

Vision: The wool industry to be profitable, acceptable and sustainable, as an industry in its own right
Data to support total investment
Analysis to determine tipping point beyond which industry investment to support production volumes in declining demand scenario is unviable
Research should address cause, not the symptoms
Collaboration between researchers to reduce duplication as a guiding principle

Vision	Themes	Strategy	Issue	Action	Priority	Timeframe
Increased on farm profitability	Maximising animal unit profit potential (productivity: cost)	Best practice animal management	Lice	Research and development of lice control **cross reference with genetics strategy (H)	high	
				Lice control: not explored (L)		
				Investigate biological control of lice, including sulphur and volatile oils (K)	med	
				Alternative delivery system for lice treatments (K)		
				Research to maintain diazinon use in dip (M)	med	med
				Research to preservation of dipping as a treatment option (M)	high	short
				Chemical usage: identified but not explored (H)		
			Research and develop injectable systemic lousicides (M)	med	short	
			Worms	Immediate results worm test on farm (H)	high	short
				Biological control of worms (L)	high	long
				Pastures application for preventative worm treatments (L)	high	long
				Extension of information on native shrubs containing tannins for worm control (Y)		
				Develop standardised index for faecal egg counts (K)		
			Flystrike prevention	Research risk factors for fly strike (age, fibre) (M)	high	short
				Define unexplained variation in fly strike risk factors (K), eg relationship between improved pastures and dags, and effect of supplementation (A)	high	long
				Fly centric research (H)	high	long
				Fly centric research and sterility genes (M)	high	short
				Fly centric research into causes of attraction (K)	high	short
				Use of fly genome project to identify opportunities for intervention (H)	high	long
				Identify permanent topical defleecing agents (fly strike prevention) **cross reference to fly control strategy (H)	med	short
				Find lice and fly control chemical treatments suitable for use in automatic jetting races and investigate delivery vehicles (wetting agents) ** cross reference with genetic tool development and uptake strategy (K)	low	
			Further mulesing alternatives (Y)			
			Research alternatives to current husbandry procedures and identified future risks (A)			
			Disease immunity	Develop vaccine for blow flies (A) targeting L1-L3 stages (H)	high	med
				Investigate effect of trace element deficiency on host resistance to parasite infection (Y)		
				Develop biological control for fly (H,K))internal and external parasites (A); (South African Wasp** cross reference with information distribution through targeted communication topics,	high	long ; short
				Identify Immune system boost, specific to parasite infection (A)	high	
			On farm infrastructure			Analysis and cost benefit of different handling and infrastructure systems, including pros and cons for animal welfare (Y)

	Management of environmental impacts at birth	Investigate environmental impacts at birth on lifetime wool production for hairy birthcoat v fine birthcoat genotypes, the wool quality implications, primary v secondary fibres, in the mature sheep's fleece and any relationship to the coefficient of variation (A)	low	
	Management to maintain wool staple strength	Literature review to predict and respond to events to maintain wool staple strength – assoc with events (rain), supplementation **cross reference with DAFWA's current work (A)	high	short
Labour efficiency ** work with commercial interests already committed to area	Alternative wool harvesting	Wool harvesting technologies: not explored (L)		
		Research into alternative fibre cutting mechanisms in light of current technologies (K,Y), particularly wavelengths (H)	high	short long
		Literature review into alternative fibre cutting mechanisms (K,Y), laser literature review and scoping (A,M)	high	short
		Identify endogenous chemicals of regulation of defleecing (H) across all weights and age groups, and logistics (M)	commercial	short long
		Biological chemical for use in rams and (Y), all ages of sheep (fertility issues) (Y,A), pregnant ewes (A): revisit with new process and chemical (A)	high	short long
		Identify genetic components of fleece shedding (H)	high	long
		Improve Bioclip wool capture net (L) particularly for superfine wool (eg biodegradable film/ net) (Y)	high	short long
		Current chemical shearing approach upgraded commercial interest (K)	commercial	commercial
	Portable shearing	Portable/ mobile shearing infrastructure (A,Y), revisit previous R&D in light of current technologies (H,M) for practical application (K) Old infrastructure: not explored (L)	high	short long
	Shearing ergonomics	Robotic shearing: revisit with current technology and computer capabilities (M,A) and animal behaviour (K)	commercial high	commercial med
		Upright shearing platforms (H) and crutching, as well as positioning of the animal (A)	commercial	commercial
		Skirting and classing: revisit with current technology and computer capabilities (A)	commercial	commercial
	Skirting	Reduced skirting of fleece ** cross reference to Accurate supply chain intelligence (A)		
Handpieces	Expression of interest for improving shearing handpieces and shearing harvesting (L)	high	short	
Shearing rams	Protocols on anaesthesia for ram shearing (L)	commercial	short	
Shearer demographics	Demographic profiling of shearers to guide shearing alternative requirements (K)			
	** work with commercial interests already committed to area			
Commercial uptake	Review barriers to commercial uptake of previous wool harvesting technologies (Y)	high	short	
Genetic gain in productivity and easy care	Four teat sheep	Identify 4 teat ewes for Merino Select database (Y,A)	high low	short
		Identify effect of 4 teat ewes on increasing lambing percentage (A)	low	
	Breeding tailless sheep	Research breeding tailless sheep ** cross reference to refined animal husbandry (M)		
	Resistance traits	Research and development of lice resistance traits **cross reference with animal husbandry improvements strategy (H,M) including rubbing resistance (K)	high low	short long
		Research and development of lice resistance traits: not explored (L)	high	
		Research effect (correlation) of parasite resistance traits on wool production (A)	high	
		Research and development of sheep resistance to flies (H): bare breech, worm resistance, scouring (hypersensitivity) (K)	high	short
Identify odours attractive to flies and sheep genetic traits responsible for these odours (smell) (K)		high		

