



Primary Growth Partnership: Interim evaluation of the New Zealand Sheep Industry Transformation Programme (NZSTX) Projects 1 and 2



Summary report to the Ministry for Primary Industries

February 2016



Nimmo-Bell
& COMPANY LTD

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This report has been prepared by Nimmo-Bell Directors Dr Brian Bell and Michael Yap.

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1 Executive Summary

The NZ Merino Company (NZM) has submitted a proposal (called W³) to the Ministry for Primary Industries (MPI) for a second PGP programme to help develop the coarse wool sector. This report is an interim evaluation of the current NZSTX PGP programme to help inform MPI's assessment of the W³ proposal.

The NZSTX PGP programme was first reviewed in March 2014 when it was considered that "Overall, while progress has been slower than anticipated, the programme has seen a number of good outcomes, such as the industry uptake of 'estimated breeding values' (EBVs), and supply chain improvements for fibre and meat." Since then significant further progress has been made in the fibre and meat projects evaluated under this review when assessed against the Logic Model Outcomes except increased uptake of FFM products and processes which is still considered to rate as 'some progress' rather than 'moderate progress'. Medium to long term outcomes continue to be viewed as favourable.

1.1 Background

The Primary Growth Partnership (PGP) New Zealand Sheep Industry Transformation (NZSTX) Programme is a partnership between the NZ Merino Company Ltd (NZM) and the Ministry for Primary Industries (MPI) with the objective to transform the NZ Sheep Industry. This was initially a five year programme which started in September 2010. The programme was extended for a further two years from July 2015 to enable outstanding work to be completed in the Production Science work stream.

Total project funding is \$33.5 million of which the Government is funding up to \$16.8 million. As at 30 June 2015 Government has funded \$14.2 million.

The aspiration of the programme is that by 2029 NZSTX will transition half of the NZ coarse wool growers into production systems whereby they produce Fit for Market¹ (FFM) meat and wool products from true FFM sheep. NZM's aspirational objective is adding \$2 billion per annum to the NZ sheep industry by 2029. MPI's website states that the estimated potential economic benefits to NZ, will be a conservative \$250 million a year in economic benefits by 2025.

To achieve the aspiration targets, 3 projects are co-funded by the PGP:

Project 1. Transforming demand for FFM fibre

Project 2. Transforming demand for FFM meat and co products

Project 3. Growing NZ's FFM sheep base through Production Science and farmer uptake.

The first two projects have now been completed. An extension has been granted for a further two years in order to complete significant projects in the genetics, forage and animal health areas of Project 3. This report is an interim evaluation of the completed projects - Projects 1 and 2.

¹ The NZM fit-for-market model, which forms the foundation of the NZSTX programme, starts with identifying the end-market user with connections made right through the value chain back to the grower that produced the raw fibre (or meat or leather). This connection between the grower and the market encourages truly fit-for-market production, with clear specifications to be met, providing the opportunity for premiums to be generated throughout the supply chain (NZSTX website <https://mpi.govt.nz/funding-and-programmes/primary-growth-partnership/primary-growth-partnership-programmes/the-new-zealand-sheep-industry-transformation-project-nzstx/>).

1.2 Evaluation of Achievements against their intended objectives

1.2.1 Project 1. Fibre

Performance has been below target on volume but held up well on price.

Performance of the NZSTX on volume and price has been confounded by tough market conditions and the severe drought over the last two years. Market conditions especially in Europe and the United States have reduced demand and the drought has impacted on supply affecting the seasonal flow of product especially meat and to a lesser extent lamb wool. These short-term aberrations have masked long-term upward trend.

Against a background of rapidly falling supply of coarse wool down 34% over the last five years, fine and mid micron wool (auction plus contract) has remained remarkably resilient down only 7%, with wool under NZSTX contract up 6% over the same period.

NZM has positioned ZQ² as the leading brand for traceable, ethical and sustainable Merino fibre with 19 new retail brands and 9 new supply chain partners on board since the NZSTX started. A key difference in the market is its story telling and extensive support to brand partners through the 'conversion tool kit'.

1.2.2 Project 2. Meat and co-products

The Alpine Origin Merino joint venture with Silver Fern Farms has created a branded, high-value product where previously an undifferentiated product was sold at a discount on the commodity market. While sales growth has been slower than hoped for, it is increasing year-on-year, and both partners remain committed to the programme. Both Leather and Lanolin as alternative FFM products have not proved commercially scalable and have been dropped from the programme.

1.3 Extent to which these achievements have or will contribute to outcomes

Progress on Logic Model Outcomes comparing the indicators in the March 2014 evaluation³ with that assessed here show there has been significant progress in all areas but one – increased volumes of FFM animals processed, where the evidence is that there has been some progress but falling short of moderate progress.

1.3.1 Project 1. Fibre

The platform for future market growth set by the five years of NZSTX investment in Project 1, coupled with achievement of the production science targets for matching grower supply with increasing market demand, provides the opportunity for the NZSTX aspiration to be achieved. Much is yet to be done to realise this.

1.3.2 Project 2. Meat and co-products

Initial supply targets have not been met and supply has been affected by changes to specifications and drought effects. Sales of Alpine Origin Merino (AOM) meat under the *Silere* brand have been increasing year on year. Some good market development ground work done for merino leather

² ZQ is NZM's "ingredient brand". Wool that meets ZQ standards is the highest quality natural Merino fibre available in New Zealand. The label is meant to give buyers confidence that they are procuring materials that give their products substance in environmental integrity, animal welfare, social responsibility, economic sustainability and traceability. By positively addressing these factors in a certifiable manner, ZQ appeals to the IQ/Minds (intelligence quotient) and EQ/Hearts (emotional intelligence quotient) of brands and consumers alike (<http://www.nzmerino.co.nz/casestudy/products-partners.php>).

³ PriceWaterhouseCoopers NZSTX Evaluation (PwC 2014), Figure 13.

“kura”, but this and lanolin have been dropped from the programme as market conditions were not favourable for commercialisation.

1.4 Spillover benefits

It is early days but long term benefits are starting to be captured by increased premiums for FFM products leading to increased money flowing through to rural communities.

NZM’s recognition and integration of non-traditional people skills, social media and technology into the NZSTX is an example to other NZ exporters.

NZM’s industry leadership is exemplified by the Te Hono Movement and the Primary Sector Boot Camps with Stanford University. John Brakenridge’s contribution of introducing international best practice thinking to exporting has been honoured by him receiving the NZTE NZ International Business Award: KPMG Leader with an Outstanding Contribution to International Business. NZM’s business model is an example to other primary industry entities wishing to move from a commodity to customer values approach.

