

# STRATEGIC PLAN EVALUATION

AWI Strategic Plan 2019/20 to 2021/22

## Review of Economic Performance

10 March 2023

Macrologic Pty Ltd

Yottaba Holdings Pty Ltd

# Contents

- Executive Summary ..... 3
- Introduction ..... 4
- Industry Context ..... 5
- Return on Investment Evaluation ..... 7
- Changes in Sheep/Wool Enterprise Performance..... 8
- Financial Impact Evaluation ..... 10
- Strategy Level Evaluation..... 13
- Industry Collaboration ..... 14
- Performance Metrics ..... 14
- Conclusions and Recommendations..... 15
  - Appendix 1 Evaluation Methodology..... 16

# Figures – Charts & Tables

- Figure 1 Australian Share of World Merino Production..... 20
- Figure 2 Australian Production of Merino Wool ..... 20
- Figure 3 ABARES: Sheep Enterprise BCR Ratio..... 21
- Figure 4 ABARES: Wool Levy as % of Total Cash Receipts..... 21
- Figure 5 ABARES Sheep Enterprises closing the gap ..... 22
- Figure 6 RoFAM – ABARES RoFAM across Enterprise Types..... 22
- Figure 7 ABARES: Lambing Rate - All Enterprises..... 22
- Figure 8 ABARES: DSE/ha Sheep Enterprises v Average..... 23
- Figure 9 Change in Australian Wool Clip..... 23
- Figure 10 Financial impact of change in micron profile of wool clip..... 23
- Figure 11 21MPG ratio to staple fibre (NWSF) ..... 24
- Figure 12 Australian Wool Clip: Change in Value FY96 to FY22 ..... 24
- Figure 13 Estimates of Wool Supply Elasticities..... 25
- Figure 14 Australian Wool Production and Value/Price..... 25
- Figure 15 Minimum BCRs..... 26

## Executive Summary

Australian Wool Innovation's [AWI] Strategic Plan 2019/20 to 2021/22 was implemented under its new Measurement and Evaluation [M&E] Framework. Both the financial outcome for levy payers' and related elements of the M&E Framework for this period form the basis of this evaluation.

**AWI achieved a Benefit Cost Ratio for levy payers of 3.7.** The primary measure of AWI's performance is the Benefit:Cost Ratio [BCR] on levy payer contributions. For the three-year period it is estimated AWI achieved an overall BCR on projects undertaken of 2.8. When adjusted for contributions this equates to a BCR of 3.7 on levy payer contributions.

**3.7**

*BCR on levy payer contributions.*

**AWI collaborated with 344 supply chain partners.** AWI managed 304 active projects over the period with 178 or 59% of projects involving other industry partners. Overall, there were 344 individual partners who collectively contributed/participated on 540 occasions. This approach from AWI not only leveraged additional contributions for AWI projects but also increased the likelihood of success through the broader network delivered by partners.

**344**

*Collaborative partnerships.*

**AWI generated supply chain leverage of 80% from partners.** \$97.1m over the three-year period; \$52.3m in cash and \$44.8m in-kind. This equates to \$0.80 for every \$1.00 of levy payer contributions across the period. In addition to these partner contributions the Federal Government contributed \$50.5m (\$0.44 for every levy dollar) for the period, which was directed towards AWI's R&D programs.

**\$0.80**

*Leverage:  
\$Partner:\$Levy*

**AWI achieved 81% of the targets set at program level.** AWI nominated 87 metrics across its suite of programs to determine the success or otherwise of the project post-completion. Of the metrics set, 81% were either fully or predominantly achieved. Given the M&E Framework is in its first iteration, this is a positive outcome with the basis set for further improvement.

**81%**

*Target Achieved.*

**Overall, AWI has produced a positive result for levy payers.** Considering the disruption from COVID-19, AWI produced a strong result and has established a M&E Framework which will drive improved returns for the future.

**51%**

*Projects affected by COVID-19*

# Introduction

## Background

The AWI Strategic Plan 2019/20 to 2021/22 set the goal of ...

*“... to increase the profitability and support the sustainability of Australian wool industry through strategically targeted investments in research, development, and marketing designed to optimise return on investment”.*

The six AWI values of Innovative, Collaborative, Accountable, Transparent, Integrity, and Respect were to guide how AWI was to conduct itself in its efforts to deliver on this goal. This independent assessment is a continuation of AWI's commitment to these core values.

The Strategic Plan is structured around an integrated framework that centred around AWI's primary goal. AWI set six portfolios (including Corporate Services), each made up of multiple strategies (16), which in turn are underpinned by a total of 34 programs, each of which are accountable to one or more metrics and are set one or more investment focuses. These programs collectively represent a \$214m investment over the assessment period. These are detailed in Appendix 1.

To achieve the metrics or targets set per program, projects are established which each link to a specific program. Through the 3-years assessment period, AWI managed 304 active projects each bound by a set process of approval, monitoring and close-out requirements.

Underpinning the Portfolio / Strategy / Program / Project framework are four dimensions (or drivers) of productivity, efficiency, demand, and price. Each program is designed to influence at least one of the four dimensions to the benefit of woolgrowers. Improvements in productivity and efficiency lower the cost of production for Australian wool growers and improving demand and/or price leads to higher income for Australian wool growers.

## Conduct of Evaluation

The evaluation was undertaken through two key stages:

- Stage 1: A desktop assessment of the Australian and global sectors related to wool production and processing to form the basis for the assessment of AWI's impact on on-farm levy payer returns.
- Stage 2: A desktop evaluation of the financial impact of AWI's program on on-farm levy payer returns. This included a series of case studies to determine the financial impact of specific programs/projects and counterfactual assessments where a “top down” assessment of AWI's impact was the only viable means of estimation. This is expanded on in the following sections of this report. These outcomes were reviewed with program managers and refined as appropriate.

A review of AWI's M&E processes was also conducted and outcomes of that review will be included in this report where they are relevant to the financial outcomes determined.

Throughout the evaluation, the consultant worked closely with the AWI M&E function. While the consultant held numerous *informal* discussions with the M&E function, there were also several *formal* “stage-gate” meetings held through the process to review the prevailing status and preliminary findings.

## Industry Context

### Australian Wool production Sector

The period FY20 to FY22 has been a difficult one for the Australian Wool Industry.

- Average annual wool production fell by 8% to 301 million kilograms greasy compared to the previous corresponding period FY17 to FY19 [PCP]<sup>1</sup>
- Average annual EMI fell by 20% versus PCP seeing the average annual farmgate value to \$2.6B versus PCP of \$3.4B<sup>2</sup>
- The fall in wool price and supply chain disruption resulting from the COVID-19 pandemic also saw bales held back from sale nearly double compared to PCP while the average number of days bales were held in storage more than doubled compared to PCP<sup>3</sup>

The positive news is that the pipeline has since been clearing and the wool price has partially recovered. Additionally, the production of wool has reversed the long-term downward trend with FY23 production forecast at 340 Mkg greasy compared to the historic low of 284 Mkg in FY20, an increase of 20%.<sup>4</sup>

The farm gate value of Australian wool is now heading above \$3.0B annually with 77% of volume and 85% of value linked to merino production<sup>5</sup>.

Australia produces 70% of global merino wool, and 83% of merino wool 19.5 microns or finer (Figures 1 & 2).

This is a unique concentration of supply for a global commodity and one which is a core focal point of value creation and maintenance within the AWI.

Whilst wool is still a highly valued farm output its relative importance has reduced over time. The total value of agricultural production has risen from \$24B in FY95 to \$83B in FY22. Wool's share of that total has fallen from 14% to 4%, maintaining its value of around \$3B<sup>6</sup> despite a halving in wool production over the period.

Over the same period wool receipts as a percentage of total receipts from sheep enterprises has fallen from around 80% to below 40%<sup>7</sup> with meat production becoming the primary driver of profitability and the recent lift in flock size. Australia exports ~95% of its wool in greasy form and competes in the highly competitive global fibres sector. Final retail consumption of


 **8%**

FY20-FY22  
Production v PCP

 **20%**

FY20-FY22 EMI v  
PCP

**340 Mkg**

FY23 Production  
Forecast,  from  
284 Mkg in FY20

**\$3.0B+**

Farmgate value of  
Australian wool

**83%**

Australia's share of  
merino wool <=19  
micron

**<40%**

Wool receipts as %  
of Sheep Returns

---

<sup>1</sup> Wool production data sourced from Independent Commodity Services [ICS]

<sup>2</sup> Wool pricing data provided by ICS.

<sup>3</sup> Data related to bales held from sale and bale storage days were provided by a confidential, reliable industry sources.

<sup>4</sup> AWI Wool Forecast

<sup>5</sup> Data provided by ICS.

<sup>6</sup> ABARES Agricultural Commodities June 2022

<sup>7</sup> ABARES Farm Surveys data

Australian wool is almost entirely offshore. As such promotion and marketing of wool as well as other extension programs across the value chain remain predominantly an international pursuit.

