Beyond the bale

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AWI | THE WOOLMARK COMPANY

BOSTON'S MERINO MARATHON

Beyond the bale

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FRONT COVER
The performance benefits of Merino wool were once again highlighted at this year's Boston Marathon – the most prestigious marathon in the world. The campaign involved the retail and launch of an adidas Merino T-shirt that was presented to leading and influential runners and was available to purchase by other runners and consumers. **See page 4 to read more.**

awi | THE WOOLMARK COMPANY

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OFF-FARM

ON-FARM

AWI INVESTMENT STRATEGIES

Marketing | Sheep Production | Woolgrower Services | Processing Innovation & Education Extension | Business Services

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GETTING ON WITH BUSINESS

We are continuing with initiatives to help increase the demand for wool through investments in marketing and R&D – from farm to fashion.

Stuart McCullough
Chief Executive Officer
Australian Wool Innovation

BLOWFLY INSECTICIDE RESISTANCE

Some Australian sheep producers have reported shorter protection periods than claimed on the label of the flystrike products they have used. On investigation, some of these cases are the result of improper application or heavy rain following insecticide application, however in a number of cases the presence of resistance has been confirmed. This is a timely reminder for sheep producers to implement resistance management strategies to maintain flystrike protection for their flocks and slow the development of resistance within their local fly populations. AWI's Sheep Blowfly Resistance Management Strategy Working Group members have developed an eight-step strategy for sheep producers to follow to slow the development of resistance. I urge you to take a look on pages 40-41.

REGISTER NOW FOR WOOLQ

The final piece of WoolQ functionality, WoolQ Market will be released very soon, completing the suite of tools on the platform.

The WoolQ Market will be a centralised, online marketplace for Australian wool. The two-tiered platform will provide both a bulletin board of buying and selling interest accessible on a 24/7 basis as well as an efficient and easy to use online auction. WoolQ Market will serve as a complement to the current Open Cry auction markets. To use WoolQ's current functionality and to ensure you are kept informed of developments, ensure you register at **www.woolq.com.**

MERINO AT BOSTON MARATHON

The performance benefits of Merino wool were once again highlighted at this year's Boston Marathon – the most prestigious marathon in the world – thanks to the three-way partnership between global sportswear giant adidas, the Boston Athletic Association and AWI's marketing arm The Woolmark Company. The campaign involved the retail and launch of an adidas Merino T-shirt that was presented to leading and influential runners and was available to purchase by other runners and consumers. It is this type of promotion with high profile brands such as adidas that is helping build the demand for Australian wool.

AWI THREE YEAR STRATEGIC PLAN

Our Strategic Plan for the next three financial years, 2019/20 to 2021/22 will be available at the end of this month on the AWI website. We have consulted widely with woolgrowers and their representatives to ensure that industry views are incorporated into the plan – and we will continue to ensure that woolgrower levies are directed to projects that deliver the greatest value to woolgrowers.

BECOME AN AWI SHAREHOLDER

AWI shareholders are able to shape the decision-making process of the company, via their right to vote at the company's Annual General Meetings. If you are an eligible wool levy payer who is not an AWI shareholder, I encourage you to apply to become one (which is free) and join the nearly 22,000 woolgrowers who have already chosen to be a shareholder. If you have paid at least $100 in wool levies in the past three years, you are eligible to apply – simply complete the shareholder application form (available at www.wool.com/shareholders) and return it to the AWI share registry at Link Market Services. B

AWI DIRECTOR ELECTIONS AT 2019 AGM

The 2019 Annual General Meeting (AGM) for AWI is scheduled for Friday 22 November in Sydney. This year is a director election year.

There will be three directors due to retire by rotation in 2019 and they are eligible to put themselves forward for re-election. They, along with other candidates who meet the requirements for nomination, will be the persons able to be elected at the 2019 AGM. There will most likely be three positions as directors available to be filled.

NOMINATION PROCESS

Persons other than retiring directors who are interested in putting themselves forward as candidates for election must have their candidacy supported by a written nomination signed by more than 99 eligible shareholders. An eligible shareholder is an AWI shareholder with an entitlement to vote at an AWI general meeting. This means that those levy payers who are not AWI shareholders cannot be one of the 99 or more supporting signatures.

Other formalities under AWI's Constitution are that the candidate must consent to the nomination in writing; and the nomination and consent must be received by the Company not less than 60 days nor more than 78 days before the meeting date. The nomination form and consent form will be available for download at www.wool.com/agm2019 shortly.

BOARD NOMINATION COMMITTEE

In addition, AWI has a Board Nomination Committee (BNC) that considers all candidates and provides a report to shareholders on the candidates which it considers would be the most suitable for re-election or election. All candidates will be invited to have a meeting with the BNC and these meetings will be held around the end of September 2019. B

MORE INFORMATION

AWI has a policy to assist candidates with meeting the nomination requirements. Interested persons should contact the AWI Company Secretary, Jim Story, on (02) 8295 3102 and/or jim.story@wool.com.

BOSTON'S MERINO MARATHON

A post-race advert in the *Boston Globe* newspaper, the day after the race, that appeared opposite the summary results page.

AWI General Manager Operations **Nigel Gosse** holding the coveted winner's trophy, with Boston Marathon icon and COO of the BAA **Jack Fleming**. Nigel presented the **top 20 finishers** in each age category with an exclusive Boston Marathon Merino wool T-shirt from adidas.

The performance benefits of Merino wool were once again highlighted at this year's Boston Marathon – the most prestigious marathon in the world – thanks to the three-way partnership between global sportswear giant adidas, the Boston Athletic Association and AWI's marketing arm The Woolmark Company.

Begun in 1897, the Boston Marathon is the world's oldest annual marathon and ranks as one of the world's best-known road racing events. Amateur and professional runners from all over the world compete in the 26.2 mile (42.195km) race each year, and the event now attracts an average of 30,000 registered participants and 500,000 spectators.

Following its successful marketing campaign at the 2018 event, The Woolmark Company was this year back in Boston, partnering with leading sportswear company adidas and the Boston Athletic Association (B.A.A.) to place wool front and centre of the internationally recognised marathon and help market a commercially available adidas Merino T-shirt.

WORKING WITH ADIDAS

The Woolmark Company takes an active role in working with internal adidas teams, connecting the sports brand with the wider wool supply chain and supporting business units on product innovation.

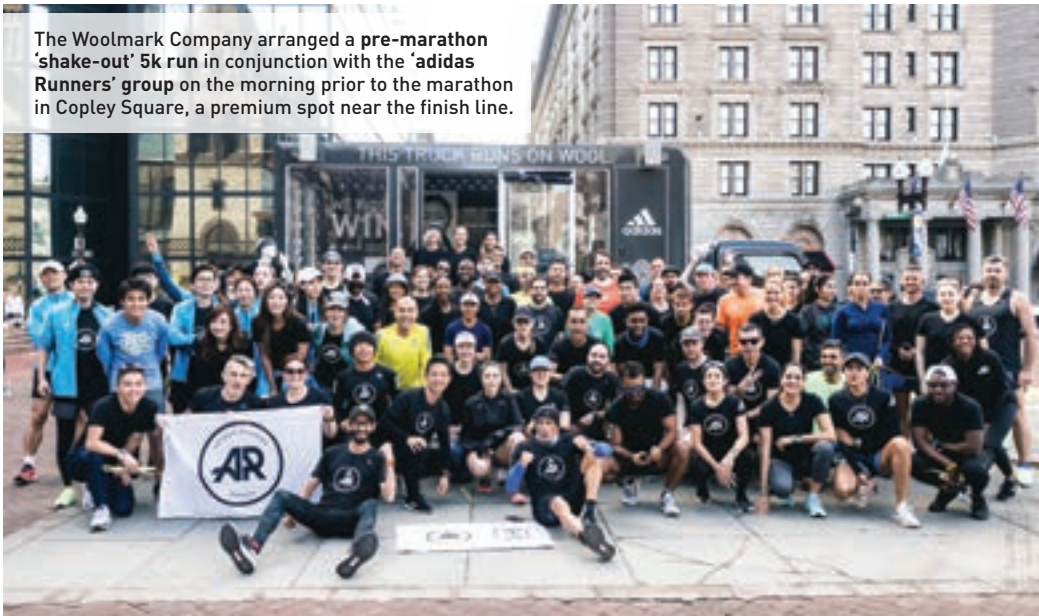
"We use Merino wool because it is the fabric and fibre that is in line with our vision in adidas running, which is to deliver the best of performance and style to the consumer," said Senior Director of Running Apparel at adidas Craig Vanderoef.

"We work with The Woolmark Company because they are innovators on the path to great things for athletes. Working together we can bring the perception of wool up to date for a new generation of athletes and consumers."

The Boston Marathon Merino wool T-shirt from adidas features 75% Australian Merino wool. It was tested during development by members of the 'adidas Runners' community of running fanatics represented in more than 60 countries.

The top 20 runners in each of the 13 age-group categories that completed this year's Boston Marathon received a special individually boxed version of the Boston Marathon T-shirt. This is anticipated to generate more awareness and interest in wool sportswear amongst the top runners who competed.

The T-shirt can be purchased by runners and consumers online on the adidas US website and it was also available at the adidas stand at the popular three-day Expo in the lead up to the race.



The Woolmark Company arranged a **pre-marathon 'shake-out' 5k run** in conjunction with the **'adidas Runners' group** on the morning prior to the marathon in Copley Square, a premium spot near the finish line.

MARKETING 'WE WOOL WIN'

Throughout March and April, a large-scale pre-race marketing campaign was created to build consumer interest in wool and the wool product, centred around the theme 'We Wool Win'.

The campaign, co-branded with adidas, ran across social media channels, in the *Boston Globe* newspaper and outdoor advertising.

The advertising promoted the Woolmark brand and championed the performance benefits of Merino wool, breaking misconceptions that the fibre is only for heavier knits in the colder months.

In the days prior to the race, The Woolmark Company was on-site in Boston with a 'We Wool Win' training truck – featuring running coaches, training runs and nutrition workshops to help the runners prepare for the race – as well as promoting the performance benefits of wool.

A key part of the campaign was the promotion of three marathon runners – see right – who trained in adidas Merino gear in the lead-up to the marathon.

All three participants shared their training journey and were heavily promoted via The Woolmark Company's social media channels and on www.boston.com. They all went on to achieve their goal of completing this year's particularly grueling race.

AWI CEO Stuart McCullough said, "Our continued relationship with both adidas and the Boston Athletic Association allows us to engage not only with industry leaders, but with strong, determined athletes who know the true value of high-performance apparel.

"It also aligns one of the world's most prestigious marathons with the world's most prestigious natural fibre." B

MORE INFORMATION
www.woolmark.com/boston

The **commercial version** of the Boston Marathon long sleeve Merino wool T-shirt made from 75% Merino wool, available to buy on the US adidas website.

Judy Taing, Anka Tezcan and Jessie Zapo training in wool.

OUR FEATURED MARATHONERS

Three American marathon runners teamed up with The Woolmark Company to showcase their experience of training for the Boston Marathon wearing adidas wool running gear.

JUDY TAING

The Boston Marathon was Judy's sixth marathon this year. She is running the six Abbott World Marathon Majors (Tokyo, Boston, London, Berlin, Chicago and New York) within 12 months to raise money for charity with the Boston proceeds going to Team For Kids.

"I like to wear Merino wool because of its breathability and it helps me maintain my body temperature on warm days and cold days. It's gotten me through two weeks of showerless days in Nepal, did great job repelling odours and it kept my three friends very happy!"

ANKA TEZCAN

After his father was diagnosed with Parkinson's disease, 25-year-old rug designer Anka Tezcan from New Jersey decided to raise money for Parkinson's research by running in Boston. He has raised more than US$25,000 for Team Fox, a group created by actor Michael J. Fox.

"I wear Merino wool because of its ability to wick away sweat and also repel rain and snow. No matter what the conditions it will keep me running longer and faster."

JESSIE ZAPO

For adidas Women ambassador and Girls Run NYC founder Jessie Zapo, running is ingrained in her lifestyle and part of her DNA. She runs to feel strong and coaches to share strength with other women.

"The Merino wool shirt from adidas is so good! I couldn't believe how light it is, but how warm it kept me in the cold winter days and how it can wick away the moisture. It's versatile because it's so light you can easily pack it; it's also easily wrapped around your waist if you become warm. The best part is it doesn't smell like body odour because of the wool – unlike every other performance fabric. I wish all of my layers were Merino wool. This shirt is the truth." B

MORE INFORMATION
Listen to AWI's pre-race interview with Jessie and other runners on episode 84 of The Yarn available at www.wool.com/podcast

FROM PADDOCK TO TRACK

Stewart McSweyn being cheered on by the capacity 40,000 crowd during the 5000m final at last year's **Commonwealth Games on the Gold Coast**, where he achieved an impressive fifth place. *PHOTO:* AAP Image/Dean Lewins

Brought up on a sheep and beef farm on Tasmania's King Island, 24-year-old distance runner Stewart McSweyn is without doubt one of Australia's most talented athletes – and he now has his sights set on next year's Olympics in Tokyo.

Running sensation Stewart McSweyn has an impressive list of athletic achievements. In 2017 he represented his country in the 3,000m steeplechase at the World Championships held in London, and last year was the first Australian home in the 5,000m and 10,000m at the Commonwealth Games on the Gold Coast.

He is currently ranked in the world top 10 for the latter two distances, with many people tipping him to be 'the next Craig Mottram' and Australia's greatest ever distance runner. Most recently, he broke the Australian indoor 1500m record at the Indoor Grand Prix in Birmingham, England.

But life began very differently for Stewart, who now lives in Melbourne where he trains with the elite Melbourne Track Club. He was brought up with his twin brother Angus and elder sister Carmen on his parent's Merino sheep and beef property on Tasmania's sparsely populated King Island.

Anchored in the middle of the Bass Strait between Victoria and Tasmania's north-west coast, King Island is one of the premier farming areas in Australia and is renowned for its high-quality beef, seafood, wool and of course cheese. It has an ideal climate for high-yielding, clean wool.

"Wool and the farm were always a big part of growing up."

Stewart McSweyn

His parents Scott and Jacky currently run about 2,000 Merinos and, although Stewart's training and racing keep him away from the farm for most of the year, he looks forward to his visits home and occasionally helping out on the property. Stewart credits growing up on the family farm with making him a strong runner.

"My father was a champion weightlifter, and we were always encouraged to take part in physical activity as kids. We'd do most sports including cricket and footy – and we'd regularly run around and play on the farm which kept us fit and strong," Stewart said.

"Working on the farm certainly made me tougher. I'd help out with tasks such as building fences and grids and being a rouseabout in the shed at shearing time. Wool and the farm were always a big part of growing up.

"The winter months on King Island are pretty cold too, so plenty of woollens were always worn."

Stewart started doing cross country running at school and his love for athletics soon took off from there. While he spends nearly half the year overseas, competing against the top runners in the world, his biggest fans are still his parents and siblings who all travel to see him race in Australia.

He is also well supported by his 1500 fellow King Islanders, with him earning the nickname of the Mayor of King Island! He holds every Tasmanian record from 1500m to 10,000m and is always happy to compete back in Tasmania; he has won the famous Burnie Ten for the past two years.

"I normally get to go home to King Island for a couple of weeks during Christmas which I really enjoy, catching up with family and friends," Stewart said. "It's a great place to run too. King Island is pretty hilly so I've always been able to do some good hard training sessions on the farm in the sheep paddocks."

Stewart's immediate goal is to qualify for the Australian team going to the World Championships later this year in Doha, Qatar. But it is the 2020 Summer Olympics in Tokyo that Stewart has his heart set on. We're sure woolgrowers across Australia wish him well. B

Stewart training back home in the **sheep paddocks** of the family farm on **Tasmania's King Island.**

FUSION OF FITNESS AND FASHION

APL's Woolmark-certified 10-piece **Perfect Merino Wool Apparel Collection** provides optimum comfort and performance from travel to training. Left: The cowl neck top, bomber jacket and women's trouser. Right: The hoodie and men's trouser.

Hot on the heels of the recent launch of its inaugural wool running shoes, LA-based Athletic Propulsion Labs (APL) has now released a 10-piece apparel collection, again highlighting Australian Merino wool.

Left: The crop top, bomber jacket and women's trouser. Right: The varsity jacket, T-shirt and men's trouser. Both are also wearing APL's Woolmark-certified TechLoom Breeze **Merino wool sneakers**, released last year.

The elite athleisure brand APL – whose products are regularly seen on celebrities including the Kardashians, Jessica Alba and even Oprah – has once again collaborated with AWI's marketing arm The Woolmark Company, this time to develop Merino wool apparel which the brand calls its "most sustainable and luxe apparel collection".

The release in March of the APL 'Perfect Merino Wool Apparel Collection' is the second launch in a series of long-term Woolmark-certified product collaborations between APL and The Woolmark Company.

"This collection marks another milestone in the long-term relationship we have formed with APL," AWI CEO Stuart McCullough said.

"Following the successful launch of APL's TechLoom Breeze Merino wool sneakers in December, we are pleased to further develop our collaboration with this studio-to-street apparel collection and champion the technical benefits of Australian Merino wool in activewear."

APL Co-Founder Ryan Goldston said the apparel collaboration with The Woolmark Company represents more than 18 months' worth of design, research, and development.

"As the brand that pioneered the luxury performance category, we felt that the super fibre wool would be an amazing foundation for building a unique apparel capsule collection," he said. "Our pieces can be worn in all different aspects of your life because of the performance benefits of Merino wool, in combination with its luxurious feel and texture."

The wool and wool-rich collection showcases the fibre's inherent qualities including softness, breathability and odour resistance – and blends the line between performance and fashion, utilising technically advanced fabrications that are unique to each garment.

The 10-piece collection includes hoodies and trousers for men and women; T-shirt, running shorts and varsity jacket for men; and for women there is a bomber jacket and a crop top and cowl neck top comprising 100% Australian Merino wool for superior next-to-skin softness and a light feel.

The full collection is available online (worldwide shipping) from the APL website. B

MORE INFORMATION
www.athleticpropulsionlabs.com
www.woolmark.com/apl

FASHION INFLUENCERS BACK THE COLLECTION

To complement the APL collection's launch in March, several US-based style influencers showcased the apparel on their social media channels.

Pictured below are US fashion influencer Natalie Lim Suarez (who has 607K Instagram followers) with her sister Dylana (who has 218K Instagram followers) in one of their Instagram posts wearing pieces from the new collection.

In the post, Natalie says: "This super chic collection of tanks, leggings, and even Merino wool sneakers are made to last longer, wear after wear. My current mindset when shopping is: invest in higher quality natural materials, and buy less. These are pieces that require me to wash less, wear more, and perform better no matter what workout I'm doing on or off the mat."

To create the ideal shirt for travel, outdoors, and every day, US company **Western Rise** started with the fabric, incorporating Australian Merino wool.

KICKSTARTING A NEW MERINO SHIRT

US performance clothing brand Western Rise has partnered with The Woolmark Company to develop a Merino wool shirt designed for every day wear. The shirt was launched via the Kickstarter crowdfunding platform and was so popular that it was fully funded by the public within just 45 minutes.

After two years of R&D and testing, Western Rise launched in April its Limitless Merino Wool Shirt – a highly functional every day shirt that can be worn more and washed less.

Combining performance with style, the Limitless Merino Wool Shirt is ideal for travel, replacing three or more shirts in your bag. It's built to stay fresh for days, move with you, pack small, and look clean, allowing you to do more with less.

"Our goal with the Limitless Merino Wool Shirt was to recreate the magic of our Merino wool T-shirts in a classic button-down that could be worn for travel, outdoors and everyday use," said Western Rise Co-Founder/ Creative Director Will Watters.

"We love Australian Merino wool because it's incredibly soft, odour resistant and temperature regulating. With the help of The Woolmark Company, we were able to find a luxuriously soft, engineered knit fabric that blended Merino wool and quick-dry polyester. The result is a shirt that can stretch in every direction, is incredibly comfortable and can be worn for days without being washed."

The engineered knit creates a honeycomb structure, which provides a nice texture to the fabric while lifting it off the skin, further enhancing the temperature regulation of the wool.

The Woolmark-certified shirt debuted exclusively on the Kickstarter crowdfunding platform on 15 April. The project was fully funded by the public within just 45 minutes and received more than of US$270,000 from backers during the month-long campaign. People who backed this Kickstarter project were offered the shirt at a reduced price in exchange for their investment. It is now available for pre-order via Indiegogo. B

MORE INFORMATION
www.westernrise.com

THE PERFECT HIGH TECH WOOL T-SHIRT

Finnish brand Formal Friday last month launched what it calls the perfect wool T-shirt, made from 100% ultrafine Merino wool from Australia.

Having spent years redefining its core product line, the Finnish brand has decided to specialise in producing the ultimate wool T-shirt, suitable for all four seasons. This bold strategic move was the result of positive customer feedback, sales data and a fresh distribution deal.

"When presenting our collection at Paris Fashion Week to international buyers, many of them after touching and feeling our T-shirt asked why we were not doing more of these," Formal Friday CEO Toni Tervilä said.

"Very often we had the T-shirt range sold out mid-season and we had to say no to our customers. That's obviously a very bad position to be in as a young company. By focusing on one product, and doing it as well as possible, we have better chance to meet the market demand."

For Formal Friday designer Teemu Muurimäki, a perfect T-shirt should encapsulate three things: user experience, aesthetics and environmental impact.

"Our T-shirt is crafted from 100% certified Australian Merino wool, which as a material is extremely breathable, comfortable, and easy to care for," said Teemu, whose design history spans Giorgio Armani, Dolce & Gabbana and Bottega Veneta.

"With the help of an Italian sub-contractor's new technology and technical support from The Woolmark Company, we've been able to create a very dense and durable fabric rarely seen in ultrafine 17.5-micron wool products. However, what we are most proud of is the minimal environmental impact that our garment has; our supply chain has such a clean manufacturing process that they even breed fish in the waste water pools."

The machine washable 17.5-micron Merino T-shirt from **Formal Friday** is available in nine colours and a range of sizes.

Despite traditionally being a menswear brand, Formal Friday also has a strong following of female customers, resulting in smaller sizes being created. B

MORE INFORMATION
www.formalfridayclothing.com

HAY CUTTERS FORM UNION WITH WOOL

Wool continues to be reintroduced into Australian sports, most recently at the Hay Cutters Rugby Union Club in the western Riverina district of NSW, whose supporters can now don a 100% Australian Merino wool replica of the team's playing jersey.

Woolgrowers and Hay Cutters Rugby Union Club stalwarts **Rowan Houston** of 'Benduck' at Hay and **Simon Booth** of 'Humewood' at Booligal sporting the club's 100% Merino wool supporter tops. They are pictured with **Lottie Ryan** of 'Curragh' at Oxley, **Alice Booth** of 'Homebush' at Booligal and **Grace McLean** of 'Greenvale' at Booligal, all daughters of woolgrowers and keen rugby players.

The team plays in the Southern Inland Rugby Union league against teams including the Deniliquin Drovers and Albury-Wodonga Steamers to the south, the Wagga Waratahs and Tumut Bulls to the east, and the more local Griffith Blacks and Leeton Phantoms.

The Hay Cutters is well supported by the town and the surrounding pastoral community – and, as with many regional clubs, the team members are largely from the land with many at the Hay Cutters from surrounding wool-growing properties. So integral is wool to the Hay Cutters that the club badge proudly features two Merino rams.

With so many passionate woolgrowers at the Hay Cutters, the club was keen to get wool into their supporter gear. Committee member Dan Korff, who has played for the club since 2007 when he lived in Hay as a jackaroo, ran with the idea and contacted AWI for advice.

"I'd seen how AWI's Fibre of Football campaign had introduced wool into the supporter gear of Aussie rules football and reckoned it could be used in our rugby union supporter gear too," Dan said.

"I've had some previous dealings with AWI, having completed its Breeding Leadership course in 2012 and been on the steering committee of the National Merino Challenge, so I knew they would be very receptive to the idea. So I gave them a call.

"I was put in contact with The Vintage Football Jumper Company in Melbourne who were very helpful. I sent them a current players' jersey and, based on that, they made a prototype of the supporters' jersey. We put in an initial order of 30 of the 100% Merino wool jerseys, with half them pre-sold to club supporters prior to delivery in April, ready for our first game of the season."

Hay Cutters' captain and coach Manning Doughty said that it was especially rewarding to see wool in the club's supporter gear because Hay is such a prime wool-growing region and so many of the players are local woolgrowers.

"Most of our men's and women's players and supporters have a direct connection to the wool industry. It's a world class fibre and in my view the western Riverina is the best place to grow it. It's great for the Club to have a jersey that is made from a fibre so prominent in the area," Manning said.