Increased R&D by better alignment with public private partnerships (PGP) particularly in production science and breeding techniques are setting the stage for wider adoption in the sheep industry.

The active collaboration with business leaders and especially Maori is laying a platform for a different kind of future than the production push mentality of the past with increased profits and incomes as a result.

1.5 Barriers/key drivers for successful outcomes

The key barriers for NZSTX to overcome and the drivers for successful outcomes are: shifting the New Zealand sheep industry’s mind-set/culture and practices from a commodity model towards a fit-for-market model; maintaining existing brand partner / supply chain relationships ; managing global NGO animal welfare relationships; ensuring continued growth in demand for New Zealand fine wool and Merino meat, coupled with increasing supply of FFM wool and meat from growers; and finally the greatest challenge of all to transition half New Zealand’s sheep production from coarse wool meat-focused breeds to finer wool dual-purpose sheep types.

1.6 Key learnings

At the start of the programme NZM had to convince everyone that its untied model would be successful and lead to a transformation of the New Zealand sheep industry. After five years the programme has established a platform for growth for fine to mid-micron wool and alpine origin meat. The top three lessons that come from the programme to date are:

1. The drivers of high end customer purchase decisions are initially the quality of the design, colour and feel of the product. This is then justified by the story behind the product that embodies environmental sustainability, animal welfare, the ability to trace back to ethical farming practices and identification with the farmers, thus linking the source of the raw material to the finished product. The value proposition embodying these attributes is seen as a unique point of differentiation for NZM from that of competitors.
2. There is a need for good animal ethics practices to maintain a social licence to operate. NZM has introduced good practices which are a key for maintaining appeal to target markets.
3. Transformation of a biological system particularly involving animal breeding, such as converting coarse wool flocks to fine or mid-micron, takes time and can be expected to follow an S curve rather than a linear progression, starting slowly and then gaining

momentum if conditions are right. The initial aspirational target of converting half the coarse wool flock to FFM within 10 years was unrealistic. This has been acknowledged by NZM. The current target is more realistic but nevertheless is very challenging. The extent to which it will be achieved will depend on continued progress and consolidation of price premiums for Fit For market wool and meat and adoption by coarse wool farmers of the FFM sheep production model. Progress to date has been very encouraging built on key supply chain relationships between NZM, growers and brand partners.

2 Introduction

2.1 Background and Objectives

The Primary Growth Partnership (PGP) New Zealand Sheep Industry Transformation (NZSTX) Programme is a partnership between the NZ Merino Company Ltd (NZM) and the Ministry for Primary Industries (MPI) with the objective to transform the NZ Sheep Industry. This was initially a five year programme which started in September 2010. The programme was extended for a further two years from July 2015 to enable outstanding work to be completed in the Production Science work stream.

Total project funding is \$33.5 million of which the Government is funding up to \$16.8 million. As at 30 June 2015 Government has funded \$14.2 million.

The original aspiration of the programme was that by 2019 NZSTX will transition half of the NZ coarse wool growers into production systems whereby they produce Fit for Market (FFM) meat and wool products from true FFM sheep, averaging \$12.00 per kg for their wool and \$9.00 per kg for their meat. At the end of year three (2012/13) the timeframe was extended to 2029 with other key aspects unchanged. Significant value add for co-products such as leather and lanolin were initially part of the programme, but were dropped in 2015 as commercialisation was not considered feasible at this time.

NZM's aspirational objective is adding \$2 billion per annum to the NZ sheep industry by 2029. MPI's website states that the estimated potential economic benefits to NZ, will be a conservative \$250 million a year in economic benefits by 2025 with the potential gain much higher if the programme is successful in its objective of transforming the sheep industry.

To achieve the aspiration targets, 3 projects are co funded by the PGP:

Project 1. Transforming demand for FFM fibre

Project 2. Transforming demand for FFM meat and co products

Project 3. Growing NZ's FFM sheep base through a Production Science and farmer uptake programme.

The first two projects have now been completed. An extension has been granted for a further two years in order to complete significant projects in the genetics, forage and animal health areas of Project 3.

NZM has submitted a proposal (called W³) for a second PGP programme to help develop the coarse wool sector.

This report responds to an invitation from MPI for Nimmo-Bell & Company Ltd (Nimmo-Bell) to undertake an interim evaluation of Projects 1 and 2 of the NZSTX Programme to help inform its assessment of the W³ proposal and to capture the key achievements and learnings from the completed projects.

To date the NZSTX has been subject to a financial audit undertaken by Ernst & Young, dated 19 November 2012 and a mid-term progress review undertaken by PricewaterhouseCooper (PwC), dated March 2014. This report builds on these two previous studies.

The objectives of the evaluation are to:

1. Evaluate the achievements of Project 1 and Project 2 against their intended objectives;

-
2. Comment on the extent to which these achievements have contributed or will contribute to the NZSTX programme's intended outcomes as set out in the business case for the programme and the outcome logic framework;
 3. Comment on barriers/key drivers for successful outcomes,
 4. Identify data needs for carrying out a full programme evaluation when the programme ends in 2017; and
 5. Identify key learnings from the programme.

2.2 Approach

We based our methodology, personnel input and costs on the terms of reference received from MPI. The interim evaluation commenced on Monday 12 October 2015.

We used a combination of documentation review, face to face and phone interviews, market research and qualitative analysis to produce the required deliverables.

While our analysis was largely qualitative, we set out the information needed to conduct a quantitative Cost Benefit Analysis (CBA) at the time of final evaluation and identify gaps in currently available information.

We relied on documentation provided by MPI and NZM along with information obtained during the interview programme as detailed in the Appendix 1. This was augmented by independent information obtained on commodity trends.

3 Evaluation of achievements against intended objectives

3.1 Project 1 (transforming demand for FFM fibre)

Objective: To transform demand for FFM fibre through 'Crossing the Chasm' and 'Blue Ocean' strategies.

At a high level, the key achievements made by Project 1 are:

- Increased branded contract sales volumes across the New Zealand fine-wool clip, often at a significant premium to the global commodity price.
- New branded contracts at both the finer and stronger edges of the fine-wool clip.
- New brand partners across a range of micron categories, new business prospects with potential brand partners and continued support from established brand partners.
- A greater suite of marketing tools, particularly in the digital communication space, through the development of a 'Conversion Tool Kit' of differentiators to assist brand partners with market positioning of New Zealand Merino fibre.
- Greater consumer demand for New Zealand Merino fibre that is traceable to its source and that has been produced in an ethical and sustainable way.