				Investigate cross parasite resistance (M)	low	med-long	
			Wool traits	Research and development of traits for wool characteristics: elasticity, softness, light refraction, faster growing fibre (twice yearly shearing) (M), fibre curvature trait (report the ASBV) (Y)		med	
				Research and development into genetic options for anti shrinkage of wool fibre (K)	low	med-long	
				Relate fibre ASBV's with product characteristics (Y)			
				Literature review into genetic options for anti shrinkage of wool fibre (K)	high	short	
			Survival traits	Research and development of Merino lamb mortality (K)			
				Research and development lamb survival traits (L)	high	short	
			Welfare traits	Investigate correlation between neck folds, productivity and animal welfare (M)			
			Meat traits in wool sheep	Selecting for meat production traits in wool producing sheep (M)			
				Research and development of traits that enable Merinos to compete with meat breeds: reproduction, production and eating quality (K)	high	short	
			Merino Select	Cost benefit analysis on new traits (M)			
				Ongoing investment in Merino ASBV tools (L) including Elites (K) and all new Merino types (Y)	ongoing high	commercial short	
				Evaluate sire effect and ewe effect (K)	high	short	
				Promotion and adoption of ASBV's (Y)		commercial	
				Ewe bloodline trials (K) for heritability efficiency (Y) and maintain wether trial linkages (K)	high	med-short	
				Benchmarking bloodline analysis from wether and ewe trials for traits (Y)	high	ongoing	
			Farming system impacts	Identify management systems to increase profitability, focusing on Merino lambs including feedbase and nutrient levels ** link with MLA extension (Y)			
Sharing in the value chain at low risk	Effective, efficient and open communication on supply chains	Accurate supply chain intelligence	Through supply chain dialogue	Common language established through each part of the supply chain (A) to allow expression of market drivers on inferior blending and lot sizes (Y)	high	short	
				Establish baseline knowledge levels through supply chain on different wool types and their use, and impact of blending of quality (Y,A) and promote producer awareness (A)	high	short	
				Communication across supply chain about fitting tested wool types to product (A) Wool blending: not explored (A)	commercial		
			Point of sale information	Continue point of sale education program: clean green image (include chemical usage compared to Prolana- Argentina) (L)			
				Point of sale education: convert CD into retail friendly production (A)	med		
				Supply chain information: CD or guidebook **use IWTO prepared material (A)			
				Database of wool selling outlets, quality and location, available as webpage (L)	high	short	
			Fibre price relationships	Ongoing supply of market intelligence on fibre price relationships (K)			
			Wool forecasting	Support wool production forecasting and supply chain information, link with decision making for future research investments, inform strategy development and targets for collaboration (L)	ongoing		
				Review Wool Production forecasting (K)			
			Increasing supply chain efficiencies and productivity by working with processing facilities	Processing	Mills benchmark performance (L)		
					Promote the improved consistency of a top from minimal skirting, preshear crutch, belly and fleece combined (Sud Wolla) (A)		
					Invest in wool processing technology adoption (longer staples and longer measuring tops to reduce fibres in cross section and increase fineness of yarn) (A)		
					Establish new standards for spinning using existing research (A)		
Establish economic impact of blending across the supply chain, concentrating on manufacturing end (K)							
	Promote the improved consistency of a top from minimal skirting, preshear crutch, belly and fleece combined (Sud Wolla) (Y)	commercial	commercial				