## Return on Investment Evaluation

AWI's Strategic Plan 2019/20 to 2021/22 nominated Return on Farm Assets Managed [RoFAM] as a core measure of its success through on-farm improvements in productivity and efficiency to lower the cost of production for Australian wool growers and supply chain initiatives aimed at increasing demand and/or price leading to higher income for Australian wool growers.

Setting a consistent RoFAM target became problematic as the capital value of farmland increased dramatically during the period. When formulating its strategic plan, the average farm capital per head of sheep and kilogram of wool (greasy) was estimated at \$1,002 and \$228 respectively. The latest survey data from ABARES has increased these numbers by more than 50% to \$1,646 and \$344 per head of sheep and kilogram of wool respectively<sup>8</sup> driven primarily by a rapid rise in agricultural property values. This equates to an estimated \$42B of capital directly related to the production of wool (excluding sheep meat production) and the quantum of assets for which AWI needs to improve returns on.

To assess the financial returns of AWI's activities the measure of Benefit:Cost Ratio (BCR) has been adopted. While not a direct proxy for RoFAM, BCR is nevertheless inherently linked to RoFAM as any BCR greater than 1 represents a positive net cashflow generated which results in a lift in RoFAM. As part of this evaluation, a BCR hurdle rate (or target) of 1.75 was set in consultation with AWI's M&E team. The basis of this target was derived from analysis of ABARES data which indicated the average BCR achieved from sheep enterprises was around 1.5 with top quartile (Q1) farmers achieving 1.75 while the bottom quartile (Q4) was closer to 1:0 (Figure 3). This was based on cash receipts versus cash costs which slightly overstates the enterprise BCR to the extent of non-cash costs (depreciation etc) however this was considered a viable benchmark for the purposes of this evaluation.

Achieving a BCR of 1.75 ensures AWI is generating returns for sheep/wool enterprises greater than what they are currently on average achieving on farm.

The wool levy is currently 1.50% of the sale value of wool. Expressed as a percentage of Total Cash Costs for sheep enterprises it has fallen from 1.35% in the early 1990's, to 0.81% in FY18 and 0.45% in FY21<sup>9</sup> (Figure 4). This statement is not offered in any way as support for the levy but is intended to place its cost in perspective of overall operational costs. The aim of this evaluation is to identify whether the levy is generating net benefits to the grower which justify the cost and are superior to alternative investments.

**\$42B**

*Farm capital  
allocated directly to  
wool production.*

**1.75**

*Minimum BCR  
Target for AWI  
Programs*

**1.50**

*Average BCR  
achieved by Sheep  
Enterprises*

**0.45%**

*Wool levy as % of  
average Cash Costs  
for Sheep  
Enterprises*

---

<sup>8</sup> ABARES Farm Surveys data

<sup>9</sup> ABARES Farm Surveys data

## Changes in Sheep/Wool Enterprise Performance

Analysis was undertaken of ABARES and other data sets to identify high level trends or movements in the performance of the sheep/wool sector and the wool market in general to identify areas potentially impacted by AWI programs. The following is a high-level summary of findings. More detail is provided in the appendices.

ABARES analysis indicates that the RoFAM performance of sheep enterprises continues to lag alternative enterprise types other than Beef Enterprises<sup>10</sup>. The average RoFAM for sheep enterprises for the 10 years to FY2021 was 1.0% compared to an average across all enterprise types of 1.9% for the same period.

A more detailed analysis shows that the performance gap between Sheep Enterprises and the average for all enterprise types has been closing over the last 10 to 15 years (Figure 5).

The average RoFAM for sheep enterprises over the 5 years to FY21 was 0.75% behind the industry average compared to 0.95% behind during the preceding 5-year period. The closing of the gap by 0.2% indicates positive productivity and price impacts (sheep meat and wool) ahead of the average across all sectors (Figure 6). On the estimated \$98B of assets allocated to sheep/wool production<sup>11</sup>, this equates to an incremental profit of \$196m above what would have been achieved if sheep enterprises had moved in line with the industry average performance changes over the period.

In seeking underlying reasons for the outperformance of sheep enterprises, analysis of ABARES highlights two areas of on-farm performance of sheep enterprises indicating an uplift of farm practices and profitability:

- The average lambing rate has increased to 90.9 for the 5 years to FY21 compared to 90.0 for the previous 5-year period (Figure 7). Several AWI programs are focussed on improving this measure.
- The measure of DSE per Hectare<sup>12</sup> for sheep enterprises compared to the industry average indicates that the ratio for sheep enterprises has increased by 0.04 DSE/Ha above the average across all enterprises in the 5-year period FY17 to FY21 compared to the previous 5-year period. Pasture improvement is another key measure targeted by several AWI programs. (Figure 8)

Analysis of wool production and price data highlights a consistent trend to finer wool production as a percentage of the total wool clip, alongside the broader trend towards meat v wool production.

**1.9%**

*Average RoFAM, All Enterprises, FY12-FY21*

**1.0%**

*Average RoFAM, Sheep Enterprises, FY12-FY21*

**↑ 0.2%**

*RoFAM Sheep Enterprises v All - FY17-21 v FY12-16*

**↑ 0.9%**

*lambing rate improvement - FY17-21 v FY12-16*

**↑ 0.04**

*DSE/ha Sheep v All - FY17-21 v FY12-16*

<sup>10</sup> ABARES Farm Surveys data utilising segmentation by Enterprise Size and Management Quartile

<sup>11</sup> ABARES Farm Surveys

<sup>12</sup> DSE or Dry Sheep Equivalent is a measure of the energy requirement of livestock – e.g. a 50kg wether maintained at constant weight as a DSE of 1. When expressed as DSE/hectare it is an indication of the carrying capacity of pasture (in the case of sheep enterprises)



Wool of 19 micron or less has increased its share of the clip from around 20% in 2010 to near 30% in 2022<sup>13</sup> (Figure 9). Whilst meat production has been a key underlying driver of sheep production it is apparent that the market signals from achievement of relatively higher prices for finer micron wools, coupled with the increased publication of and access to genetic traits in ram selection has seen growers respond to these market signals.

Across the 12-year period, the incremental value associated with the fining of the clip was \$412m or \$34.3m expressed as an annual average. In 2022, the incremental value of the clip was \$181m (Figure 10) compared to its value had the micron mix not changed from 2010.

↑ \$412m

Value-add over period FY11-FY22 through “fining” of the wool clip.

The pursuit of premium prices for Australian wool weighted towards the finer microns (pursuant to their share of total value hence levy contribution) through positioning wool via marketing programs as a fibre for higher value products and the on-farm work promoting increased use of published genetic traits in ram selection are also key focusses of AWI programs across the value chain. An element of this value improvement is attributable to AWI’s activities in these areas.

A useful indicator to assess the performance of the wool price against competing fibres at an international level is to compare the 21 Micron Price Guide ratio to Non-Wool Staple Fibres<sup>14</sup>. Comparing the average ratio for the 5-year period FY18 to FY22 to the PCP (FY13 to FY17) the ratio has increased from 5.6 to 7.5 (Figure 11) indicating an increased premium for wool compared to directly competing non-wool staple fibres. Whilst numerous factors are driving the ratio, not the least of which is the declining supply of wool over the period, this still provides a positive market indicator that wool is increasing / maintaining a premium in the international markets, part of which is likely attributable to AWI off-farm activities.

↑ 1.9 (33%)

Increase in ratio of 21 MPG to non-wool staple fibre FY18-FY22 v FY13-FY17

From a macro perspective there are clearly gains made within the sheep/wool enterprises resulting from on-farm and off-farm changes which are related to the activities of AWI. An increase in the value of wool requires a coordinated and integrated approach to on-farm and off-farm investment. On the one hand off-farm marketing and processing technology development and promotion need to focus on shifting (new users) and increasing demand (existing and new) for wool and, where possible, create a premium for woollen products ahead of competing fibres. On the other hand, on-farm programs need to increase the adoption of farm practices that increase productivity and efficiency as well as invest in R&D to lower the cost of production.

It is also important to note that AWI’s downstream activities include development of processing and marketing opportunities to expand demand for broader micron wools generally reflective of their share of levy contribution<sup>15</sup>.

The on-farm improvement within sheep enterprises indicates improvements greater than the average across all enterprises which supports the hypothesis that AWI, along with other entities such as MLA and numerous government departments, is positively contributing to the improvement in the sector’s performance.

---

<sup>13</sup> Wool production by micron data provided by ICS.

<sup>14</sup> Data and analysis provided by ICS.

<sup>15</sup> Wool 22 micron or finer represents ~90% of the value of the Australian wool clip (average for 5 years to FY22 – data sourced from ICS)

# Financial Impact Evaluation

## Evaluation Methodology

The financial evaluation was conducted at program level which is the level at which metrics are set.

The nature of AWI’s programs necessitates a range of approaches to evaluate each program. Of the 87 metrics nominated across the 34 programs, only 19 or 22% were considered direct measures of financial impact, the balance being enablers. The following examples provide a distinction between the two types.