NZM projections imply a compound annual growth rate in contracted wool volume of 18% from 2015 to 2029. This is while total wool production grows by 0.3% per annum and coarse wool production falls by 4% per annum. By 2029 half total wool production is projected to be in the fine to mid micron range compared with 8% in 2015. Overall fine and mid micron wool volume is projected to grow by 14% compound per annum. These projections of the transformation of coarse wool to fine and mid-micron are stretch targets. The projections include relatively small productivity gains and a major shift in production from coarse to fine and mid-micron wool. Overall, reaching the targets appears very challenging with the outcomes technically feasible as long as farmers are convinced footrot is beaten and the economics for the shift continue to be compelling.

3.2 Project 2 (transforming demand for FFM meat and co products)

3.2.1 Evaluation of achievements against intended objectives

Objective: To transform demand for 'other' FFM products, primarily meat, through 'Crossing the Chasm' and 'Blue Ocean' strategies.

At a high level, the key achievements for project 2 during years 1 to 5 are:

- Branded sales of Merino meat, both domestically and internationally, through the Alpine Origin Merino joint venture, with SILERE volumes continuing to increase
- The prototyping of Merino leather in the high-end fashion market, which showed promise as a concept did not prove a commercially scalable prospect at present

4 Extent to which achievements have contributed or will contribute to the programme's intended outcomes

4.1 Project 1 outcomes –Fibre

Outcome summary of progress

- Continued commitment to the contract model from existing brand partners.
- Uptake of the contract model by new partners, following successful trials of New Zealand Merino fibre.
- New uses for fibre achieved as a result of NZSTX trials (e.g. blending, bedding, 100% biodegradable garment and dark fibre).
- Expansion of the contract model to new growers.
- Further progress towards reaching critical mass in fibre procurement, which is dependent on increasing both contracted fibre demand and FFM supply. Despite market difficulties in recent times, brand partner growth expectations are significant.
- Continued improvements in supply chain management.

Continued growth in branded contract volumes for New Zealand fine wool is fundamental to the success of NZSTX. Over the period of the NZSTX the key performance indicator of NZM Branded Contract fibre sales has grown by 82% and exceeded the targets set in three out of five years (see Figure 1). In addition to NZM contract prices being in the upper quartile of 10-year commodity prices, the reduction in price volatility achieved through the contract model continues to be a key point of differentiation – both with in-market brand partners and on the supply side with growers. Unfortunately national statistics on wool prices are no longer collected in New Zealand which makes it difficult to directly compare the margin between NZM branded contract and commodity wool. Reliance must be placed on Australian auction prices which relate to the fine end of the micron range as mid-micron wool is not produced in Australia. As NZM branded contract prices include mid-micron wool (traditionally priced lower than fine wool) this will reduce the overall price when compared with Australian auction prices. This means the comparison of prices shown in Figure 2 is on the conservative side.

NZM has positioned ZQ as the leading brand for traceable, ethical and sustainable Merino fibre with 19 new retail brands and 9 new supply chain partners on board since the NZSTX started. A key difference in the market is its story telling and extensive support to brand partners through supply chain management and the 'conversion tool kit'. The strengthening of the ZQ Merino brand through initiatives funded outside of the NZSTX programme has helped to position ZQ as the leading brand for traceable, ethical and sustainable Merino fibre. This is critical as pressure from consumers for these attributes is continuing to increase.

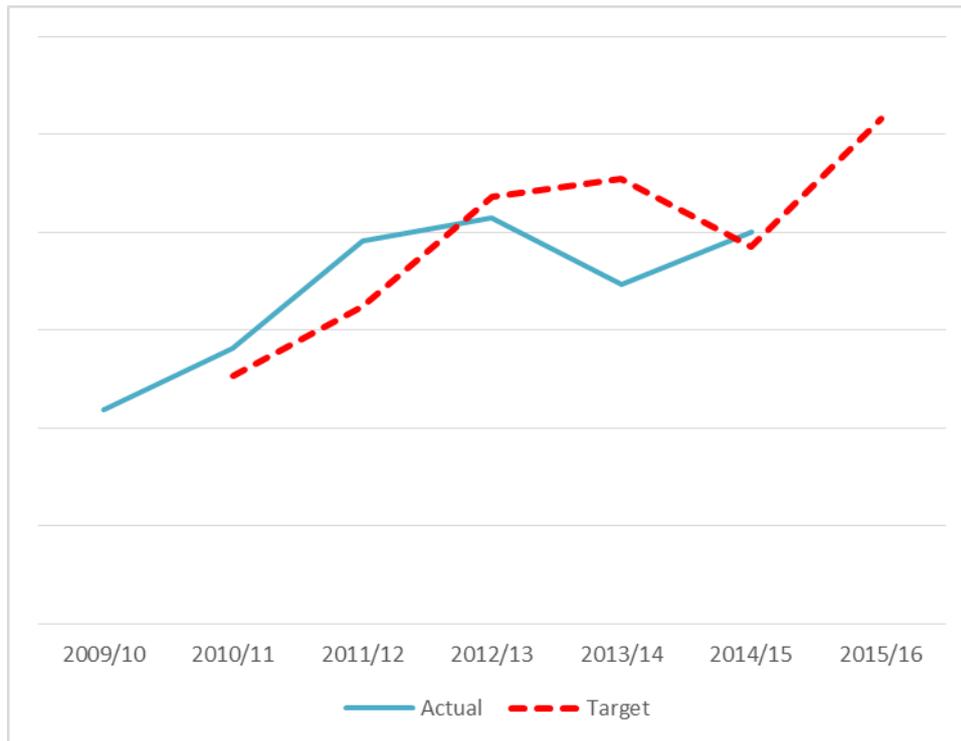


Brand partners, while sometimes initially sceptical of the FFM approach, are enthusiastic in their praise for the support NZM provides in helping to differentiate NZ merino from commodity fibre wool.

The platform for future market growth set by the five years of NZSTX investment in Project 1, coupled with achievement of the production science targets for matching grower supply with increasing market demand, provides the opportunity for the NZSTX aspiration to be achieved. Much is yet to be done to realise this.