Club president Justin Campbell said the club is delighted with the supporter gear and those who have purchased the jerseys now own a very special memento that will be treasured for years.

"Producing the iconic Hay Cutters Club colours in a wool supporters' jersey is an ideal pairing; reflecting the importance of the exceptional community support that has been a feature of the Club throughout its history and the significance of the wool industry to this district," Justin said. B

MORE INFORMATION

If you are interested in getting wool football jumpers and other supporter merchandise into your local club, contact The Vintage Football Jumper Company www.footyfandirect.com.au/contact-us

The Hay Cutters Rugby Union team. *PHOTOS:* Margie McClelland

WOOL WEEK

Retailers, department stores and consumers threw their support behind Australia's ninth annual Wool Week, held from 20-26 May to coincide with the start of the winter retail season, with many retailers having wool-themed window installations and online promotions.

The main window display at the **David Jones** store in Sydney during Wool Week.

David Jones ambassador and model **Victoria Lee**, originally from **Narrandera** in country NSW, has thrown her support behind Wool Week. Victoria is pictured here wearing a **Bianca Spender** wool suit, available at David Jones.

A Wool Week display in David Jones featuring David Jones ambassador **Jessica Gomes** wearing a wool coat that is available to purchase in store (see left of picture).

This year's Wool Week was brought to life last month by David Jones throughout its stores and digital channels, spearheaded by a beautiful campaign starring David Jones ambassador Jessica Gomes and created by The Woolmark Company. The campaign was shot at the iconic Nundle Woollen Mill in NSW.

Featured in the campaign stills and fashion film is wool-rich winter fashion and accessories, all available to buy at David Jones, from brands including Aje, Bassike, Bianca Spender, Calibre, Camilla and Marc, Dion Lee, Jac+ Jack, Reiss, Studio Italia, Trenery and Viktoria & Woods.

By heroing Australian wool, Wool Week highlighted the opportunity for consumers to check the label for a garment's fibre composition, choose wool and throw their support behind Australian woolgrowers.

Wool Week is an initiative of AWI and its subsidiary The Woolmark Company. It arose from the global Campaign for Wool that aims to educate consumers about the natural benefits of wool and increase sales of wool product.

"Wool Week is a time for the Australian wool and fashion industries to come together and celebrate our nation's precious fibre," explained AWI CEO Stuart McCullough. "This is the ninth year we have celebrated Wool Week in Australia which not only shows the admiration Australian consumers hold for our homegrown fibre, but also gives our woolgrowers a great sense of pride."

Australia's leading premium department store, David Jones, which has 47 stores across Australia as well as a popular online shop, was enthusiastic about its Wool Week promotion.

"David Jones has been a proud supporter of the International Woolmark Prize since 2011 and we are delighted to see this develop into an exciting partnership in celebration of Wool Week," said David Jones General Manager of Womenswear and Accessories, Bridget Veals.

"Australian Merino wool is a key fibre used by many of our designers and a popular choice amongst customers due to its luxurious feel and wearability. Wool and wool-blend products can be found in a range of styles at David Jones including suiting, knitwear and homewares, making it the ultimate natural fibre for a stylish life."

AUSTRALIA

AUSTRALIAN RETAILERS ACROSS THE COUNTRY TOOK PART IN WOOL WEEK, WITH WINDOW DISPLAYS AND ONLINE AND IN-STORE PROMOTIONS TO EDUCATE CONSUMERS ABOUT THE NATURAL BENEFITS OF WOOL AND INCREASE SALES OF WOOL PRODUCT. HERE IS A SMALL EXAMPLE OF SOME OF THE RETAILERS' PROMOTIONS.

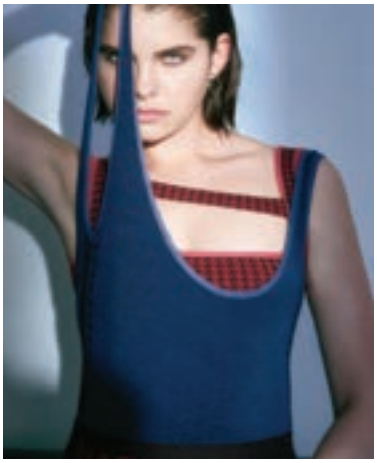
Smitten Merino: Catriona Rowntree wearing one of the brand's scarves.

Otto & Spike: Part of a Wool Week window display in Melbourne by the knitwear brand.

Waverley Mills: Window display showcasing 100% Australian wool products.

Merino & Co: MerinoSnug photoshoot at 'Lindsay Park' at Lima, Victoria, showcasing part of the brand's Winter 2019 collection. MerinoSnug is a brand of Merino & Co, owned by Australian Wool Network.

David Lawrence: Wool apparel promoted on the brand's website.



Nagnata: An exclusive editorial series with model Shaughnessy Brown wearing an Australian Merino wool blend collection.

Nadia Fairfax: The 'It girl' amongst Sydney's fashion elite Nadia Fairfax was featured on Instagram wearing **Jac+ Jack's** 100% wool Oscar sweater.

Kookaï: The Australian brand's Wool Week campaign and its wool apparel were featured as the hero on its homepage, with links through to wool products that could be bought online.

Woolerina: The brand offered 10% off its full range during Wool Week.

In all its retail stores as well as online, Country Road is promoting the Australian origin of the wool it uses. Pictured is a **window display at Country Road's South Yarra store** in Melbourne.

COUNTRY ROAD'S GOOD YARN

The provenance of Australian wool continues to be of great relevance to brands, retailers and consumers. This season Country Road has introduced an initiative that verifies that the Merino wool in its knitwear range is from Australia.

Country Road's new marketing campaign for this winter season, titled 'On the Land', features premium quality woollen products and leverages the farm to fashion story as a core ingredient in its high-value end product.

Sharing a commitment to Australian wool, Country Road and The Woolmark Company have enjoyed a collaborative relationship since the 1980s. Every year the companies work together to create beautiful garments crafted with Woolmark-certified Australian Merino wool.

Natural yarns are woven throughput this season's products – for men, women and children – and emphasise the natural qualities of the fabrications, such as warmth for Merino wool.

The latest campaign was filmed and shot in Tasmania, with one of the models being country girl Atty Mitchell (see the photo right) who featured in the cover story of the March 2018 edition of *Beyond the Bale.*

VERIFIED AUSTRALIAN WOOL

This winter season, Country Road has introduced a Verified Australian Wool initiative that applies to its Traceable Merino Knits range.

Country Road has partnered with Oritain, who use forensic science to determine where the Merino wool originates. Every fibre in the range can be mapped back to Australian farms.

"There's a story about traceability which is now really coming out to the consumer, people want to know provenance," said Oritain Australia Managing Director, Sandon Adams. "What we're there to do is to verify a claim: this product is being sold that says it's Australian Merino. Is it truthful?"

Mr Adams explains that the geochemistry of the environment differs upon where in the world you are.

"Some soils are nutrient rich, some are poor; some are high in elements, some are low. All these attributes combine in what we call a chemical fingerprint. We've mapped the chemical fingerprint of Australia and the majority of the world for wool, which we then use to verify where a product has originated.

"It's a way to highlight that these are the people doing the right things. These are good suppliers, they're selling an authentic product and here's the proof to show that they are."

A GOOD YARN

Also featured in the campaign are three of the many people who work to produce wool: a woolgrower, a stockwoman and a shearer.

Julian von Bibra, who with his wife Annabel runs Beaufront Station near Ross in Tasmania, said woolgrowers need to be mindful of the animal.

"These animals, they're born on the property, and we're responsible for looking after them. We nurture them. We're dependent on each other in that we provide them with food and water, see that they're well looked after, and at the same time respect the process that they're providing the wool.

"We've got an opportunity to create an amazing garment that we use in the fashion industry and its coming from an animal on our farm. What an amazing story that is in terms of a natural fibre."

An important part of the supply chain arrangement for the Verified Australian Wool program is Alistair Calvert of Wool Solutions, a new Tasmanian wool marketing and brokerage business, who liaised between Country Road and the woolgrowers to supply the wool for the program.

"Relationships are key to the success of programs like this; by bringing the grower and the brand together we can form a long term, sustainable supply of wool for Country Road," Alistair said.

"The other key factor ensuring the success of this program is the fact that we are working closely with Australian Merino Exports who, via their traceability app, provide full transparency of the logistics and processing involved to both grower and brand alike."

Country Road's marketing covered online channels including website, social media, video and direct emails; as well as in-store marketing collateral including retail window displays, pop-up displays and banners in its own stores and outlets including David Jones.

Country Road has 79 retail stores and 96 concessions across Australia. B

MORE INFORMATION
www.countryroad.com/a-good-yarn

A promotion on the **Country Road website**, which provides shoppers with direct links to purchase wool garments.

The **Ella Sanders' 'Sophie Sweater'** made from 100% Australian superfine Merino wool, photographed in the shearing shed built by the great grandfather of the brand's founder.

RETURN TO HER FAMILY'S MERINO ROOTS

The fashion designer behind the Ella Sanders brand, Danielle Sanders, chose her great grandfather's shearing shed in regional Victoria as the backdrop to showcase her latest Australian Merino knitwear collection.

Danielle's grandfather (left) and uncle (right) from many years ago, in action producing beautiful Australian Merino wool.

The early upbringing of Danielle Sanders included spending holidays on her grandparents' wool-growing property and being surrounded by knitting – a background which has influenced the quality and timeless style of her brand's beautiful Merino knitwear.

"My Mum, who has always been a keen knitter, grew up in regional Victoria at Morrisons, where the farm and shearing shed are located. I have wonderful memories of visits to the farm and playing with wool fleeces in the shearing shed with my cousins," Danielle said.

Danielle teams this passion for wool with her own flair for knitting – a skill passed down by her mother and grandmother – which forms the backbone of the Ella Sanders brand, which she launched in 2008.

To photograph the campaign imagery for her brand's Autumn/Winter 2019 collection – titled 'Stellar' – Danielle, who is now based in Melbourne, returned to the Morrisons farm.

"With a long history of producing Merino wool in the family, it was was such an amazing day seeing the latest collection come to life at such a special place for me," Danielle said.

"We loved using the original spaces, textures and features within the shearing shed. It was built more than 80 years ago and is still in use today, producing some of the finest Australian Merino wool. We've been able to capture the origin and essence of Australian Merino wool really well in our new season sweaters, cardigans, accessories and coats."

Ella Sanders creates timeless luxury for style-conscious women with a collection of fashionable, durable and wearable pieces. Premium, natural yarns and fabrics including 100% pure Australian Merino wool are used to create signature staples beautifully crafted to layer or stand-alone.

"We are known for our superfine Merino apparel, and once you understand the quality and longevity combined with unique design you can't turn back. I just love wool's durability, softness and natural qualities.

"Our customers range from mid-twenties through to 70-plus, which is really wonderful to see. The one thing that they love is the quality of our knitwear, understanding that it will last throughout many seasons."

A global brand with a local attitude, Ella Sanders has its flagship boutique in Brighton, Victoria. Its apparel is also sold through more than 70 speciality stockists across Australia and via the online store on the Ella Sanders website (flat rate shipping in Australia). B

MORE INFORMATION
www.ellasanders.com.au

MERINO MAGIC

2017 International Woolmark Prize winner Gabriela Hearst, who was brought up on a Merino ranch in Uruguay, recently launched her new 40-piece Spring Merino collection.

Australian model **Victoria Lee** wearing the 100% wool Kira dress by **Gabriela Hearst** at the launch of the Gabriela Hearst Spring Merino collection at the brand's flagship store in **New York** in April. Victoria, currently based in New York, is from **Narrandera** in the Riverina region of NSW where she has many friends and family who work on the land. Pictured behind Victoria is part of a stunning Merino wool and silk art installation crafted by Australian textile artist **Jacqui Fink.**

Partnering with The Woolmark Company, Gabriela Hearst unveiled the Spring Merino collection in April at her new flagship store on Madison Avenue in New York.

The designer has become known for redefining natural textiles for a new generation of fashion. Forming part of her wider Spring/Summer 2019 collection, the new 40 piece Spring Merino collection highlights the fibre's trans-seasonal properties and suitability for timeless luxury apparel.

Growing up on a working sheep ranch in Uruguay, the principle of farm-to-fashion has always been a huge part of her DNA, resulting in the use of natural fibres that lend themselves to women's suits, evening gowns, superfine Merino wool sweaters, knitted bodysuits and trench coats.

"My passion for this noble material is personal, being a Merino sheep grower myself and because it is one of the most complete fibres in the world," said the designer.

"It is a luxury fibre and one of the best insulators that can be used in cold and warm weathers. It is incredibly soft, for the modern luxury markets that require textures to feel smooth, durable and season less, allowing us to create a collection that speaks to our values of luxury and quality."

The collection is available now, online and via major international retailers such as Bergdorf Goodman, Net-A-Porter, Matchesfashion.com and MyTheresa. B

MORE INFORMATION
www.gabrielahearst.com

Designer **Gabriela Hearst** examining superfine Merino wool in August 2017 during a visit to Dave and Skye Wards' 'Spring Ponds' property near Goulburn, where she also hosted an intimate lunch with the region's fellow women of wool.

Venetian gondoliers wearing their Woolmark-branded 100% Merino wool uniforms, alongside the new **43 stations of the Gondola Service that now also feature the Woolmark logo.** The Woolmark logo is displayed on the sleeve of this sweater.

WOOL IN VENICE

Following the reintroduction in 2017 of wool into the uniforms of the iconic Venetian boatmen of Venice after an absence of more than a century, the stations of the Gondola Service are now also displaying the Woolmark logo to the estimated 60,000 tourists that visit Venice every day.

AWI's marketing arm, The Woolmark Company, in April proudly unveiled the Woolmark logo on 43 new signs installed at the stations of the Gondola Service in the Venetian lagoon, from Grand Canal to San Marco, Venice. For the next four years, the logo – owned by Australian woolgrowers – will be visible to the 85 million people that are expected to visit the city.

The promotion follows on and complements the introduction in 2017 of 100% Merino wool uniforms worn by the 433 gondoliers, an initiative of The Woolmark Company together with iconic Venetian brand Emilio Ceccato (owned by Italian retailer Al Duca D'Aosta) and the Association of Venetian Gondoliers.

The iconic blue and white striped Merino wool uniform comprises a polo shirt made using 100% Merino wool fabric from Reda Active, a sweater made from 100% Merino wool yarn from Tollegno 1900, and a quilted vest from Tessuti Marzotto Fabrics with 100% Merino wool fabric and 80% wool wadding.

An **inauguration ceremony** of the new Woolmark-branded gondolier stations took place on 9 April, attended by many of the delegates from the Congress of the **International Wool Textile Organisation (IWTO)** which was held in Venice.

The gondoliers' job is strenuous and undertaken in all weathers, so they are thankful that their uniforms are now being made from such a performance fibre. Merino wool's natural, inherent benefits – including thermoregulation and breathability – help ensure maximum comfort and freedom of movement during physical activity.

The Woolmark logo is displayed on the outside of the apparel, showing visitors that the uniforms are made from 100% wool. The wool uniform is available to the public to purchase from the three Venice stores of Emilio Ceccato and online at www.emilioceccato.com (shipping worldwide).

"We are proud that, after almost a century, the gondoliers have rediscovered wool for their uniforms," said AWI Global Strategy Advisor Fabrizio Servente.

"Their job requires a high-level of physical performance in extremely variable weather conditions. The return to Merino wool usage confirms the ability of this natural fibre to respond to their needs; this is why The Woolmark Company wanted to support this project with the historical brand Emilio Ceccato and Association of Venetian Gondoliers."

MORE INFORMATION
www.emilioceccato.com

Award-winning Chinese actress **Mei Ting** viewing Edition's new Woolmark-certified Merino wool collection at its VIP and media launch event in Shanghai in March.

CHINA'S EPO CHOOSES MERINO

Multi-brand fashion corporation EPO Fashion Group, which has a strong market share and influence in China, has become one of AWI's long-term strategic retail brand partners in the region.

Founded in 2004, EPO Fashion Group owns four fashion brands, including high-end womenswear brand Edition. The Group has more than 1,000 stores across Greater China and abroad, and is projected to reach RMB12 billion (AU$2.5 billion) in sales revenue in 2020 across its whole business. It recently became a Woolmark licensee.

Jenny Kim, the founder of EPO, is known for pioneering the mindset that 'Made in China' can mean "high quality and fashionable products". She was also recently listed in the Business of Fashion 500, further putting her and the company on the global and local fashion map.

The Woolmark Company has partnered with EPO for the current Spring/Summer 2019 season in the northern hemisphere, helping its Edition brand create and market a collection made from Australian Merino wool. The collaboration will extend into the Autumn/Winter 2019/20 season, during which several other of EPO's brands will also highlight Merino wool.

"Partnering with this leading Chinese fashion group helps promote the versatility and natural quality of Australian Merino wool, driving new demand for the fibre in womenswear," said AWI Country Manager for China, Jeff Ma.

For the Spring/Summer collection, Edition and AWI collaborated to create a dynamic but comfortable and practical wardrobe using high-quality fabrics made from Australian Merino wool. The collection comprised suits, coats, sweaters, athleisure knits and other classic items.

"This collection shows consumers that Merino wool provides realistic and pragmatic options for the warmer as well as cooler seasons. It shows that wool can be a lightweight, trans-seasonal and all-year round fibre – it is breathable and cool in summer yet comfortable and warm in winter," Jeff added.

The collection was launched at an event attended by VIPs and media in Shanghai in March, and promoted in *T Magazine* and through other targeted media promotions including social and digital media.

The front cover of China's ***T Magazine*** with supermodels wearing Edition's wool apparel. On the inside pages was fashion editorial and a photoshoot promoting the collection and the natural benefits of Australian Merino wool.

MORE INFORMATION
www.edition.com

Some pieces from **Edition's** latest Spring/Summer collection: A wool blend mesh smock; Merino wool blend jumper;100% Merino wool suit.

WOOLMARK STUDIO 3.0
CHINA TALKS DIGITAL INNOVATION

The third edition of Woolmark Studio in Shanghai connected members of the wool supply chain and shone the spotlight on opportunities to leverage digital innovation in the wool industry.

The digital revolution is rapidly transforming the era in which we live. New technologies, a connected global market and changing ways that modern consumers make their purchasing decisions, have created a more innovative and dynamic environment in which enterprises conduct their business.

Highlighting these opportunities for the wool industry, The Woolmark Company in March held its third Woolmark Studio event, at Donghua University with the theme of 'New Manufacturing, New Retail, New Consumption'. It was attended by a broad range of supply chain businesses and professional institutions.

"Only by keeping up with developments in technology and grasping the pulse of innovation can enterprises grasp the future in their own hands," said AWI Country Manager for China, Jeff Ma, in his opening address to the conference.

Key speakers from the wool industry were President of the China Wool Textile Association, Yanli Peng; Director of the China Textile Development Center, Binhong Li; and Qi Zheng from textile manufacturer SHEPHERD. There were also key speakers from the Artificial Intelligence Creation Division at Microsoft Search Technology Center Asia; Microsoft Mixed Reality Asia; Alibaba Tmall Clothing; Gerber Technology; and the Luxe.co luxury fashion website.

After the meeting, the guests visited the Wool Education Center at Donghua University's College of Fashion and Innovation, which was established by The Woolmark Company in May last year.

"The Centre enables students, designers and partners throughout the supply chain to explore the benefits and possibilities of Australian wool, and learn about current trends, new technology and supply chain developments," said Jeff Ma.

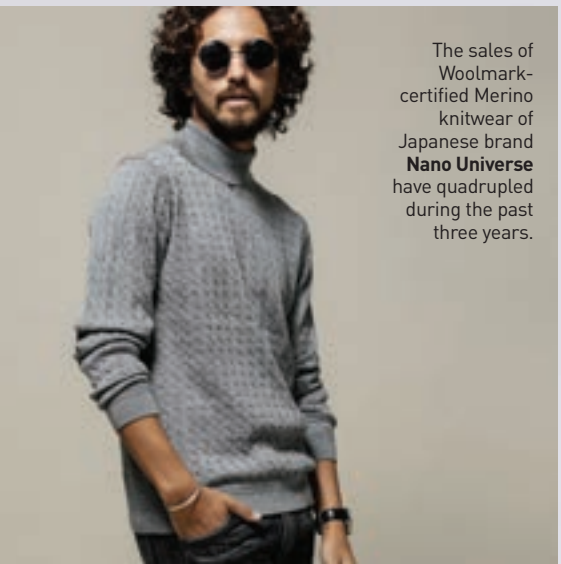
The expert speakers at the **Woolmark Studio** held in March in Shanghai.

This was the third edition of the Woolmark Studio, established in 2017 to highlight the benefits of Australian Merino wool to the Chinese textile trade and media. It brings together exhibitions, forums, training and education – connecting the industry upstream and downstream, from manufacturers to retail brands, from designers to fashion media.

The inaugural edition of Woolmark Studio was held at Shanghai Fashion Week and shone the spotlight on International Woolmark Prize alumni; the theme of the second edition held last year was sustainability in fashion. B

MERINO KNITWEAR BIG IN JAPAN

For the third year running, one of Japan's largest apparel brands Nano Universe has increased its sales volume of Woolmark-certified knitted garments, thanks to a co-branded promotion with The Woolmark Company.



The sales of Woolmark-certified Merino knitwear of Japanese brand **Nano Universe** have quadrupled during the past three years.

Established in 2002, Nano Universe sells quality casual wear to young men and women. It is the largest multi-brand store chain of TSI Holdings, one of the biggest apparel groups in Japan.

While Nano Universe has impressive annual sales of more than AU$300 million, TSI Holdings has annual sales of a massive AU$1.9 billion and owns many other well known apparel brands including Margaret Howell and the domestic rights for streetwear brand Stussy.

The Woolmark Company has supported the knitwear campaigns of Nano Universe's private brand (70% of its sales) since the Autumn/Winter 2016 season. Production volumes of Woolmark-certified men's pieces (average price of AU$115) have more than quadrupled during the past three years from 20,000 pieces to 83,000 pieces.

"We have been keen to keep supporting the increase in sales of Nano Universe's Woolmark-certified Merino knitwear collections, but also encourage the company to introduce wool into new product categories," said AWI Country Manager Japan, Samuel Cockedey. "We want to make Nano Universe and TSI Holdings strong partners for future collaborations and potential new licensees."

The Woolmark Company's contribution to the Nano Universe campaign this past autumn was to provide a 'Merino Wool Benefits' brochure for distribution to all customers who buy Woolmark-certified products.

Nano Universe promoted its Woolmark-certified products in advertorials in men's magazines, on co-branded in-store point of sale collateral, and on dedicated pages on the company's website. The promotion emphasised the anti-pilling properties of the knitwear. B

YOUNG WOO
IMPRESSED BY CHINA

Young woolgrowers from across Australia saw wool's manufacturing process first-hand during a recent self-funded study trip organised by AWI to China and Hong Kong.

Young woolgrowers from across Australia have returned from a tour of China with a new, global perspective of their industry.

The self-funded trip, organised by AWI, involved 13 young woolgrowers visiting a number of China's biggest manufacturers and AWI offices in the region to gain a greater understanding of the journey Australian wool takes once exported.

Close to 80% of Australia's raw wool production is exported to China each year for early-stage processing. Once predominately a manufacturing hub, China in recent years has also fast become a large consumer of luxury wool apparel.

They met with key vertically integrated mills such as Sunshine and Nanshan, key processors such as Tianyu, Linglong Woollen Mill, the Wool Development Centre set up in collaboration between Nanshan and AWI, the Knitwear Development Centre setup by Xinao with AWI and the Wool Education Centre set up at Donghua University in collaboration with AWI.

The group also visited AWI's Shanghai office and Wool Resource Centre in Hong Kong.

Encouraging the next generation of wool industry workforce participants is critical to the prosperity of the Australian wool industry. AWI aims to help improve the engagement of young people interested in the wool industry, thereby developing and retaining the skills the wool industry needs to be innovative in response to new challenges

The young woolgrowers on the tour were:

NSW
Aaron Granger, Emma Northey, Cameron Picker, Emma Shippen, Ben Simmons

VIC
Jonno Hicks, Claire McGauchie

SA
Angus Ashby, Josh Cousins, John Dalla, Will Gebhardt, Tom Taheny

TAS
Matilda Scott

The **young Australian woolgrowers** seeing the processing of wool top at leading textile enterprise **Nanshan** in China.

The **young Australian woolgrowers** were warmly welcomed in **China**, such as at leading vertically integrated textile enterprise Nanshan.