		Review existing research (scour baths, graziers investment company ANDAR) and investigate opportunities for decreasing processing costs (K,A)	high	short
	Potassium recapture	Investigate potassium recapture from wool (current research) (on shore processing) (Y)	low	long
		Identify energy use efficiencies in the processing chain, through learning from the life cycle analysis **collaboration with commercial partners (Y)	med	ongoing
	Lanolin	Cost benefit analysis on investigation into lanolin (Y)	low	long
		Clarify volume, value and ownership of lanolin, to inform investment into environmental credentials of lanolin as product for human and industrial use (Y)	low	long
	Innovation uptake	Increasing uptake of innovations with commercial partners and ensure delivery of product through improved contracts: improved business planning in pre-commercialisation phase (L,Y)		
Product Innovation	Products & retail brands	Discuss with different fibres to develop novel blends and brands (L)		
		Whitening of wool: not explored (L)		
		Colour and design: not explored (L)		
		Retail brand development and linking wool with retail brands: not explored (A)		
		Identify new markets for wool and analyse their investment potential, compared with traditional markets (A)	high	short
		Commercialisation of CSIRO research into perspiration (sports wool) (A)	high	ongoing
Developing confidence in wool product measurement for quality	Fabric testing	Facilitate workshop for manufacturers on consistency of fabric test methods (L)	high	short
		Develop ISO standards for fire resistance breathability (learn from other industries, comparative analysis with alternative products) (A)	high	short
		Science to support ISO standards (A)	high	short
		Product labelling for shrinkage and comfort factors (L)		
		Develop measurement devices to meet customer needs: knitting structure, wool type, comfort	med	
		Meeting market specifications compared to synthetic fibres: not explored (Y)		
Managing risk of sharing in value chain	Alternative wool selling systems	Communication of alternative wool selling systems and their risks (H), including long term forward contracts (K), risk management and learn from other industries (Y)	commercial low	commercial long
		Assess alternative wool selling systems risk management and new impact of new technologies, including cost benefit analysis and value propositions as to why to change selling system (A)	low	long
		Analysis of traditional market (A)		
		Review into wool futures and other industries futures trading regarding risk management strategy for industry and to identify barriers to adoption, how to make it of more relevance to wool growers **link with critical mass issue (L)	high	long
		Promotion of alternate selling systems: to growers, dialogue with customers or Austrade (Y)		
		Cost benefit analysis and value propositions as to why to change selling system (Y)	commercial issue may	
		Define principles for decentralised wool marketing system, not subject to the order in which the lots are sold and which discovers true price of wool (A)		
		Workshop to define principles relevant to developing an efficient decentralised wool trading system that is free of the limitations of the sequential auction process and that, as far as is possible, establishes the true value of wool instead of merely discovering the (lowest) price at which it can be bought at a particular instant (Y)	low	short
		Wool described as recognised brands/ varieties and grades in the selling system (Y)	commercial	commercial
Reduce steps of wool handling in supply chain	Investigate Costs	Cost benefit analysis of time spent differentiating low value fleece components and value to different parts of the supply chain (K)	high	short
		Benefit/ cost analysis of on farm storage of wool bales to reduce handling and storage costs (H)	low	long
	In shed testing	Certification of in shed sampling and development of in shed testing for fleece characteristics (H)		
	Classing	Assess alternatives or improvements to AWEX classing requirements (K)		

			Bale identification	Certification of in shed bale identification (DNA) (K) and electronic/alternative (H) Use current technologies to assess potential for transponders in wool bales including value proposition **cross reference to Assess and Address credence characteristics (A)	high		
				Improved traceability post farm gate through using current technologies and value proposition to assess potential for transponders in wool bales **link to Reduce steps of wool handling in supply chain (A) ** cross reference with Reduce steps of wool handling in supply chain strategy (H,G)			
Consumer acceptance and confidence in the wool farming system	Recognised environmental and animal production credentials	Assess and address credence characteristics	Declaration forms	Develop whole flock level mulesing declaration process (K) Develop standardised single declaration form (K)	high	short	
			Organic wool	Verification of organic status, achieving consistency between different organic systems and promotion of organic status in garments (L)			
			Science for marketing	Science for marketing natural and welfare claims triggered by market signals (M) Support "natural, biodegradable and renewable" image of industry through scientific approach to identified gaps in this marketing (Y)	high		
				Science to support marketing performance benefits of wool, eg sleep (Y)			
				Review "Land Water Wool" before investing in new programs, relating to sheep as tools to manage environment, and use results for image promotion and product integrity (Y)	high	short	
			Chemical usage & residues	Individual farm certificate for on farm chemical residue test results (Y) Chemical residues: not explored (K)	commercial	commercial	
				Verification of drug company chemical application regimes where residues fail to meet international cut offs (L) Lock test from one line validates chemical residues status of wool clip (Y)	commercial	commercial	
					low	long	
			Supply chain dialogue	Establish and facilitate dialogue both up and down the supply line, between the growers and retailers/ consumers/ processors by distance or in person, to encourage through sector understanding of constraints, opportunities and early identification of credence and verifiable characteristics to enable rapid response (H,M,K)	high	short	
				Dialogue with brokers for identifying and declaring credence characteristics (L) Establish and facilitate supply chain dialogue over verifying credence characteristics on farm	commercial	commercial	
			Woolmark brand	Audit and enforce Woolmark brand standards (K)	low	long	
			Fine ends wool	Link fine ends wool program to on farm practices (M)	short		
Awareness and adoption of wool industry messages	Effective communications with industry and the wider community	Information distribution through targeted communication topics, timing and content	Flies	Drenching and fly repellents (M)	high		
			Parsites	Parasite management (A)	high		
			Lice	How to use lice detection tests (Y) Shearing biosecurity for lice (M) Targeted industry extension focusing on current lice resistance (K) and chemical use (M)	high	short	
				Residue levels from use of lice chemicals extension (L)	high	short	
			Websites	Update LiceBoss and WormBoss with research findings (L) Information distribution regarding Wormboss.com to sheep/ cereal zone (M) Information distribution regarding Flyboss.org to sheep/ cereal zone (M) Information distribution regarding Liceboss.com to sheep/ cereal zone** cross reference with refined animal husbandry strategy (M) Independent tracking for functionality of web programs and recommendations for improved web design (L)	high	short	
				Industry promotion	Promotion of wool production to other farmers, to increase profile of wool industry and attract new entrants (A,Y) Demonstrate economic advantages of Merino in production system (K,Y) including end use of wool (A) and compare with alternative breeds (L) Promote leaders through online case studies, Landline and Beyond the Bale stories (L) Develop grower champions for wool through grower leadership program (L,Y)	ongoing low	