- **Direct:** In the program “Vertebrate Pests” the metric is “Reduce the negative impacts of predation by 10% by 2022.” The industry-wide cost of predation has been accurately estimated enabling this metric to be converted to a direct financial impact on-farm.
- **Enabler:** In the program “Health and Wellness” the metrics are related to publishing evidence of specified next-to-skin Merino garments being beneficial for eczema and sleep quality and setting protocols to measure wool’s breathability in dynamic conditions. This is a strategic program which elevates wool’s attractiveness in high value markets, expanding demand for wool. The impact of these programs require assessment on a counterfactual basis, i.e., what would happen to wool price/demand if this program were discontinued?

An assessment of the direct metrics identified that they were available for 38% of programs (weighted by value) but did not always cover the entirety of the projects within those programs. Additionally, where direct metrics were achieved it was not always possible to attribute the direct financial impact attributable to AWI.

In the case of on-farm programs, a good example is AWI’s activities related to Vertebrate Pests involving 6 projects in collaboration with 24 partners who collectively contributed 60% more than AWI to the direct project cost. The annual adoption rate of the program directly attributable to AWI can only be determined via making assumptions that are not supported by reliable data. Similar issues arise with off-farm programs.

The approach adopted was to apply a top-down approach via the use of counterfactuals to determine the BCR for each program. Programs were allocated to Categories as per the following table:

Category	Description	% of Spend*	Program Examples	Evaluation Approach
1	On-Farm Programs related directly to productivity and/or efficiency	15%	Vertebrate Pests, Lifetime Ewe Management (LTEM)	Counterfactual: “To what extent does the AWI suite of Programs increase the long-term adoption rate of on-farm practices aimed at improving productivity and/or efficiency?”
2	Marketing Programs directly related to increasing the long-term demand for and price of wool.	55%	Brand Partnerships, International Woolmark Prize	Counterfactual: “What would be the long-term impact on price if AWI stopped all downstream promotional activities?”
3	Off-Farm Programs across the value chain aimed at increasing applications and use of wool	13%	Eco Credentials, Health & Wellness, Trade Extension	Counterfactual: “What would be the long-term impact on price if AWI stopped all downstream value chain activities?”

<b>4</b>	Enablers that cannot be directly linked to productivity, efficiency, demand, or price in the immediate term.	14%	Events, Forums, Statutory Obligations, some R&D	<p>Minimum BCR: "What BCR is appropriate from the perspective of the levy payers' view of the activity?"</p> <p>Maximum value of 1.0:  0 = No perceived value  1 = Fully supported expenditure</p>
----------	--	-----	---	--

\* Allocation on total spend excl. Govt Contribution. Excludes Corporate Services Programs which is less than 3% of the total

*Category 1 – On-Farm*

For on-farm programs with direct relatability to productivity and efficiency a long-term maintainable rate of adoption of 2.5% has been assumed. This implies that the overall industry adoption rate would be 2.5% lower over the long-term if AWI ceased developing and supporting these programs. The major exception to this rule is Vertebrate Pests where the maintainable rate has been set to 5%. This is reflective of both the intensive program involvement by AWI and the nature of the program where the risk of attrition (sheep enterprises more at risk of dropping out of the program) is considered higher than for programs more related to daily farm practices such as for the Lifetime Ewe Management program (LTEM).

2.5%

AWI Maintainable Adoption Rate

*Category 2 - Marketing*

For marketing activities undertaken by AWI the counterfactual relies upon work published by Malcolm Abbott in 2016 on the effectiveness of wool promotion schemes<sup>16</sup>. This econometric study determined that an increase in promotional expenditure of 1.0% would lead to an increase in demand of 0.097%. Similarly, a decrease would work in the other direction. Other sources were used to estimate the supply response and price impact, and these are covered in detail in Appendix 4.

4.6%

Long-term price effect of AWI Promotional Expenditure

The analysis indicates that a cessation of AWI’s promotional activities would result in the long-term price for wool sitting 4.6% lower than it would be under a continuance of AWI’s programs.

To place this in context, the average annual change in the wool price over the past 26 years is +/- 14.3% (Figure 12). Applying the assumptions above, a +/- 10% change in AWI expenditure is estimated to have a price impact of +/- 0.46%. This relativity may be reflective of the conservative approach taken to assessing AWI’s impact. It also highlights that whilst the price impact of AWI is overshadowed by greater market forces, AWI produces an attractive return on levy payer funds through generating a positive price margin throughout the peaks and troughs of the general wool price pattern.

*Category 3 – Off-Farm*

Off-Farm activities include programs such as those related to value chain activities to increase the applications for wool (new products), technical transfer to expand the capacity to utilise wool and traceability. These programs are strongly aligned to the marketing program and are included in the same counterfactual analysis as for Category 2.

---

<sup>16</sup> Malcolm Abbott (2015) A long-term view of the effectiveness of wool promotion schemes, Agrekon, 54:3, 87-106, DOI: 10.1080/03031853.2015.1085229

#### Category 4

Programs under this category represent approximately 14% of AWI's annual spend. Most of this expenditure is targeted at on-farm related activities such as developing extension networks, planning, and attending events, investing in early-stage R&D, and producing market intelligence. Several programs involve expenditure related to meeting statutory obligations through liaison with government and industry bodies. Minimum BCR's were applied to programs reflective of the likely value placed on the expenditure by levy payers.

**0.9**

*Average BCR for Programs under Category 4*

#### Wool Clip Change in Composition and Value

In addition to the impact on price generated by AWI activities there is also the substantial uplift in the value of the Australian Wool Clip over the past 10 years as the micron profile has continued to shift towards finer microns (Figures 9 and 10). AWI's activities in the marketing area in the promotion of fine wool products as well as its long-term efforts to expand the use of MERINOSELECT in ram selection warrant some attribution of the value added. The average annual value increase over the 12 years from 2010 to 2022 is \$34.3m with the value of the 2022 clip being \$181.5m higher compared to what its value would have been if the micron composition had not changed since 2010. A conservative approach has been adopted with an apportionment of 25% of this annual increase (\$8.6m) which equates to 0.3% of the FY2022 farmgate value<sup>17</sup>. This assumption is aligned to the Category 1 & 2 counterfactuals, implying that the continued "fining" of the wool clip would be at a rate 25% lower in the absence of AWI activities.

**0.30%**

*Annual uplift in clip compositional value resulting from AWI marketing and genetics activities.*

#### Other assumptions

Corporate Services was excluded from this evaluation as it is considered an internal enabler to overall corporate capacity to deliver on the programs undertaken. As such, the cost of Corporate Services was allocated to each of the programs for the final BCR calculation.

#### Financial Outcomes

Utilising the above-described methodology, AWI achieved a BCR of 2.8 on a fully costed basis and 3.7 on levy payer contributions (this figure excludes the contribution from government). Given the conservatism of several of the assumptions and the degree to which activities were impacted by COVID-19 this is considered a good outcome on levy payer contributions.

**3.7**

*BCR on levy payer contributions.*

The evaluation method has relied upon a counterfactual approach with the simple premise "How would returns to levy payers change if AWI ceased activities?" At the margin, it also addresses the question of the impact of any increase or decrease in levy. The alternative approach is to separately assess each project/program using the metrics and Completion Reports. For the reasons described above, namely the lack of completeness of the required data, the counterfactual approach was considered the only viable option for assessment. The counterfactual case is supported by Case Studies and metrics are supportive of the counterfactual assumptions.

The methodology, core assumptions and workings related to the above outcomes are detailed in Appendix 1.

---

<sup>17</sup> Farmgate value of FY22 Australian wool clip is \$2,900m.

## Strategy Level Evaluation

Whilst metrics are set at program level, it is at the strategy level where the success is more realistically assessed as the programs within a strategy often address different components of the strategy.

The following table highlights the overall performance across the 16 strategies (although the last three were not assessed but are included for completeness):

Strategy	Total Spend \$m	Partner Contrib'n \$m	Leverage \$Partner:\$ Levy	BCR (incl Govt Contrib'n)	COVID Impact (% of Projects impacted)	Total Metrics
Trade	\$8.9	\$0.1	0.0	4.3	10%	2
Business & Talent Development**	\$18.6	\$7.2	0.7	4.1	95%	8
Consumer	\$90.8	\$35.4	0.7	2.7	30%	7
Healthy Productive Sheep	\$22.4	\$40.4	2.6	5.3	79%	14
Training & Technology Takeup	\$14.0	\$0.7	0.1	2.1	49%	7
Agri Technology	\$6.3	\$4.6	1.0	1.0	62%	5
Woolgrowers	\$10.0	\$1.5	0.2	1.0	88%	8
Industry	\$4.4			1.0	11%	2
Supply Chain Initiatives	\$5.4			1.0	7%	5
Fibre Science	\$5.6	\$2.2	0.7	3.6	50%	8
Woolmark Licensing	\$1.5			1.6	40%	2
Education & Extension	\$15.5	\$1.4	0.2	2.1	46%	11
Processing & Product Innovation	\$5.5	\$0.7	0.3	3.2	22%	8
Corporate Services*	\$2.2	\$3.0	1.3			
Business Development*	\$1.0					
Digital Services*	\$2.2					
<b>Total</b>	<b>\$214.3</b>	<b>\$97.1</b>	<b>0.8</b>	<b>2.8</b>	<b>51%</b>	<b>87</b>

\* Corporate Services, Business Development and Digital Services excluded from the detailed project evaluation

\*\* Whilst impacted by COVID-19, rescheduling or utilisation online methods were effective workarounds. Overall metrics were achieved.