Against a background of rapidly falling supply of coarse wool down 34% in 2014-15 compared with 2009-10, NZSTX fine and mid-micron wool (auction plus contract) has remained remarkably resilient down only 7%. Over the period of the NZSTX the key performance indicator of NZM Branded Contract fibre sales has grown by 82% and exceed target in three out of five years (see Figure 1). Tough market conditions in 2012/13 and 2013/14 lead to reduced sales with excess stocks carried over from 2012/13 absorbed in 2013/14. Overall the trend is positive with 2014/15 sales exceeding target and further strong growth expected in 2015/16. Short-term aberrations have disguised the long term upward trend.

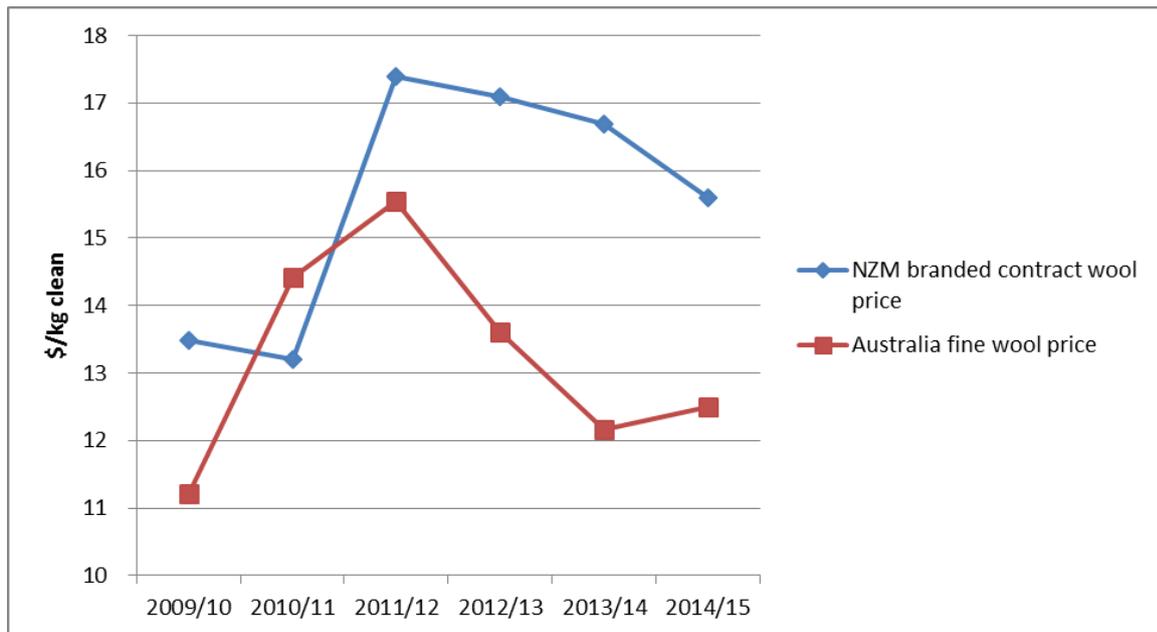
Figure 1: NZM Branded Contracts: Actual v Target (tonnes clean)



Strong growth in Branded Contract sales has been achieved in all three fibre ranges (ultra-fine, fine and mid-micron) compared with pre-NZSTX with further growth expected in all categories in 2015/16.

Significant premiums have been established for NZM Branded Contract FFM wool compared with commodity wool in four of the five years of the NZSTX (see Figure 2).

Figure 2: Wool prices (\$/kg clean)



Source: NZM for contract prices, Australian auction prices

Whether NZM can maintain the momentum in the shift from auction to contract will depend on the additional value proposition NZM can add for growers as well as for brand partners. So far, the fact that overall New Zealand fine to mid micron wool volume has fallen by 7% compared with an increase of 82% for contract wool points to the value proposition being compelling.

4.2 Project 2 outcomes – Meat and Other Co Products

Outcome summary of progress

- Increased value achieved for Merino meat (newly differentiated as part of NZSTX)
- Increases in volume of branded meat sales compared to year four
-
- Contracts better structured to address seasonal components
- Continued improvements in supply chain management including tightening of specifications, penalties and killing to order.

The Alpine Origin Merino joint venture with Silver Fern Farms has created a branded, high-value product where previously an undifferentiated product was sold on the commodity market. While sales growth has been slower than hoped for, it is increasing year-on-year, and both partners remain committed to the programme.

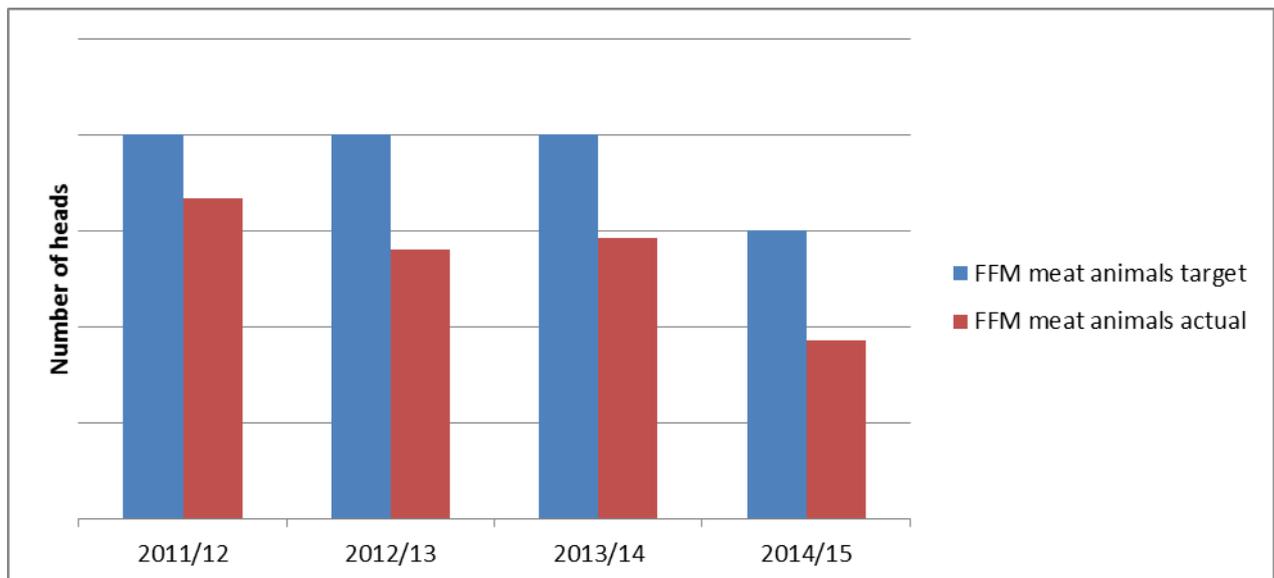
While the prototype for Merino leather in the high-end fashion market is not commercially scalable at present, the NZSTX leather initiative demonstrated the potential for differentiate New Zealand Merino products beyond fibre and meat.