OLGROWERS
A'S WOOL INDUSTRY

Beyond the Bale caught up with two of the young woolgrowers, Jonno Hicks and Matilda Scott, to get their thoughts about the trip.

Jonno Hicks runs a mixed sheep and cropping property in Kaniva in Western Victoria, managing **Hannaton Merino stud** as well as a commercial flock averaging 19.5 microns.

Matilda Scott works on her family's property **'Myrtlewood'** at Cleveland in Tasmania, where they farm 700 breeding ewes with an average micron of 17.5.

Has this trip given you a greater understanding of what it takes to convert raw wool into a final product?

Jonno Hicks (JH): As producers, often the last time we see of our wool is when it gets loaded onto the truck on farm or on the auction floor and we don't give it much thought after that. This trip was a fantastic opportunity to see wool processing and all the stages from raw wool to finished garments.

Matilda Scott (MS): Yes, this trip has developed my understanding of raw wool processing and garment manufacture. Before the tour, I viewed some videos of wool processing, but nothing could prepare me for the scale and speed that raw wool was being processed into tops, yarn, fabric and then garments.

Were you impressed by what you saw in the Chinese wool industry?

JH: I was amazed by the level of investment and technology in the wool processing. I had assumed that because of the massive workforce in China they wouldn't have the level of mechanisation and modern equipment. But some of the processing plants we visited were very advanced with state-of-the-art machinery that used the latest technology to produce a high quality and consistent product.

MS: Imagine walking into the biggest warehouse you have ever seen, and then replicate that 30 times, each filled with cutting edge machinery. That is the scale of some of the mills that we had the privilege of seeing. I was impressed by the continuous development of new technology and designs and the integration of the new technology.

What are the Chinese mills' opinions of Australian wool at the moment?

MS: The current price of wool was a topic of conversation at the Chinese mills. We also discussed the future of wool demand in China and it is evident that the quality and quantity of Australian wool is a significant driver in efficient processing and marketing of wool products. They were also very interested in building relationships with young woolgrowers to develop direct sale of wool from farm to yarn.

JH: Chinese processors definitely view Australian wool as a top-quality product. While there was some concern with the current high prices, they were more concerned with ongoing supply and the current threat to supply with the poor season in many wool-growing areas. Some processors did require a specific product and would like to see more fine wools but the Chinese market as a whole has strong demand across a range of microns.

What is driving demand at retail in China?

JH: The demand for Australian wool products is ever increasing in China with a growing middle class. AWI's marketing arm The Woolmark Company is doing a fantastic job to partner with both designers and fashion labels to educate consumers and promote wool and its versatility in active wear, outerwear, next to skin apparel. The latest processing technology for machine washable and easy-care wool garments is also helping to drive demand.

MS: Yes, one of the main drivers in retail in China is the rise of the middle class. With a greater population earning a higher annual disposable income, there are more people able to buy luxury woollen garments. Australia is well positioned to capitalise on this demand for quality products.

What is your opinion of the work being done by AWI's marketing subsidiary The Woolmark Company in Hong Kong and China?

JH: The most impressive part of the trip for me was the work of The Woolmark Company in China. From the research and development through to marketing and the impact it's having on our industry and the price of wool. With the range of new products being developed I was impressed by the versatility of wool and the fantastic campaigns being promoted by The Woolmark Company. The staff we met and their passion for wool was evident and is obviously having an impact on The Woolmark Company's success in China.

MS: I think AWI and The Woolmark Company are doing an exceptional job marketing wool as a renewable, breathable and comfortable fabric. They are putting in a great effort educating young designers about the properties of wool and encouraging them to include wool in their garment collections.

Having been on this trip, do you as a young woolgrower feel more confident about the future of the Australian wool industry?

MS: Going on this trip has given me the confidence to say that the wool industry in Australia is going to continue to have a strong relationship with China. It is important to maintain the reputation of superior quality of our raw wool to ensure the continuation of the very successful partnership with China and other wool processing nations.

JH: The trip made me proud to be an Australian woolgrower, seeing China's processors and consumers' recognition of our top-quality product. The level of investment and the scale of Chinese processing capacity gives me great confidence in the sustainability of the Australian wool industry and optimism for our future. B

INTERNATIONAL WOOLMARK PRIZE
TEXTILE INNO

The International Woolmark Prize is more than a fashion competition. An important aspect of it is to wool fabrications. Here we take a look at a selection of these innovations from five of the finalists in

FLOATING FLAT KNIT

To emphasise Merino wool's lightweight characteristics, i-am-chen changed the fundamental knitting structure by floating the 100% superfine Merino wool yarn over a monofilament so that the wool hangs decoratively on the surface.

CHEMICAL-FREE WIND- AND WATER-RESISTANT WOOL OUTERWEAR

A 100% wool Optim™ outer fabric, in which the yarn was pre-stretched before being woven to create the light but compact fabric that is water- and wind-resistant without the use of chemicals or coatings.

WAX-COATED CAVALRY TWILL

Used in a bomber jacket and a utilitarian boot, Edward Crutchley's cavalry twill – a traditional coat fabric made from 100% Merino wool by Dormeuil, with the weight and drape of leather – was wax-finished to make the textile durable and waterproof.

WOOL PUFFER JACKET

The puffer features a lightweight insulated 100% wool fill bonded with corn fibre that's 'cooked together' and washed in a chlorine-free process to produce a renewable alternative to conventional down or synthetic fill. The puffer outer is made from a traceable 90% wool fabric that is water- and wind-resistant.

DYED WOOL JACQUARD FUR

Imitation fur made from wool was developed with a jacquard pattern of six tones. These colours were created with environmentally friendly dyes, developed and engineered to show how well wool can take vibrant colour.

SCREEN-PRINTED WOOL WITH PROTEIN-DISSOLVING PIGMENT

On a lightweight 100% Merino wool weave, beige printed stripes have been pressed in contrast to the unprinted white, fluffy strips. A black ink pattern was then applied, which reacted differently on these two sections. A protein-dissolving pigment was then used to give a lace-effect, highlighted with a gold foil edge.

VATIONS

encourage the designers to develop new and innovative
the 2018/19 competition.

INTERNATIONAL
WOOLMARK PRIZE

CORDING TECHNIQUE

The cording uses a water-soluble base fabric that when placed in water totally dissolves. This water solubility leaves the embroidered flower patterns intact on the surface, thus creating an open like lace with wool blend yarn. This fabric was developed with digital programming so there is zero waste.

100% WATERPROOF OUTERWEAR

In collaboration with Hancock Vulcanised Articles, Nicholas Daley created a bonded Lochcarron Merino wool tartan check with rubberised cotton. Every garment is hand seam taped together in the Scotland atelier, giving a 100% waterproof finishing.

KNITTED PUFFER COAT

A flat-knitted puffer coat with 100% extrafine Merino wool for the insulation inside the jacket and 100% superfine Merino wool for the outer, all of which are knitted into one single piece. Despite its technical structure, it can be produced relatively quickly.

WOOL SNEAKERS

Developed with Reebok, Colovos created a sneaker with inserts from washable and traceable 100% Merino wool.

EMBOSSED CIRCULAR KNITTING

A machine-washable 100% extrafine Merino wool knit was created with a 21-gauge circular knitting machine to create a mottled effect and the brand's name embossed into the fabric.

SHIBORI DYEING

Using Arashi Shibori, a centuries old method of dyeing woven fabric, the fabric of Zegna Baruffa rib knits was wrapped around a cylindrical former to create random creases and then bleached.

PUSHING THE LIMITS OF KNIT INNOVATION

For the first time, leading knit innovator BYBORRE has introduced Merino wool into its textile family to add a new weight and look to its garments, thanks to a collaboration with The Woolmark Company.

Established in 2010, BYBORRE is a well-known Amsterdam-based textile innovation studio working on the frontiers of knit development, designing and engineering multi-layered fabrics.

BYBORRE's studio houses a knitting and innovation lab, a fully outfitted atelier, a team of specialists and experts, a Byborre archive, and endless amounts of pioneering fabrics.

Designing from the yarn up allows BYBORRE to develop innovative knits, both within their own collections and for leading brands. Past collaborating partners have included leading brands such as adidas, Nike, The North Face, Rapha and GORE-TEX.

Most recently, BYBORRE has also been working with The Woolmark Company – and, for the first time, BYBORRE has developed luxurious Merino wool variations of all of their signature fabrics, using wool's inherent properties to further push functionality.

BYBORRE's Autumn/Winter 2019 collection, titled The Layered Edition™, developed in partnership with The Woolmark Company, was showcased to retailers at a special event during Paris Fashion Week in January.

For the collection, three unique knitted fabrics were developed with Merino wool yarns from Chinese company Xinao.

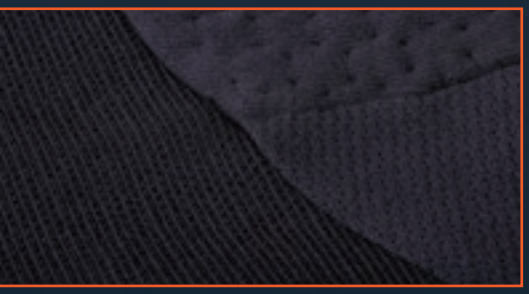
Placement of the BYBORRE fabrics on particular parts of a garment have been deliberately used for a desired functionality. For example, heavier fabrics like the 3D™ have been used to provide warmth, whereas lighter weight fabrics like the 8-Bit™ are used in areas that require a higher range of motion or which are warmer.

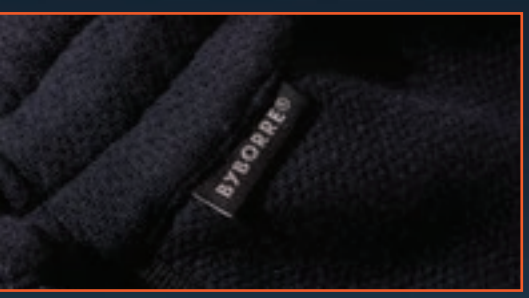
The result is that BYBORRE has brought together several different fabrics in a single garment.

As part of The Layered Edition™ collection, certain key garments have been even more experimental, using GORE-TEX INFINIUM™ product technology with Merino wool to add different functionality.

"Who would have thought that The Woolmark Company would be coming together with GORE-TEX and BYBORRE? Two completely different areas of textiles and I think that's what's particularly exciting working with complementary and competitive industries," said The Woolmark Company's European Product Marketing Manager, Rebecca Kelley.

The Woolmark Company is continuing its relationship with BYBORRE to push the boundaries of wool innovation and increase the adoption of novel Australian wool products by manufacturers, retailers and ultimately consumers.





Pieces from **BYBORRE's** latest collection that demonstrate how several different Merino wool **multi-layer fabrics** have been used in a single garment. *PHOTOS:* Team Peter Stigter (on-body looks) and Bram Spaan (fabric shots).

MORE INFORMATION

The collection will be available in selected stores and online on byborre.com

CRACKING DESIGN WINS BRADFORD WOOL AWARD

Through sponsorship of the prestigious Bradford Textile Society Awards, AWI continues to promote Merino wool to tertiary textile students in the UK.

Textile student Xingchen Lu of the Royal College of Art has won this year's The Woolmark Company Award as part of the renowned Bradford Textile Society Awards.

Entrants had to create an innovative wool-rich fabric which can be used for fashion/accessories or for interior furnishings. The fabric had to contain a minimum of 60% Merino wool and highlight the versatility and natural benefits of the luxury fibre.

As part of the prize, Xingchen has the opportunity to complete one week's work experience with the House of Holland brand.

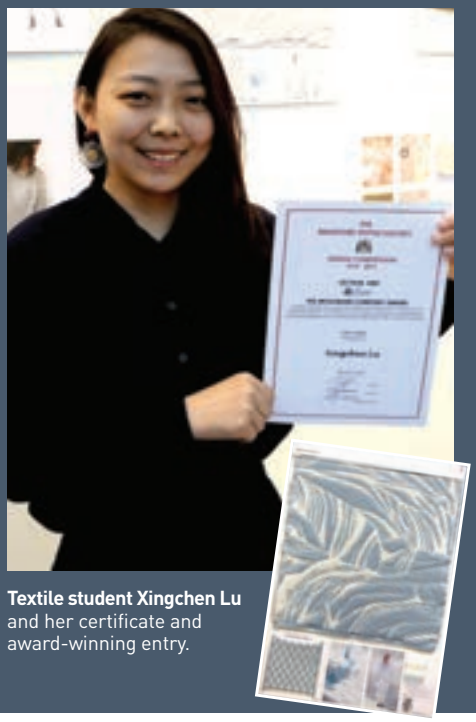
Xingchen said her winning design was inspired by the landscape in Iceland.

"I hiked on the glacier and felt the power from the nature, so I drew this beautiful view into a geometric pattern and used a SHIMA machine to knit double-sided tubular jacquard with inlay yarns to keep the fabric soft, warm and it can be worn on both sides," said Xingchen.

"Merino wool is very soft and fine. The fabric with Merino wool has high quality and is comfortable next to the skin. I was so excited and surprised to get this honour from The Woolmark Company and get this fantastic intern opportunity. I met so many creative designers in Bradford; it is an unforgettable experience."

The Woolmark Company sponsors the award to promote Merino wool amongst the next generation of designers. The awards offer an excellent opportunity for future textile designers to have their work recognised by the most important people within the industry.

"The winning entry displayed sophistication both in its design aesthetic and consideration of technique. The student interpreted the brief that was set, and was able to clearly demonstrate an appreciation of Merino wool's properties and benefits," added The Woolmark Company's Product and Education Extension Manager for the UK, Louise Campbell. B



Textile student Xingchen Lu and her certificate and award-winning entry.

PADDOCK PEN PALS

Young Farming Champions (YFC) are being beamed directly into the classrooms of city kids so they can learn about the sheep and the wool industry, thanks to the 'Paddock Pen Pals' initiative from Picture You in Agriculture in association with AWI.

Paddock Pen Pals is a new school-based program that utilises Google Hangout sessions so city school students can see and talk live with real farmers about their daily life and jobs. The program was launched recently at Sydney's Carlingford West Public School, a large inner-west primary school with a high percentage of English-second-language students.

"Many of my students have little time outside and have never visited a farm," teacher Zoe Stephens said. "In order to make their learning relevant, I wanted to connect them to real farmers to see what real farms are actually doing in Australia."

The first YFC to talk to the students via the big screen was CSIRO Sheep Researcher Dr Danila Marini who discussed animal wellbeing, virtual fencing and technology. The following day the students were introduced to Riverina Local Land Services District Veterinarian Dione Howard.

"I think Dione may have inspired some students to become future vets," Zoe said. "The medical equipment she showed the students was amazing, especially as they could identify that we use the same equipment for humans."

Wool Technical Coordinator at Elders National Wool Selling Centre in Melbourne Sam Wan was the third YFC to Google Hangout with the students and she had an immediate connection, being herself originally a city kid.

"The students were amazed that someone like them, a city kid from with a similar background, could become involved in the wool trade," Zoe said.

The final AWI-supported YFC was Sheep musterer Chloe Dutschke who beamed into the school direct from the vast plains of Hay, and the students were fascinated by the huge open spaces.

"Every farmer brought a unique perspective to our students and opened windows into the world of agriculture that they had never experienced," Zoe said. "When I asked the students to raise their hand if they enjoyed meeting a farmer, every hand when up! That just doesn't happen with Year 6." B

MORE INFORMATION

Hear more from Zoe in an upcoming episode of AWI's The Yarn podcast at www.wool.com/podcast.

300 Year 6 students from Sydney's **Carlingford West Public School** learnt about the wool industry live from AWI-supported Young Farming Champions, including **Dione Howard** (pictured) located in the **Riverina.**

WOOL4SCHOOL
EXPANDS INTO UK AND ITALY

Now in its eighth year, AWI's Wool4School design competition invites students to think about the versatility of wool fabrics as part of a creative design of their own. The competition's success has seen it expand from Australia and Hong Kong into Italy and across the UK.

First launched in Australia in 2012, Wool4School is an annual design competition for school students to learn the fundamentals of fashion design and explore the benefits and versatility of wool and the fabric it creates.

"The aim of the design competition is to teach school-aged students the benefits of Australian wool so that these future designers and consumers understand wool's benefits and are more likely to use Australian wool as their fibre of choice," said AWI Project Manager for Education Extension, Ashley Hollis.

On the back of the success of Wool4School in Australia, the competition was launched in Hong Kong in 2015 and England in 2017. It was last year extended to all parts of the UK (England, Scotland, Wales and Northern Ireland) and introduced to Italy. Wool4School has now involved nearly 100,000 students globally.

The students in the inaugural UK and Italy competitions were asked to design a multi-functional outfit made from at least 80% wool. The winners were recently announced (see right).

2019 AUSTRALIAN COMPETITION

Australian students that have registered to enter the 2019 edition of the Wool4School competition are reminded that submissions close on 25 July.

This year, students are asked to design an outfit that embraces the use of technology to enhance garment performance or function, such as wool footwear that tracks your run.

There are once again a host of amazing prizes on offer. The winners will be announced on 22 August. B

MORE INFORMATION
www.wool4school.com

UNITED KINGDOM

Harlow College student Elise Bailey is the inaugural Wool4School UK winner. Incorporating the performance benefits of Merino wool, Elise designed a survivalist jacket, trousers, gloves and a hat, with solar panels inbuilt into the jacket sleeves.

"During my research for this competition I looked at different ways in which wool can be used. I was amazed by how versatile wool is and I learnt how many possible uses it has in clothing, which I didn't know about before this competition," Elise said

"Having done mountain walking from childhood I have a strong knowledge of outdoor gear and what is necessary to aid survival in more extreme conditions. This is where I decided to incorporate solar panels that would heat up a jacket. I liked the idea of solar panels because they are eco-friendly."

Elise wins a short course at the prestigious London College of Fashion.

Following the success of this year's competition, next year's competition will expand in the UK from sixth form students aged 16-18 to include students at the younger GCSE level.

Inaugural Wool4School UK winner **Elise Bailey** with her winning designs.

ITALY

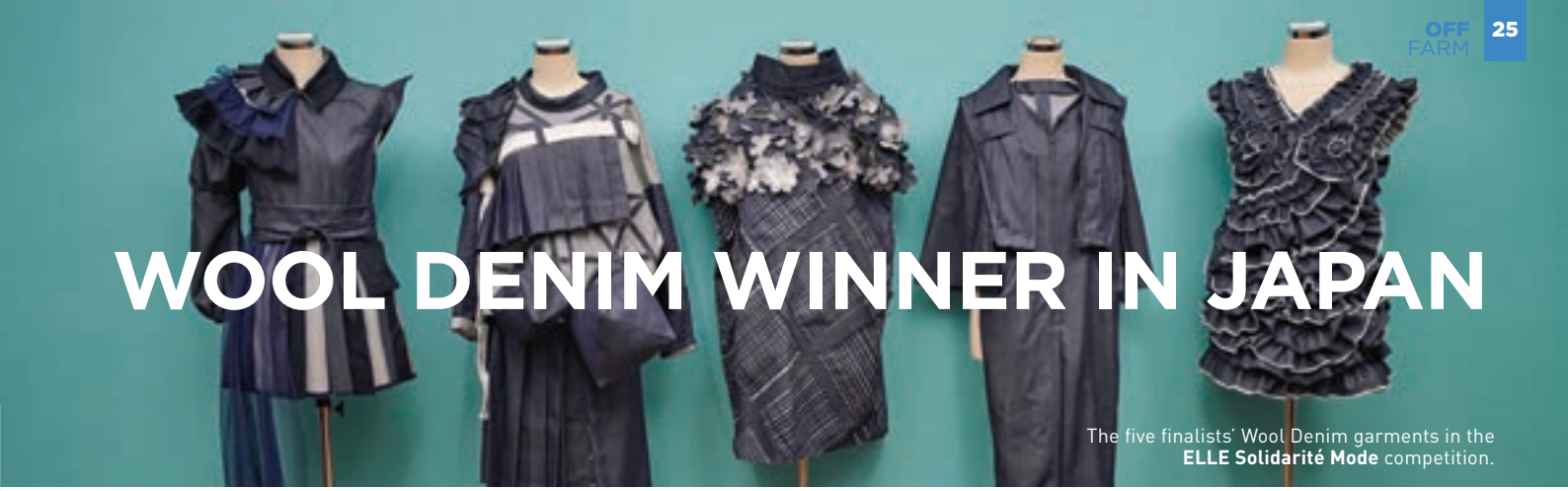
Wool4School was launched for the first time in Italy in October 2018 and was open to Italian school students aged 16-19 attending the last three years of upper secondary school in Lombardia and Piemonte.

Inaugural winner Romchel Fuentes, studying at IIS Caterina Da Siena in Milan, designed a jacket that could be converted into a backpack, a shoulder bag that could be converted into a hat, and some soft Merino denim jeans. The transformation of the first two multifunctional garments takes place through a series of intuitive zips and laces.

Romchel said she was especially delighted to win the competition because the panel of judges comprised notable fashion professionals. She wins an internship at prominent fabric manufacturer Vitale Barberis Canonico.

Special congratulations also went to Omar Valentino of IIS Eugenio Montale in Milan, who designed a stylish jacket with a collar and lapels that can be pulled up to transform it into a windbreaker when needed on a sailboat. The apparel also includes an inflatable safety device and a GPS tracker.

Inaugural Wool4School Italy winner **Romchel Fuentes** with her winning designs.



The five finalists' Wool Denim garments in the **ELLE Solidarité Mode** competition.

WOOL DENIM WINNER IN JAPAN

An outstanding design using Wool Denim has won a talented young designer in Japan a three-year scholarship at a leading fashion school, in an initiative from ELLE magazine and supported by The Woolmark Company.

The costs of attending fashion school can be prohibitive for young designers from poorer backgrounds, which is why ELLE launched in France the ELLE Solidarité Mode scholarship program in 2004 for young women who don't have financial resources of their own.

Last year, for the first time, ELLE rolled out the scholarship program abroad – in Japan – and AWI's marketing arm The Woolmark Company was the official sponsor. More than 100 high schools and fashion institutions were contacted. Applicants aged 18 to 23 from across Japan competed for the scholarship, designing garments with the theme 'Denim Style in Wool'.

Ten semi-finalists created apparel made from Wool Denim from Japanese denim mill Showa Textiles. Five gifted students were then selected for the grand final held on 9 March in Tokyo, which was won by 18-year-old Ayame Sasaki from Sendai. She wins a three-year scholarship to attend leading design school ESMOD JAPON.

"The Woolmark Company's sponsorship of this highly visible fashion-related scholarship program has helped raise wool's profile in student education in Japan," said AWI Country Manager Japan, Samuel Cockedey.

"It has also helped the company build connections and reinforce the company's relationships with ELLE and ESMOD in Japan as well as the established designers on the competition's jury.

"ELLE's print, digital and video platforms provided vast media exposure for the scholarship and Wool Denim, and as a bonus we also received complimentary promotion of the International Woolmark Prize from ELLE."

Editor-in-Chief of **ELLE** Japan, **Kanako Sakai**, with the scholarship winner **Ayame Sasaki** and her winning design.

TALKING TURKEY

Spanning both Asian and European markets, Turkey is an important country in which AWI works to build the awareness and use of Australian wool.

With Turkey's growing domestic market becoming increasingly sophisticated and with the country boasting a strong local manufacturing industry, AWI works to build the presence of Australian wool within the Turkish textile and retail sectors.

BUSINESS LEADERS FORUM

In March, AWI's marketing arm The Woolmark Company brought together about 40 leaders from the Turkish textile industry, including washing machine manufacturers, at a business forum in Istanbul to promote Australian wool and show how the fibre can further benefit the Turkish textile industry.

This annual event is an important networking event for the leading businesses of the region's textile industry. The keynote speaker this year was the Victorian Government's Commissioner to the Middle East, Africa and Turkey, Gerard Seeber, who emphasised to the audience the scale of the Australian wool industry and the quality the its fibre.

NATURALLY INSPIRING SEMINAR

The Woolmark Company also hosted in March in Istanbul another of its Naturally Inspiring seminars for tertiary fashion and textile students. The seminar showcased the properties and benefits of Australian wool as well as various employment opportunities within the industry – providing the students with a knowledge of and connection with the fibre which will stay with them as they progress through their professional lives.

More than 200 students attended the seminar to hear speakers from The Woolmark Company and the broader textile industry. The students also had the opportunity to view The Wool Lab sourcing guide to the best commercially available wool fabrics and yarns from some of the world's leading spinners and mills.

The Victorian Government's Commissioner to the Middle East, Africa and Turkey, **Gerard Seeber,** speaking at this year's **Business Leaders Forum** in Istanbul hosted by The Woolmark Company.

