyers would strongly considering buying the product.

Source: Coriolis report

Summary of customer feasibility

While there could be a variety of local customers for domestically grown peanuts, it will be necessary to match the price and quality of international imports to attract the interest of a significant proportion of potential customers.

However, a minority of customers, like Pics, do see value from locally produced peanuts and place some value on this.

As a reference for the remainder of this work, we assume that a local market exits for 250 to 2,500 tonnes of peanuts with a maximum cost to the customer of $3,000 - $3,500. Beyond this point, it is understood that international peanut prices would be more economically viable for their production model.

Testing the feasibility of establishing a peanuts industry in Northland

For growers

Growers

- Profitable
- Low opportunity cost

In this section, we evaluate the feasibility of the producing peanuts for Northland growers. For growers, growing peanuts to supply a domestic peanut industry must:

- Be profitable (i.e. a positive gross profit per hectare of production)
- Have a low opportunity cost (i.e. there are no, or minimal, suitable alternative crops that have a higher gross profit per hectare – peanuts would therefore be the best use of that land)

To assess these criteria, we developed a bottom-up model characterising the revenue earned and costs incurred in a peanuts production system. The model draws on the structure of calculations from the gross margin analysis in Plant and Food Research's 2021 Feasibility Report. Given the high-level of uncertainty at this stage in the trial of three core parameters – yield, farm gate price, cost of production – we integrate a series of sensitivity analyses to understand how changes to these inputs affect the growers' gross profit of production. The model that accompanies this report is also a project deliverable.

Economic criteria from growers questions

For a growers, the following two criteria must be achieved for growing peanuts to be considered feasible:

		Criteria achieved?
1. Positive gross profit per hectare	(1 Yield * 2 Farm gate price) > 3 Cost of production	?
2. Low opportunity cost	Peanuts gross margin (1 * 2) - 3 > 4 Gross margin of alternative crop	?

The following slides evaluate the gross profit of a peanuts production system in Northland with consideration to the four core variables highlighted above. Given the uncertainty associated with each variable we start by determining an appropriate range drawing on case studies from international peanut industries.

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1 Yield and water availability

Yield is highly influenced by water availability especially at strategic times throughout the growing season. Irrigated vs. non irrigated land will be a large determent of yield and therefore, feasibility of grower participation. We have used Australian data as one reference for the yield range used in our analysis.

DISTRICT	Yields (Metric Tonnes/Hectare)				
	2016	2015	2014	2013	2012
North Qld (Dryland & Irrigated)	3.88	5.29	4.66	4.07	4.60
Irrigated (Central / Southern QLD)	4.92	4.38	4.90	4.98	3.30
Dryland (Southern QLD)	2.4	2.16	0.77	2.54	2.50

Yield numbers are based on shelled peanuts.

Source: Peanut Company Australia 2017 Annual Report

1 Yield

Yields below are drawn from domestic and international data and are based on **unshelled peanuts**

Source	tonnes/ha
Plant & Food Research, 2021 Yield estimates based on Australian yield for a similar crop	2.9 – 5.3
Northland trial data, 2021 Actual yields from nominated Northland trial site	2.1 – 3.7
USDA – Foreign Agricultural Service 5 years production average	4.5
Peanut Company of Australia Australia Peanut Production Guide	2.5 – 6.0

Given the reference points to the right, we estimate the range in yield per hectare for a Northland production system to be between **2.50** and **5.00** tonnes per hectare for unshelled peanuts on irrigated land.

Source: As noted above

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2 Farm gate price

Farm gate prices from domestic and international research are outlined below and are estimated for **unshelled peanuts.**

Source	$NZD/tonne
Plant & Food Research, 2021 Feasibility report for Northland peanuts	$1,050*
Queensland Govt Modelling of a peanut production system	$750
USDA, 2024 Average industry peanut prices	$860

** Plant and Food Research used a farm gate price of $1,400 for shelled peanuts in their analysis, we have converted this number to unshelled equivalent farm gate price.*

We assume that this stage that a domestic production system should be feasible at for farm gate prices comparable to those received by growers around the world. That is, we neglect the potential price premium payable by domestic customers at this time.

Given the reference points to the right, we estimate the range in farm gate price to be received by a Northland grower is between **$700** and **$1,200** per tonne

Source: As noted above

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3 Cost of production

Production costs from domestic and international research are outlined below and are estimated for **irrigated land***

Source	$NZD/hectare
Plant & Food Research, 2021 Production costs estimated in feasibility report	$2,959
Northland trial data, 2024 Production costs to date at nominated Northland trial site	$4,792
South Georgia production system Estimated costs for an established peanut production system	$3,230

**Irrigation is estimated to increase costs by ~$1,000 per hectare*
***Cost of production may be higher than these if costs of seeds are not included and cannot be reduced from trial costs (~$9,000 to be airfreighted)*

Given the reference points to the right, we estimate the range in cost of production per hectare for a Northland production system to be **$3,000** and **$5,000** per hectare.

Source: As noted above

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Modelled gross profit per hectare

Drawing on the ranges identified from the previous three slides, we estimate the gross profit per hectare as the product of yield and farm gate price, *less* the cost of production. Given the uncertainty in what the appropriate yield and farm gate price is in this calculation, we produce sensitivity tables for different levels of cost of production to understand how different combinations of yield and farm gate price will affect the modelled gross profit per hectare. In these tables, green suggests a feasible combination of yield and farm gate price given the static cost of production (i.e. positive gross profit), while the red suggests an infeasible combination (i.e. negative gross profit). The yellow dotted outline indicates the spread in gross profit for the agreed yield and farm gate price ranges from the previous slides.

The following sensitivity table indicates the gross profit per hectare of producing peanuts when the cost of production is held constant at: **$3,000**

Farm gate price (NZD/tonne) \ Yield (tonnes/ha)	1	2	2.5	2.75	3	3.25	3.5	3.75	4	5
$ 700.00	-$ 2,219	-$ 1,547	-$ 1,211	-$ 1,043	-$ 875	-$ 707	-$ 539	-$ 371	-$ 203	$ 469
$ 800.00	-$ 2,123	-$ 1,355	-$ 971	-$ 779	-$ 587	-$ 395	-$ 203	-$ 11	$ 181	$ 949
$ 900.00	-$ 2,027	-$ 1,163	-$ 731	-$ 515	-$ 299	-$ 83	$ 133	$ 349	$ 565	$ 1,429
$ 1,000.00	-$ 1,931	-$ 971	-$ 491	-$ 251	-$ 11	$ 229	$ 469	$ 709	$ 949	$ 1,909
$ 1,100.00	-$ 1,835	-$ 779	-$ 251	$ 13	$ 277	$ 541	$ 805	$ 1,069	$ 1,333	$ 2,389
$ 1,200.00	-$ 1,739	-$ 587	-$ 11	$ 277	$ 565	$ 853	$ 1,141	$ 1,429	$ 1,717	$ 2,869
$ 1,300.00	-$ 1,643	-$ 395	$ 229	$ 541	$ 853	$ 1,165	$ 1,477	$ 1,789	$ 2,101	$ 3,349
$ 1,400.00	-$ 1,547	-$ 203	$ 469	$ 805	$ 1,141	$ 1,477	$ 1,813	$ 2,149	$ 2,485	$ 3,829
$ 1,500.00	-$ 1,451	-$ 11	$ 709	$ 1,069	$ 1,429	$ 1,789	$ 2,149	$ 2,509	$ 2,869	$ 4,309

At a cost of production of $3,000 per hectare, we estimate the gross profit for Northland growers to range from -$1,211 to $2,869 per hectare

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Source: Scarlatti financial model of peanut grower economics

Modelled gross profit per hectare

The following sensitivity table indicates the gross profit per hectare of producing peanuts when the cost of production is held constant at: $4,000