Fit For Market meat is derived from FFM procured animals extracting premium as SILERE branded meat. Farmers receive a price premium for participating in FFM procurement programme.



Figure 3 shows the target number of animals procured under FFM was reduced from 2013/14 to 2014/15. The number of actual animals procured is lower than target for all years and is trending downwards. This is largely a function of tightening the specifications to exclude 2 tooth, (i.e. only take lambs and hoggets and narrow the carcase weight specification from 14.0 - 22.9 kg to 16.0 - 22.9 kg) and the impact of the drought affecting seasonal supply.

Figure 3: FFM meat animals target vs actual

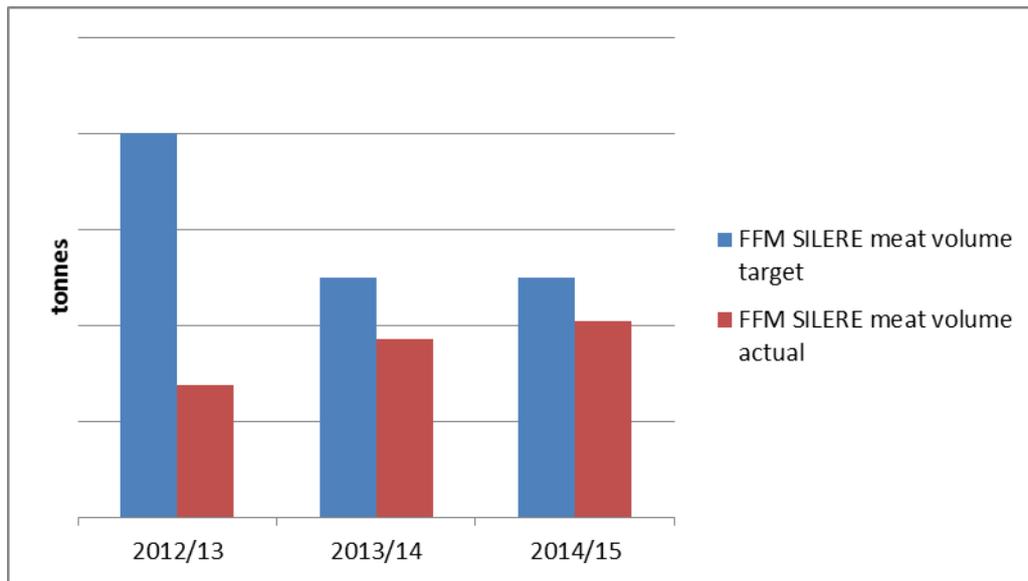


Source: NZM

Similarly, Figure 4 shows that target FFM *Silere* meat volume decreasing from 2012/13 to 2014/15. Despite declining number of FFM animals procured, actual *Silere* meat sales volume has increased by 48% though still missing target volumes. This apparent mismatch between procurement of animals and SILERE sales is a function of seasonal factors with farmers holding lambs longer to increase wool weights for the finer wool at first shearing.

In order to achieve the necessary condition of 52 week supply to restaurants and retailers there will need to be a better alignment between lamb breeders and finishers. This is proving very difficult to achieve.

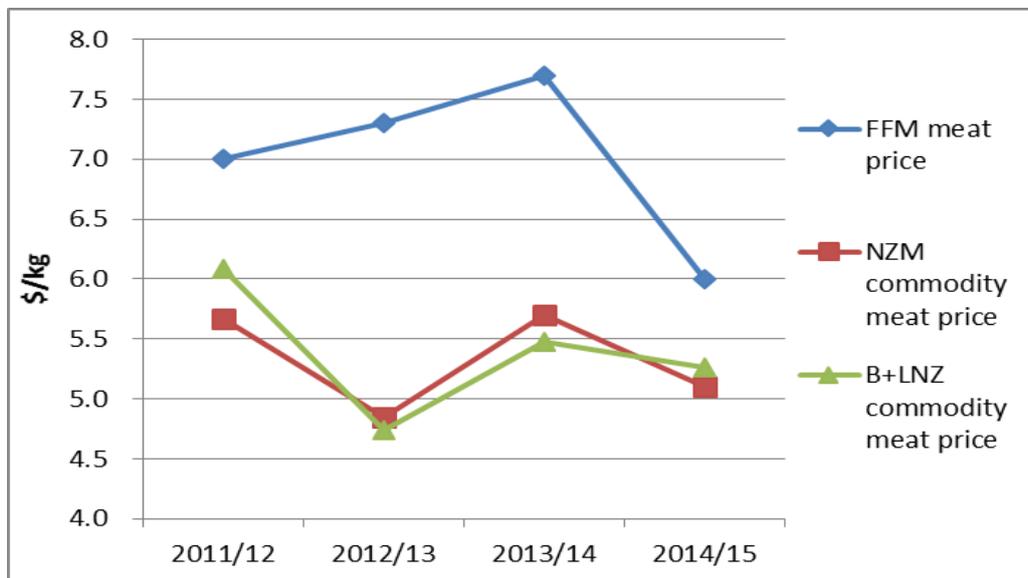
Figure 4: FFM SILERE meat sales volume target vs actual



Source: NZM

NZM AOM meat prices have been able to achieve a premium compared with commodity lamb prices as shown in Figure 5 ranging from 14% to over 50% based on Beef+Lamb New Zealand data and Nimmo-Bell analysis.

Figure 5: FFM meat price and commodity prices (NZM and B+LNZ)



Source NZM and B+LNZ

5 Progress against logic model outcomes: Projects 1 and 2

Table 1 below highlights progress on Logic Model Outcome comparing the assessment made in the PwC progress report in 2014 with that assessed here. For Projects 1 and 2, there has been significant progress in all areas but one – increased volumes of FFM animals processed, where the evidence is that there has been some progress but falling short of moderate progress.