More than 200 tertiary students learnt about Australian wool at the recent **Naturally Inspiring** seminar held in Istanbul.

MINIJUMBUK'S DROUGHT RELIEF FUNDRAISER

Drought conditions on **Roger Wilkinson's Camborn Station** at Wentworth in NSW.

Leading wool bedding brand MiniJumbuk has teamed up with a drought-affected NSW farmer to create a limited edition wool quilt to raise funds to support Australian drought relief efforts.

The limited edition Farmer's Heart Wool Quilt, being sold in partnership with department store David Jones, is one of 1,000 being made. $50 from the sale of each quilt will be donated by MiniJumbuk and David Jones directly to Rural Aid to help Aussie farmers get back on their feet.

The quilt has been made by Woolmark licensee MiniJumbuk using Poll Dorset wool from one farm, Roger Wilkinson's Camborn Station at Wentworth in NSW, making the wool uniquely traceable to a single source.

Roger, the fourth generation of his family to produce wool at the 38,000 hectare Camborn Station, is directly experiencing the impact of the severe drought.

"It's hard to comprehend the full effects until you witness the drought's impact first-hand," Roger said.

"Businesses are really struggling so I'm very proud that my family is supporting other Australian communities and Rural Aid with this project. I think it's tremendous how MiniJumbuk and David Jones are giving back to the Rural Aid program."

The 1,000 quilts (across single, double, queen, king and super king sizes) were hand-crafted and finished at MiniJumbuk's rural headquarters in Naracoorte, South Australia.

"It's great to be involved in a project where we can work with the source of the product that makes our premium wool bedding, we can partner with one of the premium department stores in Australia, and we can do something really meaningful to give back to the communities that are struggling in the drought," said MiniJumbuk Managing Director, Darren Turner.

"I think it's a real challenge for the average Australian to understand the impact of drought, particularly when they live so far away from the communities that are struggling through it. So we're hoping with this program to remind people that conditions are tough at the moment out in the bush."

All the wool for **MiniJumbuk's Farmer's Heart Wool Quilt** has been sourced from **Roger Wilkinson's** Poll Dorset sheep.

Not only is the quilt helping raise vital funds, the premium Poll Dorset wool from Camborn Station has rated exceptionally highly in terms of resilience, with extra fill power for lasting loft and warmth in the quilt.

A great all-rounder, MiniJumbuk's Farmer's Heart Wool Quilt is available exclusively from $439.95 in select David Jones stores nationwide, MiniJumbuk retail outlets in South Australia and online. B

MORE INFORMATION
www.minijumbuk.com.au
www.davidjones.com/brand/mini-jumbuk

WOOLSTAR'S NEW FARM TRACEABILITY PROGRAM

The new 'Farm 2 Shelf' traceability model of Australian premium bedding brand Woolstar enables its customers to learn about the specific Australian farm that produced the wool in their Woolstar product.

Woolstar founder Graeme Kerr with **Dennis Rowley** who runs **'Springwaters' at Boorowa, NSW** – one of several properties that supplies wool to Woolstar.

Woolstar is a long-term Woolmark licensee that produces high quality woollen bedding such as quilts, underblankets, mattress toppers and pillows. Company founder and managing director Graeme Kerr says its new traceability model provides its customers, especially in Asian markets, with reassurance knowing that the filling in the products is Australian wool which is well known for its quality.

"By simply scanning a QR code and then entering a product key displayed on their product, customers will be able to see pictures, information and a location of the farm which the wool in the product came from," Graeme said.

"We work only with farmers who are committed to best animal husbandry practices, embrace good environmental processes, while producing the highest quality wool fibre. The traceability gives more credibility to our product, more authenticity, it becomes more genuine.

"Our ultimate vision is to have a direct working relationship with Australian farmers that produce downs wool that meets our specifications – and share their stories and hard work with our customers through our products, thereby ensuring the woolgrowers receive the recognition which they deserve for the amazing wool which they produce.

"Poll Dorset sheep produce downs wool of 28 to 33 micron, and that's the micron we want because it's essential for bedding. It has the perfect mix of natural performance, strength and softness, providing excellent loft and comfort for bedding. It's just a beautiful fibre to work with."

Graeme says Woolstar's traceability program complements the Woolmark certification of Woolstar products.

"The Woolmark logo is one of the world's most recognisable textile symbols, and it indicates that a product bearing the mark is made from 100 per cent Pure New Wool," he said. "Consumers recognise that Woolmark certified products meet key performance standards – providing confidence that a quality product is being bought."

WOOLSTAR'S EXPORT GROWTH

The Woolstar brand was established by Graeme 23 years ago in south west Sydney. The company invested in high quality textile machines which provided the opportunity to focus on developing innovative products for both the domestic and export markets.

Graeme says the overseas market as well as the domestic market loves Australian wool products.

"Export sales of our high-quality Australian made, 100% Australian wool products continue to grow," he said. "Many of our products are exported to countries as diverse as Argentina, India, Japan, Korea, Russia, Taiwan, Turkey, the UK and USA – but China is increasingly important, and we should be seeing more of our products on the shelves of Chinese retailers during the coming years."

Woolstar was invited to the first ever China International Import Expo trade event in November 2018, organised and supported by China's Ministry of Commerce.

"Australian wool and manufacturing are extremely favourable amongst Chinese consumers, and the people at the expo were especially pleased to see our Farm 2 Shelf traceability feature which provides them with assurance that Woolstar is an authentic product of Australia," Graeme said.

"We were very proud to be invited to this event and raise the flag high for the whole Australian wool industry."

MORE INFORMATION
www.woolstar.com.au
For information on how you can join the Farm 2 Shelf program, email
woolproducts@woolproducts.com.au

Poll Dorset sheep at 'Springwaters' Poll Dorset Stud near Boorowa, NSW, which grow the wool that goes into bedding products manufactured by Woolmark licensee Woolstar.

REMEMBERING AN INNOVATOR

With the passing of Dr Jim Watts in January 2019, Australia lost a passionate and innovative scientist, educator, and sheep, angora goat and alpaca breeder. As a company dedicated to innovation in the wool industry, AWI acknowledges the contribution Dr Watts made to sheep breeding innovation.

In this article, industry consultant Dr Paul Swan reviews some of the technical and educational foundations of what became the SRS breeding program.

Over 40 years, Jim led an at times rowdy revolution in breeding, one consistently focussed on producing fast-growing, highly aligned fibres of low fibre curvature and low inter-fibre variation in diameter, from sheep which became increasingly plain, early maturing, and of a non-mules type.

As Jim openly acknowledged, there were a number of key scientific foundations for what later became the SRS breeding program.

The first major foundation was laid by Harold Burnell (H.B.) Carter, a graduate of the University of Sydney's School of Veterinary Science in 1932. Carter and his team at the McMaster Laboratory mapped out the follicular traits of all major Merino strains and breeds of sheep, and Jim Watts, who graduated from the same veterinary school 40 years later, built on these foundations in exploring the links between skin attributes and fleece rot.

The second foundation came in 1975, when CSIRO's Neville Jackson, Ted Nay and Helen Newton-Turner had published a pioneering analysis of the likely genetic controls over fleece attributes, concluding that it was possible to produce a long and dense but fine fleece, through simultaneous selection for a high number of secondary to primary follicles, and long and deep follicles. Over the following decade, Jackson, Maddocks, Lax, and Moore uncovered the critical role of the primary follicle in influencing secondary follicle development in the foetus and explored the implications for wool quality.

This team was ultimately defunded and disbanded by CSIRO following the launch of the short lived WOOLPLAN national sheep breeding scheme. Jim, a first-hand witness to this as a collaborator with the team, moved into private practice and sought to extend their work and to bridge the gap between histology and practical sheep breeding.

THE STUD INDUSTRY

Another key element in the story is Jim's extensive early collaboration with Merino studs and with some notable sheep classers, including John Coy. Through the 1970s and 1980s, studs generously and repeatedly provided Jim and other researchers with access to sheep and so too wool and skin specimens.

Jim kept detailed records of his observations of the thousands of stud sheep he had seen, and it was when pondering these records in 1989, Jim had his key intuition that fibre bundles, not thick staples, were the basic unit of the fleece – that thick locks were a function of entanglement, not true follicle density. It was also from his engagement with leading breeders that Jim developed the complementary frame/wool mating approach which underpinned the ensuing commercial sheep classing system he developed.

THE WRIST PROGRAM

A final foundation was the WRIST Elite Wool: Fibre to Fabric Program – a pioneering national grower education program, which attracted $500,000 in Commonwealth funding, and cemented Jim's national profile.

The WRIST workshops were both ground-breaking and also conducted at break-neck speed. Over three years, this program delivered 81 woolgrower workshops to 3,300 woolgrowers, conducted 35 advanced wool preparation workshops and 38 wool processor workshops, and held an international tour.

The workshops were empowering for the farmers who attended – increasing their understanding of wool production, preparation, and processing. Eighty per cent changed their sheep breeding or wool production practices in accordance with what they had learnt – a record I think has never been bettered.

LEGACIES

Jim Watts went on to commercialise the SRS™ breeding program, and to lead thereafter industry thinking of the production of highly fertile, non-mules Merinos of outstanding staple length and wool quality.

Jim's teachings on the importance of secondary derived follicle contributed to the 2002 initiation of the AWI-funded Lifetime Wool Program, which led directly to the now highly successful Lifetime Ewe Management (LTEM) Program. Jim was a strong advocate and early support in the establishment by MLA and AWI of MERINOSELECT. The excellent quality, wide accessibility and immense practicality of the Elite Wool workshops also established a new standard for grower education workshops – how to communicate science with passion and clarity, and in a practical and respectful manner to the people who fund it.

Organisers of the WRIST field day at Molong included Ken Duxson, Gelandemar stud, Marnoo, Vic.; Allan Stewart, Stockton stud, Balmadale, Vic.; Courtney Wheatley, WRIST consultant based in WA; Dr Jim Watts; Ron Rayner, Glenna stud, Gulgong; Victoria Mack, WRIST director; Hamilton, Vic., and John Carter, Wallaloo Park stud, Marnoo, Vic.

A newspaper clip of the early WRIST team. (The Land, May 4, 1995.)

The eventual SRS Merino. (Image courtesy of SRS website.)

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References: 1. Virbac trial protocol No. 578-15. 4. Swaney *et al*. (2014), WBC, Cairns. 3 Ferreira *et al*. (2016), WBC. Dublin. 4. Ball (2016), AVA Proceedings, Adelaide. Benefits outlined in the above studies are not registered label claims.

REGENERATIVE AGRICULTURE

A growing number of innovative farmers are embracing 'regenerative agriculture', successfully restoring their farm landscapes while increasing their businesses' profitability and their own wellbeing.

Since European settlement, many of our land management practices, including agriculture, have unwittingly caused damage to the landscape. While high input pasture improvement practices including superphosphate application has significantly increased productivity on farms across Australia, it has also put the agricultural landscape, and soils in particular, under stress.

The consequence is that the landscapes of conventionally farmed properties are vulnerable to degradation, reliant on high inputs – resulting in low-profit operations and susceptibility to an increasingly variable and dry climate.

Many farmers have laudably undertaken natural resource management initiatives on their properties to make their landscapes more sustainable. But there are a growing number of farmers who have gone one step further and embraced 'regenerative agriculture'.

What is regenerative agriculture? Put simply, it is a system of farming which actively regenerates, rather than degrades or maintains, the current natural resource base. It works with nature, rather than against it.

Improving soil health is a key priority. Strong, healthy soils (structural and biological) with deep carbon levels retain water, support strong, nutrient rich plants, and promote biodiversity in soil microbes and plants. They also sequester greater amounts of carbon from the atmosphere, which helps combat climate change.

As well as creating a healthier landscape, the benefits to the farmer have been shown to be significantly reduced input costs and improved cash flow, greater profitability and financial resilience, and greater wellness (see opposite page). B

MORE INFORMATION
www.wool.com/regenag

KEY TECHNIQUES AND BENEFITS

Regenerative agriculture is not a 'one size fits all' approach to land management. Its techniques generally focus on integrated management of soil, water, vegetation and biodiversity. Techniques of interest to woolgrowers include:

IMPLEMENTING TIME-CONTROLLED PLANNED GRAZING

By dividing a property into smaller paddocks and rotationally grazing them, the short duration of grazing combined with a longer planned plant recovery period reduces overgrazing of the desirable species. The higher stock density can result in a more even grazing over each paddock. Intestinal parasite cycles can be broken by rotational grazing.

SLOWING THE FLOW OF WATER ON THE PROPERTY

Constructing interventions in the landscape or waterways, such as 'leaky weirs', slows down the rate of runoff, especially after rain. This allows time for water to percolate into the soil layers and rehydrate the landscape. Also, sediment is deposited, gradually rebuilding eroded creek beds.

LIFTING AND MAINTAINING GROUND COVER

Good ground cover improves the water cycle of the land so that when it gets rain there's very little run off. It also helps prevent moisture evaporation, further extending the growing season. Permanent ground cover also protects the soils from wind and water erosion, while providing organic matter for the soil.

AVOIDING OVERSTOCKING

Rather than dictating to the land what stock it has to carry, it is better to look after the land, evaluate what it has to offer and then attempt to stock it accordingly. Leaving enough grass in the paddock and maintaining living roots enable the pasture to recover quickly. Living roots feed soil biology. The planned approach to grazing also allows for timely feed budgeting.

ENCOURAGING PERENNIAL NATIVE GRASSLANDS

Native grassland has diverse species (some have shallow roots, some deep etc), with each playing a role in maintaining soil health. They have evolved to suit the soils and climate and are adept at surviving droughts and heavy rains. They also help crowd out weeds. Many of the native perennials can have high feed quality.

REDUCING CHEMICAL INPUTS

As well as being costly, synthetic fertilisers have negative impacts on the natural biological life in the soil that is vital for fuelling the nutrient cycle that feeds plants. Applying organic composts, fertilisers and bio-amendments can be healthy for the soils. Promoting biological activity of soils reduces the reliance on chemical inputs.

AVOIDING TILLAGE OF SOIL

As well as limiting chemical disturbance of the soil, limiting mechanical and physical disturbance of the soil helps improve the structure of the soil, including the aggregates and soil pores that allow water to infiltrate into the soil. Tillage can result in soil erosion.

UTILISING LIVESTOCK AS A FARM TOOL

Stock can be used, in effect, as the farm machinery such as to transfer nutrients off sheep camps, move seed through the farm and reduce weeds and intestinal worm infection. Stock density, the herd effect, and planned rest from grazing are as much tools as is a plough.

PASTURE CROPPING

Pasture cropping involves sowing crops into living perennial pastures and growing them in combination, so that the cropping and grazing benefit each other. No ground cover vegetation is killed prior to sowing and no tilling occurs, which improves soil structure and fertility.

REVEGETATING THE LANDSCAPE

Supporting a diversity of vegetation, including trees, helps to moderate temperatures, provides habitat and shelter, builds resilience in the landscape (especially to climate extremes) so it is able to recover more quickly, and contributes to the long-term productivity of the land.

MANAGING WATERWAYS

Degraded waterways and banks can be improved by fencing off stock and implementing water reticulation for stock, alongside the establishment of a vegetated strip at least 10 metres wide with a mix of native trees, shrubs and grass. These can be appropriately grazed.

REGENERATIVE GRAZIERS ARE PROFITABLE AND HAPPY

A new report shows that regenerative grazing practices can be very profitable and improve farmer wellbeing, at the same time as increasing the health of Australia's grassy woodlands.

For some decades, regenerative land managers have claimed that their production practices have led to regeneration of the environment and biodiversity, and that this has enabled them to generate a strong and stable level of farm profit and increased wellbeing. Individual case studies have supported this.

However, a unique study released in March, titled *Graziers with better profitability, biodiversity and wellbeing* has now examined the differences in profitability between 15 commercial-scale regenerative wool and/or beef graziers (in regions of eastern Australia where box gum grassy woodlands are found) and conventionally farmed sheep, sheep-beef and mixed cropping-grazing businesses in their regions.

In summary, the study concluded that regenerative grazing can be at least as profitable, and at times more profitable, than other methods, whilst increasing the graziers' wellbeing.

The study found that the regenerative graziers are often more profitable than comparable contributors to the ABARES Farm Survey, especially in dry years; that their average levels of farm profit were similar to the Holmes Sackett AgInsights average benchmarks, although less profitable than the top 20%; and the regenerative graziers experience significantly higher than average wellbeing when compared to other NSW farmers that have contributed to the University of Canberra regional wellbeing survey.

STUDY RESULTS: FARM PROFIT AND COSTS OVER 10 YEARS

- The average profit levels of the regenerative graziers were consistently higher (12 out of 14 years) than the average ABARES Farm Survey participants and showed less variability over the study period.
- The average profits of regenerative graziers were consistently better in years where there was low rainfall. The study noted that 11 of the past 15 years had some degree of deficit in rainfall from long term averages and were classed as "unfavourable".
- The average profit levels from the regenerative graziers were comparable with the Holmes Sackett average producers. Average net profit/DSE for the regenerative graziers was just below the average of the Holmes-Sackett sample for Wool Flocks and above the average for Beef Herds.
- When the regenerative graziers ranked their goals, the most important financial goal was to "achieve a satisfactory level of income", as opposed to the goal of "maximizing income" that scored significantly lower. Interestingly, the regenerative graziers were able to achieve a level of profit comparable to industry benchmarks as a *by-product* of their approach to land management.
- The regenerative managed farms had substantially lower cost structures, in key areas such as supplementary feed costs/DSE, pasture costs/DSE and animal health and breeding costs/DSE.

STUDY RESULTS: FARMER WELLBEING

- The regenerative graziers had significantly higher wellbeing than other comparative farmers.
- They had significantly higher levels of general health compared to other farmers of similar age.
- They had greater confidence in their ability to achieve farming goals, cope with difficult conditions on farm, and were more satisfied with their future security.
- When they self-assessed their farm's financial performance, they were more likely than other farmers to report being satisfied with their farm financial performance, and to report having very good cash flow.

This project was supported through funding from the Australian Government's National Environmental Science Program and was conducted by the Australian National University, University of Canberra and University of Queensland researchers and economists, Vanguard Business Services' agricultural consultants and economists from NSW State Government and ABARES. B

MORE INFORMATION
The full report and summary reports are available on the Vanguard Business Services' website at **www.vbs.net.au**

CASE STUDIES

In the latest three editions of *Beyond the Bale*, AWI has provided case studies of the following NSW woolgrowers whose regenerative agriculture practices are increasing their profitability, while also making their properties more resilient to drought.

COLIN SEIS 'WINONA', GULONG

The property of Colin Seis on the Central Tablelands of NSW is coping with the drought better than a lot of other farms in the region, which he attributes to his pasture cropping, rotational grazing, maintenance of ground cover and perennial grassland.

View the case study at www.wool.com/seis

CHARLIE & ANNE MASLIN 'GUNNINGRAH', BOMBALA

The focus of the Maslins on the Southern Tablelands of NSW has been to look after the land, evaluate what it has to offer and then attempt to stock it accordingly. As well as introducing rotational grazing, they have lifted ground cover and improved the water cycle so when it rains there is very little run off.

View the case study at www.wool.com/maslin

TIM WRIGHT 'LANA', URALLA

By introducing time-controlled rotational grazing of their livestock and focusing on native pastures, Tim from the Northern Tablelands of NSW has regenerated his landscape and business – increasing productivity while reducing inputs costs, despite long periods of reduced rainfall.

View the case study overleaf and at www.wool.com/wright

INCREASING PRODUCTIVITY AND RESILIENCE TO DROUGHT

By introducing time-controlled rotational grazing of his livestock, Tim Wright from the NSW Northern Tablelands has regenerated his landscape and business – increasing productivity while reducing inputs costs, despite the increasingly frequent and intense drought periods.

Tim and Suzanne Wright own 'Lana', 22 km west of Uralla on the NSW Northern Tablelands. On their 3,350-hectare property, which comprises moderately treed granite slopes and open riparian zones adjoining two major creeks, they run Merino sheep and breeding cows. Their superfine wool is sold to Loro Piana.

Tim took over the property from his father, Peter, in 1980, who had farmed it since 1952. Various strategies of pasture improvement had been used on the property in the past, including top-dressing the property with superphosphate and seeding from the air. Oat fodder crops were under-sown with various pasture species, and this pasture improvement enabled stock numbers to be more than doubled between 1981 and 1992.

However, with the expensive inputs, the property barely broke even over a five-year cycle. In the 1981 and 1992 droughts, production records revealed that the improved paddocks had lower yields than the unimproved paddocks. The land was too susceptible to drought and profit margins were falling. Tim says it made sense to seek a change.

"When we went into the early 1980s drought, I thought we'd manage OK because we had full haysheds and silos," he said. "But by the time the season broke, they were empty, our finances were under severe pressure and the land took five years to recover. It's droughts that really knock woolgrowers over, not depressions in wool prices.

Tim Wright with his superfine clip at 'Lana'.

"We knew there would be droughts in the future and so we made the effort to learn a different way of farming. We were motivated by two key considerations: firstly, the excessively high cost of production, especially labour but other inputs as well, had to come down; and secondly, our grazing management needed to better utilise our livestock."

Tim decided to use a holistic management approach that involved establishing smaller paddocks and introducing time-controlled rotational grazing at higher density, using stock for nutrient movement, enhancing soil fertility, maintaining ground cover and regenerating native grassland species.

ROTATIONAL GRAZING AND SMALLER PADDOCKS

In 1980, Lana was originally subdivided into 30 paddocks of generally 100-120 hectares, with varying grazing areas. Since 1990 these have increased to 350 paddocks, averaging 10-15 hectares. Pastures are heavily grazed for short periods, but for most of the time are in recovery phase. Each paddock gets an average of eight to ten days grazing per year, or two to three days grazing in each season. (During lambing, three paddocks are opened up at a time to reduce mis-mothering.)

"The short duration of grazing, combined with a higher stock density, results in a more even grazing over each paddock and a lengthy recovery period," Tim said.

"It's important to match stocking rate to the carrying capacity of the land. Pasture availability now drives stocking levels and rate of rotation."

Cattle and sheep on Lana are grazed separately in a 'leader-follower' system. Cattle are generally grazed first for two days, opening up the pasture for the sheep and reducing the worm burden. Sheep then follow for two days. Intestinal parasite cycles have been broken by this rotational grazing.

The livestock's grazing practices have driven the land's fertility, which has increased pasture availability and quality, improving production – even with reduced rainfall and during times of drought. On average, carrying capacity has increased from around 8000 DSE to 20,000 DSE.

No hay or grain has been fed to the livestock since 1990. The only supplements that have been used are bypass protein supplement during drought and Himalayan salt for its minerals.

The grazing system has proved resilient in the face of the current drought which is the worst the property has ever experienced. Last year it received just 350mm rainfall, well below the average annual rainfall of 769mm.

"There is still plenty of grass in the paddock for my sheep and it will respond well when we do receive some rain," Tim emphasised.

Tim has destocked most of his cattle, but has kept his sheep. "Merinos are designed to suit dry conditions – the breed comes from Spain. They drink far less water than cattle."

INFRASTRUCTURE WORKS WITH THE LAND

Tim says their network of paddocks is designed to suit the property's topography and land.

"We fenced on contours to prevent sheep camps from developing on high ground and to spread nutrients laterally and more evenly. Soil organic matter content and fertility have been improved by this grazing action and the interaction of livestock nutrient deposits with soil biology."

Each subdivision required about three quarters of a kilometre of fencing, costing about $1,500 per kilometre at current prices.

Heavily eroded watercourses were fenced off to heal, and weirs were constructed to stop head-wall erosion and divert water from watercourses onto the flood plains. However, the rotational grazing operations have also had a positive impact on watercourses, riparian zones, dams and wetlands. There is now no erosion of stream banks. Regeneration of vegetation in riparian zones is increasing from natural seeding.

A water trough system was constructed to supply clean water to the new paddocks for the Wrights' stock. This required installation of 3.5 km of 50mm poly pipe from one end of the property to the other, which mainly uses gravity feed from dams built high in the catchment and, in some cases, uses solar-powered units to pump from creeks to header tanks on high ground.

"We don't need troughs in wet seasons, but they are a good drought standby. A mix of dams and troughs gives us the best of both worlds," Tim said.