Farm gate price (NZD/tonne)	Yield (tonnes/ha)										
	1	2	2.5	2.75	3	3.25	3.5	3.75	4	5
$ 700.00	-$ 3,219	-$ 2,547	-$ 2,211	-$ 2,043	-$ 1,875	-$ 1,707	-$ 1,539	-$ 1,371	-$ 1,203	-$ 531
$ 800.00	-$ 3,123	-$ 2,355	-$ 1,971	-$ 1,779	-$ 1,587	-$ 1,395	-$ 1,203	-$ 1,011	-$ 819	-$ 51
$ 900.00	-$ 3,027	-$ 2,163	-$ 1,731	-$ 1,515	-$ 1,299	-$ 1,083	-$ 867	-$ 651	-$ 435	$ 429
$ 1,000.00	-$ 2,931	-$ 1,971	-$ 1,491	-$ 1,251	-$ 1,011	-$ 771	-$ 531	-$ 291	-$ 51	$ 909
$ 1,100.00	-$ 2,835	-$ 1,779	-$ 1,251	-$ 987	-$ 723	-$ 459	-$ 195	$ 69	$ 333	$ 1,389
$ 1,200.00	-$ 2,739	-$ 1,587	-$ 1,011	-$ 723	-$ 435	-$ 147	$ 141	$ 429	$ 717	$ 1,869
$ 1,300.00	-$ 2,643	-$ 1,395	-$ 771	-$ 459	-$ 147	$ 165	$ 477	$ 789	$ 1,101	$ 2,349
$ 1,400.00	-$ 2,547	-$ 1,203	-$ 531	-$ 195	$ 141	$ 477	$ 813	$ 1,149	$ 1,485	$ 2,829
$ 1,500.00	-$ 2,451	-$ 1,011	-$ 291	$ 69	$ 429	$ 789	$ 1,149	$ 1,509	$ 1,869	$ 3,309

At a cost of production of $4,000 per hectare, we estimate the gross profit for Northland growers to range from -$2,211 to $1,869 per hectare

Source: Scarlatti financial model of peanut grower economics

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Modelled gross profit per hectare

The following sensitivity table indicates the gross profit per hectare of producing peanuts when the cost of production is held constant at: $5,000

Farm gate price (NZD/tonne)	Yield (tonnes/ha)										
	1	2	2.5	2.75	3	3.25	3.5	3.75	4	5
$ 700.00	-$ 4,219	-$ 3,547	-$ 3,211	-$ 3,043	-$ 2,875	-$ 2,707	-$ 2,539	-$ 2,371	-$ 2,203	-$ 1,531
$ 800.00	-$ 4,123	-$ 3,355	-$ 2,971	-$ 2,779	-$ 2,587	-$ 2,395	-$ 2,203	-$ 2,011	-$ 1,819	-$ 1,051
$ 900.00	-$ 4,027	-$ 3,163	-$ 2,731	-$ 2,515	-$ 2,299	-$ 2,083	-$ 1,867	-$ 1,651	-$ 1,435	-$ 571
$ 1,000.00	-$ 3,931	-$ 2,971	-$ 2,491	-$ 2,251	-$ 2,011	-$ 1,771	-$ 1,531	-$ 1,291	-$ 1,051	-$ 91
$ 1,100.00	-$ 3,835	-$ 2,779	-$ 2,251	-$ 1,987	-$ 1,723	-$ 1,459	-$ 1,195	-$ 931	-$ 667	$ 389
$ 1,200.00	-$ 3,739	-$ 2,587	-$ 2,011	-$ 1,723	-$ 1,435	-$ 1,147	-$ 859	-$ 571	-$ 283	$ 869
$ 1,300.00	-$ 3,643	-$ 2,395	-$ 1,771	-$ 1,459	-$ 1,147	-$ 835	-$ 523	-$ 211	$ 101	$ 1,349
$ 1,400.00	-$ 3,547	-$ 2,203	-$ 1,531	-$ 1,195	-$ 859	-$ 523	-$ 187	$ 149	$ 485	$ 1,829
$ 1,500.00	-$ 3,451	-$ 2,011	-$ 1,291	-$ 931	-$ 571	-$ 211	$ 149	$ 509	$ 869	$ 2,309

At a cost of production of $4,000 per hectare, we estimate the gross profit for Northland growers to range from -$3,211 to $869 per hectare

Source: Scarlatti financial model of peanut grower economics

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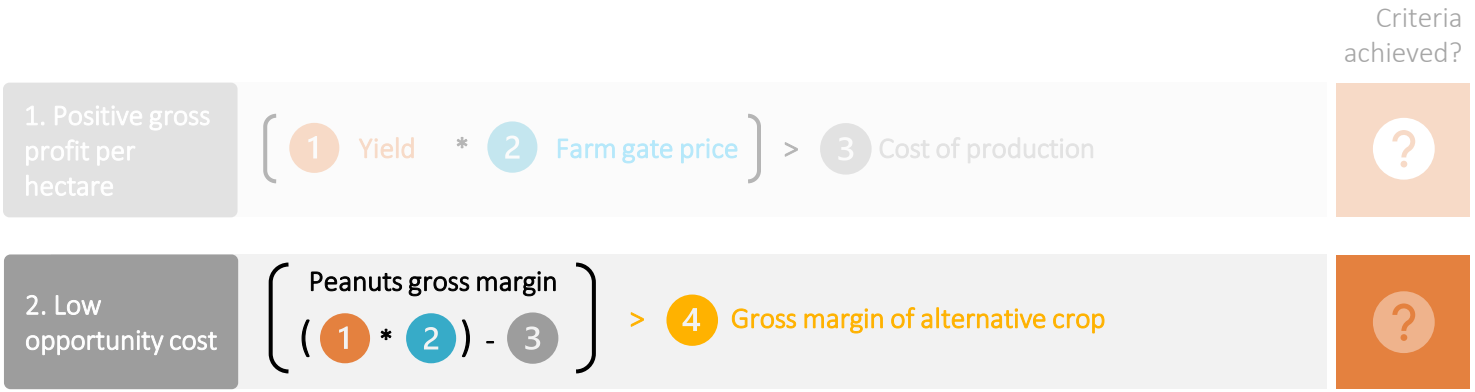
Testing grower feasibility

The analysis on the previous three slides suggest that if yields and farm gate price are favourable, a Northland grower could realise a positive gross profit so long as the cost of production is kept low. As the cost of production increases to around $4,000 per hectare and above, there are very few combinations of yield and farm gate price that produce a positive gross profit number. At this stage, we conclude **that the first criteria has the potential to be met, but the odds are not good on an ongoing basis given the nature of the three variables to fluctuate year on year.**

So how about the second criteria to have a low opportunity cost?

Testing grower feasibility

The analysis on the previous three slides suggest that if yields and farm gate price are favourable, a Northland grower could realise a positive gross profit so long as the cost of production is kept low. As the cost of production increases to around $4,000 per hectare and above, there are very few combinations of yield and farm gate price that produce a positive gross profit number. At this stage, we conclude **that the first criteria has the potential to be met, but the odds are not good on an ongoing basis given the nature of the three variables to fluctuate year on year.**



So how about the second criteria to have a low opportunity cost?

4 Opportunity cost of production

The alternative uses of land we consider to assess the opportunity cost of peanut production is maize as it has the potential to be grown on the same land profiles. The gross profit realised from growing maize is considered the bar for gross profitability that peanuts will need to achieve for peanuts to be a comparatively attractive land use. Naturally, this will vary by grower, but it provides a useful reference point.

Source	$NZD/hectare
Maize – for silage	$2,800
Maize – for grain	$1,700

Given the reference points to the right, we estimate the bar for gross profitability to be **$2,000** per hectare.