Total Spend at strategy level includes the allocation of overheads including Corporate Services.

The \$214.3m is funded \$115.2 from levies collected during the period, \$50.5m contribution from government, \$14.3m from Woolmark Licences, \$11.4m from other investments and \$23.0m drawn from cash reserves (previously collected levies). Only the government contribution was removed for the calculation of the BCR on levy payer contributions.

The BCR across the strategies is solid with the performance of the major on-farm, off-farm and marketing strategies driving the overall result.

## Industry Collaboration

The economic performance was supported by the high degree of consultation and collaboration across the value chain. AWI has maintained a strong focus on consultation and collaboration across the five assessed portfolios. 59% of projects undertaken were in collaboration with partners. This involved 344 individual partners collaborating on 540 occasions across 178 separate projects.

These partners brought expertise and extension networks ensuring a higher probability of market impact or industry adoption. They also contributed \$97m over the three-year period (\$52m in cash and \$45m in-kind). At the project level, this equates to \$0.80 from partners for every \$1.00 of levy payer contribution. The government contribution over the same period of \$50.5m equates to further leverage of \$0.41, lifting third-party contributions to \$1.21 for every \$1.00 of levy paid, representing a leverage ratio of 121%.

**344**

*Individual Partners*

**\$0.80**

*Leverage:  
\$Partner:\$Levy*

## Performance Metrics

Economic performance is underpinned to various degrees by the achievement of metrics. AWI sets metrics at program level which facilitates the measurement of the efficacy or otherwise of program delivery. During the period under evaluation there were 87 metrics set across the 16 strategies.

Of the 87 metrics set for the period, 56 (64%) were fully delivered, 13 (15%) were moderately delivered, and the remaining 18 (21%) were not delivered, in many cases due to the impact of COVID-19. This resulted in an overall (weighted) delivery of metrics of 81%.

Overall, 51% of projects were either strongly (6%) or somewhat (45%) affected by COVID-19. In some instances, this was often mitigated by switching to online rather than face-to-face delivery however, in multiple cases this was not a feasible option.

**81%**

*Metrics  
Achievement  
(weighted for  
value)*

**51%**

*Projects affected by  
COVID-19*

## Conclusions and Recommendations

AWI has achieved a good result for levy payers for the period under review with a BCR of 3.7. At the total spend level (including government contribution) the BCR of 2.8 is a solid result, particularly considering the disruptions caused by COVID-19.

Examination of AWI's suite of programs over recent times indicates an agile approach to industry priorities, ensuring momentum is generated in the uptake/adoption of on-farm programs and demand for wool is underpinned across the value chain generating an increased buoyancy to the price of wool.

The counterfactual assumptions are supported by metrics at the program level however, the lack of several core metrics (e.g., adoption rates) and more recent analysis of market dynamics (e.g., in relation to elasticities) has necessitated a more conservative approach to underlying assumptions. As such, it is recommended that additional market research be undertaken to ensure the elasticities utilised in counterfactual evaluations are updated to reflect the current wool market.

During this evaluation process it was apparent that AWI has materially lifted its M&E processes and has engendered a commitment to consultation, partnering, continuous measurement and feedback which has supported the financial results achieved.

### Performance Highlights

Supply Chain Collaboration	344 Partners	Throughout the evaluation period, AWI engaged and worked in collaboration with 344 individual supply chain participants who engaged on 540 occasions
Levy Leverage	121%	For every \$1.00 paid to AWI as levy, AWI secured an additional \$1.21 from supply chain partners or the government
Benefit Cost Ratio	3.7	For every \$1.00 Paid to AWI as levy, AWI generated a return of \$3.70 to the levy payer.
Net Economic Value Added	\$444m	The net economic value to levy payers (net of levy paid) generated over the three-year evaluation period

## Appendix 1 Evaluation Methodology

### Counterfactual Approach to Category 1 Programs

AWI collects participation rates for some but not all programs it implements. The additional challenge is that participation does not always mean adoption while participation can also be initiated through other means (on-line, via demonstration events etc). There is also a potential attrition rate which is not recorded.

**2.5%**

*AWI Maintainable  
Adoption Rate*

Reliable data was available for the Lifetime Ewe Management program which identified an average annual uptake of the program of 2.4% p.a. over a 16-year period. Similarly, for the Vertebrate Pest program, the annual uptake in participation was 2.9% p.a. with high variability by State, reflective of the varying degree of severity.

With uncertainty as to what level of adoption within any year of a program was attributable to AWI it was considered unreliable to use the CRRDC guidelines for determining the Present Value [PV] of each program's investment. For example, the counterfactual assumption applied for LTEM was a 2.5% maintainable adoption rate over the long-term resulting from AWI activities. This generated an annual benefit of \$8.5m for that program. Using the CRRDC PV approach, an adoption rate in any given year of 0.16% generates the same value.

The counterfactual approach may be considered overly conservative in that it assumes annual expenditures and benefits each year that stop once AWI ceases activities, however, the risk of overstating the actual annual adoption rate on a year-by-year basis resulting from AWI's activities is high and potentially misleading. In the absence of meaningful monitoring of actual adoption rates across the suite of Programs, the general rate of 2.5% is considered conservative but appropriate.

There are several exceptions to this rule:

- The Vertebrate Pest program has been allocated a maintainable rate of 5.0% as it is a program gaining momentum and is obtaining high adoption rates in this relatively early stage. The additional loading (bringing it to a maintainable 5%) reflects an estimated reduction in participant attrition rate due to the extent and continuity of the program.
- The Emergency Animal Disease Response Program [EAD] undertaken by AWI is to assist preparedness to avoid or mitigate the potentially catastrophic cost (\$2.2B) to the industry of a widespread and prolonged disease outbreak<sup>18</sup>. The conservative assumption applied is that AWI's activities in this area are attributed with 1.0% of the 15.5% increase in preparedness recorded through AWI programs (0.16%). Effectively this is an insurance value applied.
- One initiative that does not lend itself to an adoption rate counterfactual is the investment in the training of shearers and shed hands. This has been a highly active and successful program demonstrating a high level of retention post training. The approach taken is a counterfactual on shearing costs. For this program a counterfactual assumption of a long-term 1.5% maintainable decrease in shearing costs through productivity and efficiency improvements has been assumed (which equates to an 0.8% of growers' wool related costs).

A summary of the AWI on-farm programs covered by these assumptions is provided in the table below as well as a comparison of the annual, sustainable incremental adoption rate to achieve the equivalent annual value under the Present Value calculation as per CRRDC Guidelines.

---

<sup>18</sup> The Australian Wool Industry EAD Preparedness RD&E Strategy 2019/20 - 2021/2. The Net Present Value of the cost to the industry is estimated to be \$2.2 billion.



Program/Project Suite	BCR (Industry - where available*)	Annual \$ Impact of 1% Adoption	AWI Maintainable Annual Adoption	AWI Annual Impact \$m	CRRDC: PV 1% adoption	Breakeven AWI Annual Incremental Adoption
Reduction in Parasite Impact	4.1	\$4.26	2.5%	\$10.66	\$65.54	0.16%
Reduction in Flystrike Impact	2.4	\$1.31	2.5%	\$3.28	\$20.15	0.16%
Reduction in Lice Impact	3.0	\$0.30	2.5%	\$0.75	\$4.61	0.16%
Increase in EAD Preparedness	4.5	\$22.00	0.2%	\$3.41	\$338.19	0.01%
Wild Dog Programs	13.3	\$0.69	5.0%	\$3.43	\$10.64	0.32%
LTEM Adoption - Reproduction & Nutrition Impact		\$2.72	2.5%	\$6.79	\$41.74	0.16%
LTEM Adoption - Improvement in Stocking Rate		\$0.68	2.5%	\$1.71	\$10.49	0.16%
Beneficial Feedbase Developments (PGM 523 M1)		\$1.43	2.5%	\$3.58	\$22.03	0.16%
Increase use of genetic traits in ram selection (for selected traits)		\$0.64	2.5%	\$1.61	\$9.91	0.16%
Attribution to AWI of locked in genetics improvement horizon		\$0.64	2.5%	\$1.61	\$9.91	0.16%
Impact on SBTM costs (reflected as cost reduction and productivity)		\$10.30	0.8%	\$8.32	\$158.41	0.05%

\* The data available for several Programs did not enable a calculation of BCR.

The Program Achievement Reports [PAR] should be read in conjunction with this evaluation. The PARs contain details of participation rates, R&D and other outcomes that support the approach taken and the adoption rates assumed although it is arguable that the assumptions are conservative.