	Animal health	Animal health producer groups (A) for worm and lice control (Y) Management of footrot, lice and Johne's disease (L)	high	
	Wool Cheque	Update Wool Cheque (Y) Promote and extension of Wool Cheque (Y) Cost of Production calculator Wool Cheque: unexplored (A)	high high	short short
	INFORMATION DELIVERY			
		Promote and further develop online centralised information hub for access to sheep/ wool related information (K)		
		Easier access to publications and journal articles: through online availability (A,Y)	high	short
		Communication network for production: online forum/ chatroom (? moderator) (L,A)	high	short
		Ipad project (L)		
		Pod cast media for extension on productivity (L)		
		Multiple methods of delivery (L)	ongoing	
		One page document/ email with multiple grabs with links to full articles (L)		
		Mimic MLA's "Tips and Tools" publication (A)	high	short
		Delivery of wool prices via text messaging (K)		
Skills	Wool classing	Wool classing certification on farm, including prior learning recognition (K) Wool classing training where market failure exists (M,K) Shearing, shed hand and wool classing training and promotion (including OH&S) where market failure exists (L)	high high high	short short ongoing
	Registered training	Development of voluntary courses and registered training to recognise producer capabilities, for use if verification required (A)		
	Business improvement	Build skills to accurately benchmark wool portion of enterprises and how to analyse results, targeted at young producers, with ongoing facilitation to encourage adoption (L) Develop incentive and promotion system within shearing process to reward quality of work – shearing masterclass (K) Business improvement on farm: not explored (L)	high high	short short
	Training opportunities for young people in wool (secondary and tertiary)	Increase promotion of scholarships and Australian Wool Education Trust (L) Develop vocational training at TOCAL & Longreach, school trips and resources for teachers, connected approach with agricultural curriculum (L) Offer PhD opportunities in extension (A)		
	Information adaptation	Maintain investment in research extension and demonstration sites for local adaptation (H) Identify systems and share knowledge re adapting production systems (L) Maintain investment in research flocks securing genetic diversity for future research (K) Learn from other states disease control programs (eg lice, footrot) (L) Revisit commercialisation "failures" in order to make them available for future use (A)		
	Support for strategic thinking	Industry analysis		
		Analysis to determine tipping point beyond which industry investment to support production volumes in declining demand scenario is unviable (L) Cost benefit analysis to be done to inform research decisions (L) Confidential independent review of how the mulesing threat was handled to produce lessons learnt and strategic plan to manage future threats (L) Improve relationship of peak body and RDC to support international messaging and to increase strength of the industry (Y)	high high	short short
	Wool production costs	Collect data and calculate value of industry by micron to guide expenditure for ongoing justification of support to industry (L) Accurately benchmark cost of production (fibre diameter, fleece weight, body weight) of wool portion of enterprise (A) by rainfall and wool type (Y) Analysis of labour requirement needed to support contracting industry (L) Socioeconomic analysis of impacts of alternate sheep breeds (L) State by state benchmarking of wool production (L)	high high high	short short short

			Demonstrate economic advantages of Merino in production system (L)	ongoing	short
		Culture	Culture of innovation commercialisation, including branded extension packages (L)		
			Culture of education along the supply chain (Y)		
			Cultural shift towards learning and innovation uptake (A)		