Source: As noted above

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Gross profit with consideration to the hurdle rate

We introduce the bar of $2,000 identified in the previous slide by changing the definition of what constitutes a feasible combination of yield and farm gate price for a static cost of production. For this analysis, we determine that a feasible combination (e.g. highlighted green in the following sensitivity table) will generate a gross profit greater than the hurdle rate of $2,000, while an infeasible combination will be less than $2,000 per hectare.

The following sensitivity table indicates the feasible combinations of yield and farm gate price for a static cost of production of **$4,000** per hectare, and a hurdle rate of **$2,000**

Farm gate price (NZD/tonne)	Yield (tonnes/ha)										
	1	2	2.5	2.75	3	3.25	3.5	3.75	4	5
$ 700.00	-$ 3,219	-$ 2,547	-$ 2,211	-$ 2,043	-$ 1,875	-$ 1,707	-$ 1,539	-$ 1,371	-$ 1,203	-$ 531
$ 800.00	-$ 3,123	-$ 2,355	-$ 1,971	-$ 1,779	-$ 1,587	-$ 1,395	-$ 1,203	-$ 1,011	-$ 819	-$ 51
$ 900.00	-$ 3,027	-$ 2,163	-$ 1,731	-$ 1,515	-$ 1,299	-$ 1,083	-$ 867	-$ 651	-$ 435	$ 429
$ 1,000.00	-$ 2,931	-$ 1,971	-$ 1,491	-$ 1,251	-$ 1,011	-$ 771	-$ 531	-$ 291	-$ 51	$ 909
$ 1,100.00	-$ 2,835	-$ 1,779	-$ 1,251	-$ 987	-$ 723	-$ 459	-$ 195	$ 69	$ 333	$ 1,389
$ 1,200.00	-$ 2,739	-$ 1,587	-$ 1,011	-$ 723	-$ 435	-$ 147	$ 141	$ 429	$ 717	$ 1,869
$ 1,300.00	-$ 2,643	-$ 1,395	-$ 771	-$ 459	-$ 147	$ 165	$ 477	$ 789	$ 1,101	$ 2,349
$ 1,400.00	-$ 2,547	-$ 1,203	-$ 531	-$ 195	$ 141	$ 477	$ 813	$ 1,149	$ 1,485	$ 2,829
$ 1,500.00	-$ 2,451	-$ 1,011	-$ 291	$ 69	$ 429	$ 789	$ 1,149	$ 1,509	$ 1,869	$ 3,309

At a cost of production of $4,000 per hectare, there are no feasible combinations of yield and farm gate price (i.e. that have a gross profit above $2,000 per hectare).

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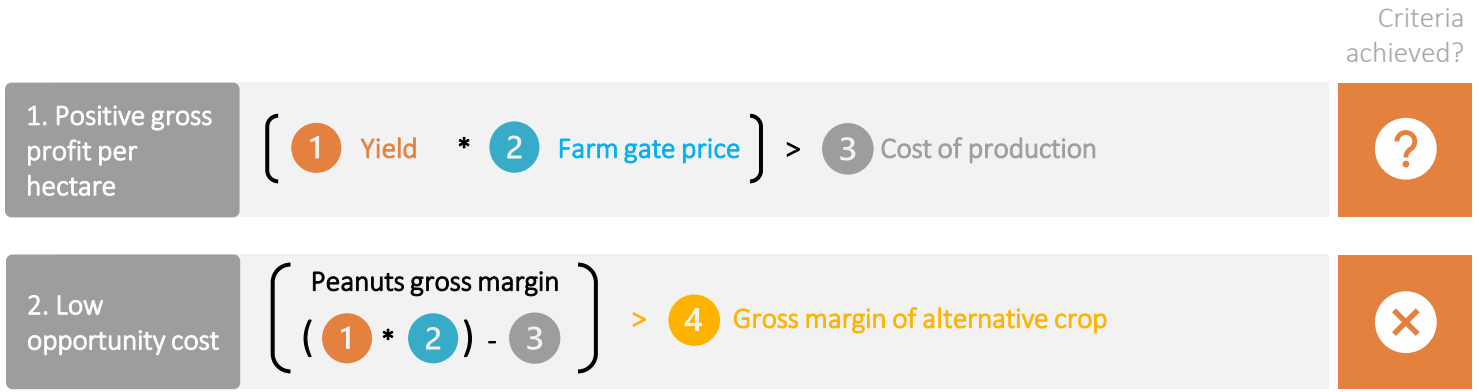
Source: Scarlatti financial model of peanut grower economics

Testing grower feasibility

The analysis on the previous slide suggests that at a cost of production of $4,000 per hectare (the mid-point in the agreed range from earlier slides), there are no feasible combinations of yield and farm gate price (i.e. that have a gross profit above $2,000 per hectare). Therefore, we conclude that **a Northland peanut production system will not have a low opportunity cost and therefore the second criteria of grower feasibility will not be achieved.**



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Secondary factors that may affect the economics

As mentioned in the introduction to the grower feasibility section, a grower may also consider social, cultural and environmental factors in their decision to grow peanuts, not just the economics. Some of these other factors are considered below.

Favourable factors

- Fungal and insect pest pressure may be lower in New Zealand than other countries leading to a possible yield benefit
- Not all land potentially planted in Northland has an opportunity cost as high as maize.
- Peanut has value in a crop / pasture rotation as N-fixing (although the economic benefit of this is relatively small – ~$100 per hectare) and this is already factored into the financial model to some extent.
- The opportunity to sell peanut shells have not been considered.

Unfavourable factors

- As New Zealand autumns are wetter than other growing locations, peanuts may not be fully field dried when threshed (adding to subsequent processing costs).
- Weed pressures make it difficult to include peanuts in a pasture – peanut rotation (although a pasture – maize – peanut rotation might work?)
- Fewer spray options exist in New Zealand

Source: Stakeholder discussions

International case studies

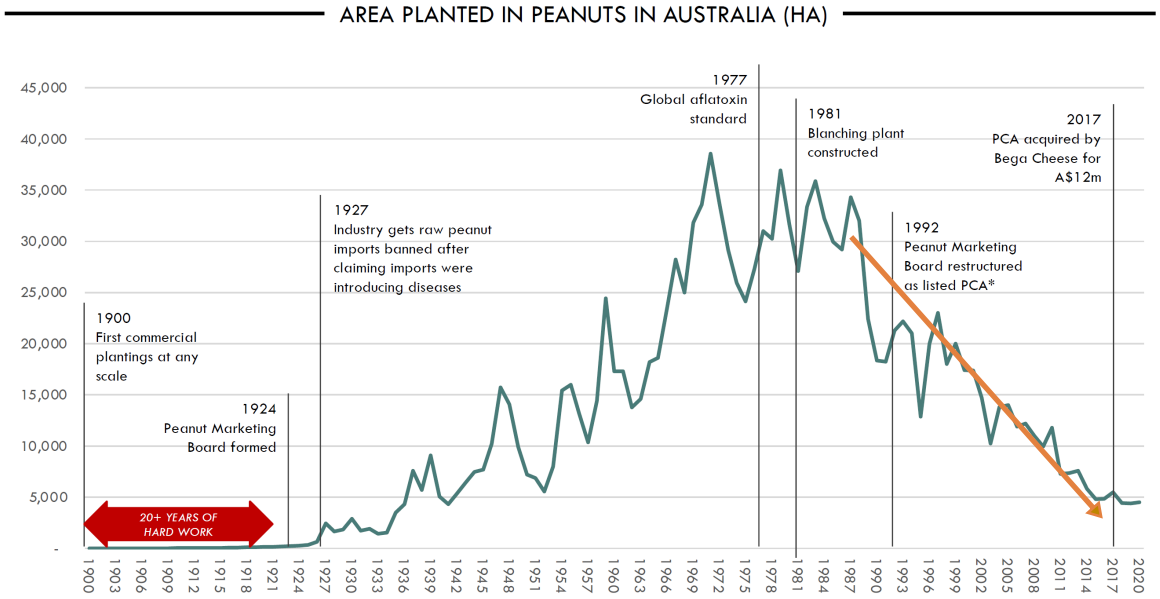
In addition to the bottom-up analysis of a New Zealand peanut growing system, we did a brief review of the growing landscape in international markets with established supply chains to identify any other favourable or unfavourable considerations that could factor into our analysis of grower feasibility. A particular goal of this analysis is the determine how peanut growing is viable in other developed countries given our conclusion that it is not viable in New Zealand.