#### Counterfactual Approach to Category 2 & 3 Programs

For promotional marketing and off-farm (downstream) development activities undertaken by AWI the counterfactual relies upon work published by Malcolm Abbott in 2016 on the effectiveness of wool promotion schemes<sup>19</sup>. This econometric study determined that an increase in promotional expenditure of 1.0% would lead to an increase in demand of 0.097%. Similarly, a decrease would work in the other direction.

**0.097%**

*Δ demand for every 1% change in AWI Promotional Expenditure*

The impact on price of a change in demand for a given supply is estimated to be AUD 5.5 cents per kilogram clean for every 1-million-kilogram change in demand<sup>20</sup>. This equates to a change in price of 0.77% for every 1.0% change in demand<sup>21</sup>.

**0.77%**

*Δ Price for every 1% change in Wool Demand*

Wool supply elasticity estimates are provided in Figure 13 and range from a medium-term response (5 years) of 0.13 to 0.45. Many of these predate the termination of the Australian Reserve Price Scheme for wool in 1991 and the significant downsizing of the flock that followed. Following the downsizing the overall emphasis of sheep enterprises has shifted from wool production to meat production with wool receipts falling from ~80% of total receipts for sheep enterprises in 1990 to below 40% by FY 2022<sup>22</sup>. Wool supply showed minimal response to the significant wool price rises over the last decade (Figure 14) where supply continued to decline. The tail end of that period was also influenced by drought in some areas which would have suppressed any possible supply response. The last few years now indicate flock growth, more likely driven by sheep meat demand and price factors. For conservatism, this analysis has set a supply elasticity of 0.5 and assumed the change

**0.50%**

**4.6%**

*Long-term price effect of AWI Promotional Expenditure*

<sup>19</sup> Malcolm Abbott (2015) A long-term view of the effectiveness of wool promotion schemes, Agrekon, 54:3, 87-106, DOI: 10.1080/03031853.2015.1085229

<sup>20</sup> Estimate provided by ICS.

<sup>21</sup> This figure uses the FY17-FY22 average annual wool production of 201 mkg clean and the average EMI the same period of 1525 c/kg clean.

<sup>22</sup> ABARES Farm Surveys data

is immediate which will remove the short-term impact of cessation of AWI promotional activities<sup>23</sup> and rely upon only the long-term price impact.

Based on the above parameters it is estimated that a cessation of AWI's promotional activities would result in a long-term decline in the wool price received by levy payers' price of 4.6%.

Several AWI marketing programs were reviewed by third parties. An example is the China Case Study which produced a BCR of 3.2. The program involved 0.52m kg of clean wool and an incremental margin to the retailer equivalent to AUD 1,117 c/kg for every kg of wool was generated. The challenge is to convert this to a change in wholesale margin across the entire clip (or that portion that matches this market segment). Such programs are clearly successful and generate commitment (and a sharing of critical data) with strategic retail partners and can be used in supporting the counterfactual.

This analysis is intentionally conservative due to age of the research used, and the shortage of data to allow a more comprehensive review of the impact of individual programs. To avoid unnecessary conservatism in future it is recommended that the research upon which these assumptions are based is updated to consider more contemporary data. It is also imperative that the data collected for programs is more closely aligned to the quality of data collected for the China Case Study.

As with Category 1 programs, the PARs should be read in conjunction with this evaluation as they contain significant detail of Program achievements in relation to partnerships and kilograms of wool influenced during the period. In particular, the social media reach has shown substantial growth across geographies and demographics supporting the strategy of AWI to extend the reach of wool into the dominant marketing media channels.

#### *Category 4*

These remaining programs represent 14% of the programs undertaken by AWI and should not be given a zero benefit in the absence of data directly related to the financial impact on levy payers. As a surrogate, and in consultation with AWI program managers, it is recommended that a minimum BCR be applied to project expenditure reflective of the likely value placed on the expenditure by levy payers. These minimum BCRs are detailed in Figure 15.

This is considered conservative as the BCR at the project expenditure level was limited to 1.0 and, in some cases was as low as 0.5. For context, the benefits allocated in this category total \$9.2m which is less than 5% of the total benefits generated by AWI.

**0.9**  
*Maximum BCR for Programs lacking effective metrics to determine actual BCR.*

#### *Other Assumptions*

In apportioning the off-farm counterfactual to individual programs a weighting was applied based on each programs achievement of metrics compared to the average for off-farm programs, i.e., those with a relatively high degree of metric achievement received an above average apportionment of \$ Counterfactual per \$ Investment.

---

<sup>23</sup> Conservative approach adopted due to age of the analysis and the significant changes that have occurred since the original analyses were undertaken. Ideally this analysis will be updated to consider more contemporary data.

### Overall BCR Results

The overall BCR achieved on a fully costed level (including government contribution) was 2.8 across all portfolios. The following shows the variation across program types:



By removing the government contribution from program expenditure, we can derive the BCR on direct levy payer contributions which lifts the overall BCR to 3.7. The following shows the variation across program types:



## Figures Charts and Table

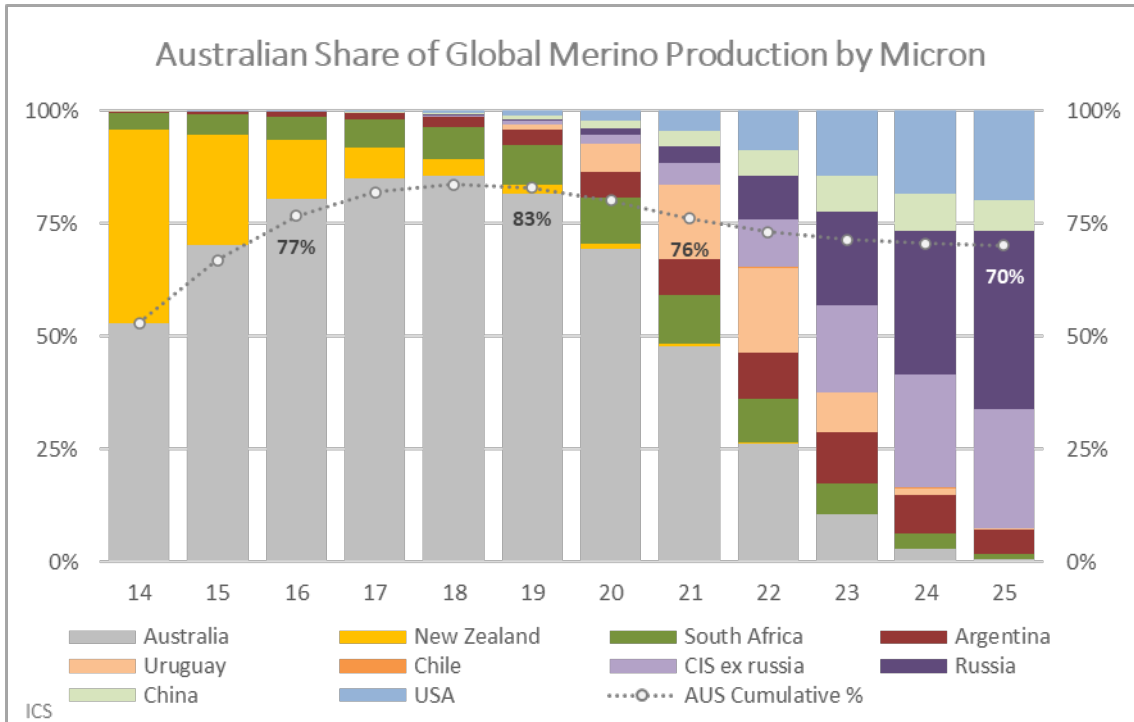


Figure 1 Australian Share of World Merino Production

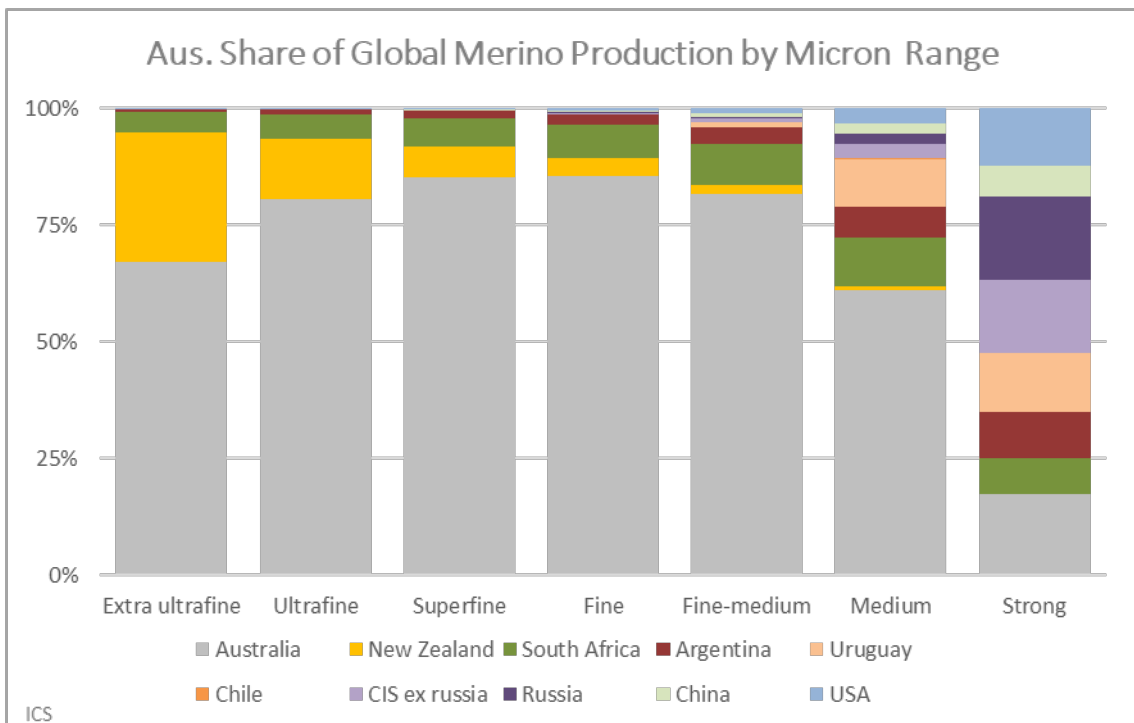


Figure 2 Australian Production of Merino Wool<sup>24</sup>

<sup>24</sup> Micron definitions sourced from Australian Association of Stud Merino Breeders

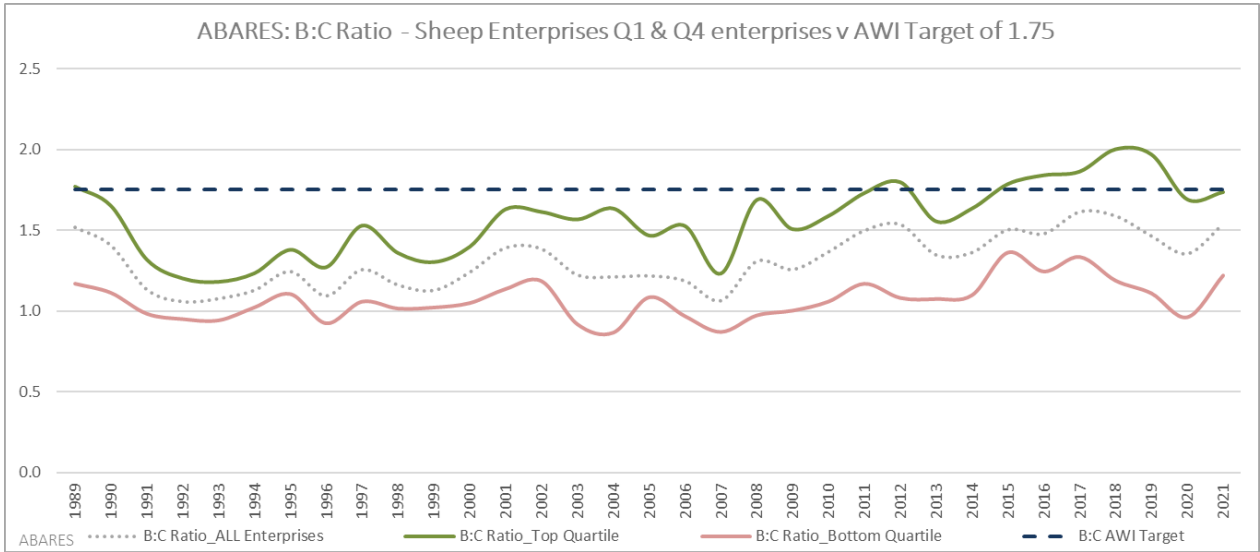


Figure 3 ABARES: Sheep Enterprise BCR Ratio

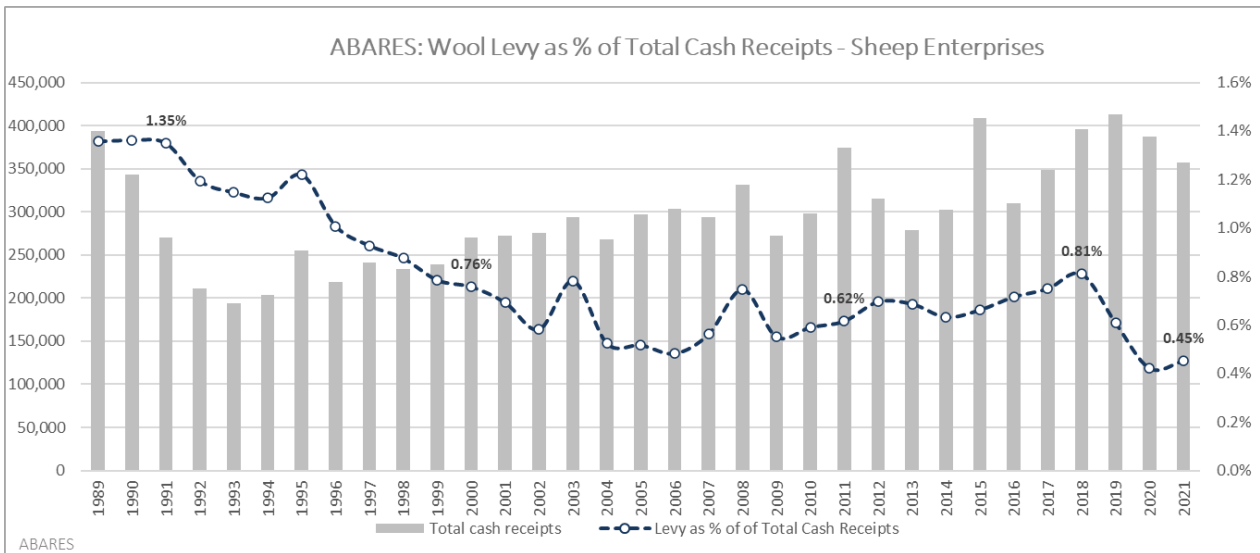


Figure 4 ABARES: Wool Levy as % of Total Cash Receipts

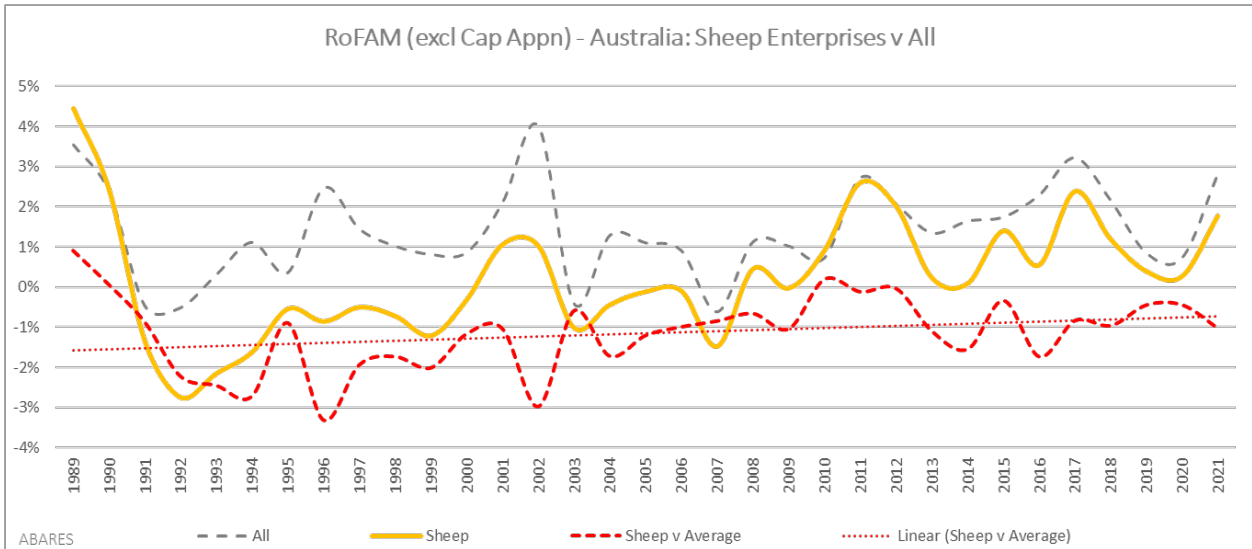


Figure 5 ABARES Sheep Enterprises closing the gap

Ungear % return on farm assets managed across enterprise types (Broadacre)	Enterprise	Cropping	Mixed	Beef	Sheep-Beef	Sheep	All	
	1989	5.2	4.7	1.1	2.6	4.5	3.5	
	1992-2021	3.7	1.4	0.3	0.3	0.1	1.4	
	2012-2021	4.2	2.2	0.6	1.0	1.0	1.9	
	2012-2016	4.1	2.0	0.4	1.1	0.860	1.814	Sheep v Avg -0.954
	2017-2021	4.4	2.4	0.8	1.0	1.205	1.952	Sheep v Avg -0.747
	2021	4.7	3.6	1.6	2.3	1.8	2.8	Δ +0.207