Table 1: Progress against logic model outcomes (Projects 1 and 2)

Outcome	Progress		Comment
	2013	2015	
Short-term 2012-2019			
Change in industry mindset/culture and practices			<ul style="list-style-type: none"> Continued commitment to the contract model from existing brand partners Uptake of the contract model by new partners, following successful trials of New Zealand Merino fibre Commitment from Silver Fern Farms to the FFM concept with ownership taken (see Appendix 4, brand partner interviews) Expansion of the contract model to new growers
Increased understanding of FFM products by consumers and buyers/sellers			<ul style="list-style-type: none"> Improvement in understanding of FFM products by buyers and sellers, and increased awareness amongst consumers, through facilitated in-market activities (see Appendix 4, brand partner interviews)
Critical mass in procurement via NZM facilitation.			<ul style="list-style-type: none"> Further progress towards reaching critical mass in fibre procurement, which is dependent on increasing both contracted fibre demand and FFM supply. Despite market difficulties in recent times, brand partner growth expectations are significant
Increased uptake of FFM products and processes.			<ul style="list-style-type: none"> Further progress towards increasing use of the contract model for fibre Continued commitment to the contract model for meat procurement Contracts better structured to address seasonal components Significant additional FFM sheep recorded in the 'transitioning growers' log' since NZSTX commenced
Increased ability to produce FFM goods for a targeted end audience			<ul style="list-style-type: none"> Progress towards delivering forage, genetic and animal health solutions that will better enable growers to develop and supply fit-for-market goods for specific end-markets
Improved brand recognition and differentiation			<ul style="list-style-type: none"> Continued work on generic differentiation, with specific brand work funded by NZM outside of NZSTX
Improved supply chain management			<ul style="list-style-type: none"> Continued improvements in supply chain management for fibre and meat
Medium-term 2015-2022			
Increased volume of FFM animals processed			<ul style="list-style-type: none"> Branded contracted fibre volumes while behind target in 2012/13 and 2013/14 are reviving and set to increase strongly in 2015/16 Increases in volume of branded meat sales compared to year four
New, higher value products and co-products produced			<ul style="list-style-type: none"> New uses for fibre achieved as a result of existing trials (e.g. blending, bedding, 100% biodegradable garment and dark fibre) Increased value achieved for Merino meat (newly differentiated as part of NZSTX)
Enhanced reputation			<ul style="list-style-type: none"> New Zealand Merino fibre and meat products have an enhanced reputation in the market NZM's reputation as a leader in New Zealand's primary industry is strengthened Spillover benefits for New Zealand Inc. as a result of the gains made through NZSTX
Increased certainty of supply and consistency of product			<ul style="list-style-type: none"> Continued communication throughout the value chain from the market to growers (and back to the market) to ensure continued certainty of supply and consistency of FFM products
Long-term 2020+			
Increased value of products			<ul style="list-style-type: none"> Improved value proposition for both growers and brand partners across fibre and meat
Market growth or protection			<ul style="list-style-type: none"> Strong base for market growth once global economic conditions improve

 Achieved
  Substantial progress
  Moderate progress
  Some progress
  No progress

Source: PwC, Nimmo-Bell and NZM

6 Spillover benefits

As a result of NZM's involvement in NZSTX, the following spillover benefits have been achieved outside the programme. The benefits are categorised according to the outcome logic model and are largely qualitative at this stage:

Long term outcomes

- Supporting rural communities through profitable farming
 - Early days, but significant price premiums are beginning to flow through to increased profitability and spending by an as yet small group of transitioning growers

Impact on wider economy (medium term outcomes)

- Increased knowledge of NZ Inc.
 - Contribution to the development of 'brand New Zealand' as NZM evolves differentiation strategies for fibre, meat and other products
 - Enhanced marketing capability in the New Zealand primary industry, especially around social media and technology

Effect of activities (short-term outcomes)

- Collaborative partnerships across the primary sector including leveraging other PGP programmes
 - Founding of Te Hono Movement (the Primary Sector Boot Camp), with John Brakenridge continuing to have a key leadership role. This initiative exposes other leading New Zealand exporters to the NZM philosophies around the FFM approach helping to differentiate New Zealand products from that of competitors and increase exports
 - Further development of NZM's collaborative partnerships with other primary sector organisations
- Extension of thinking for strong wool sector
 - The FFM approach is being promoted and receiving support in the sector leading to a future PGP programme initiative for strong wool

Enablers: Input, activities and outputs

- Strengthening R&D and improving linkages between researchers, commercial organisations and markets
 - Better alignment of private-public partnerships and increased profile for PGP with positive media exposure (particularly around production science)
 - Up-skilling resources within the industry, with extension of research, development and innovation capability particularly through the wide range of production science
- Introducing international expertise and capability to the NZ primary sector
 - The collaboration with Stanford University is exposing NZ export leaders including Maori to top international thinking
 - John Brakenridge receiving the NZTE NZ International Business Award: KPMG Leader: Outstanding Contribution to International Business

6.1 Commentary

NZM's leadership exemplified by the Te Hono Movement and the Primary Sector Boot Camps with Stanford University and honoured through John Brakenridge receiving the NZTE NZ International Business Award: KPMG Leader: Outstanding Contribution to International Business winner. NZM's business model is an example to other primary industry entities wishing to move from a commodity to customer values approach. The active collaboration with business leaders and especially Maori is laying a platform for a different kind of future than the production push mentality of the past.

7 Barriers/key drivers for successful outcomes

The key barriers for NZSTX to overcome looking forward and the drivers for successful outcomes are:

- Shifting the New Zealand sheep industry’s mindset / culture and practices from a commodity model towards a fit-for-market model with long-term contracts linking growers directly to the end market.
- Maintaining existing brand partner / supply chain relationships and establishing contractual relationships with new partners to sustain growth.
- Ensuring continued growth in demand for New Zealand fine wool and Merino meat, coupled with increasing supply of FFM wool and meat from growers.
- Successfully managing animal welfare activist relationships to positively and clearly to differentiate superior NZ FFM practices from poor international commodity practice.
- Transitioning New Zealand sheep production from strong wool meat-focused breeds to finer wool dual-purpose sheep types (with high production and reproduction, as well as lower input requirements than a ‘traditional’ fine wool sheep). This is the biggest challenge to achieving successful outcomes and is a key plank of the two year programme extension – to promote adoption of the FFM model developed under NZSTX for use by strong wool farmers.

7.1 Commentary

In the short-term, drought and tough market conditions have put a brake on both supply and demand. Indicators that highlight the strength of the base that has been built and therefore the likelihood that growth will speed up include: on the supply side the maintenance of price premiums and volumes while commodity lines contract and on the demand side the fact that there have been no contracts broken to date and a strong new business book.