The markets reviewed are in the following slides include:

- Australia
- United States of America
- Argentina

International case study – Australia

The competitive advantage of the Australian peanut industry appears to stem from the large area of land with suitable environmental conditions and soils available for growing peanuts. However, Coriolis identified that the area planted in peanuts in Australia has been declining for that past 40 years due to climatic pressures, suggesting that the Australia industry is not actually globally competitive.



Source: Coriolis report

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International case study – USA

The competitive advantage of the USA peanut industry appears to, again, stem from the large area of land with suitable environmental conditions and soils available for growing peanuts. Importantly also, growers receive a significant subsidy from the government up to approximately NZD $460 annually per hectare and around $130 per tonne (assuming a 3.5 tonne yield on average per hectare).

Between 2014 – 2016, peanut growers in the USA received subsidies in the order of:

- $340 USD per acre
- $113 USD per acre annually

This is the equivalent of:

- $1,380 NZD per hectare between 2014 - 2016
- $460 per hectare annually.

Source: Reflections-on-the-US-peanut-program-it is-nuts

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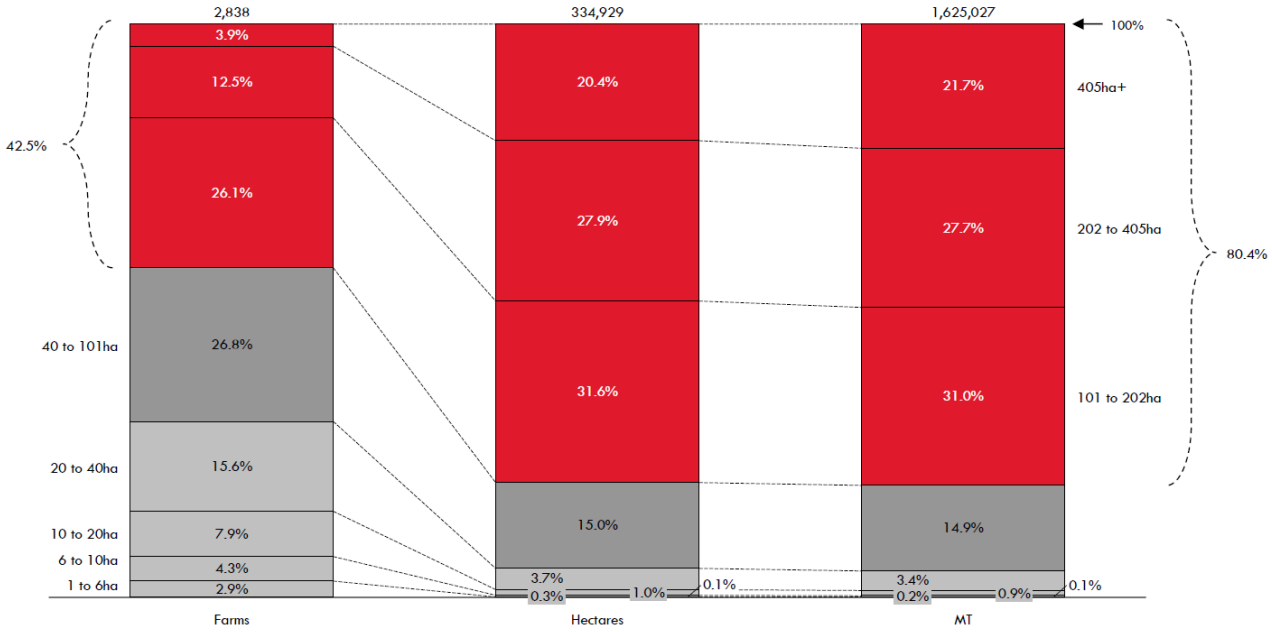
International case study – USA

The USA peanut industry is the last large peanut industry in a developed country and is dominated by large farms – approximately 40% of farms are larger than 100 hectares and they produce 80% of the industry's total production.

GEORGIA: PEANUT METRICS BY FARM SIZE



Source: Coriolis report

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International case study - Argentina

The competitive advantage of the Argentinian peanut industry appears to be a combination of:

- Large areas of land available with suitable environmental conditions to grow peanuts
- The low cost of land
- Efficient farmers
- Lower operating costs
- A handful of very large processors creating economies of scale

Source: Coriolis report

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Summary of grower feasibility

There are many factors a farmer may take into consideration when deciding whether or not to grow peanuts on their land. We assessed the economic feasibility in this above section with some qualitative consideration to the other social, cultural and environmental factors also. This analysis showed that there are some combinations of yield, farm gate price and cost of production that could generate a positive gross profit per hectare providing the cost of production is kept low. As the cost of production increases to around $4,000 per hectare and above, there are very few combinations of yield and farm gate price that produce a positive gross profit number.

When considering an alternative use of land in maize, we found it is unlikely that peanuts will have a low enough opportunity cost to consider it the best use of the available land – from an economic perspective.

A quick scan of international peanuts industries and established supply chains highlighted that the most comparable industry in Australia has been declining for several decades now for reasons also likely to affect a potential New Zealand peanut industry. USA, as the last remaining large peanut industry in a developed country has been propped up by Government subsidies. In both cases, the circumstances surrounding the industries in these developed countries suggest they are not sustainable, nor globally competitive.

Overall, this analysis has shown that a growing peanuts in Northland could be profitable given the right circumstances, however it is unlikely that peanut growing will be the best use of land for many landowners.

Testing the feasibility of establishing a peanuts industry in Northland

For processors

Processors

- Consistent supply
- Profitable

In this section, we evaluate the feasibility of the processing peanuts. For processors, a domestic peanut industry must:

- Produce a consistent supply of peanuts
- Be profitable (i.e. have low operational and annualised capital costs)

To assess these criteria, we undertook several top-down analyses where we drew on secondary sources and available data on the costs associated with establishing and operating a processing plant. Unfortunately, efforts to validate the models and their outputs with Australian processors were unsuccessful. Regardless, we feel confident that the inferences drawn from the secondary sources in the following analyses are representative within an acceptable order of magnitude.