Figure 6 RoFAM – ABARES RoFAM across Enterprise Types

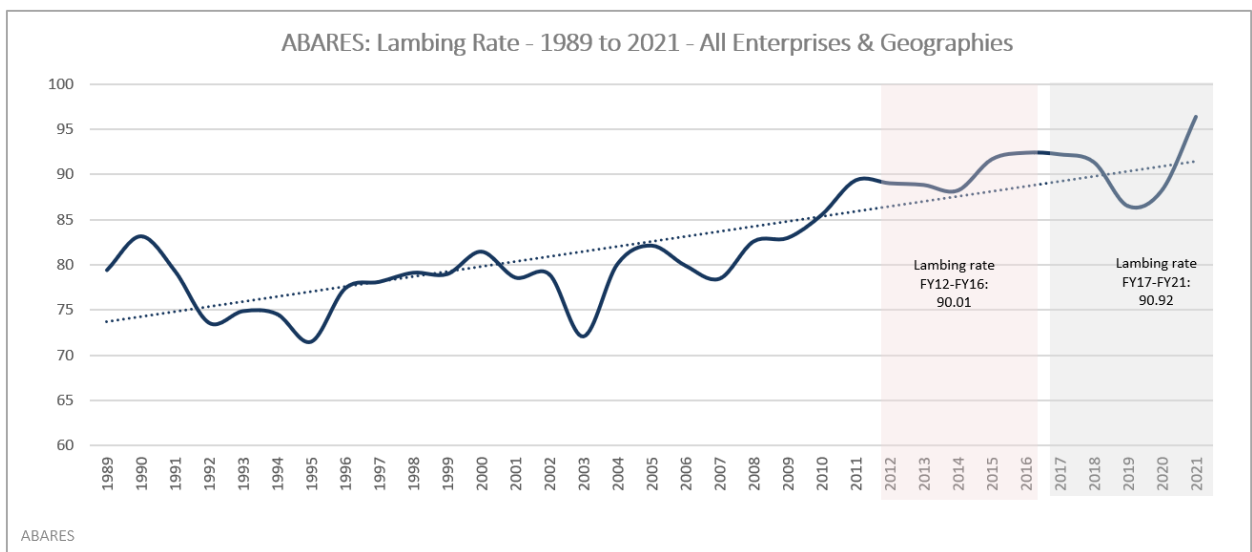


Figure 7 ABARES: Lambing Rate - All Enterprises

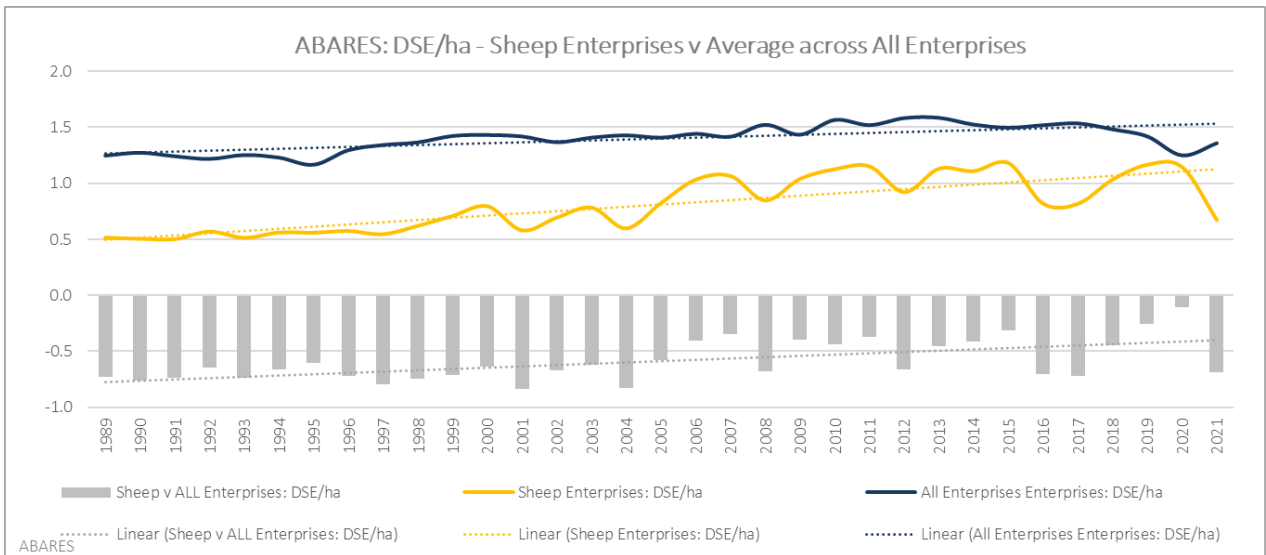


Figure 8 ABARES: DSE/ha Sheep Enterprises v Average

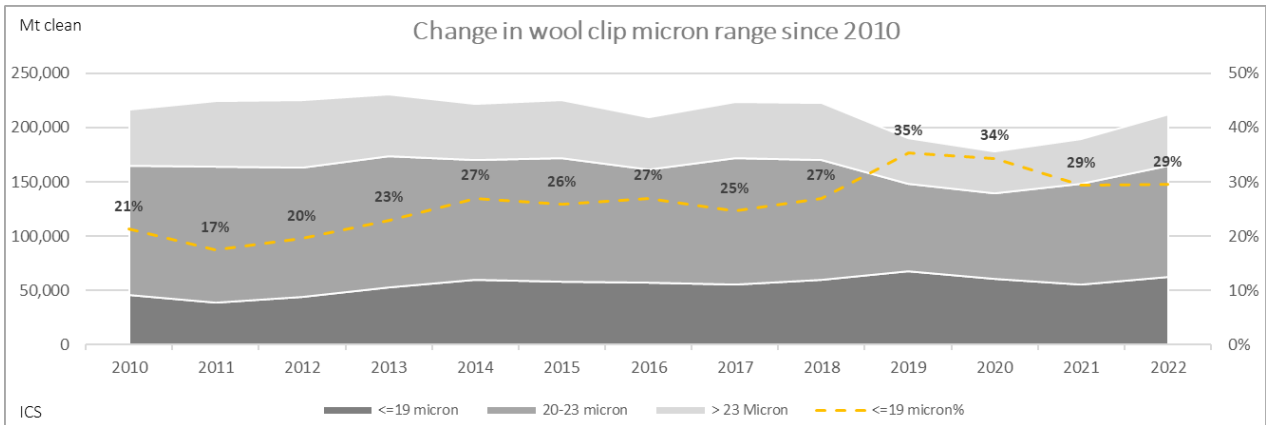


Figure 9 Change in Australian Wool Clip

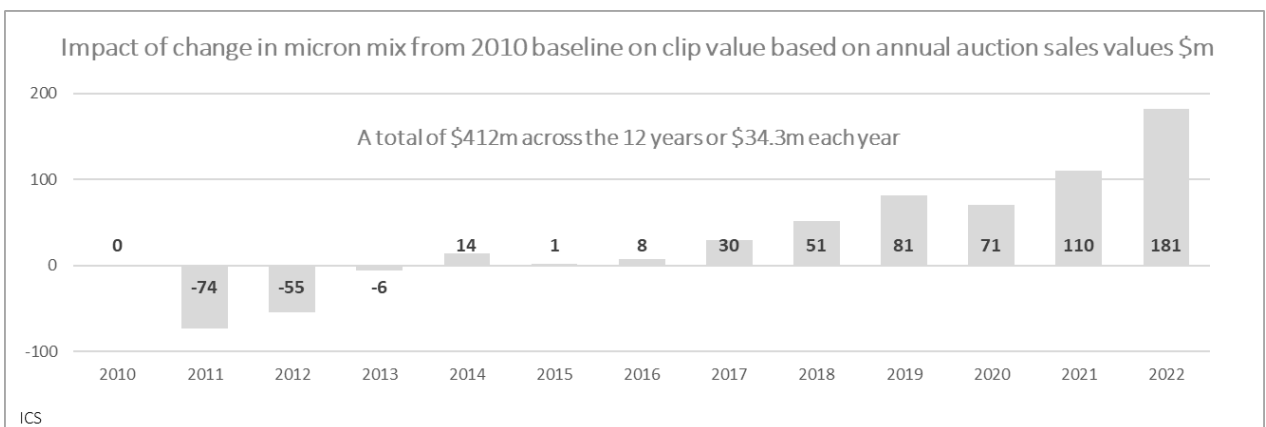


Figure 10 Financial impact of change in micron profile of wool clip

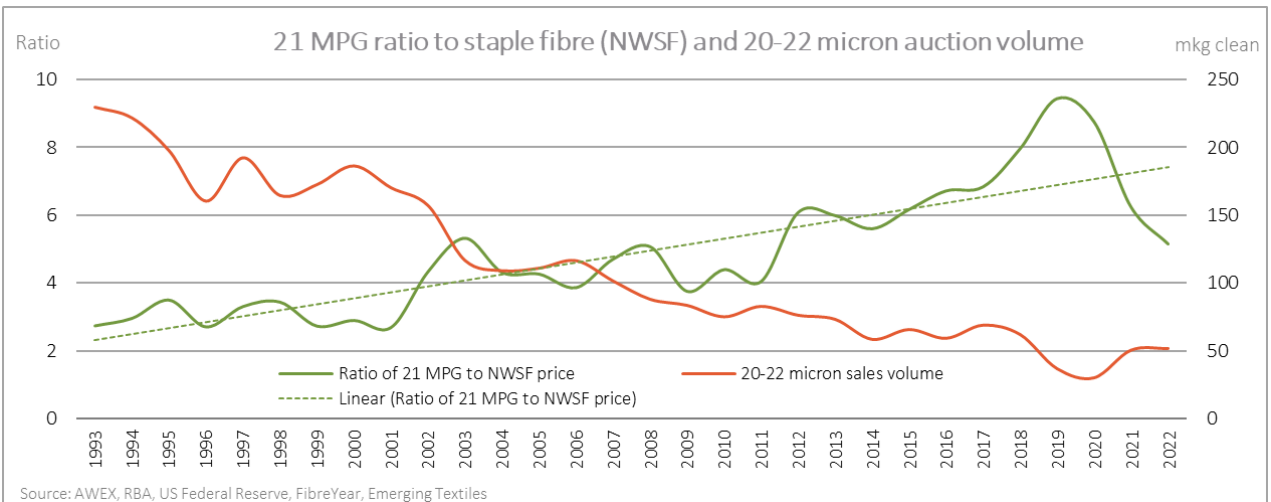


Figure 11 21MPG ratio to staple fibre (NWSF)

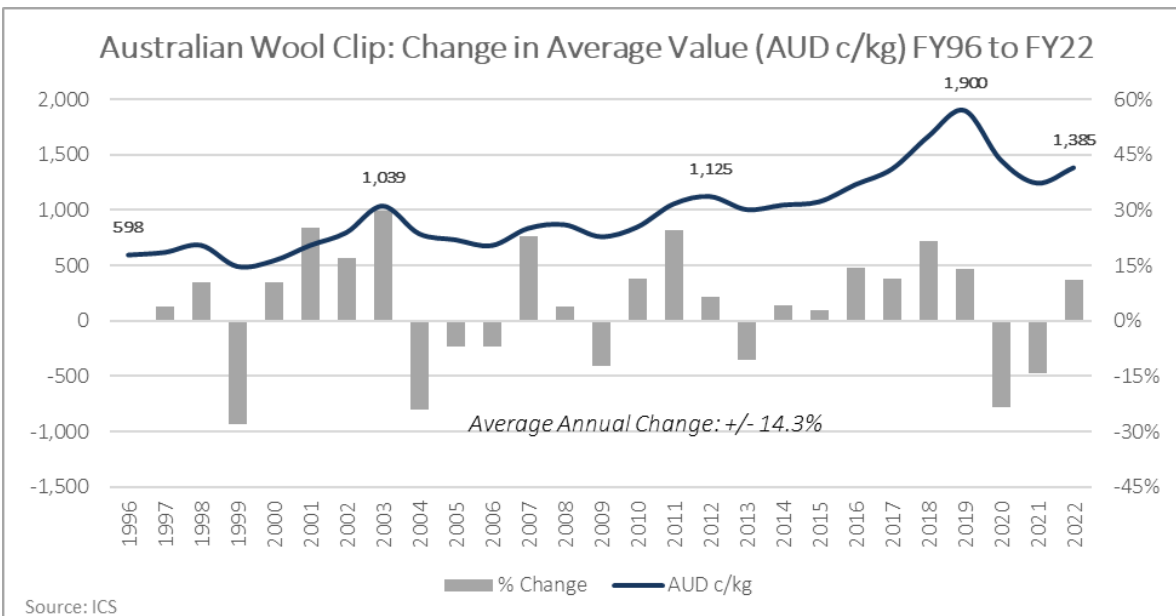


Figure 12 Australian Wool Clip: Change in Value FY96 to FY22



### Estimates of Wool Supply Elasticities

Authors	Short term	Medium term
<u>Australia</u>		
Powell and Gruen 1967	0.07	0.33
Witherell 1969	0.07	0.13
Wicks and Dillon 1978	0.25	0.36
Vincent, Dixon and Powell 1980	na	0.26
Meikle, Smith and Smith 1981	0.09	na
Adams 1984	na	0.46
Hall 1985	na	0.35
Dewbre, Shaw, Corra and Harris 1987	0.04	0.35
Harris and Shaw 1990	0	0.22
Connolly 1993	0.04	0.45
Kokic, Beare, Topp and Tulpule 1993	na	0.45
<u>Argentina and Uruguay</u>		
Findlay, Dewbre and Geldard 1989	0.1	0.36

Short term is one year, medium term five years.

Figure 13 Estimates of Wool Supply Elasticities

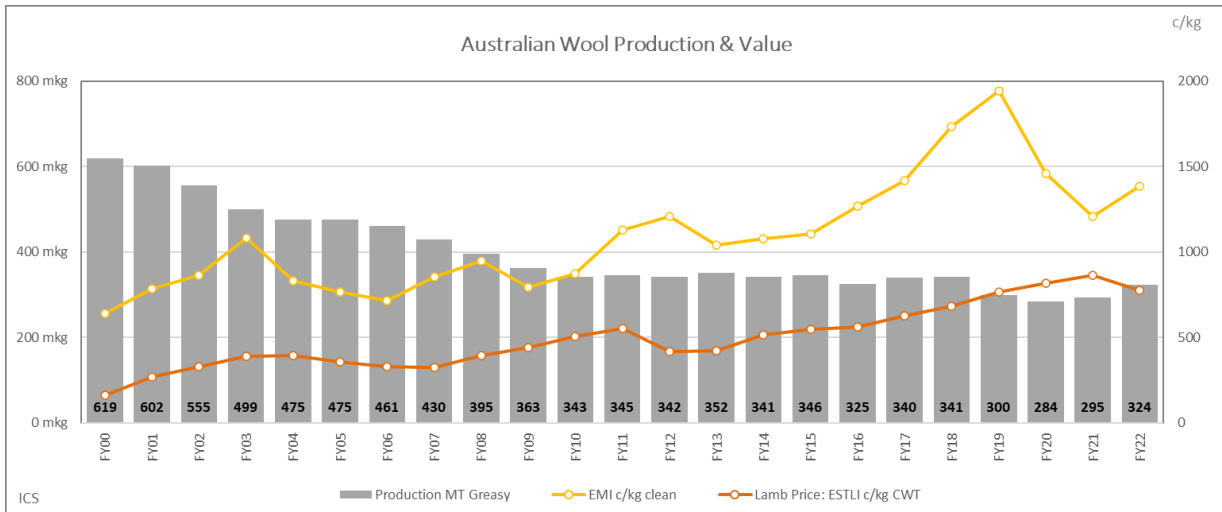


Figure 14 Australian Wool Production and Value/Price

Programs	Portfolio	ON/OFF Farm & BUS	Default B:C if no BU or TD impact
Brand Partnerships	Marketing	MKTG	0.50
Fibre Advocacy (C)	Marketing	MKTG	0.50
International Woolmark Prize	Marketing	MKTG	0.50
Woolmark Performance Challenge	Marketing	MKTG	0.50