Open flats and drainage plains on 'Lana' with a healthy amount of regenerating trees as a result of planned grazing. *PHOTO:* Nick Reid

Molong Creek on 'Lana'. Note the well-vegetated drainage line, riparian zone and the regrowth red gum on the banks. *PHOTO:* Nick Reid

LOWER COSTS AND HIGHER PRODUCTIVITY

The new fencing and water infrastructure were initially funded by the reduction in other costs, such as fertiliser and hay, and abandoning pasture renovation. Increased production through the ability to raise stocking rates also covered the financing of the infrastructure.

However, Tim emphasises the cost of development is returned within two years.

"The point is you've got to spend money on infrastructure to get to the point where there is minimum input cost," he says.

"I wonder how many people in this drought might have been better if they had de-stocked a lot more and spent their money on fencing and poly pipe, and less on feed. We need to put dollars into solutions not band-aid treatments."

Grazing management has also significantly reduced vegetable matter (VM) in their wool. VM in skirtings has reduced from 9% to 2% since 1982, enabling Tim to decrease the amount of skirtings, increasing the main fleece lines and subsequently the overall value of the wool clip.

Tim has shifted to shearing every 8-9 months. "It seems to be better for the sheep and wool quality with less VM and cotted wool."

Production improvements have seen wool staple strength increasing from an average 40 N/Ktx to 48 N/Ktx. Average fibre diameter has improved from 17.5 micron to 16 micron. Merino lambing has increased from 80% to 90%; calving rate has also increased from 80% to 90%.

Larger mobs enable more efficient management and generally require less human input except for key periods such as lambing and shearing. Permanent labour requirements on the farm have reduced from one person per 4,000 DSE in the 1980s to one person per 16,000 DSE today, significantly lowering costs to the business.

Importantly, it has also enabled the Wrights to have more time for off-farm social, community and consulting activities.

LIVESTOCK ARE THE FARM TOOLS

The Wrights show that stock can be used, in effect, as the farm machinery such as to transfer nutrients off sheep camps, and reduce weeds and intestinal worm infection.

"We use the farm livestock as the tools to enhance the land as well as them being a source of income," Tim said. "The slasher is their teeth, the plough is their feet and the fertiliser equipment is in their rear. Stock density, the herd effect, and planned rest from grazing are as much tools as is a plough."

Pastures are now altered by using grazing management and no chemicals are used.

"Our animals distribute nutrients across the grazed areas and build soil. The livestock spread native seeds through their dung and the increasing fertility of the soil becomes an ever-improving seed bed. Earthworms, dung beetles and other soil builders are critical to the development of healthy soil.

"Chemical fertiliser has not been applied for many years, yet our carrying capacity is increasing largely due to the smaller paddock size that results in improved soil biological activity brought about by greater animal impact."

NATIVE PASTURES AND SOIL HEALTH

Pastures are no longer sown, and the property is managed for biodiversity, particularly of native species.

"We rely on an increasing variety of native pastures to provide carrying capacity all year round. Overwhelmingly, native pastures now dominate, with a continuing variety of species regenerating. Natives crowd out not only weeds, but also remnant exotics," Tim said.

"We focus on having 100% ground cover 100% of the time so that soil is always protected, maximising the retention of available rainfall and extending growing periods during dry times. Softer soils also attract fertility and generate regrowth.

In the 1990s, University of New England researchers identified a four to five times increase in available phosphorus in areas that hadn't been fertilised over a three-year period, along with increases in total nitrogen and potassium.

These findings confirmed improved soil health. The pasture is in recovery phase 95% of the time, meaning the pasture roots were growing deeper, drawing up previously unavailable nutrients. Also, more litter is being laid down, enriching the topsoil with organic matter and building soil organic carbon. The transfer of nutrients off the sheep camps also has a positive effect.

"Trees are an integral part of our ground cover and ecology," Tim adds. "We encourage tree growth to extend shelter corridors and to provide habitat for wildlife."

ONGOING LEARNING

Tim believes that the innovative farming practices at 'Lana' could not have been done without acquiring an understanding of how the land 'works' and an increase in knowledge and skills development.

'Lana' is a wonderful example of how woolgrowers can produce quality wool and healthy profits while looking after and restoring their natural resource base. As a result of regenerative agriculture, the biodiversity and ecosystem functions at 'Lana' have improved, along with profits.

And with an increasingly variable climate, Tim can rest assured that much has been done to drought-proof the property – something from which other woolgrowers can learn.

"The threat of drought is always with us and we must plan that into our farming strategies," Tim adds. "Old ideas of drought subsidies are not sustainable; it is farmers that must manage the impact of drought on their businesses." B

MORE INFORMATION
For more information, view **www.wool.com/lana** and **www.soilsforlife.org.au/case-studies/lana**

A NEW AGRICULTURE, A NEW EARTH

AN INTERVIEW WITH CHARLES MASSY

Charles Massy is a Monaro woolgrower, a scientist and a renowned author. His classic book *The Australian Merino: The Story of a Nation* is the authoritative account of how Merino sheep became one of the main supports of the Australian economy. More recently, Charles' *Call of the Reed Warbler: A New Agriculture, a New Earth* exemplifies his own role as an advocate for regenerative agriculture.

AWI's Marius Cuming caught up with Charles to record his thoughts on this new way of farming for an episode of AWI's The Yarn podcast. Here is an abridged version of that interview.

Marius Cuming (MC): Regenerative agriculture is an interesting concept, but what you're saying is that traditional agriculture, or industrial agriculture, that has served us for so long, is now failing everyday farmers.

Charles Massy (CM): It is in some cases, yes. With the rise of modern industrial agriculture after the Second World War, we're now finding there are some long-term costs starting to emerge: what we're doing to soils, chemicals getting into our food, increasing desertification of our landscapes and getting hard pans under the cropping fields etc. But there is proof that techniques of ecological grazing and cropping and those sorts of things, particularly in the past 15-20 years, are actually leading to greater profits through better resilience and even better performance without those higher industrial inputs. So the regenerative space is really exciting and it also has all sorts of benefits for the marketing of our beautiful natural wool fibre.

MC: How have you adopted this on your own property?

CM: We've adopted over the past 20 years or so what's called holistic grazing management (developed by Allan Savory in Zimbabwe in the 1960s) which is essentially mimicking the way big mobs of African animals migrated and regenerated the soil and landscape functions and ecosystems. That's now adapted for practical management and the practice is spreading across the world including Australia. I've just been to the United States and there has been huge adoption there in the ranch country.

MC: How does this differ from rotational grazing?

CM: The techniques that have been refined really focus on intensively grazing your land with a large amount of animal density, so the animals' urine and dung and the animal impact stimulate the soil ecology. It really focuses on healthier soil function and then giving those grazed grasslands (and it can be multi species cropping etc) a lot of rest to recover and continue root development. This approach encourages all your most valuable grasses, your deeper-rooted perennials and forbs, and it builds carbon in the soil. The key thing that drives profitability in farming, both cropping and grazing, is healthy soil biology and the access of nutrients.

> "What we're finding with the leading croppers now is that if you really want to drive your cropping system in a sustainable productive manner you need livestock to graze those crops because the livestock enhance the soil health. They graze the crops down, putting down dung and urine. They're walking fertilizer machines."
>
> Charles Massy

MC: How do you create more pasture growth from less inputs?

CM: By correct grazing and biological impacts, you are stimulating an enormous growth of soil biology – and as that in turn stimulates your grasslands, you get this explosion of life. Rather than the soil being killed off and just pumped full of industrial inputs, you've got the soil biology now accessing the key nutrients. For example, in a cubic metre of healthy soil the invisible feeding tubes of the root fungus, the mycorrhiza fungi, might be 25,000km in length. Their bargain with a healthy plant environment is: the plants release sugars into the soil which feeds the fungi; in return the fungi go off and access a whole range of nutrients for those plants.

MC: How has it changed your stocking rate? Are you still running the same number of sheep?

CM: In the 1980s' five-year drought, we fed our stock by buying a lot of grain, got into a big debt and belted the hell out of our landscape, all because I kept too many animals. The shift in thinking for me as I moved across to using the flexible systems of grazing was: the key asset we've got is actually the healthy landscape, the healthy soils and land, not the animals. The animals are an adjunct to that. So our approach now to droughts and dry times is to be very responsive to what the land can carry at any stage of the season. We've got very good tools that give you two or three months' warning that things under the ground are really starting to collapse – and this gives you the advantage of selling earlier while the stock is still good and the markets are still good.

> "I'm incredibly bullish about the future of a beautiful natural fibre like wool."
>
> Charles Massy

MC: Can that work alongside for example Lifetime Ewe Management, or is it counter to that?

CM: No, it's not counter at all, because with the frequent moves and monitoring of whether your country is growing or not, the animals are on a lot more even plane of nutrition. For example, we sold some wool last year that topped the Sydney sales because of its high tensile strength, well over 40Nkt, in a drought market where there were virtually no wools like that. Our fertility hasn't dropped at all; we're weaning 115-120%, that's on joining numbers, which still stacks up as a profitable enterprise. We've eliminated a lot of our drenching because every two or three days we're moving one mob so we're not getting that worm burden.

MORE INFORMATION

Hear the full interview with Charles Massy in episode 85 of The Yarn, available at **www.wool.com/podcast**

SHEEP ENTERPRISES KEEP GETTING STRONGER

According to analysis by NSW Department of Primary Industries, 2018 gross margins were all very positive for wool-based enterprises and positive for most sheep meat enterprise, even while accounting for supplementary feeding.

The impact of the drought has been very challenging for sheep producers during the past 18 months, but the strong underlying profitability of sheep enterprises has cushioned the impact.

NSW Department of Primary Industries (DPI) analysis of standard sheep enterprise gross margins for 2018 shows that the underlying gross margins for nearly all the enterprises in 2018 were positive, even while accounting for a supplementary feed price of $320/tonne landed on-farm.

NSW DPI sheep development officer, Geoff Casburn, says the 2018 average gross margin of all sheep enterprises in the state rose by $5.50/DSE to around $50/DSE or $500/ha at a stocking rate of 10 DSE/ha, while wool focussed enterprises rose even more, up on average by $9.50/DSE.

"The analysis shows the 18 micron self-replacing Merino enterprise achieved the highest gross margin of $63/DSE, smashing the $600 per hectare barrier at 10 DSE/ha. While this result is primarily due to increased wool income, the enterprise has also seen a 21% increase in the sale value of four-month-old wether lambs due to the increased demand from wether enterprises," he said.

"The 20 micron wether enterprise saw the largest gain, with gross margin up $13.07 to $49/DSE, or to put it another way, $130/ha at a stocking rate of 10 DSE/ha.

"Even despite having to pay more for wether lamb replacements, wether enterprises performed exceptionally well, with the 18 micron wethers achieving $59/DSE."

ANALYSIS WITH FULL DROUGHT FEEDING

The same analysis for 2018, but with the addition of an 8-month period of full drought feeding, shows the majority of sheep enterprises had weathered the initial onslaught of the drought, especially the enterprises with low fodder costs.

Despite these extra feeding costs, all Merino based enterprises had a positive gross margin, except for the 20 micron enterprise joined 100% to terminals with -$3/DSE which had one of the highest estimated fodder costs at $62/DSE.

The 18 micron wether enterprise performed the best with a gross margin of approximately $24/DSE, followed by the 18 micron ewe enterprise with $21/DSE and 20 micron wethers with $15/DSE. These three enterprises also had the lowest fodder costs.

The first-cross ewe joined to a meat ram and the self-replacing Dorper enterprise had negative results of -$9/DSE and -$20/DSE, respectively. While these enterprises had some of the highest feeding costs, they already had significantly lower returns per DSE before the additional feeding costs were included.

"Over the past 10 years, sheep enterprise performance has been steadily improving. Notably, there has been a large improvement in wool focussed enterprises over the past five years."

Geoff Casburn, **NSW DPI**

The aim of the farm enterprise budgets prepared by NSW DPI is to provide producers with an additional planning tool to help evaluate their own budgets and options. The budgets also include sensitivity tables that allow producers to assess the impact that changing prices and production levels will have on the gross margin. Producers are advised to develop their own gross margins using actual costs and income. B

MORE INFORMATION

To access the full gross margin outputs, visit **www.dpi.nsw.gov.au/agriculture/budgets/livestock**

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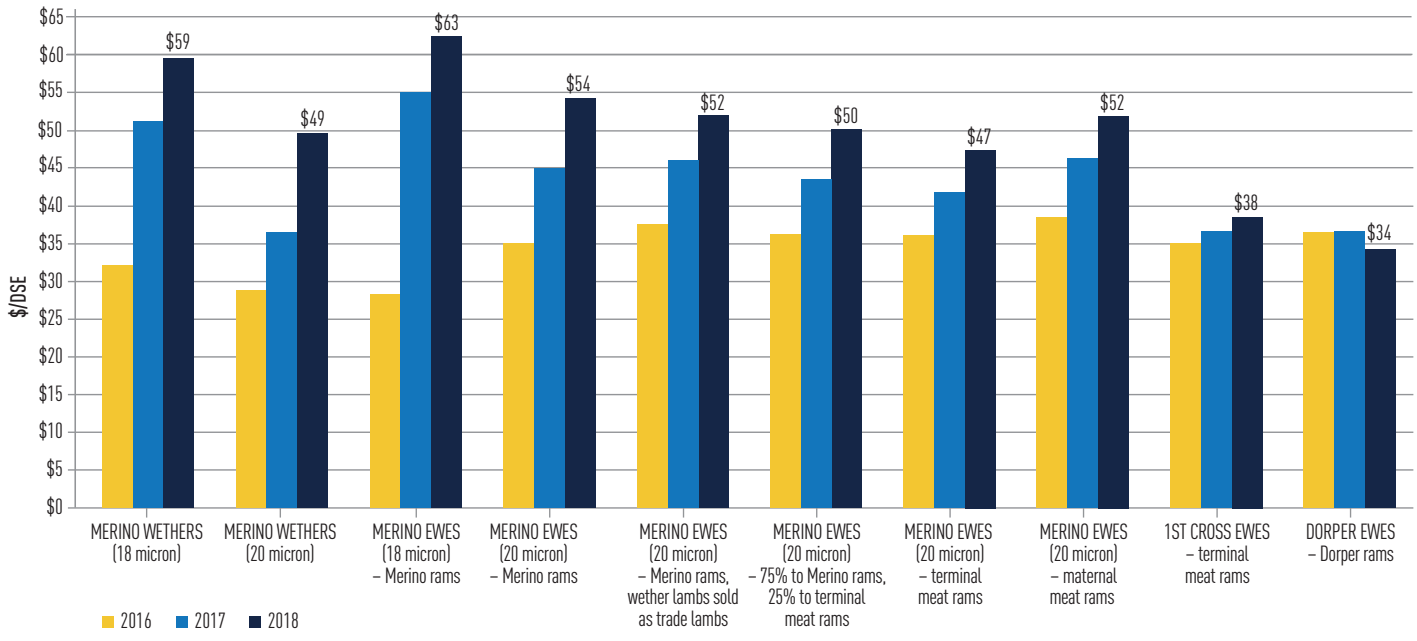
NSW sheep enterprise gross margins for 2016, 2017 and 2018*



*Gross Margin calculations based on average wool and sheep prices from 1 March to 30 September for 2016 and 1 April to 1 September for 2017 and 2018.

LOW WRINKLE–HIGH FLEECE WEIGHT

PRODUCTIVE SIRES EASIER TO FIND

MERINOSELECT has added Adult Clean Fleece Weight as a standard ASBV in the website's Animal Search function. This means that both Yearling and Adult Fleece Weight are displayed – enabling woolgrowers to more reliably select animals that are good for early and adult fleece weight.

As ram breeders are increasingly collecting more hogget and adult fleece weight data on their animals (ewes and sires) the accuracy of adult fleece weight ASBVs will increase and will be less driven by the correlations with the young post weaning and yearling age fleece assessments.

Importantly the Merino Lifetime Productivity (MLP) Project continues to raise the focus on older age assessments, both visual and objective, and will provide key outcomes for genetic benchmarking and selection for lifetime productivity.

Where breech wrinkle and cover assessments have been taken, adult fleece weight will assist ram breeders to find more sires that are both relatively high for fleece weight and low for wrinkle, and improve the future sustainability and welfare of their Merino enterprise.

The Breeding for Breech Strike Resistance project (2006-2016) has shown that gains in both production and welfare traits can be made at the same time but that the rate and impact of the progress is dependent on starting breech scores, environment (length and intensity of the strike risk and risk of dags) and the variability of these traits within each Merino type.

FAST FACTS

1. MERINOSELECT has added Adult Clean Fleece Weight as a standard ASBV in its Animal Search function. This means that both Yearling and Adult Fleece Weight are now displayed in the website search function – and therefore woolgrowers will be able to more easily select animals that are good for early and adult fleece weight.
2. The MERINOSELECT search function can be used by an individual to find objectively assessed sires that best meet their breeding objectives.
3. There are sires available to ram breeders that are trait leaders for productivity and welfare traits.
4. Ram breeders are selecting for productivity and welfare; but with more sires assessed for these traits, further increases in the number of suitable sires will occur.
5. Taking older age fleece weights and submitting body and/or wrinkle scores would increase the number of directly measured sires to select from and lead to increases in the genetic gain of these traits.

Head to www.sheepgenetics.org.au then from the header menu select 'Getting started' and then 'How to use the databases'.

MERINOSELECT has added Adult Clean Fleece Weight to the standard ASBVs that appear in their Animal Search function.

This can be found by going to **www.sheepgenetics.org.au**, then:

- Click on 'MERINOSELECT'
- Click on 'MERINOSELECT Analysis Results'
- You can then click on one the 18 different standard search lists that may interest your enterprise (this includes rams with semen available or currently listed for sale)

To specifically search for sires that are high in adult fleece weight, low in wrinkle, and high on both Merino Production and Dual Purpose Indexes several steps need to be followed.

- Click on 'MERINOSELECT Analysis Results'
- Click on 'Advanced search'

1. In the 'General criteria' section:

- Click on SIRE in the 'Sire/Dam/Any' box
- Type 20 in the 'With at least progeny' box
- Click on 'With current drop progeny' to tick it

2. In the 'ASBV criteria' section, tick the Trait Leader boxes for:

- Adult Clean Fleece Weight (ACFW)
- Early Breech Wrinkle (EBWR)
- Merino Production Plus Index (MP+), and
- Dual Purpose Plus Index (DP+)

3. In the 'Result Sorting' section:

- Click on 'Merino Production Plus', so the selected sires appear in decreasing Index order

4. Then you can complete your search:

- Click on 'Search' in the bottom left hand corner.

The data is updated every two weeks but, using data from the 21 April 2019, seven sires (see Figure 1 on opposite page) met the criteria.

ASBV trait leader and percentile

Trait	Trait Leader ASBV (top 10%)	Average ASBV	Bottom 30%
Adult Clean Fleece Weight (ACFW)	>+19.2	9.4	<+5.3
Breech Wrinkle (EBWR)	< -0.7	-0.2	>+0.1
Breech Cover (EBCOV)	<-0.4	-0.1	>+0.1
Dags (LDAG)	<-0.3	-0.1	>+0.0
Merino Production Plus Index (MP+)	>+159	+137	<+128
Dual Purpose Plus Index (DP+)	> +160	+137	<+128

(Since 2000 there has been a breed reduction of 0.2 breech wrinkle score, a reduction of 0.1 breech cover score and reduction of 0.1 dag score.)

Figure 1: Sire selection based on: current sire with more than 20 progeny, trait leader for adult fleece weight, wrinkle, Dual Purpose and Merino Production Index. Trait leaders' criteria is highlighted yellow in the table.

Helix symbol = the sire has been genotyped (DNA tested)
MSS = the sire has been used in Sire Evaluation
REF = the sire has been used in the MLA Resource Flock

CPT = the sire has been used in the NZ Merino central progeny test flock
SA = the breeder has informed Sheep Genetics that there is semen available.

These seven sires are also high in body weight, fibre diameter, fat and muscle. They may or may not suit many ram breeders, so other criteria needs to be entered to select the best sires relevant for other breeding objectives and/or sheep types.

A wide range of alternative criteria can be selected. If a search selects sires with a maximum Fibre Diameter ASBV of -3.0 and a trait leader for the Fibre Production Plus index, the lowest wrinkle ASBV animal that meets the criteria is 0.0. This is 0.2 score higher than average for the Merino database. It is very difficult to find and breed low FD sheep that are also trait leaders for the FP+ index and for low wrinkle.

However, every 0.1 reduction in breech trait score improves welfare outcomes for both mulesed and not mulesed enterprises.

Target progeny wrinkle ASBVs to go non-mulesed without significantly increasing the reliance on chemicals and crutching varies greatly between regions – generally between -0.3 in drier low strike risk regions to -1.0 in high strike risk regions. Approximately 3% of animals have a wrinkle score of -1 and lower.

Based on the MERINOSELECT run data dated 21 April 2019:

- Searching for sires that are trait leaders for wrinkle, cover and Dual Purpose Plus index results in 19 sires meeting the criteria.
- Searching for sires that are trait leaders for wrinkle, cover and Merino Production Plus index results in seven sires meeting the criteria.
- There are currently no sires that are trait leaders for wrinkle, cover and are Super Fine type Merinos.
- Searching for sires that are trait leaders for winkle and dags results in only 25 sires meeting the criteria. Twelve of these sires are also trait leaders for breech cover.
- Searching for sires that are trait leaders for adult fleece weight, wrinkle, dags and Dual Purpose Plus index results in only one sire meeting the criteria. With around half of Australia's Merinos in areas where dags are an issue for strike and stain, there is some way to go before there are large numbers of progeny naturally resistant to strike in high dag areas.

ASBVs for wrinkle, cover and dags were released in late 2009 (relatively recent in genetic improvement terms) and there are breeders keenly selecting for these traits and making increasing gains in both productivity and breech strike resistance. These studs have sires that show up in these searches, however the low numbers from the searches above demonstrate the current difficulty in finding and breeding naturally flystrike resistant Merinos, particularly in high risk areas.

Most of the sires that meet the search criteria of the above scenarios are young sires, which highlights the recent progress that is being made, ie the older AI sires bred pre 2014 are rare to find in the above searches.

While the number of sires with adult fleece weight, wrinkle, cover and dag assessments is increasing, there would be a much larger number of sires that meet the search criteria if more animals were formally assessed and, therefore, available to ram breeders seeking trait leaders in these areas. To increase the number of sires with direct assessments, MERINOSELECT members can collect older age fleece and breech traits and non MERINOSLECT ram breeders can consider entering their likely candidate sires into Merino Sire Evaluation trials.

MERINOSELECT is planning to include neck and body wrinkle in the Breech Wrinkle ASBV as there is very high correlation between the wrinkle traits. This will result in ram breeders with very plain sheep and ram breeders that have mulesed their animals being able to generate wrinkle ASBVs on all their current ewes and sires.

The searches do reveal the size of the challenge ahead and the value of new breeding objectives that select for both improved productivity and welfare, given the time it takes to build genetic momentum in ram breeding flocks, and then spread those genetics through to the progeny of commercial flocks.

MORE INFORMATION
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GENETICALLY REDUCI
HOW FAST AND WHAT AR

How fast can genetic improvement build high levels of resistance to breech flystrike while still making productivity gains?

What are the consequences for overall productivity of Merino sheep when breeding for increased resistance?

These are questions addressed in a recent AWI-funded project 'Rate of genetic gain in reducing breech flystrike' carried out by Associate Professor Dr Forbes Brien of the University of Adelaide and Dr Sam Walkom of the Animal Genetics and Breeding Unit at Armidale.

Motivation for the project comes from a general acceptance in the Australian wool industry that many woolgrowers have the choice to embark on breeding more resistant sheep as a critical component of programs to control breech and tail strike in non-mulesed flocks as well as reducing the risk of strike in mulesed sheep or sheep with a smaller mules.

Using all the information generated from AWI's flystrike prevention program since 2005 (representing a WA medium wool Merino type in a Mediterranean environment and a superfine wool type in a NSW summer rainfall environment), the researchers predicted the genetic gains that could be made in reducing the risk of breech strike while also improving overall productivity. Note, the gains predicted are for breech flystrike rather than gains in the indicator traits of wrinkle, cover and dags.

"When designing the study, following consultation with AWI we decided to predict genetic gains for these two different environments, at Mt Barker in WA and Armidale in NSW due to the actual data gathered on these flock over the 10 years. Dags are a lot more prevalent in the Mediterranean environment, but at Armidale the fly risk season lasts longer," stated Dr Brien. Both these factors influence the rate of genetic gain that can be made for increasing resistance to breech flystrike.