Processor feasibility

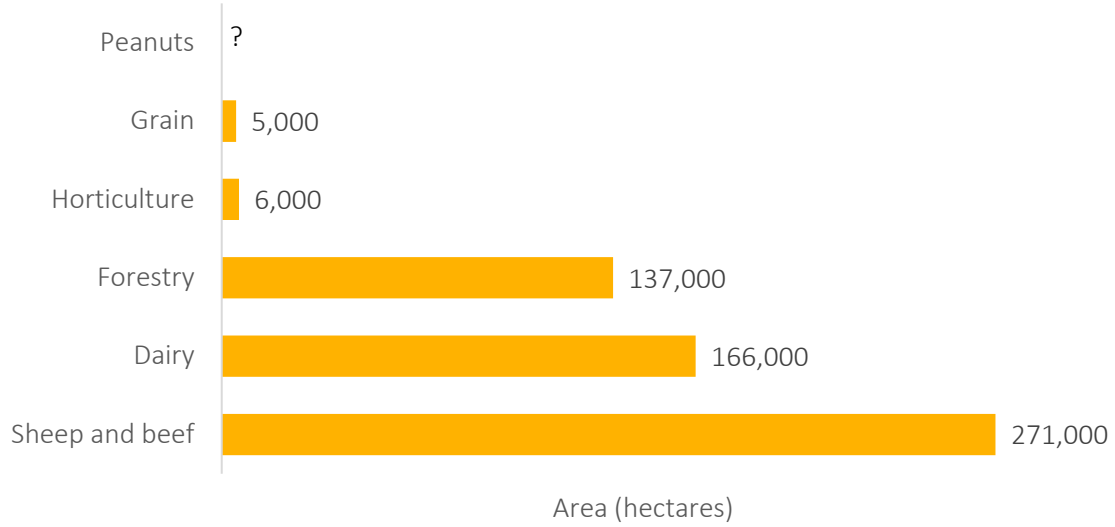
For processors, the following three criteria must be achieved for growing peanuts to be considered feasible:

		Criteria achieved?
1. Consistent supply	Regular and consistent supply aligning with processing capacity	
2. Establishing the infrastructure	Capital investment = feasible to be raised by the partners	
3. Operating costs per tonne	Customer price - farm gate price - transport costs > variable processing costs + annualised capital costs of processing	

The following slides assess these three criteria drawing on a range of available sources and information.

Consistent supply of peanuts – Availability of land

Earlier in this report, we indicated that to adequately supply Pic's with domestically produced peanuts, the industry would need to commit between 100 – 1,000 hectares annually to peanut production. It is important to first determine whether there is the land available to achieve this scale of production. A quick scan of Northland land use on Stats NZ suggests there is enough suitable land across Northland planted in other horticultural crops that could be converted to peanuts providing the economics support growers doing this.



Source: https://www.stats.govt.nz/indicators/agricultural-and-horticultural-land-use

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Consistent supply of peanuts – Availability of land

A more detailed review of Northland's land use, drawing on regionally available data, estimates the available land (~550 ha) is of a similar order to the 100 to 1,000 ha identified as the potential requirement in the customer section above.

Suitable land use options	Estimated area (ha) in region	Commentary	Indicative area (ha) available for peanut production
Currently low productivity, sandy soils and non – irrigated.	100's	Area is available; however, these areas are often non-contiguous, regionally isolated and can lack infrastructure which would increase freight costs and increase risk for disruptions.	50
Currently in vegetable cropping (potatoes, carrots), could rotate with peanuts.	~2,000 (AgriBase)	Highly relevant to potatoes and carrot production. Would estimate half amount of total area that is rotation at any one time. Estimating that only a quarter of people would adopt the crop rotation.	250
Currently used for growing maize grain and could rotate with peanuts.	~1,000	~5000 hectares of maize is grown in region but a minority is in grain production. Estimating 20% of maize production is grain. Peanuts would be in rotation so would only have a proportion plus lower estimated adoption rate – 5%	50
Currently used for pasture and maize silage and could rotate with peanuts.	~4,000	Rotating with pasture is high risk with weed burden and high opportunity cost so don't count on much – 5%	200
Total indicative area available for growing peanuts			**550**

Consistent supply of peanuts – Rotational cropping

Stakeholder discussions have suggested that peanuts could be integrated into a rotational cropping model and / or in with rotation with pasture.

Where the peanut industry is established with rotational cropping in mind, this would require the industry to have two to three times the number of required hectares committed to peanut production to ensure a consistent supply of peanuts annually. For example, a three-year rotation cycle would mean a total of 300 to 3,000 hectares across the region committed to peanuts. There is a risk with this model that if growers choose not to grow peanuts within their rotation for whatever reason, the supply chain would have a lower volume of peanuts than required.

Aligning incentives across the supply chain without accountability will be difficult. Conceivably, this risk could be managed by having growers commit to long-term growing contracts. The alternative model would be to have growers grow peanuts year on year, rather than within a rotation.

Source: Stakeholder discussions

Processor feasibility

The analysis on the previous slides suggests that there is enough land in Northland to supply approximately 50% of Pic's requirements, although it will require conversion of land from existing uses such as pasture, arable or vegetable cropping. Adopting a rotational cropping model would reduce the volume of peanuts produced annually unless more land can be made available. Alternatively, an annual cropping model would mean less land needs to be committed to growing peanuts year on year for the required annual volume.

		Criteria achieved?
1. Consistent supply	Regular and consistent supply aligning with processing capacity	?
2. Establishing the infrastructure	Capital investment = feasible to be raised by the partners	?
3. Operating costs per tonne	Customer price - farm gate price - transport costs > variable processing costs + annualised capital costs of processing	?

Required capital investment – Large scale processor

To estimate the required capital investment to establish a processing facility in Northland, we drew on two examples of processing plants established in the USA. We would expect the required capital investment to scale as the capacity of processing plant increases, but not at a constant rate (i.e. increasing economies of scale). The examples we drew on in this analysis are from two ends of the spectrum – a very large-scale processor, and a small-scale processor.

Example 1: Very large-scale processor

Arkansas, United States of America

180,000 tonne capacity

$70M USD / $115M NZD in capital costs

NZ$638 of capital per tonne of capacity

Source: https://www.mfaoil.com/farmer-owned-peanut-shelling-facility-gives-growers-more-control/

Required capital investment – Small scale processor

Example 2: Small large-scale processor

Georgia, United States of America

40 tonne capacity

$275K USD / $450M NZD in capital costs

$11,250 of capital per tonne of capacity

Table 4.1 Initial Projected Capital Requirements for a Small, On-Farm Peanut Processing Facility	
Long Term Capital	**Total Costs**
Buildings	
Storing Facility	$ 36,000
Shelling/Sorting	$ 57,600
Roasting & Further Processing	$ 25,740
Total Buildings	$ 119,340
All Equipment	$ 128,356
Subtotal Buildings & Equipment	**$ 247,696**
Land	$ 27,500
Total Long Term Capital	**$ 275,156**

Source: https://getd.libs.uga.edu/pdfs/black_gary_w_201112_ms.pdf

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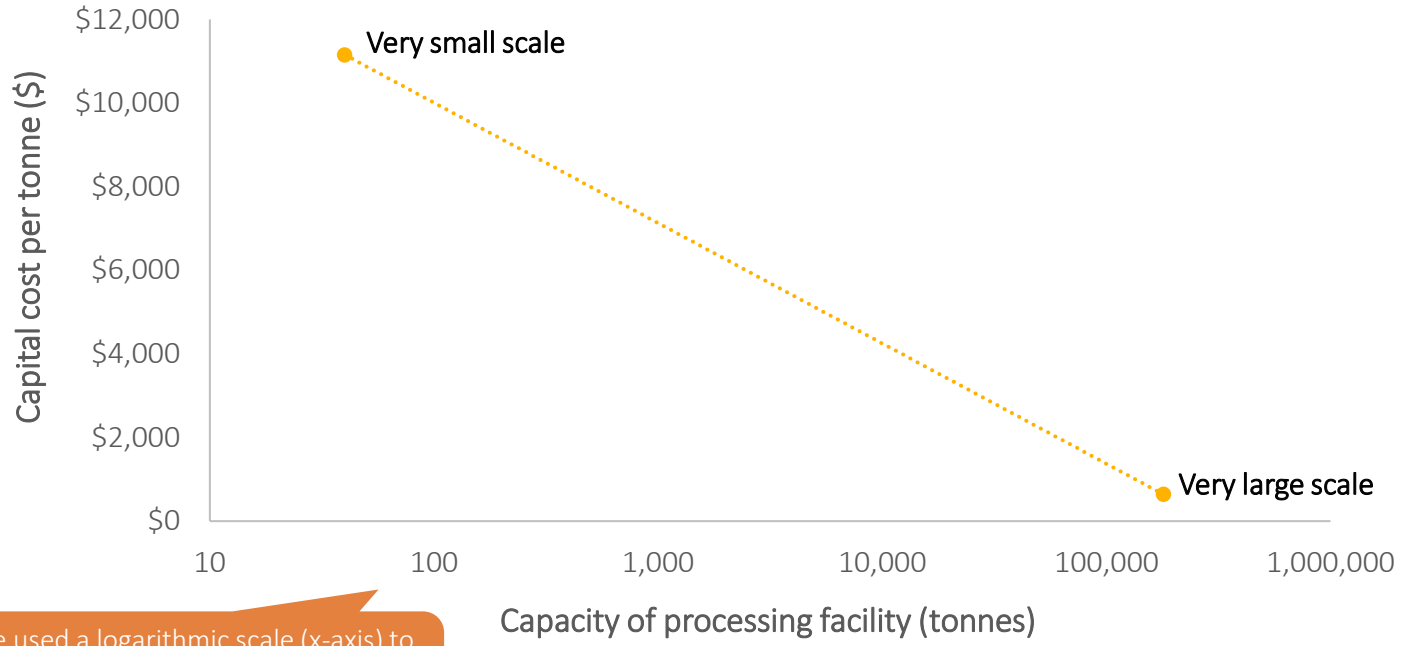
Required capital investment – Increasing economies