8 Data needs for carrying out a full programme evaluation

A full programme evaluation will embody a quantitative cost benefit analysis (CBA). We have identified the following information gaps that need to be filled in order to carry out such an analysis:

The counterfactual. CBA is about quantifying the marginal changes between what is expected to happen with the PGP programme and what would have happened without the programme. In this case, there is a high level of uncertainty around both these aspects.

Firstly, without the injection of the PGP, what is the likelihood that existing trends of a declining industry would continue:

- 18,500 kg per day of wool lost to the NZ industry since 1990
- 3,490 sheep per day lost to the NZ industry since 1990

Secondly, with the programme, most of the benefits are expected in the future. This is because increasing the supply of FFM product involves biological processes that take time to realise. Much will depend on the success of the breeding programmes in reducing foot rot to acceptable levels in sheep that have high value wool and high meat production (derived through increased lambing percentage and more efficient meat production).

Adoption needs to be quantified, highlighting the timeline in terms of estimated numbers of farmers and number of sheep by years converting from Merino, Half Breed and Cross Bred to FFM sheep over the next 30 years compared with the status quo without the PGP NZSTX programme.

Early indications are that the PGP NZSTX could significantly reduce the innovation phase of adoption from 10 years to 4 to 6 years and thus halve the second phase adoption period when the majority of farmers can be expected to make the transition.

In our view, quantifying the benefit from FFM wool requires estimating the incremental volume and price premium. Incremental volume is the difference between actual FFM contract or NZSTX wool volume and forecasted counterfactual wool volume. The latter should be based on trend analysis of wool volumes without PGP NZSTX. NZM estimates that without PGP NZSTX, fine to mid-micron wool volume would have been 11,000 tonnes in 2014/15 compared with actual production of 13,500 tonnes. By 2029 this category is projected to be 89,000 tonnes, half of total wool volume. A similar analysis is required for meat.

8.1 Costs

Two types of costs need to be considered in the CBA. The first type of cost is R&D costs. These are mainly the costs (government and industry contribution) of the PGP NZSTX programme for the period 2010/11 to 2016/17 (Table 2). The second type of costs is industry costs for the FFM programme. These are incremental FFM costs from baseline year of 2009/10 and incremental farmer costs for participating in or converting to FFM. These costs need to be collected for the purpose of cost-benefit analysis.

Table 2: PGP NZSTX programme costs

(\$'000)	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
MPI	1,687	3,115	4,286	2,817	2,341	1,321	1,203
Industry Partners	1,687	3,115	4,286	2,817	2,341	1,321	1,203
Total	3,374	6,230	8,572	5,634	4,682	2,642	2,406

9 Key learnings

At the start of the programme NZM had to convince everyone that its untied model would be successful and lead to a transformation of the New Zealand sheep industry. After five years the programme has established a platform for growth for fine to mid micron wool and alpine origin meat.

On the demand side, NZM has developed a collaborative model with a group of enthusiastic brand partners who totally buy into the value concept, which starts with the drivers of purchasing decisions by high end customers and ends on high country farms in New Zealand. Story telling and tangible support to partners justify a premium that partners see value above that provided by commodity traders. As long as there is continuing value to both sides of the relationship there is a huge potential of demand to be filled.

On the supply side, the nucleus group of farmers are confident that a dual purpose sheep with both high value wool and meat productivity is a reality. The next stage is to move beyond this nucleus group to the innovators in the industry, which is just starting now and likely to take 4-6 years to demonstrate that the economic advantage is real and sustainable. Then the third stage where the bulk of farmers make the transition will begin to take place. This stage could take another 10 to 20 years with a key performance indicator being how much sooner this can be achieved. Thus the target of transitioning half the coarse wool flock to FFM sheep by 2029 is technically feasible but is considered to be a stretch target.

Key lessons that come from the programme to date are:

1. The drivers of high end customer purchase decisions are initially the quality of the design, colour and feel of the product. This is then justified by the story behind the product that embodies environmental sustainability, animal welfare, trace back to ethical farming practices and identifying with the farmers thus linking the source of the raw material to the finished product. The value proposition embodying these attributes is seen as a unique point of differentiation for NZM.
2. There is a need for good animal ethics practices to maintain a social licence to operate. NZM has introduced good practices which are a key for maintaining appeal to target markets.
3. Transformation of a biological system particularly involving animal breeding, such as converting coarse wool flocks to fine or mid micron, takes time and can be expected to follow an S curve rather than a linear progression, starting slowly and then gaining momentum if conditions are right. The initial aspiration target of converting half the coarse wool flock to FFM within 10 years was unrealistic. Raising expectations on supply and then not being able to deliver is unacceptable to the market.
4. NZM have their own views from the lessons they have learned – see Appendix 5.

Appendix 1. Project 3 (Production science and farmer uptake)

Relevance to Projects 1 and 2

While evaluation of Project 3 is not within our terms of reference, performance on its objectives are critical to achieving the desired outcomes for Projects 1 and 2. This is because additional wool and meat that is FFM depends on a successful breeding programme with a high uptake of the genetics.

The key to increased uptake of the genetics that will produce FFM products is progress on foot rot. All sheep get foot rot to a degree, but Merino sheep are particularly susceptible. Before contemplating a change most farmers will need to be convinced that the breed is less susceptible to foot rot than their existing flock, have similar or better productivity and with consistently higher priced meat and wool. In other words, the economics are superior. In practical terms this means less than 5 per cent culling for foot rot compared with the current level in Merinos of around 15 per cent.

Project 3 has made good progress on foot rot to the stage that farmers within the Southern Cross group of seven multiplier farmers⁴ consider while it is a work in progress it is nearly there. The Southern Cross breed is three quarters Merino with one quarter cross breed (Lincoln, Polwarth, Romney, Border Leicester and Corriedale).

There are now 3,000 ewes in the Central Progeny Testing (CPT) regime, including the 500 ewes in the stabilised Southern Cross nucleus flock (the minimum needed for a new stabilised breed). This nucleus flock produced its first drop of lambs in 2013 and is now in the third drop (lambling at 130-135% with 21-23 micron wool from a 60 kg ewe).

Significant progress has been made on reducing foot rot through a combination of quantitative 1 to 4 scoring of ewes and hoggets on an individual basis and through the use of genomics (DNA testing). The NZSTX provided 50% of the costs for leasing ewes, artificial insemination (AI) and monitoring, with the other 50% input provided by growers (this support ended 30 June 2015). The Merino breeders have lagged behind other breeders in the use of breeding values and central progeny testing and the NZSTX has been instrumental in the uptake of advanced breeding techniques amongst Merino ram breeders.