In the prediction study, after removal of 35% of the sheep based on visual assessments, the remaining animals were selected on modified MERINOSELECT indexes (especially created for the prediction study) that included breech flystrike incidence (FSI), with the amount of emphasis on the FSI trait varying from zero to very high. Three different sheep types were modelled:

1. For fine and superfine Merinos, selection was based on a modified Fibre Production plus (FP+) index option, which targets significant reductions in fibre diameter and modest gains in fleece weight and staple strength as well as reducing flystrike incidence.
2. For fine to medium Merinos, selection was based on a modified Merino Production plus index option (MP+) which targets significant gains in fleece weight, modest reductions in fibre diameter and modest gains in reproductive rate, as well as reducing in flystrike incidence.
3. For dual purpose Merinos, selection was based on a modified Dual Purpose Plus index option, which targets significant gains in reproductive rate, modest gains in fleece weight whilst maintaining the level of fibre diameter as well as reducing flystrike incidence.

QUALIFIERS

The scenarios have limitations as they are modelled from data (but the best we have) from a superfine wool summer rainfall and a medium wool Mediterranean rainfall production system.

"We assumed all sheep had pedigree information available and were recorded for breech traits (wrinkle, breech cover and dag), the key productivity traits and were visually recorded for constitution and conformation traits," Dr Brien said. For a ram breeding flock that has recorded none of this information, it could add 2-6 years to the timelines predicted in the scenarios below.

In any particular breeding program, the length of time it takes to reduce breech flystrike incidence to low enough levels to make mulesing unnecessary will depend on the starting sheep type, including the initial level of wrinkle, breech cover and dag, the environment (amount of dags, length and intensity of the strike risk period) and the amount of emphasis given to the trait relative to others being selected for. Where the initial breech traits are high, the expression of dags is high and the sheep type has less variability in the breech traits, then the time taken will again be longer.

The calculations also work with average rates of strike and not the impact of high strike seasons.

Where a ram breeders' long-term average breech flystrike expectation is less than one per 100 ewes, the time to move to a non-mules enterprise, (without increased use of chemicals and risk of strike), will again take longer than quoted in the prediction scenarios below.

It is important to note that the study only took account of selection within a particular flock. The use of outside sires in particular may help breeders achieve results more quickly than suggested below, and needs to be considered on a case-by-case basis.

Breeders wishing to utilise (breech and/or welfare) modified MERINOSELECT indexes to assist in breeding for reduced flystrike incidence should make inquiries to Sheep Genetics, as they are not currently available as standard options.

Genetic gains in commercial flocks follow the gains made in the studs that supply them with rams, but the average genetic merit 'lags' behind, typically it adds an additional 7-9 years to the time. **An article for the gains in commercial flocks will appear in the next edition of *Beyond the Bale*.**

PREDICTION STUDY RESULTS

SCENARIO 1

A superfine ram breeder in a summer rainfall environment decides to include breeding for reduced breech flystrike incidence in the stud flock, with the aim of moving in the future to a non-mules enterprise without increased reliance on chemical protection or crutching. Flystrike incidence is routinely suppressed in the flock by crutching, mulesing and strategic chemical treatment.

At the start of the breeding program if the sheep were unmulesed and crutched but not given routine preventative treatment, we would expect the long term average flystrike incidence to be around 10% or 10 strikes per 100 ewes per year, similar to those recorded by CSIRO in the breech strike experimental sheep at Chiswick, near Armidale in NSW. It is assumed that the flock starts off with typical risk levels for flystrike, with average wrinkle, dag and breech cover scores for the superfine sheep type for the area.

The ram breeder has been using a Fibre Production Plus index to aid in sheep selection, but now wishes to put considerable

NG BREECH FLYSTRIKE
RE THE CONSEQUENCES?

selection emphasis on reducing breech flystrike incidence with a modified index, by adding breech wrinkle, breech cover and dag score records to assess animals for the breeding program.

Our results suggest that the breeder could reduce breech flystrike incidence to low levels (less than one strike per 100 ewes per year in unmulesed sheep) after 13-14 years of selection, enough to consider ceasing mulesing. This genetic improvement could also slightly reduce the need and use of flystrike prevention chemicals. Use of strategic chemical treatments may still be required. Although fleece weight is still being genetically improved in the breeding program, the rate of increasing fleece weight is reduced by about one-quarter (27%). There is however no sacrifice in genetic gains for fibre diameter and reproductive rate.

SCENARIO 2

A medium wool ram breeder in a winter rainfall high dag area in Western Australia's south-west decides to breed medium wool Merinos as fast as possible to reduce breech flystrike incidence, using a modified Merino Production Plus index.

The average breech flystrike incidence in unmulesed but crutched sheep (with no preventative chemical treatment) in the local area has been recorded as six strikes per 100 ewes per year at Mt Barker. The breeder's flock starts off with typical levels of risk for flystrike, with average wrinkle, dag and breech cover scores for medium wool sheep in the area, noting that wrinkle scores are a little lower but dags are higher than for the superfine sheep in Scenario 1.

Our results suggest that after 11-12 years of selection, the stud flock can reduce incidence to below one strike per 100 ewes per year in the average year (in unmulesed sheep), without affecting genetic gains in reducing fibre diameter and improving reproductive rate, although there would be a reduction in genetic gains for fleece weight (gains down by 30%). Again, this would put the breeder's flock in a strong position to consider ceasing mulesing.

SCENARIO 3

A fine wool ram breeder in a high rainfall part of Victoria's Western District, with high levels of dag with a high potential incidence of breech flystrike (10 strikes per 100 ewes per year in unmulesed sheep) decides to breed sheep that have a much lower flystrike risk, again with the aim of moving in time to a non-mules enterprise without increased reliance on chemical protection or crutching.

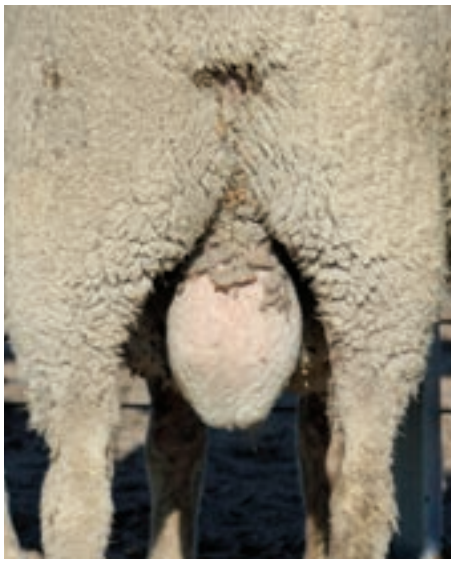
The breeder uses a modified Merino Production Plus index. Unlike in summer rainfall areas, the main flystrike risk period, although challenging, is shorter and concentrated in the mid to late spring period, prior to shearing. In this case, the genetic gains in reducing flystrike incidence are slower than can be achieved in summer rainfall areas due to the lower heritability of flystrike. Again, the breeder's stud flock starts off with average wrinkle, dag and breech cover scores for the area and the sheep type.

Our results suggest that it will take 19-20 years of selection (considerably longer), in the stud flock to reduce incidence to below one strike per 100 ewes per year in the average year (in unmulesed sheep). Genetic gains in fleece weight, although still positive, are 30% less than what they would be if no selection emphasis was being given to reducing flystrike incidence. As in Scenario 1 and 2, genetic gains in reducing fibre diameter and improving reproductive rate are unaffected.

FAST FACTS

- Recently completed work has predicted how long it takes to breed Merino sheep for low breech flystrike risk to a point where mulesing could be ceased without increased use of chemicals or risk of strike. The predictive study was based on flystrike research on Merinos run in Mediterranean and summer rainfall areas.
- In ram breeding flocks of average flystrike risk, with efficient well recorded programs aided by modified MERINOSELECT indexes, it may take between 11 to 20 years to reduce the incidence of flystrike to less than one strike per 100 ewes per year. This is low enough to cease mulesing without increased reliance on chemical protection or crutching.
- Although selection for reduced flystrike incidence can reduce genetic gains for fleece weight by up to 30% in the scenarios modelled, the gains remain positive. Genetic gains in reducing fibre diameter and reproductive rate are unaffected.
- The time taken to reduce breech flystrike incidence to low enough levels to make mulesing unnecessary will depend on the starting sheep type, including the initial level of wrinkle, breech cover and dag, the environment (amount of dags, length and intensity of the strike risk period) and the amount of emphasis given to the trait relative to others being selected for.

MORE INFORMATION
View the full project report at
www.wool.com/flystrikelatest



Breech wrinkle, urine stain, breech cover and **dags** are the key indicator traits that lead to **increased risk of flystrike.**

INSECTICIDE RESISTANCE STRATEGY TO MAXIMISE FLYSTRIKE CONTROL

It is vital that sheep producers prudently manage their use of flystrike insecticides, to maintain protection for their flocks and slow the development of resistance within their local fly populations. Producers should follow the eight-step strategy below, developed by AWI's Sheep Blowfly Resistance Management Strategy Working Group.

KEY POINTS

- The Australian sheep blowfly has demonstrated a capacity to develop insecticide resistance to a variety of insecticide groups, reducing their effectiveness.
- There are only a limited number of insecticides registered against flystrike so increasing insecticide resistance will have a significant impact on the industry.
- There is an urgent need for sheep producers to strategically manage the use of insecticides to maximise flystrike control and to maintain the efficacy of available products on their property.

There have been a number of confirmed cases of the Australian sheep blowfly having developed some resistance to insecticide treatments, with some sheep producers having noticed shorter protection periods than claimed on the label of the flystrike products they have used.

This is a timely reminder for sheep producers to implement strategies to manage insecticide resistance. There are only a small number of chemical groups registered for flystrike control, so it is important to prolong the useful life of these insecticides on your property for as long as possible.

"Without access to effective preventative insecticide treatments to control flystrike, sheep producers would be more reliant on mulesing, crutching and continual surveillance of flocks followed by manually clipping and dressing of wounds," explained AWI General Manager for Research Dr Jane Littlejohn.

"By implementing resistance management strategies, sheep producers can slow the development of resistance, which will help increase the effective life of registered insecticide products."

AWI's Sheep Blowfly Resistance Management Strategy Working Group members have developed the following eight steps for sheep producers to follow to slow the development of resistance.

1. USE AN INTEGRATED APPROACH TO REDUCE RELIANCE ON INSECTICIDES

- Breed for resistance to all types of flystrike: poll, pizzle, body and breech (breeding for polled animals; low wrinkle, cover, urine stain, dags; and white wool colour. Cull struck sheep).
- Shear or crutch at times that maximise protection against flystrike.
- Dock tails to the correct length.
- Manage sheep to minimise scouring.
- Use breech modification if required, until sheep are genetically resistant to flystrike.
- Use chemicals sparingly.
- Where the above approaches are insufficient, mules with pain relief.

2. KNOW YOUR CHEMICAL GROUPS

- Insecticides used for flystrike control fall into different groups or chemical families; see Table 1 below.
- Flies resistant to one insecticide in a particular chemical group are likely to be resistant to other insecticides in the same group.
- Different flystrike products may contain the same chemical or a related chemical from the same chemical group. When looking for alternatives, change to a different chemical group, don't just change insecticide brands.
- Use the FlyBoss Fly and Lice Products Tool at www.flyboss.com.au/tools/products.php to search for flystrike products, determine their chemical group and make your selection.

3. ROTATE CHEMICAL GROUPS WHERE PRACTICAL

Insecticide choice should be tailored to your particular location and management.

- Consider rotating insecticide products from different chemical groups to slow the development of resistance.
- Use a different chemical group for treating struck sheep to that used for flystrike prevention.
- Successive treatments within the fly season should generally be different chemical groups.
- Choose a product with the appropriate protection period and time of application.
  - A product that provides a shorter period of protection may be sufficient in some instances. For example, when sale of sheep or lambs for slaughter is imminent, when sheep are soon to be crutched or shorn, or when close

Table 1. Chemical groups and actives available for flystrike control and their application methods

CHEMICAL GROUP	CHEMICAL ACTIVE	APPLICATION METHOD[1]			
		Spray-on	Jetting	Dipping	Dressing
Insect Growth Regulator (IGR)	Cyromazine	Yes	Yes	Yes	Yes
	Dicyclanil	Yes	No	No	No
Neonicotinoid	Imidacloprid	Yes	No	No	No
Spinosyn	Spinosad	No	Yes	No	Yes
Macrocyclic Lactone (ML)	Ivermectin	No	Yes	No	Yes
Synthetic Pyrethroid (SP)	Alpha-cypermethrin[2]	Yes	No	No	No
Organophosphate (OP)	Diazinon, Propetamphos & Chlorfenvinphos	No	No	No	Yes

[1] Always follow label directions

[2] Registered for prevention of body strike only

monitoring of sheep is not possible for a short period because of other farm tasks or holidays.

– The Flyboss Fly and Lice Products Tool can help you select a chemical group that will provide the length of protection that is required.

4. MINIMISE THE NUMBER OF INSECTICIDE TREATMENTS APPLIED IN A SEASON

- Optimise the timing of treatment to provide full protection during high risk periods.
- Utilise other management strategies, such as shearing and crutching, to minimise the length of time flies may be exposed to inadequate levels of insecticides on the sheep. However, ensure that you abide by wool harvesting intervals so that there are no unacceptable chemical residues in the wool.

5. CONSIDER TREATMENTS FOR OTHER PARASITES, PARTICULARLY LICE TREATMENTS

- Exposure to insecticides used for treatment of other parasites (particularly lice) can contribute to resistance selection in blowflies, and vice versa.
- Where possible, use a different chemical group to treat flies and lice.
- Aim to eradicate lice and avoid the need for lice treatments.

6. APPLY INSECTICIDES CAREFULLY AND STRICTLY AS SPECIFIED ON THE LABEL

- Shorter protection periods are often due to poor application, not resistance. Be sure to apply insecticides carefully according to the label instructions.
- Poor application can expose flies to sub-lethal levels of insecticides; this can contribute to an increase in resistance.

7. MONITOR FOR FLYSTRIKE FREQUENTLY

- Check every 2–3 days during high risk periods to identify struck sheep early.
- Treat sheep and kill maggots before they become larger and are harder to kill.
- Record when strike occurs in relation to preventive treatments.
- Notify the product manufacturer if you suspect resistance.

8. COLLECT AND KILL ALL MAGGOTS FROM FLY STRUCK SHEEP

- Place maggots and shorn wool into a sealed plastic bag and leave in the sun so the maggots are killed.
- If maggots are not collected or destroyed the most resistant ones can burrow into the soil, complete development and contribute to the next generation of flies.

ARE SHORTER PROTECTION PERIODS ALWAYS BECAUSE OF RESISTANCE?

In cases where flystrikes are occurring earlier than expected based on the protection period on the product label, you should first rule out other causes of reduced protection:

- The individual sheep did not receive a treatment.
- Treatment was applied, but incorrectly.
- Wool length was too short at application time.
- Soiled or lumpy wool.
- Seasonal rainfall has been excessive and washed some chemical out of the treated area.

AWI's Sheep Blowfly Resistance Management Strategy Working Group, who contributed to the development of this eight-step strategy are: Brian Horton (University of Tasmania), Peter James (University of Queensland), Deborah Maxwell (ParaBoss), Jane Morrison (MSD Animal Health), Bridget Peachey (AWI), Nick Rolls (Elanco) and Narelle Sales (NSW Department of Primary Industries).

MORE INFORMATION
www.flyboss.com.au

STAY VIGILANT OF LIVER FLUKE

EVEN IN DRIER TIMES

While snail populations that host liver fluke larvae are reduced during extended periods of drought, it's still important to remain attentive to the prospect of liver fluke infections in your flock.

During dry conditions, liver fluke is concentrated where remaining green pasture is located, potentially increasing the infection rate of sheep that gather there. Even as water sources dry out, the snails can survive by sheltering in damp mud beneath ground.

Liver fluke *(Fasciola hepatica)* is a parasite affecting a range of livestock and other species. Millions of sheep and other livestock graze pastures where liver fluke is endemic, mainly in south-eastern Australia.

Liver fluke disease – or fascioliasis – is one of the most debilitating parasitic diseases of sheep in Australia. It can cause serious production losses, even in dry times, so it pays to treat and prevent liver fluke if you have it on your property. Production losses for sheep is estimated to be nearly $25 million per year, and $50-$80 million per year in all livestock.

Significant losses in sheep and cattle include:

- death
- reduced quantity and quality of wool
- reduced lambing percentages
- poor growth rate
- increased cost for replacement stock
- liver condemnation.

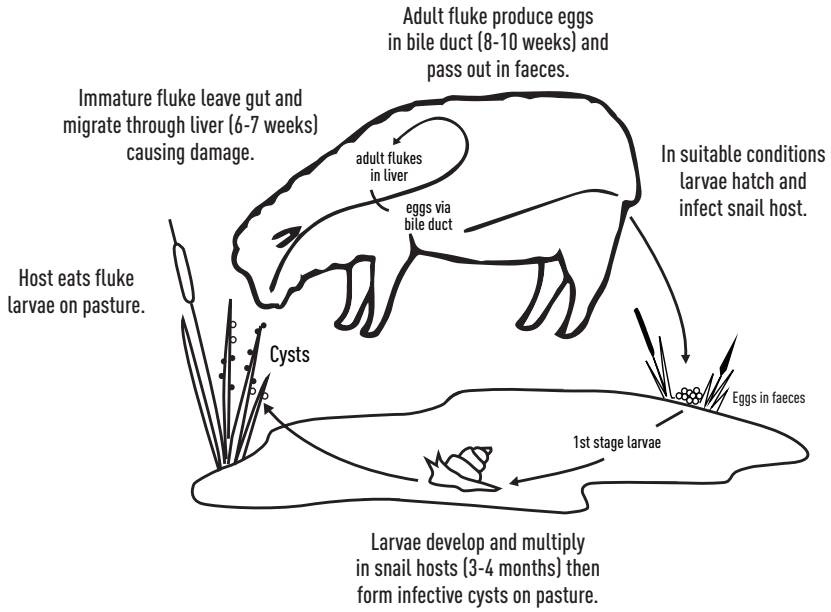
Eradication of liver fluke is almost impossible; however, sustainable control can be achieved by the strategic use of drenches combined with grazing management and improved drainage of fluke-infested areas.

WHERE DOES LIVER FLUKE OCCUR?

Liver fluke is widespread in high rainfall areas (about 600 mm or more) of eastern NSW, Victoria, Tasmania and small areas in Queensland and South Australia - see map opposite. Not all properties in these areas have liver fluke as a suitable habitat for the host snail is also required.

Ideal snail habitats are springs, shallow marsh areas, bogs, slow-moving streams, irrigation channels, seepages and low-lying river banks where the land is marshy.

The Liver Fluke Lifecycle



WHAT ARE THE SIGNS OF LIVER FLUKE DISEASE?

Immature fluke migrate through the liver causing bleeding and tissue damage (scarring), while feeding adult fluke cause blood loss and damage to the bile ducts; these result in anaemia and jaundice.

Disease can be acute (sudden onset), sub-acute or chronic (long-term), depending on the size of the infection and how quickly stock become infected; the acute forms often result in death.

DO I HAVE LIVER FLUKE ON MY PROPERTY?

If you don't know whether your sheep are infected with liver fluke and you are in a high rainfall area, test those mobs run on paddocks where conditions appear suitable for fluke. Initially test three times a year (January, April and August – when disease or production losses from liver fluke are suspected) for at least two years (ie six tests) using liver fluke egg counts.

You can also identify whether a specific paddock is affected by testing mobs only run in that paddock since the last fluke-treatment.

Testing options include:

- Liver fluke egg counts, using faecal samples, but remember fluke eggs only appear in the faeces of the host 8-10 weeks after infection.
- An antibody test (ELISA) using blood samples.
- A faecal antigen test from the Charles Sturt University, Wagga Wagga, NSW.

HOW AND WHEN DO I TREAT?

Any positive fluke egg count means treatment is needed. If testing for two years confirms that sheep are infected at all test times, then ongoing testing can be stopped. In this case, three routine treatments for liver fluke should be given to sheep that have been grazing the affected paddocks in:

- April/May
- August/September
- February.

If fluke has been confirmed, but is sporadic, then ongoing monitoring in January, April and August is recommended to determine whether treatment is needed.

Table 1. Liver fluke treatments and the age of fluke they target

ACTIVE INGREDIENT	AGE OF FLUKE KILLED
Triclabendazole	All stages
Triclabendazole plus oxfendazole	All stages
Closantel	From 8 weeks
Albendazole	From 12 weeks
Closantel plus albendazole*	From 6 weeks
Oxyclozanide plus levamisole	From 12 weeks

*Available only in the 4-active combination: Q-Drench

The most important treatment is the April/May treatment and should be based on the flukicide, triclabendazole, which is effective against all stages of the fluke found in the sheep. If treatments are also required in August/September and/or February, one or both of these treatments should be a flukicide other than triclabendazole (if this was used in April/May). This treatment rotation will reduce the rate of development of fluke resistant to triclabendazole. See Table 1 above for drenches effective against fluke.

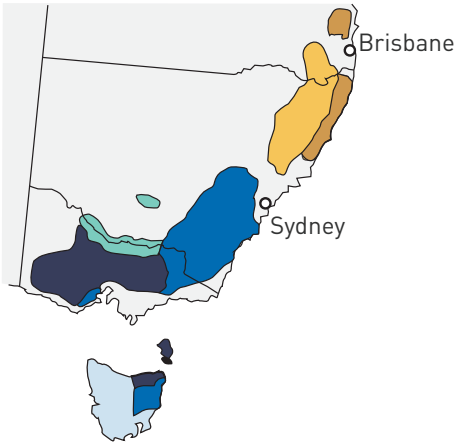
Grazing management can also be used to help control fluke. As 'flukey' areas are confined to certain parts of a farm, grazing of these areas can be managed or even avoided, particularly by the most vulnerable stock (sheep, goats and young cattle).

Improving drainage of wet areas and repairing leakages can remove or lessen the habitat for fluke snails.

When introducing stock from a high rainfall area, consider treating for fluke as part of your quarantine drench, or at least test first to see if the stock are infected. While your property may not sustain a fluke infection, fluke already in the stock can live for years. B

MORE INFORMATION
www.wormboss.com.au/worms/flukes/liver-fluke.php

Distribution of liver fluke, showing the different climate regions



- S-E NSW & most of Tasmania
- Most of Victoria
- Northern tablelands (NSW) & Southern Queensland
- Irrigation areas of NSW and Victoria
- North Coast (NSW) & South Coast of Queensland

Source: Adapted from NSW DPI Primefact 446 'Liver fluke disease in sheep and cattle'. (J Boray, March 2017).

CLASSING MERINOS FOR LIFETIME PRODUCTIVITY

There are many outcomes of the Merino Lifetime Productivity (MLP) project, but one specific focus is to highlight the role sheep classers play in selecting for lifetime productivity. While it is still early days for the trial, important data is now being generated comparing classing at relatively young ages.

MLP FAST FACTS

- The AWI-funded MLP project is a $7 million (plus $5 million from partners), 10-year partnership between AWI, the Australian Merino Sire Evaluation Association (AMSEA), nominating stud Merino breeders and site hosts.
- The project aims to increase the understanding of the genetics, environment and economic interactions for a diverse range of Merino types producing wool, lambs and meat during their lifetime.
- The MLP project runs at five sites where sire evaluation trials operate for the first two years and then continue tracking performance of ewe progeny as they proceed through four to five joinings and annual shearings.
- A full suite of assessments will be undertaken during the MLP project including visual trait scoring, the objective assessment of a range of key traits, classer gradings and index evaluations.

Nathan King undertaking the **Professional classing** at the **Pingelly** MLP site, assisted by **Henry Vaughan** (November 2018).

The **Balmoral site committee** standing along the classing line looking from the **Professional classing** box back along the **AMSEA Visual classing** line and midside sampling point (December 2018).

Breeding decisions play a vital role in delivering ongoing productivity to Merino breeding businesses. While the decision-making process varies, one established method is through the engagement of a professional sheep classer who applies a unique combination of visual and hands-on assessments to evaluate animals during the selection process.

The MLP project is combining the use of sheep classers and their various approaches with measurement-based selection techniques to assess the accuracy of a range of sheep selection scenarios when selecting for ewe lifetime productivity.

MLP CLASSING TRIALS

The MLP project incorporates a range of approaches to selection including two forms of sheep classing. The first of these, the **AMSEA Classer's Visual Grade**, is currently used across all of AMSEA's Merino sire evaluation trials. It involves a three-way classing of the complete progeny group into tops (25%), flocks (50%) and culls (25%). This reflects an approach that might be undertaken at the commercial flock level.

The second form of classing is termed a **Professional Grade** which involves a five-way classing into tops (1%), studs (9%), seconds (60%), sales (20%) and culls (10%). This reflects what generally happens in a stud selection situation.