When plotted on the same chart, we can see how the cost of capital per tonne reduces as the capacity of the processing plant increases.



We used a logarithmic scale (x-axis) to understand the relationship between the processing sites.

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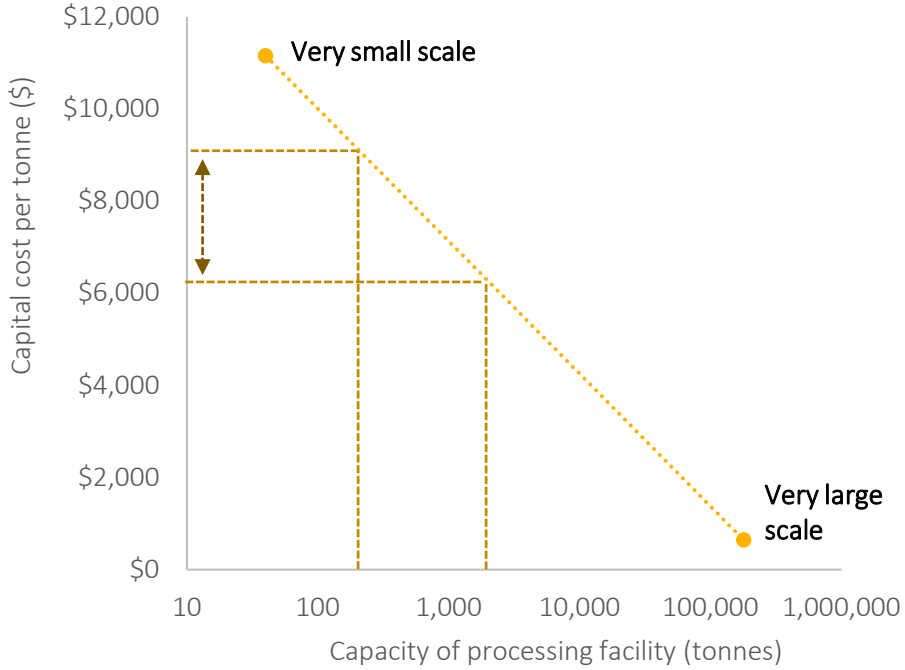
Required capital investment – Northland plant

From the analysis in this document so far, we've identified the scale of a Northland peanut industry should be somewhere between 100 – 550 hectares. Assuming an average yield of 3.5 tonnes per hectare, this suggests the industry could produce between 350 and 1,900 tonnes of peanuts annually.



For a processing plant processing between 350 and 1,900 tonnes annually, we estimate the average capital cost per tonne of capacity to be **$7,500** (approx. midpoint)

Source: Scarlatti analysis

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Required capital investment – Northland plant

For a hypothetical Northland plant processing between 350 and 1,900 tonnes of peanuts annually, we estimate the following drawing numbers from the previous slides.

- Northland, New Zealand
- 350 – 1,900 tonne capacity/year
- $7,500 of capital per tonne of capacity
- $2.6 TO $14 million in capital costs
- $200K to $1.2M in annual depreciation costs

A hypothetical processing plant in Northland, given these parameters, could be expected to cost between **$2.6** and **$14** million to build (capital cost).

Annualised over 10 years with a 20% residual value, this means **$600 per tonne in annualized capital costs** (i.e. depreciation).

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Annualised over 10 years with a 20% residual value, this means **$600 per tonne in annualized capital costs** (i.e. depreciation).

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Required capital investment – Accounting for growth

If a processing site is to be built, then it should be built to account for future desired scale. In other words, the processing plant should not be built to accommodate 350 tonnes at the lower end of this range only for the industry to grow and the processing plant to become overcapacity.

Planning for growth from the outset would reduce unnecessary costs being incurred down the track to build extra capacity. Allowing for some industry growth would mean building a plant between $5 - $10 million from the outset.

Processor feasibility

The analysis on the previous slides suggests a processing plant in Northland would cost between $5 - $10 million to establish – this is the equivalent of adding $600 of depreciation costs annually per tonne processed. This analysis has not gone as far to test whether the level of required capital investment is feasible for the stakeholders involved – it remains unclear at this stage whether the second criteria can be achieved. It is worth noting though that the annualised cost of this capital introduces a significant cost factor into the supply chain (see the following slides for further analysis).

		Criteria achieved?
1. Consistent supply	Regular and consistent supply aligning with processing capacity	?
2. Establishing the infrastructure	Capital investment = feasible to be raised by the partners	?
3. Operating costs per tonne	Customer price - farm gate price - transport costs > variable processing costs + annualised capital costs of processing	?

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Operating costs

To estimate the operating costs associated with processing peanuts, we again have drawn on examples from established processing plants in the USA, Australia and Argentina. For the following analyses, we have relied on secondary sources and financial statements publicly available. Unfortunately, efforts to validate the models and their outputs with Australian processors were unsuccessful. Regardless, we feel confident that the inferences drawn from the secondary sources in the following analyses are representative within an acceptable order of magnitude. Again, we assume economies of scale will be at play here with the operational costs reducing as the capacity of the processing plant increases – the examples we draw on for this analysis are of different scales.

Example 1: Small scale processing plant
Hypothetical on-farm processing facility - Georgia

- 40 tonnes throughput
- Variable costs = USD$1.68 per pound

- Farm gate price = USD$0.25 per pound

For this processing plant, the operating cost per tonne processed is roughly 5.7x the farmgate price paid to their suppliers.

Source: https://pca.com.au/wp-content/uploads/2017/07/financial-statement-2017.pdf

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What are the operating costs?

Example 2: Moderate scale processing plant
Peanut Company of Australia - Australia

- 14,000 tonnes throughput
- Cost of sales = AUD$48 million
- Cost of sales = AUD$3,400 per tonne

- AUD$2,400 processing costs per tonne
- Farm gate price = AUD$1,000 per tonne

For this processing plant, the operating cost per tonne processed is roughly 2.4x the farmgate price paid to their suppliers.

Source: https://getd.libs.uga.edu/pdfs/black_gary_w_201112_ms.pdf

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What are the operating costs?

Example 3: Large scale processing plant
Hypothetical processing facility - Argentina

- 180,000 tonne throughput
- Customer price ~$3,000 per tonne
- Transport to NZ ~$500 per tonne

- Farm gate price ~$1,300 per tonne

- Variable processing costs = Customer price – transport to NZ – Farm gate price = **$1,200 per tonne**

For this processing plant, the operating cost per tonne processed is roughly the same as the farmgate price paid to their suppliers.