The Southern Cross breed will initially target the half bred segment which makes up 5-10 per cent of the national flock (1-2 million ewes, Corriedale and Others, see Table 3). Once success is shown with this segment, strong wool flocks on the eastern coast of both islands will be targeted. Other targets of the NZSTX are:

- Ultra-fine wool sheep transitioning to increased meat productivity
- Fine wool sheep transitioning to the mid micron range with increased FFM meat productivity.

Ultimately, it will be profitability that will count as to uptake. Based on information provided by multiplier farmers, for a half breed farmer it will mean the same income from lambs and \$30 to \$40 per ewe extra for wool. For a Merino farmer shifting to Southern Cross it will mean a 20 per cent increase in lambing with increased value add meat and the same value of wool, in the order of \$500 per hectare increase in gross revenue with no increase in costs.

⁴ Breed the initial rams for other commercial breeders as well as innovator farmers.

Table 3: NZ Sheep Breeds and Numbers in 2014

Increasing the FFM flock					
Ewes (million)	2014		Wool		
	%	Million*	Coarse	Mid to Fine	Microns
Breeds					
Romney	46	9.1	9.1		31-41
Composite	13	2.6	2.6		
Perendale	12	2.4	2.4		30-37
Coopworth	8	1.6	1.6		32-42
Merino	4	0.8		0.8	17-24
Corriedale	3	0.6		0.6	27-34
Other	14	2.8		2.8	
	100	19.7	15.6	4.1	
50% Coarse wool ewes			7.8		
* 25% decrease on 2004					

Source: Farm Facts 2015
Microns: Lincoln University Technical Manual

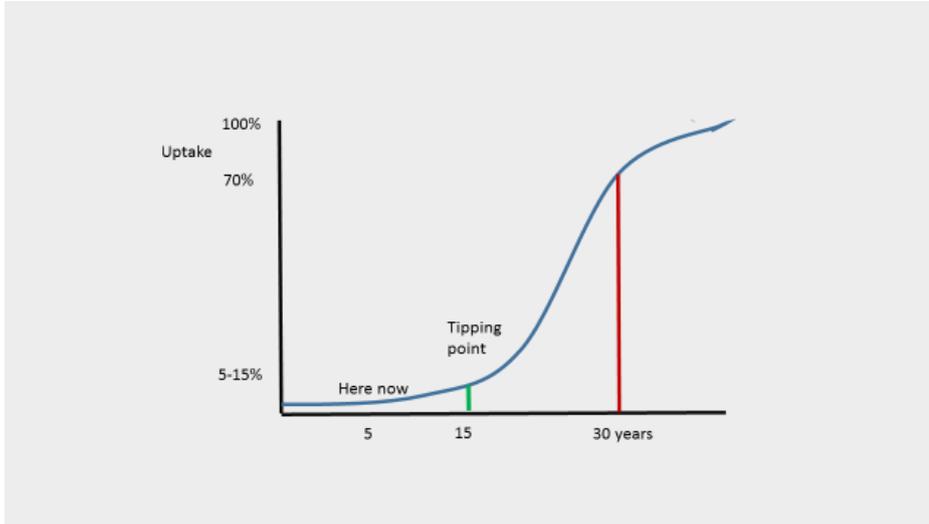
Currently most cross-bred sheep farmers when comparing performance think in terms of lambing percentage and weaning weight with no emphasis on wool. The Southern Cross breed will need to demonstrate the superior economics of mid micron wool without sacrificing meat value to get an uptake by cross-bred farmers. Economic necessity will drive the change. If farmers feel comfortable with the existing situation little change can be expected.

The Southern Cross breed is at the start of the adoption process. Should the economics prove favourable and there is a perception foot rot is beaten then early adopters will increasingly come to the fore. This group makes up 5 to 15 per cent of farmers and is starting to convert based on the number of farmers joining the NZSTX or showing interest. Without the extra push of the NZSTX it would take another 20 years before 70 per cent of farmers come on board should conditions stay favourable, and another 10 years to reach 90 percent adoption. See Figure 6 below. The objective of the programme is to speed up the innovation phase and reduce the second phase adoption by the majority of farmers.

The tipping point is when there are enough early adopters showing significant independently assessed economic benefits that perceptions change and the bulk of farmers start to come on board.

The aspiration of the programme is that by 2029 NZSTX will transition half of the NZ coarse wool growers into production systems whereby they produce Fit For Market (FFM) meat and wool products from true FFM sheep. Based on 2014 ewe numbers, this means approximately 7.8 million ewes are expected to make the transition. This is a big ask within a 15 year timeframe. It is technically feasible and the issues are around perceptions rather than science. The likelihood of achieving the target will be better gauged once the tipping point is reached.

Figure 6: Typical industry adoption curve



Appendix 2: NZM's view on key lessons

Walking into the NZM office is unlike any other company with its base in a primary industry. Words that come to mind are design, flair and innovation. This is a company that puts the customer at the start of the value chain where deep empathy research begins the journey back to the way production is undertaken on the farm. In NZM's view key lessons are:

Things that got reinforced along the way:

- that production science and the environment are an important part of the story
- that the business is in the value space rather than in the commodity space
- that selling commodities is easy and the point of least resistance, while selling on value is hard work
- that talented young people don't have to come with a primary industry background or even be New Zealanders, once they get involved they develop a huge passion and love it
- that the skills needed include design, engineering, IT, fine arts and people skills
- that reputation will be governed by global NGOs such as PETA tapped into smart phone technology
- that Maori are the single point of difference that New Zealand truly has and Maori culture (mihi to waiata) should be embraced
- that post PGP, scale is needed to keep the momentum going.

Things to do differently:

- scale back aspirations as the business is dealing with the constraints of biological science and with it the need to understand the psychology of dealing with farmers and farmer uptake.

Looking forward:

- competition will increase as others try to emulate the programme both in New Zealand and off-shore, but no one covers all the touch points and right now no one else can do it
- Other countries including China will look to New Zealand for raw materials because their standards will be higher than ours. New Zealand is the cross road largely producing commodities with a risk to the environment
- Think again where the potential market lies. The US luxury market is bigger than the combined luxury markets of China, Japan, Italy and France. New York spends more on luxuries than all of Japan
- New Zealand primary industries need to collaborate horizontally, which is the idea behind the Boot Camp series, now coming into number five.