The ewes are classed randomly as a mob to the site's breeding objective without access to measurements, data or any sire identification. Both of these approaches are undertaken annually on each drop.

Classers also complete an annual assessment of specific visual traits, as is done in Merino sire evaluation trials. Wool, conformation and breech traits are scored according to the Visual Sheep Scores publication, which is available for download at www.wool.com/breedingpublications.

A third classing approach, the **Wells Classing Trial**, has been established at several sites as an MLP Add-On Project.

This method will explore the results from classing within sire progeny groups. Progeny are presented in their sire groups, still with sire unidentified, and the classer is informed of the entrant/sire group's breeding objective. Classers then class the progeny group four ways as tops (10%), firsts (25%), seconds (30%) and culls (35%) according to the entrant's breeding objective. Two classers complete this method independently.

The Wells Classing Trial differs significantly from the AMSEA Classer's Visual Grade and Professional Grade in that ewes are presented for classing in their sire groups. This recognises that each site is made up of divergent sire types and that not all entrants' breeding objectives are the same.

This MLP Add-On Project is occurring for one drop of F1 ewes at the MerinoLink (Temora, NSW) and Balmoral (Harrow, Vic) sites and on both drops of ewes at the Macquarie (Trangie, NSW) site. Classing will occur at the one year old, two year old and final (at approximately five years of age) assessment to determine how animals visually perform later in their lifetime relative to their earlier visual classing(s).

Preliminary AMSEA Classer's Visual Grade and Visual Sheep Scores, along with the Professional Classing results, are reported at MLP Field Days and within the MLP Reports for each site. These reports are available via www.wool.com/mlp.

The overall results of these different classing approaches will be included in the MLP dataset and examined to understand how industry can optimise cost effective selection approaches to better deliver lifetime productivity outcomes. B

MORE INFORMATION

www.wool.com/MLP and subscribe to the MLP quarterly newsletter. MLP Reports an be downloaded from **merinosuperiorsires.com.au**

Geoff Lindon, AWI Program Manager Genetics & Animal Welfare Advocacy 0427 572 228

Bill Walker and **Nathan King** undertake the **Wells Classer Trial** at MerinoLink's **Temora MLP** site (March 2019).

Bill Walker (front) and **Chris Bowman** (rear) undertaking the **Wells Classing Trial** (February 2019).

Briefing classer **Chris Bowman** for the **Wells Classer Trial group** classing at **Macquarie**; peg allocation, sire's breeding objective (February 2018).

AMSEA CLASSER AT THE BALMORAL SITE: DAVID WHYTE

The AMSEA classer at the Balmoral site, David Whyte, has classed the 2015 drop ewes as tops, flocks or culls each year for the past four years and will again twice more to complete their lifetime within the MLP project.

"When I undertake the AMSEA commercial classing I go into robot-mode and assess each sheep as it appears in front of me. I score each trait for their visual scores and then class them an overall top, flock or cull," David explained.

"It's good to then see this all come together in the results for each sire group and over the different years as published in the reports. This is interesting as it shows trends which are obvious in the report but not considered when I'm classing the sheep individually in the race."

Table 1 is an excerpt from the Balmoral MLP Report, February 2019, and shows the **AMSEA Classer's Visual Grade** performance to date of the 25 sires used in the Balmoral 2015 drop. These grade results are expressed as adjusted sire means. The adjustments account for non-genetic differences between the sire's progeny such as birth and rear type (singles or twins), age of dam, age at measurement, management groups (which includes accounting for differences in the foundation ewe source) and number of progeny a sire has in the analysis.

These Balmoral 2015 classing results show that some sire groups' performances change significantly over time, while others appear to be more stable. Once the MLP project is complete, the lifetime data will provide information on how well the scoring, objective assessments and classers have predicted lifetime productivity and at what age. Comparisons between the objective and classing data at each age will also consider the repeatability of these assessments.

UPCOMING MLP FIELD DAYS

NEW ENGLAND MLP FIELD DAY
(2017 and 2018 Progeny on Display),
New England Highway, Armidale, NSW
Date: Thursday 20 June
Contact: Jen Smith 0411 825 748

MACQUARIE MLP FIELD DAY
(2018 Progeny on Display),
Trangie, NSW
Date: Wednesday 10 July
Contact: Kathryn Egerton Warburton 0429 943 708

PINGELLY MLP FIELD DAY
(2016 and 2017 Progeny on Display),
UWA 'Ridgefield', Pingelly, WA.
Date: Friday 25 October
Contact: Bronwyn Clarke 0418 957 293

Most of these lifetime comparisons will not be available until 2024 when the ewes reach five and six years of age at every site.

Table 1. Balmoral 2015 Drop Classer's Visual Grade Results, February 2019

BREEDERS FLOCK, SIRE NUMBER	PROGENY NO	TOPS (%)				CULLS (%)			
		P	A2	A3	A4	P	A2	A3	A4
Billandri Poll, 130087	14	16	0	7	6	-3	-5	-2	-8
Bogo, 111424	22	-12	26	32	14	3	-19	-20	-17
Bundaleer Poll, 13V741	29	-7	-14	7	-2	3	-19	-20	-17
Bundilla, 111265	19	28	-17	-15	-17	-8	12	25	10
Centre Plus Poll, 207316	20	-19	-9	4	12	22	3	-6	-17
Darriwell, 130941	16	5	-10	-15	-16	14	-2	-5	13
Glenpaen, 120042	24	-12	-15	24	23	7	29	-2	-6
Greenfields Poll, 130599	19	-10	8	-5	-7	22	-9	4	-8
Hazeldean, 11.43	26	28	13	9	1	-13	-5	-3	-14
Kurra-Wirra, SR5681	21	-8	6	8	11	28	4	-19	-12
Leahcim Poll, 090918	26	-9	-9	-13	-3	1	17	17	2
Leahcim Poll, 123153	22	-4	-15	-12	-8	-5	3	14	10
Merinotech WA Poll, 100081	25	-1	19	4	-3	-9	-12	-11	-2
Mokanger, 120092	16	-28	-27	-8	-4	14	36	0	3
Moojepin, 100248	20	-17	-9	-21	-21	15	14	39	19
Mumblebone, 130389	13	-12	10	-13	-14	-5	3	29	10
Mumblebone, 130850	14	43	18	2	14	-28	-12	0	-8
Nareeb Nareeb, 130380	20	23	1	-2	-2	-11	-15	-8	-7
Nerstane, 130467	22	-8	24	5	9	3	-11	0	6
One Oak No.2, R56	33	-5	-11	7	20	5	0	-13	2
Roseville Park, 140019	18	-4	-10	15	6	-10	-8	-21	-15
The Mountain Dam, 11/ESA004	30	-2	-5	-10	-6	-15	0	16	15
Tuckwood Poll, 121021	28	4	17	1	6	-7	-6	-8	-7
Yalgoo, 120043	29	13	9	4	-12	-11	-10	-11	13
Yiddinga, 130374	27	-1	2	-13	-7	-5	-12	-6	16
AVERAGE	22	27	28	20	22	28	19	33	22

Number of ewes in sire progeny group

P: Post Weaning age stage, 210-300 days old

A2: Adult2, 1.5-2.5 years
A3: Adult3, 2.5-3.5 years
A4: Adult4, 3.5-4.5 years

Blue shading highlights trait leaders which are the top performing sires for that trait.

+28
This sire group has 28% more ewes classed as Tops at the Post Weaning stage than the average of this drop.

-19
This sire group has 19% less ewes classed as Culls at the A3 stage than the average of this drop.

An improvement with age from Post Weaning to A4 can be seen in these results.

Consistent results across all age stages are observable for this sire group

Average number of ewes in sire progeny group

Average percentage of ewes classed at the Post Weaning stage as Tops across all sire progeny groups

A clip from the 'Rabbit warren ripping and harbour destruction' video available at **www.wool.com/rabbits**

INTEGRATED CONTROL METHODS

While biological control of rabbits is very effective at reducing rabbit numbers, biological control alone is not enough. It is important to apply and integrate a number of control methods. In most situations, no single method will provide adequate control of rabbits in the long term.

POPULATION KNOCKDOWN

The first step is to reduce the rabbit population from medium–high densities down to a manageable level. This is usually done by biological control (via natural outbreak or deliberate release) and/or chemical control (eg a poison baiting program) during the non-breeding season.

If RHD or myxomatosis are already present, then poison baiting should be delayed to allow the disease to reduce rabbit numbers. If rabbit density is low then extensive control can be started straight away.

EXTENSIVE CONTROL

The next part of the control program should destroy all source areas (where rabbits are living) and reduce rabbits to very low numbers. Control activities include warren ripping and destruction/removal of harbours which provide rabbits with shelter, such as fallen logs, building debris or dense vegetation. Where the use of heavy machinery is not an option for warren ripping, alternative techniques such as explosives and fumigation may be used.

Extensive control ensures that the rabbit population cannot recover quickly but it must be done thoroughly to ensure success. If any warrens or harbour are not destroyed, rabbit numbers will simply build up again. Sometimes rabbits can also dig back in and 're-open' warrens if ripping is not done thoroughly (deep or wide enough) and the collapse of the warren structure is inadequate.

MOP-UP ACTIVITIES

There are usually small numbers of rabbits that survive extensive control, so advanced control is necessary for long-term management. This is where follow-up techniques such as fumigation, shooting and trapping are used in rabbit-active areas.

Rabbits are **Australia's most destructive agricultural pest animal** and also **threaten the survival of 321 native species**. *PHOTO:* John Schilling

RABBIT BIOCONTROL IS A WINNER

The nationally coordinated release of the RHDV1 K5 rabbit biocontrol agent in 2017 – which saw an average 36% reduction in rabbit numbers at release sites – has been awarded one of the Australian Government's top biosecurity awards.

The strain of rabbit calicivirus (RHDV1 K5) was released during the first week of March 2017 at 323 locations across the country, as part of the RHD Boost project funded through the Invasive Animals CRC (now the Centre for Invasive Species Solutions (CISS)) with additional funding from AWI.

It was the first nationally coordinated release of a new rabbit biocontrol agent in 20 years. After receiving pre- and post-release data from 230 participating release sites, the RHD Boost team has reported an average 36% decrease in wild rabbit numbers at the sites one month after the agent's release (although not all sites experienced the same results).

Rabbit eating carrots infected with **RHDV1 K5.** *PHOTO:* WA Government

RHDV1 K5 is available to purchase as a commercial product but is classified as a Schedule 4 restricted chemical product and can only be supplied to persons who are authorised to use the product under the laws of their state or territory. Check **www.pestsmart.org.au/purchasing-rhdv1-k5** for details.

The CISS was awarded an Australian Biosecurity Award in March this year for its role in coordinating the release, monitoring and evaluation of RHDV1 K5.

"The initiative was a massive combined effort with investment and support from the Australian Government, all state and territory governments, the CSIRO and the livestock industry through AWI and MLA," CISS CEO Andreas Glanznig said.

"The release was consistent with our Centre's rabbit biocontrol pipeline strategy outlining the need for new and additional biocontrol tools every eight to ten years, to keep rabbit populations at bay."

AWI General Manager of Research Dr Jane Littlejohn reiterated the importance of industry support and investment to combat this introduced species.

"Rabbits are agricultural and environmental vandals. They cost upwards of $250 million in lost agricultural production each year and threaten the survival of more native species than any other invasive species in Australia," Jane said.

"They actively compete with Australian livestock and native animals and – particularly during drought – can strip pastures bare. Just two rabbits per hectare are enough to stop plant regeneration," Jane said.

"The impact of rabbits would be much greater without myxomatosis and rabbit haemorrhagic disease being introduced into Australia. It has been estimated that biological control agents have resulted in

rabbit abundance being about 15% of the potential population size in Australia.

"Both AWI and MLA are therefore proud to involve ourselves in national collaborations to ensure we are getting strategic vertebrate pest management tools into the hands of farmers, producers and land managers quicker, ensuring value for money and effort.

"We continue to invest, with MLA, in the Centre's rabbit biocontrol program and look forward to it further develop and progress."

COORDINATED RABBIT CONTROL VITAL

Analysis shows that RHDV1 K5 appears to work as a biocide, meaning its impact is greatest at a local scale and it generally does not spread beyond the release site like a self-disseminating biocontrol agent does.

AWI Program Manager Vertebrate Pests, Ian Evans, says rabbit biocontrol is most beneficial if applied as part of an integrated and complementary pest management approach.

"RHDV1 K5 is not a silver bullet and we need private and public land managers to be vigilant in not taking their foot off the pedal when it comes to their regular rabbit control," Ian said.

"A coordinated community-led response is needed. RHDV1 K5 offers a new opportunity to begin a conversation with neighbours with the aim of integrated best practice rabbit control at a landscape scale.

"After a rabbit population knockdown, warren destruction by ripping or other means should be considered, followed by mopping up activities such as shooting and trapping."

A separate RHD virus called RHDV2 is also circulating within the Australian landscape, after being first reported as a biosecurity outbreak in wild rabbits in May 2015. This virus has spread throughout most of Australia and is currently the dominant circulating RHDV strain at a national scale.

Having the National Rabbit Biocontrol Monitoring program in place as part of the RHDV1 K5 release enabled researchers to quantify the effect RHDV2 has had on wild rabbit populations. The impact of RHDV2 is estimated to have significantly reduced mean rabbit abundances by 60% in NSW and SA, 66% in WA, with an equivocal 52% reduction in Victoria.

AWI encourages all landholders to continue to monitor their rabbit populations and report rabbit sightings and deaths through RabbitScan – www.rabbitscan.org.au B

MORE INFORMATION
Refer to **www.wool.com/rabbits** for more information about RHDV1 K5 and to access videos and information about conventional control including poison baiting, warren fumigation and warren ripping.

The establishment of effective wild dog control programs has seen sheep – and calm – return to many areas of Victoria (pictured here near Glenaladale in south-east Victoria), but producers are being warned to **continue with wild dog baiting as a precaution** against the menace returning.

WILD DOGS CONTINUE TO BAIT BEFORE IT'S TOO LATE

Wild dog control has come a long way in recent years. But in areas where wild dogs have been brought under control, it's vital that farmers and local communities do not become complacent, otherwise the wild dogs will return.

In regions where a collaborative and community-driven approach has been taken with wild dog control, there has been some great wins in the past decade. But producers, landholders and public land managers need to remain committed.

AWI provides funding under its 'Community Wild Dog Control Initiative' to wild dog control groups to undertake control activities. In many parts of the country, AWI funding has been primarily for the purchase of tools (eg canid pest ejectors) and facilities to prepare and store baits on-farm (eg drying racks, freezers, coolrooms). However, there are regions, especially in Victoria, where the funding has been largely used to directly purchase baits.

Funding to individual groups is only available for a maximum of three years and emphasis is placed on assisting groups to become self-sufficient in the longer term.

AWI funding will soon be exhausted for many current groups, and AWI's wild dog coordinators are working with these groups to help them transition away from AWI funding and maintain stable and effective programs to support farming enterprises.

However, the development of self-sustaining groups has seen mixed results, especially in communities that have relied on AWI funding to purchase baits – in some cases with groups ceasing or drastically reducing baiting once AWI-funding ends.

KEEP BAITING, IT'S CHEAP INSURANCE!

Talgarno farmer and National Wild Dog Management Advisory Group member Peter Star says the Victorian wild dog control programs have been strong but no one can afford to become complacent.

"Effective wild dog management practices have been introduced to communities and it's vital that baiting continues, otherwise communities run the risk of wild dogs returning," Peter said.

"AWI has assisted landholders to get wild dog control programs up and running, and they have been well supported within the community, but AWI doesn't have a bottomless bucket of funds for baits.

"AWI funding was a godsend in Victoria and helped wild dog-affected sheep producers over a crisis. While it might be tempting for producers to stop baiting because the sheep losses have stopped, the situation can quickly turn sour. By the time producers see the losses again, the wild dogs are likely to have bred up and then we have to start all over again.

"We'll return to crisis if producers don't keep baiting as a precaution; let alone the benefits from killing foxes when producers bait for wild dogs.

"Baits are not a high cost for producers. It would cost each of them under $200 per year to buy some baits, which compared to the price of a single prime lamb, or compared to the rise in wool production, is very cost-effective. Baiting is cheap insurance." B

MORE INFORMATION
www.wool.com/wilddogs

COORDINATING WILD DOG CONTROL

AWI-funded wild dog coordinators in each mainland state are helping reduce the impact of wild dog predation in sheep producing areas – thereby improving on-farm productivity, rural community wellbeing and rural biodiversity.

The eight coordinators (see map below) help woolgrowers and other stakeholders work together to strengthen their rural communities' efforts to achieve sustained on-the-ground control of wild dogs. They also help coordinate on-ground wild dog control activities.

The coordinators use a 'nil-tenure landscape level' approach with local communities that highlights the benefit of focusing on the 'common problem' rather than attributing ownership of the wild dogs to individual land managers.

This approach encourages good working relationships between private and public land managers. Through this consultative process, local farmers can not only share in the 'ownership' of the decision making but can identify and pursue the resources required to successfully implement a local and regional solution.

More importantly, it can have a positive impact on the emotional well-being of farmers in the area who now feel that something positive is being done to address the constant financial and emotional impact of wild dogs.

AWI Program Manager Vertebrate Pests, Ian Evans, says collaboration between local landholders is vital but can be challenging without the external help provided by an independent coordinator.

"Woolgrowers recognise the vital need for wild dog control, but they often don't have the relationships with all land managers across sometimes vast distances that are needed to be able to work together on the wild dog problem," he said.

"Nor do they necessarily have all the skills or resources to combat dogs, and those people that are actively involved in dog control can often feel burnout due to the scale of the problem and low participation within a region.

"That is why communities need a coordinator to step in and help out. They need somebody independent, who can break down these barriers and get landholders working locally and across shires."

MORE INFORMATION
www.wool.com/wilddogs

AWI-FUNDED WILD DOG COORDINATORS

AWI funds and co-funds wild dog coordinators in each Australian mainland state to help landholders and communities work together to combat wild dog attacks. If you have a problem with wild dogs on your property, contact your region's wild dog coordinator below to see how you can get on top of the problem.

- **Victoria (north-east):** Michael Freeman 0477 358 061
- **Victoria (Gippsland):** Brian Dowley 0408 436 600 and Lucy-anne Cobby 0488 712 616 (shared position)
- **South Australia:** Marty Bower 0419 835 120
- **Western Australia:** Meja Aldrich 0417 622 780
- **Queensland (central-west):** Position being filled
- **Queensland (south-west):** Skyela Kruger 0429 232 089
- **NSW (north-east):** Dave Worsley 0429 638 078
- **NSW (western):** Bruce Duncan 0409 515 471

QUEENSLAND

Wild dog coordinator for the south-west of Queensland Skyela Kruger was appointed last year and she has hit the ground running.

Skyela Kruger, who started in the coordinator position in April last year, is based in St George. She has been working with woolgrowers and other landholders, as well as Local Government Rural Lands Officers in shires across south-west Queensland to encourage participation in baiting and other wild dog control measures.

One of the highlights of the past year for Skyela has been making significant inroads into getting the community onboard with coordinated baiting in the Charleville region. Working closely with stakeholders, Skyela managed to reconvene the Murweh Shire Wild Dog Committee and increase landholder participation in baiting within the shire, which covers nearly 41,000km^2.

"I have phoned and sat down with non-participating land managers and new land managers, explaining their pest management responsibilities to them and providing them with local knowledge. One of the biggest issues we face is the number of absentee landlords, so I have been engaging with several foreign-owned properties that have not baited for years," Skyela said.

"By encouraging landholders to be part of the solution and making the most of some positive changes in management, participation in the spring baiting increased from 39 to 60 properties, which equates to wild dog control over an extra 300,000 hectares in the shire."

Skyela and other stakeholders have recently been busy with the autumn baiting program that runs across six shires. About 80% of baits are put out via aerial baiting, due to large property sizes and inaccessible areas, such as the heavy timbered mulga country.

There is also a wild dog coordinator position for the central-west of Queensland. The position is currently vacant but being filled.

The two wild dog coordinator positions are co-funded by AWI, with further support from MLA Donor Company, the Queensland Department of Agriculture and Fisheries, and the Queensland regional bodies of RAPAD and the South West Regional Economic Development Association (SWRED).

Brett Carlsson (Senior Wild Dog Coordinator / North Queensland) along with the two Western Queensland coordinators, speak weekly, working toward building effective coordination and action across approximately 70% of the state.

WESTERN AUSTRALIA

In the three years since taking on the newly created position of wild dog coordinator for Western Australia, Meja Aldrich has achieved very significant achievements in previously uncharted wild dog coordination territory.

Having previously worked on several stations and export depots in Western Australia, Californian-born Meja Aldrich already had a good understanding of how damaging predatory behaviour can be for farm operations in the state.

But after three years in the role as the state's wild dog coordinator, Meja now knows more about combating wild dogs than most other people. Sheep producers will be pleased to hear that Meja has recently signed up for another three years. Meja is currently based at Geraldton in the Mid West region of WA.

"Since I took on the role three years ago, my focus has primarily been on the Northern Agricultural Region and the adjacent pastoral region across the WA State Barrier Fence," Meja said.

"I've held numerous wild dog workshops with DPIRD to promote wild dog awareness within communities. These workshops were my launching point. I could gather contacts, record wild dog data, build relationships and generate conversations.

"Leading on from this, I've helped establish or strengthen Recognised Biosecurity Groups (RBGs) along the Barrier Fence and help identify and fill gaps in control by Licenced Pest Management Technicians (doggers)."

RBGs are groups, formally recognised by the WA Minister, that enable landholders and managers to develop a coordinated approach to control and manage declared pests (such as wild dogs, foxes and rabbits) in their area. RBGs can access funds from a 'pest rate' in areas declared by the Minister.

At the northern end of the Barrier Fence, Meja helped generate an interest with landholders and DPIRD to form a new RBG, which resulted in the establishment of the **Northern Biosecurity Group** (NBG) which services the shires of Chapman Valley, Greater Geraldton and Northampton.

"The group is taking a proactive and coordinated approach to pest management across the vast area, working with local landholders, doggers and government departments," Meja said.

Adjoining this RBG to the south, Meja helped revitalise the **Central Wheatbelt Biosecurity Association** (CWBA), which covers Koorda, Perenjori, Dalwallinu and Morawa.

"The RBG is now running strongly with doggers working on affected farms, pastoral land and crown lands; the RBG also runs bait rack days to produce 1080 meat baits for landholders," Meja said. "There has been a significant drop in wild dog activity in the area and farmers are successfully running sheep in paddocks where they were previously losing stock."

Meja has also identified the Midlands as a region that is starting to experience wild dog attacks, and proactively conducted the West Midlands Coastal Dog Project which led to the formation of the **Midlands Biosecurity Group** in conjunction with DPIRD in October 2018.

With an increasing capacity of wild dog control in the Northern Agricultural Region creating self-sufficiency, Meja's attention is broadening to include other wild dog affected sheep production areas.

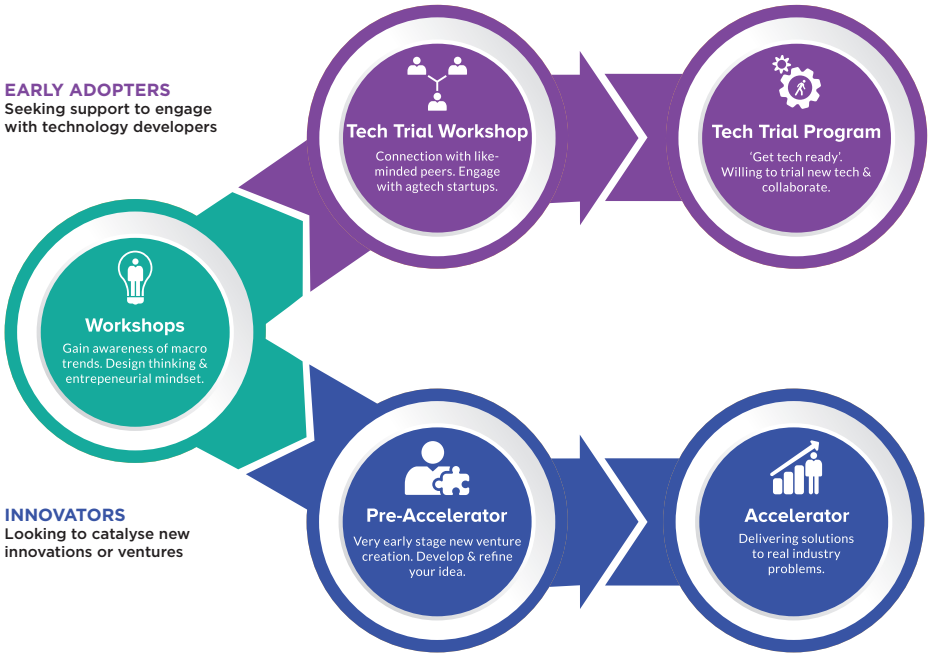
Meja's coordinator role is supported and advised by a Project Advisory Group drawn from a cross section of stakeholders, including the National Wild Dog Facilitator, DPIRD staff, and various wool producers. B

MORE INFORMATION

Hear more from Meja in episode 81 of AWI's The Yarn podcast at **www.wool.com/podcast.**

AG TECH OPPORTUNITIES

Are you interested in pursuing opportunities with ag tech startups? The new Farmers2Founders program provides all the necessary tools, resources, training, coaching and support to help producers deliver technological solutions to agricultural industry problems.