Source: : Pics, CEIC data, Scarlatti analysis

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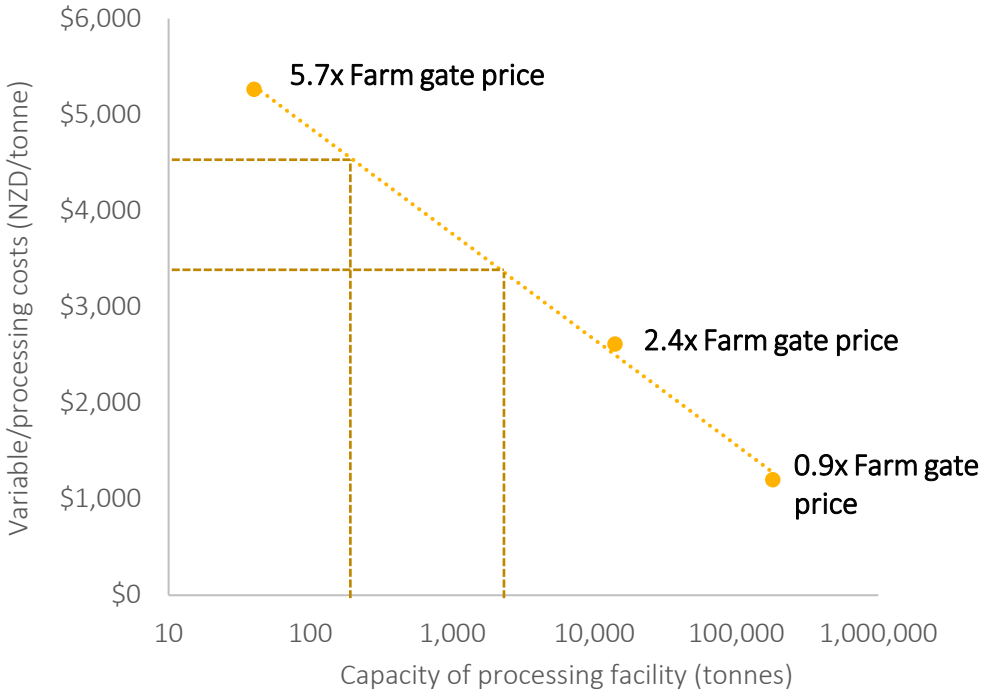
What are the operating costs?

From the analysis in this document so far, we have identified the scale of a Northland peanut industry should be somewhere between 100 – 550 hectares. Assuming an average yield of 3.5 tonnes per hectare, this suggests the industry could produce between 350 and 1,900 tonnes of peanuts annually.



For a processing plant processing between 350 and 1,900 tonnes annually, we estimate the operating cost to be **$4,000 to 5,000** per tonne of capacity. This is between 3x and 6x the farm gate price (given the range from earlier in this report)

Source: Scarlatti analysis

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Processor feasibility

The analysis on the previous slides suggests that the costs of processing peanuts per tonne (i.e. the operating costs plus the annualised capital costs) is **$4,000 to $5,000** per tonne. The third feasibility criteria for processors requires the operating costs to be less than the customer price ($3,500) minus the farm gate price ($1,200) minus the transport costs from Northland to Nelson (~$200), or $2,100 per tonne. Given that it does not, the third feasibility criteria is not met .

		Criteria achieved?
1. Consistent supply	Regular and consistent supply aligning with processing capacity	?
2. Establishing the infrastructure	Capital investment = feasible to be raised by the partners	?
3. Operating costs per tonne	Customer price - farm gate price - transport costs > variable processing costs + annualised capital costs of processing	✗

Summary of processor feasibility

We estimate there is approximately 550 hectares available across Northland for peanut production, although it would require the conversion of land from other land uses such as pasture, arable or vegetable cropping. While the land may be available to establish the industry, the incentive for growers to convert to peanuts is questionable given the high opportunity cost of peanuts production concluded from the grower feasibility section.

At 550 hectares, a peanut industry could produce up to 1,900 tonnes assuming an average yield of 3.5 tonnes per hectare. At this scale, a processing plant would cost $14 million to establish adding $600 of annualised capital costs to each tonne of peanuts processed. We would suggest that a more realistic scale of a processing plant to start with would be from around 600 tonne capacity (~170 hectares). While it's unlikely this capacity will be filled from the outset, this scale would allow for industry growth. At this scale, we estimate the operating costs will be approximately $4,000 per hectare.

Overall, this analysis has shown that while there is potential for the first two feasibility criteria to be achieved for processors, the annual processing costs (i.e., the annualised capital costs plus processing costs) of $4,600 per tonne are prohibitively expensive meaning the third feasibility criteria is not achieved and the supply chain is not feasible from the processor's perspective.

Summary of industry feasibility

In the previous section, we have assessed the economic feasibility of establishing a peanuts industry in Northland from the perspective of customers, growers and processors given a set of feasibility criteria for each stakeholder. For a Northland peanuts industry to be considered feasible, it must be feasible for these stakeholders individually. As summary of the analysis is provided below.

	Feasibility criteria	Achieved?	Comments	Stakeholder feasibility
Customers	Consistent supply	✓	There is enough land in Northland available to grow enough peanuts to supply ~50% of Pic's annual requirements providing an annual cropping system is used. A three year rotational cropping model would be able to supply 25% of Pic's annual requirements	✗
	High quality peanuts	–	It is unclear whether this criteria can be achieved at this stage. We would expect clarity on this point following a crop assessment post-harvest.	
	Economically viable	✗	Given the results from the analysis of processor profitability, it is unlikely Pic's will be able to source domestically grown peanuts at a cost in line with their current costs. At a minimum, we estimate the cost of peanuts per tonne would be $6,000 per tonne (~70% more than what Pic's currently pay for peanuts.	
Growers	Profitable	✗	While there are some combinations of yield and farm gate price that are estimated to generate a positive gross profit so long as the cost of production is kept low. As the cost of production increases, the number of feasible combinations reduces significantly. While this criteria has the potential to be achieved in favourable conditions, the odds are low.	✗
	Low opportunity cost	✗	There are no combinations of yield and farm gate price that are estimated to generate a level of gross profit that is greater than the gross profit of alternative land uses ($2,000/ha) given a cost of production of $4,000 per hectare (mid point of range).	

Summary of industry feasibility cont

	Feasibility criteria	Achieved?	Comments	Stakeholder feasibility
Processors	Consistent supply	✓	See 'Consistent supply' above for Customers	✗
	Capital investment required is achievable	–	We estimate the level of capital investment required to establish a commercial scale peanut industry in Northland is between $5 and $10 million. This analysis has not gone as far to test whether the level of required capital investment is feasible for the stakeholders involved – it remains unclear at this stage whether the second criteria can be achieved.	
	Profitable	✗	We estimate the annual costs of goods sold to be $6,000 per tonne according to the following breakdown: • Operational costs = $4,000 per tonne • Annualised capital costs (i.e. depreciation) = $600 per tonne • Transportation costs from Northland to Nelson = ~$200 per tonne • Price paid to growers for peanuts - $1,200 per tonne Collectively, the total cost of goods sold is ~70% more than what Pic's would realistically be willing to pay for processed peanuts (~$3,500).	

The feasibility analysis in the previous slides has concluded that a Northland peanut industry would **not be feasible** for either of the three stakeholders individually.

What could change our findings?

In this slide we consider the what effect changing the key levers considered in this work would have on our overall conclusions about viability.

Customer	Price	A local industry would become viable if customers were prepared to pay 2 to 2.5 times international pricing for a locally produced peanut.
Grower	Yield	Changing these levers would have little impact on the viability of the industry. As the processing costs would be considerably more than the farm gate price, even changing yields and costs of production to international best practice levels would not significantly change the findings.
	Cost of production	
	Alternative land-use	
Processor	Capital costs	A local industry would become viable if a new processing method became available that was economic at much smaller scales than large international processors.
	Operating costs	

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What could change our findings? – vertical integration

In this work (including the previous slide) we have assumed that the current supply chain remains in place. That is:

- Growers sell to a processor
- A processor sells to food manufacturers
- Food manufacturer sells to a retailers
- Retailer sells to a consumers

Based on current transfer pricing (see, for example, slide 12), most of the value added occurs in the later stages of this supply chain.