Fibre Advocacy (T)	Marketing	MKTG	0.50
Hardware & Software Development	Sheep Production, Science & Technology	ON	1.00
Mechatronics	Sheep Production, Science & Technology	ON	1.00
Novel Applications	Sheep Production, Science & Technology	ON	1.00
Wool Harvesting & Quality Preparation	Sheep Production, Science & Technology	ON	1.00
Sheep & Wool Management Skills	Sheep Production, Science & Technology	ON	1.00
Reproduction & Nutrition	Sheep Production, Science & Technology	ON	1.00
Sheep Health & Welfare	Sheep Production, Science & Technology	ON	1.00
Vertebrate Pests	Sheep Production, Science & Technology	ON	1.00
Genetics	Sheep Production, Science & Technology	ON	1.00
Market intelligence & Communications	Consultation	ON	1.00
Extension Networks	Consultation	ON	1.00
Events & Forums	Consultation	ON	1.00
Media	Consultation	ON	1.00
Representative/Government Bodies	Consultation	BUS	1.00
Eco Credentials	Traceability	OFF	0.75
Health and Wellness	Traceability	OFF	0.75
Fibre Identification & Tracing	Traceability	OFF	0.75
WoolQ	Traceability	ON	0.50
Partnered Innovation	Processing Innovation & Education Extension	OFF	0.75
Textile & Retailing Technologies	Processing Innovation & Education Extension	OFF	0.75
Quality Control	Processing Innovation & Education Extension	OFF	0.75
Licensing	Processing Innovation & Education Extension	OFF	0.75
Retail Education	Processing Innovation & Education Extension	MKTG	0.75
Student Extension	Processing Innovation & Education Extension	OFF	0.75
Trade Extension	Processing Innovation & Education Extension	OFF	0.75

Figure 15 Minimum BCRs