If Northland growers successfully established a vertically integrated business that produced a branded, retail-ready product it might be possible to create enough value-added to, in effect, subsidise the economic inefficiencies at the growing and processing end of the supply chain.

Presumably 'locally-grown, locally-made' should be a central part of a premium brand story to justify the use of Northland grown peanuts.

3

Stages of building the industry

This section captures the key considerations, opportunities and challenges associated with establishing a peanut industry at different scales to inform future implementation strategies (providing the industry is feasible from the perspective of the three stakeholder groups).

In this section, we consider what would be required from each stakeholder group for an industry at three different scales – 10, 100 and 1,000 hectares.

Pathway to reach 10 hectare scale

To establish a Northland peanut industry of 10 hectares, the following considerations will need to be addressed:

- Grower recruitment – Commitment would be required from existing growers, plus (probably) a few more, to reach the 10-hectare scale. Say a subsidy of $5,000 per hectare is needed to make this happen.
- Market development – Someone (who?) will need to take a lead in developing a market for snacking peanuts including arranging contract processing / packaging. Say costs are of the order $200,000 – $300,000.
- Investment needed – 10 hectares is essentially a small scaling up of the current project. For the industry to progress to this point at least one stakeholder will need to (continue to) subsidise the industry establishment by $250,000-$500,000. At least this amount again should be allocated to cover the planning, recruitment and fundraising needed to get to the 100 hectare scale.

Industry at 10 hectare scale

The following table characterises what a **10 hectare** peanut industry would look like for the three stakeholder groups; customers, growers and processors.

	What is needed?	What does it look like?	How to achieve it	Questions remaining
Customers	Products	Possibly snacking nuts if right seed is selected.	Seed selection needs consideration to be optimised for snacking nut product.	Who will develop a snacking product market?
Growers	Seed supply	Indicatively 10 tonnes (1 tonne per hectare) bought in advance.	Freighted in from overseas.	Is seed supply consistent enough to meet need? What seeds should be selected?
	Equipment (seeding and harvesting)	Use existing equipment. Seed selection need to be compatible with the maize plate (fits down the chute) enabling retrofitting tractors.	Developed in last season. Trial plate could be shared if timing allowed it.	
Processors	Processing facility with minimum 35 tonne capacity (assuming 3.5 tonnes per hectare)	• Collation of supply into one location, complete drying and cleaning processes. • Transport to Food Lab in Nelson for sorting, shelling **OR** keep in Northland for local processing – will need a temporary processing facility either way.	Transport (fly?) crop to Nelson or build a processing plant in Northland.	• Could the Food Lab support this volume? (~35 tonnes) • If the main market is Auckland, would it be better to process in region? • Would Northlanders buy the product if sold within region?

Pathway to reach 100 hectare scale

To grow a Northland peanut industry from 10 to 100 hectares, the following considerations will need to be addressed:

- Grower recruitment – A grower pool of something like 20 – 50 is likely to be required, with each committing an average of 2 – 5 hectares annually.
- Seed supply – Seed cost continues to be a barrier until a New Zealand seed bank can be established. There are different rights and legal parameters on this that should be addressed early so this can happen and mitigate this barrier.
- Farm equipment – At this scale, multiple sowing and harvesting equipment will be required. Growers will need to purchase this. There may be an opportunity to reduce costs by having equipment shared between collocated sites but limiting factors would be the time windows available for sowing and harvesting, and geographic distance between farms.
- Processing – Significant investment will be required for the infrastructure (~$5-10m). Forming a collective to pool resources will be required especially as size of site should be larger than what is needed at this scale to account for sector growth.
- Investment – Going from 10 hectares to 100 hectares requires investment in a processing facility, harvesting equipment, seed supply, working capital… It seems likely that a group working towards this commercial scale should be aiming to raise $15-20m.

Industry at 100 hectare scale

The following table characterises what a **100 hectare** peanut industry would look like for the three stakeholder groups; customers, growers and processors.

	What is needed?	What does it look like?	How to achieve it	Questions remaining
Customers	Products	Pic's NZ peanut butter	Incorporation of locally produced nuts into Pic's production as a new product line or to supplement general supply.	
Growers	Seed supply	Indicatively 100 tonnes (1 tonne per hectare) bought in advance.	Freighted in from overseas – not air freight at this volume due to expense.	Which varietal(s) would meet Pics requirements?
	Equipment – sowing and harvesting.	Purpose built seeding plates that can be retrofitted to maize planters and shared between collocated sites. Harvesting equipment will be at scale as timing of harvesting will be required at a small window.	Multiple seeding plates and threshers available for concurrent use at different locations.	How much can equipment be shared given geographic distances and overlaps in seeding / harvesting times? Assuming that some sharing is possible, how would this be organised commercially?
Processors	Processing facility with minimum 350 tonne capacity (assuming 3.5 tonnes per hectare)	A purpose-built processing facility is required.	Commercial investment of $5 to $10m is needed.	Where should this be built?

Pathway to reach 1,000 hectare scale

To grow a Northland peanut industry from 100 to 1,000 hectares, the following considerations will need to be addressed:

- Grower recruitment – At this scale, the pool of growers from the 100 hectare scale (20 – 50) would not need to change significantly, however the commitment from each grower would need to increase with each committing an average of 20 – 50 hectares annually.
- Seed supply – At this scale, the seed costs will continue to be a barrier unless a New Zealand seed bank has been established by the time this scale is achieved.
- Farm equipment – At this scale, the capacity of sowing and harvesting equipment will need to grow significantly as more volume of peanuts will need to be harvested within the same timeframe as the 100 hectare scale. Growers will need to purchase this. Again, there may be an opportunity to reduce costs by having equipment shared between collocated sites but limiting factors would be the time windows available for sowing and harvesting, and geographic distance between farms.
- Processing – Upwards of a $20 million investment will be required for the infrastructure. Forming a collective to pool resources will be required especially as size of site should be larger than what is needed at this scale to account for sector growth. It is likely additional partnership between stakeholders will be required to achieved processing capacity for this scale.
- Investment – Going from 100 hectares to 1,000 hectares requires investment in a processing facility, harvesting equipment, seed supply, working capital… However, the incremental investment over the 100 ha scale might be only a factor of 2-3x, as efficiencies become available.

Industry at 1,000 hectare scale

The following table characterises what a **1,000 hectare** peanut industry would look like for the three stakeholder groups; customers, growers and processors.

	What is needed?	What does it look like?	How to achieve it	Questions remaining
Customers	Products	NZ peanut butter and potentially other uses. At this scale, there would be surplus supply to Pic's requirement.	Get supermarkets on board early because it takes a long time with promotion time and required supermarket negotiations.	How to balance initial interest with long term price point to make selection of the product a long-term choice.
Growers	Seed – 1 tonne per hectare (varies based on irrigation level).	1,000 tonnes	Hopefully using NZ seed bank to save costs.	Who imports and stores this?
	Equipment – sowing and harvesting.	Purpose built seeding plates that can be retrofitted to maize planters. Sharing harvest equipment with collocated growers if timing allowed.	Multiple seeding plates available for concurrent planting and harvesting at different locations.	How many would be needed at this scale?
Processors	Processing facility with minimum 3,500 tonne capacity (assuming 3.5 tonnes per hectare)	Full processing facility.	Partnership between partners (central Government, industry and growers). Capital investment upwards of $20 million.	A large investment collaboration project.