Across two streams, Farmers2Founders supports **Innovators** to accelerate their ag tech ventures, plus **Early Adopters** to adopt and engage with cutting edge technologies.

Farmers2Founders (F2F) is a world-first innovation program tailored to producers that equips them to act as frontline innovators and supports them to develop entrepreneurship and technology capabilities, so they can solve critical agricultural industry challenges.

This new collaborative project involving five rural Research and Development Corporations – AWI, MLA, GRDC, AgriFutures and Wine Australia – aims to give producers the lead in developing technology solutions for their industry. A collaborative approach reduces costs and leverages network benefits.

"The aim from AWI's perspective is to develop a support system to attract and then develop innovative woolgrowers who are looking for cutting edge innovation and adoption of new technologies to solve wool industry problems," said AWI Program Manager, Farm Automation & Reproduction, Carolina Diaz.

"The project will develop entrepreneurship and technology capabilities amongst participants so they can then solve critical industry challenges and successfully bring new ag tech solutions to market. The joint-RDC approach will help increase collaboration between producers and the global ag tech ecosystem and attract private investors to the industry."

F2F received a boost in March with the Minister for Industry, Science and Technology announcing the program has received national Government funding through the Incubator Support initiative. B

MORE INFORMATION
Visit **www.farmers2founders.com** and contact **stuart@farmers2founders.com**

AWI SMART TAGS

YOUR CHANCE TO GET INVOLVED

Do you have predation or disease issues on-farm? Are you interested in trialling new smart ear tags to determine if they can provide early warnings for these issues? If so, read on.

Predation and disease are major headaches for the sheep and wool industry with significant impacts on profitability and animal welfare. However, new sensor technologies have the potential to provide producers with an early warning of behaviours associated with predation or the development of disease in individual sheep in their flock.

AWI has partnered with CQUniversity in an Advance Queensland Industry Fellowship to test the AWI smart ear tag.

This project is aimed at developing algorithms which provide alerts to changes in sheep behaviour ahead of predation or disease events. This will enable producers to detect and manage problems well before they turn into more significant issues.

"This project addresses sheep health and wellbeing issues faced by woolgrowers – from the detection of predation events, to more subtle behaviour changes associated with disease development."
Dr Jaime Manning, CQUniversity

CQUniversity is seeking woolgrowers willing to participate in on-farm testing of the AWI smart ear tag in order to develop the behavioural algorithms that provide alerts to critical issues.

TO FIND OUT MORE OR REGISTER YOUR INTEREST

Contact:
Dr Jaime Manning
Lecturer – Agriculture,
CQUniversity Advance Queensland Industry Research Fellow
Phone 0438 155 240 or
Email j.k.manning@cqu.edu.au

Sheep with **AWI smart sensor ear tags.**

FENCING? NO SWEAT!

By the end of this year, 25-year-old Hugh McKay aims to develop a prototype automated trailer system that is capable of building farm fences, removing the physical labour normally required and vastly decreasing the time needed for installation.

Agricultural fencing is essential on all livestock farms, but installing it is a costly, time consuming and labour-intensive process. However, there could soon be a much cheaper and effective solution, thanks to a new project being undertaken through an AWI-sponsored Science and Innovation Award for Young People in Agriculture.

A dislike for installing fencing on his family's sheep and cattle property at Henty in NSW has inspired Hugh McKay to develop a fully automatic fencing trailer. Hugh studied product design and engineering at Swinburne University, and previously worked for Adshel in Melbourne.

In need of a break, and with his parents glad of an extra pair of hands during the drought, he returned to the family farm a year ago.

"I've always thought fencing was a very slow and tedious process, moving back and forth up the fence a number of times. I decided to apply my product design engineering background and develop a fully automated fencing trailer, the Smart Fencer," Hugh says.

"While there are some products on the market that help speed up some components of the fence (post drivers or wire spinners) there is yet to be a completely automated solution that will complete a fence in one run."

The GPS controlled fencing trailer can be towed by any standard ute and Hugh aims for it to be capable of completing well over 10 km of fencing in a day by a single individual. With the Smart Fencer being able to complete all the components of constructing a fence in one run, it's estimated to run more than 10 times the speed of an average fencing contractor team.

Inside the Smart Fencer will be a specialised feeder system that allows up to 40 fence posts to be automatically fed directly to the post rammer where they are automatically pounded into the ground. The system will be a self-stabilising unit ensuring that the fence posts are always rammed vertically into the ground.

The Smart Fencer utilises specialized GPS technology which enables the operator to plot out the position of the fence to cm accuracy. Using this technology, the user can quickly and easily see the distance that the fence will cover, the number of posts that will be needed, the amount of wire and netting that will be required, as well as an accurate estimated time of installation with the Smart Fencer.

"Once you've got all your posts in the machine and your wire spinner's set up, then you just drive to the beginning of the fence, tie on your wires to the strainer and you're ready to go" Hugh says. "From there it will pull the fence posts out individually, bang them into the ground, direct you to go forward to the next post and build the fence as you drive along comfortably in the cabin of the ute."

The Science and Innovation Awards for Young People in Agriculture are coordinated by ABARES and are open to young people aged 18-35 years working or studying in rural industries. The annual awards aim to encourage the uptake of science, innovation and technology in rural industries.

Hugh was presented with his award in March and he aims to complete a working prototype of his trailer by the end of 2019.

MORE INFORMATION
hugh.mckay94@gmail.com
www.wool.com/scienceawards

SOLAR POWERED
SHEARING SHED WORKS A TREAT

In an age of increasing power costs and pressure to move to renewable sources of energy, a farming couple from Victoria have taken the plunge and built a brand new woolshed and sheepyards entirely off the power grid. Designing and seeing it materialise was a dream come true for the couple.

Solar panels on the roof of **Peter** and **Jane Waters'** new shearing shed near **Coleraine** in western Victoria.

Peter and Jane Waters together with son Adam run a Merino and crossbred flock near Coleraine in western Victoria and when faced with building a new shed, things came to a head.

"The old shed was just simply not working anymore and I always wanted to have our shed and yards right here. It was going to cost $100,000 just to connect the power here so we looked at building it off the grid. With the latest solar powered set-up, it was to cost $45,000 so the decision was pretty easy in the end," Peter says.

With a new four-stand, U-shaped raised board with two wool presses operating using three-phase power, the challenge was there to see what could be delivered – and after two shearings, the Waters are more than happy with their decision.

"It's been able to do it without a sweat. We shear in January and again in March so the summer/early Autumn really helps but even without fully sunny days it could do it," he adds.

There are 40 photo-voltaic solar panels on the shed roof and each panel has a capacity of 300 watts in full sun, therefore the combined panels are capable of generating and delivering 12,000 watts or 12 KVAs.

The low voltage electricity generated on the roof is turned into standardised 240-volt power by three inverters that have a combined capability of 15KVAs which are fed and stored in a series of Lithium batteries if not being used.

With four Evo shearing machines and two wool presses operating, the entire shed uses about 8KVAs, and when the wool presses are not operating the power demand is about half this at 4000 watts. The use of LED lights, a microwave in the kitchen and a power supply in the yards are the other drains on power.

Jane and **Peter Waters** with their solar unit.

With shearing starting at 7.30am it means that for a large part of the first run of shearing the solar panels are not operating. This has not been an issue as the batteries supply more than enough for the first run with the storage falling to about 75% at morning smoko before lifting back up to almost full by lunchtime.

"Cloudy days in the winter might be a bit of an issue but I haven't seen the battery below 50% and we do have a diesel generator as a backup if we really need it. It all kicks in automatically as things change through the day but we haven't used the generator yet," Peter says.

The solar power was supplied by Keppel Prince from Portland, the shed itself was made by Thornton engineering originally from Penshurst but now also at Geelong, and the builder was Kevin Peters who built the 80m x 30m shed in six weeks from start to finish.

"So it was really nice to have local companies involved and both were just fantastic to deal with," said Jane.

With the shed set to last a century, the solar power is also a long-term investment. The battery itself is expected to last 15 years, the inverters 15-20 years and the solar panels are covered by a 25-year warranty.

"By then there will be newer and better technology, but I am looking forward to no power bills from here," Peter laughed.

His advice for people looking at solar power for woolsheds:

- It is very doable; he has become a solar convert.
- It is getting cheaper all the time and technology is also improving.
- Some minor issues arose early, the inverters needed to be bigger than first thought.

MORE INFORMATION

Listen to the Waters take you through their new solar-powered shed in an upcoming episode of AWI's The Yarn podcast at **www.wool.com/podcast.**

SHEARING R&D

GROUND-BREAKING, NOT BACK-BREAKING!

Pioneering research to help shearers minimise back injuries, through the use of wearable robotics, is being undertaken by the University of Melbourne thanks to funding from AWI.

Attracting and retaining shearers is one of the biggest challenges facing woolgrowers and the industry. A major factor is that shearing can be a 'back-breaking' profession, with injuries to shearers being six times the all-industry average in Australia. Lower back injuries are the biggest issue due to their long rehabilitation time and associated lost productivity.

A new project funded by AWI aims to understand exactly how these injuries arise and then research potential wearable robotic solutions for shearers to reduce the risk of injury while still allowing the high degree of maneuverability required for shearing.

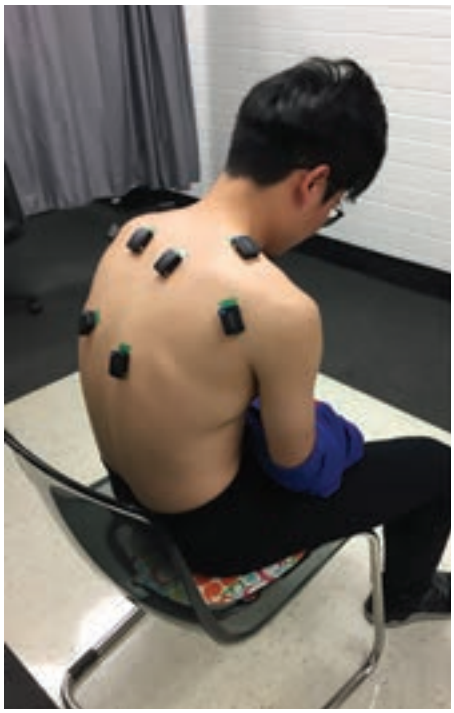
AWI Program Manager for Farm Automation & Reproduction, Carolina Diaz, says the initial objective of the project is for the researchers to accurately identify the mechanisms of lower back musculoskeletal injuries in shearers.

"With this knowledge, researchers aim to develop a practical and cost-effective prototype tool to be worn by shearers to alert them when they are becoming vulnerable to potential injuries. This sensing unit would propose optimal resting cycles and could potentially be connected to a mobile phone application," she said.

"However, by the end of this 12-month project, researchers will also develop a conceptual design for a more active solution for fatigue management and injury prevention, such as an exoskeleton that the shearer can wear, which is very exciting."

The project is led by the University of Melbourne robotics team, including Associate Professors Denny Oetomo and Ying Tan and Professor Chris Manzie. Associate Professor Oetomo, whose expertise is in the physical assistance and clinical applications of robotics, says muscle fatigue is recognised as a precursor to injuries during shearing.

"During shearing, when 'fast' responding muscles of the back tire, the burden of shearing is left to the 'slower' muscles that are less capable to respond to sudden movements and therefore are more prone to injuries. Furthermore, the long period spent by the shearers in stooped postures also contributes to significant changes to their musculoskeletal behavior, which reduces the body's ability to protect itself from physical injuries.



The measurement platform will combine two separate sets of wireless sensors to measure **muscle activity** (left) and **shearers' body motion and posture** (right) simultaneously, allowing the study to take place inside shearing sheds instead of inside a lab.

"In this project, the back muscles from a range of shearers will be measured using Electromyography (EMG) signals, which will be studied as the primary indicator of the lower back's capability to resist injuries.

"Secondly, we will measure and study the shearers' posture. It is widely accepted that when humans get fatigued during a repetitive task they shift their posture, to distribute the load to other muscles, often creating sub-optimal posture for the task which can lead to injuries."

University of Melbourne researchers will collect the measurements from shearers on a specially designed portable measurement platform that will be installed in a real shearing shed where it is possible for the shearers to shear more than 200 sheep per day. Researchers will therefore be able to study the shearers' biomechanics in authentic conditions.

A measurement system will be developed for shearers to wear during the research. This system will monitor the shearers' muscle activities and posture to estimate the potential injury risk.

"Through family connections I know how difficult sheep shearing is, and the high risk of injuries," said University of Melbourne PhD student Mark Robinson, who initiated the project.

"While I was taking Associate Professor Oetomo's robotics class I was introduced to his work in assistive robotics, which I thought would find a good application in sheep shearing to minimise injuries, and reduce the physical burden of a job which by most accounts has not significantly changed for 100 years.

"I talked to him about the possibility of a PhD in this area, and he encouraged me to apply. We sought to work with AWI shortly after I started. It is great to work so closely with an industry partner like AWI to solve a problem that directly affects people, and hits close to home for me."

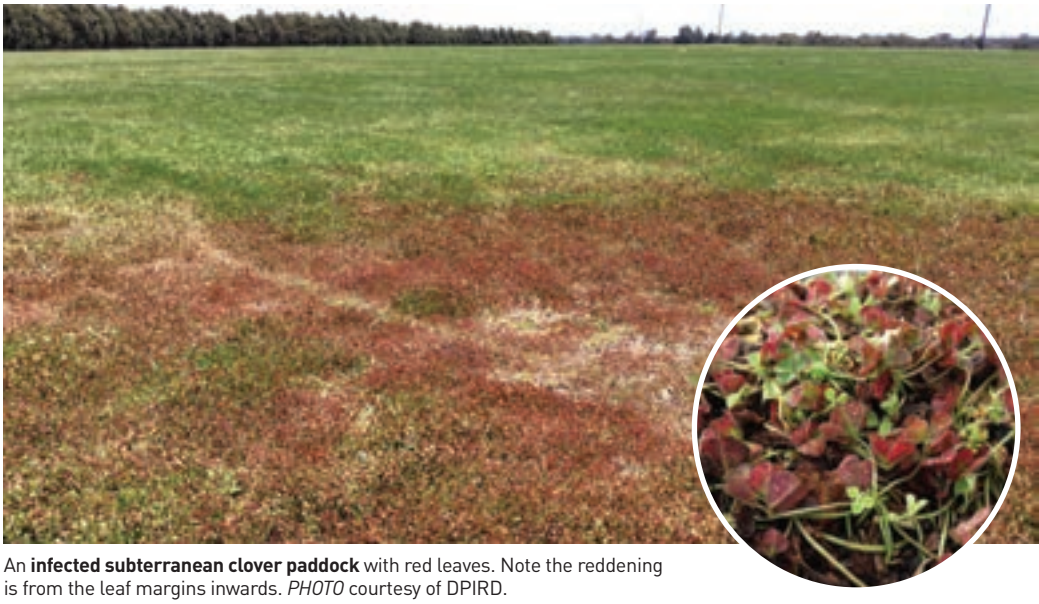
To understand the dynamics of lower back muscles under different shearing environments, factors that will be considered include whether or not each shearer has had a prior injury, the different skill level of each shearer (highly experienced or new to shearing), the age of each shearer and whether or not a back harness is used.

FREE TESTING FOR SUB CLOVER RED LEAF SYNDROME

Farmers who suspect red leaf syndrome in their subterranean clover are reminded free testing is available again this season.

FAST FACTS

- Research into subterranean clover red leaf syndrome has determined the main cause of the syndrome as Soybean Dwarf Virus (SbDV), which is spread by aphids.
- FREE testing of leaf samples is available to producers who suspect their clover pasture is infected with SbDV.
- Producers are encouraged to read the 2018 industry fact sheet and continue reporting incidents of the virus.
- To combat the risk and spread of SbDV, producers should use a variety of control measures.



An **infected subterranean clover paddock** with red leaves. Note the reddening is from the leaf margins inwards. *PHOTO* courtesy of DPIRD.

Researchers in Western Australia are keen to test plants with symptoms of subterranean clover red leaf syndrome as part of a broader project to better understand this syndrome.

Symptoms of the virus include reddening leaves, stunted plant growth and premature seedling or plant death which can lead to significant loss of dry matter, biological nitrogen and seed production in pastures. Loss of sub clover production is greatest when the plants are infected by the virus in autumn or early winter.

The current investigation is a collaboration between the Department of Primary Industries and Regional Development (DPIRD) and the University of Western Australia (UWA).

Researchers believe that SbDV is the most likely cause of the syndrome but it is likely that a number of other contributing stress factors are involved. SbDV is spread by aphids and frequently infects subterranean clover.

If producers suspect their clover pasture is infected with SbDV, they are encouraged to arrange **FREE testing of symptomatic leaf samples** by contacting Paul Sanford (DPIRD) at paul.sanford@dpird.wa.gov.au or Kevin Foster (UWA) at kevin.foster@uwa.edu.au, who are co-leading the research work. This research and testing are being co-funded this season entirely by DPIRD and UWA. AWI provided a subsidy for the testing in the previous two seasons but can no longer continue this due to reduced company income.

Producers who submit samples are provided with the test results and management advice. The testing will also enable the project team to develop a better understanding of the distribution of the virus and susceptible varieties.

Detailed guidance to help producers manage the syndrome was produced by AWI, MLA, UWA and DPIRD last year in the form of an **8-page fact sheet**, available on www.wool.com/weeds. The fact sheet provides producers with a clear plan of attack if they are, or suspect they are, impacted.

To help researchers and livestock RDCs determine the extent of the syndrome, producers are also encouraged to continue reporting incidents of it via the **online producer survey** (available on www.wool.com/weeds) which is conducted jointly by AWI and MLA.

To **combat the risk and spread** of SbDV, producers are encouraged to use a variety of control measures, including:

- Use of insecticides only when the risk of early infection is high
- Implementation of annual ryegrass or forage oats into pasture regimes, as grasses do not host SbDV
- Consider sowing alternative legume species, such as serradella, which do not appear to be affected by SbDV. B

MORE INFORMATION
www.wool.com/weeds

A recording of the webinar by **Geoff Duddy** of Sheep Solutions is available free to view on the website of AWI's Sheep Connect NSW network at **www.sheepconnectnsw.com.au/tools**

CONTAINMENT FEEDING AND DROUGHT

Given ongoing drought conditions across large parts of eastern Australia, it is not surprising that a recent webinar that provided an introduction to containment feeding during drought proved very popular. A recording of the webinar is available to view on the Sheep Connect NSW website.

Woolgrowers who tuned in to the webinar run in April by AWI's Sheep Connect NSW network learnt a multitude of practical tips on containment feeding during drought. 320 people registered for the live webinar.

According to a survey of attendees (at the start of the live webinar), 45% were producers who had not done containment feeding before and were looking for as much information as possible, 32% were producers who were attending to get a refresher and to learn anything new, with the remaining attendees comprising advisors who wanted to keep up to date (18%) or were new to the concept (6%).

For those who missed it, the hour-long webinar was recorded and is available to view on the Sheep Connect NSW website at **www.sheepconnectnsw.com.au/tools** free to anyone across the country.

The webinar was presented by Geoff Duddy of Sheep Solutions and covered some key topics including nutritional needs, general containment feeding recommendations, mid to late pregnancy management and lambing management. Geoff also answered questions submitted by webinar attendees. During the webinar, Geoff provided the following dos and don'ts:

- **Do** monitor ewe body condition, intakes, manure and health.
- **Do** meet feed requirements.
- **Do** minimise acidosis (grain poisoning) risk.
- **Do** provide effective fibre.
- **Do** ensure quality water.
- **Do** have a plan for when releasing stock from containment feeding systems.
- **Don't** introduce grain-based rations (and pellets) too quickly.
- **Don't** overstock.
- **Don't** restrict trough allocations.
- **Don't** be tempted to release stock from containment feeding areas too early.
- **Don't** lamb twin-bearing ewes in feedlots (because lamb losses escalate).

Other webinar recordings on drought management and other issues are freely available at www.sheepconnectnsw.com.au/tools to watch at your convenience from the comfort of your home or farm office.

A complementary handout – AWI's *Managing Sheep in Droughtlots* best practice guide – was also made available to attendees and is available at www.wool.com/droughtresources.

For woolgrowers going into, enduring or recovering from drought, AWI provides a range of drought planning and management resources, plus links to useful external resources. Visit www.wool.com/droughtresources. B

This **AWI best practice guide to managing sheep in droughtlots** highlights the purpose, benefits and experiences of woolgrowers managing sheep in containment feeding areas during drought.

AWI TRAINING IMPROVES PRODUCTIVITY!

Research demonstrates that productivity can be improved substantially and at relatively low cost through adoption of targeted management practices. Take up the opportunity now with these AWI-funded training courses!

LIFETIME EWE MANAGEMENT COURSE

The Lifetime Ewe Management (LTEM) course, supported by AWI, aims to increase producers' understanding of the influence of ewe nutrition and management on overall reproduction rates and lamb and ewe survival. Producers develop the skills to manage their ewes to achieve condition score targets and explore the economics of supplementary feeding and pasture management to review stocking rates.

PICKING PERFORMER EWES WORKSHOP

All flocks have ewes that perform better than others, affording woolgrowers the opportunity to make massive improvement through within-flock selection decisions. This one-day workshop is aimed at lifting lifetime performance from commercial self-replacing Merino flocks by recognising and placing importance on the total lifetime productivity potential and value of their Merino ewes (including fleece, meat and surplus stock).

WINNING WITH WEANERS WORKSHOP

This one-day workshop is aimed at lifting lifetime performance from their Merino ewes through improved management of their weaners. It assists participants in understanding the key issues affecting weaner survival and performance and guides them through developing targets for growth to achieve a minimum weaner survival rate of 95% from weaning to one year of age. The workshops discuss factors that contribute to weaner mortality and illthrift, and provides practical pathways for improving performance from this group of sheep.

RAMPING UP REPRO WORKSHOP

AWI has teamed up with Zoetis to bring you a hands-on one-day workshop focused on improving ram performance and working longevity in commercial sheep enterprises. The workshop is designed to increase the skill of producers across the key components of ram performance and impacts on overall breeding enterprise performance, including anatomy, physiology, spermatogenesis, metabolic demands, health, disease and biosecurity and the financial impact of the ram team. B

MORE INFORMATION

LTEM: www.wool.com/LTEM For more information, or to set up or join an LTEM group in your local area, call RIST on freecall 1800 883 343 or visit www.rist.edu.au/lifetime-ewe-management

Workshops: www.wool.com/workshops The three one-day workshops are run on a demand basis through AWI's State Grower Networks across Australia. To find out about upcoming workshops in your region, contact your Network listed opposite.

IT'S EWE TIME!

PRESENTATIONS AVAILABLE NOW

The presentations from this year's 'It's ewe time!' forums are now available online and are a great resource for any woolgrower across the country who couldn't attend this year's forums.

One of the sheep industry's most popular extension and adoption programs, It's ewe time!, returned in 2019 with a series of forums in Victoria, NSW and South Australia. A forum is also being held in Tasmania at Campbell Town on 12 June – visit **www.makingmorefromsheep.com.au/events** for details or to register.

The presentations from this year's forums were recorded and are available on the Making More From Sheep website (at **www.makingmorefromsheep.com.au/presentations**).

Each presentation includes the presentation slides along with the audio of the presenter in the one video file, so people can listen to the presenter and follow along with the slides at the same time – receiving a similar experience to actually attending the forum.

The presentations showcase practical tools and information to help sheep producers improve productivity and profitability. They are designed to deliver timely and practical tips and tools for on-farm practices and flock management.

"Ongoing drought conditions across parts of Australia's sheep production regions have been challenging for many producers," said AWI Manager for Woolgrower Education & Capacity Building, Emily King. "The It's ewe time! presentations aim to help producers tailor their management to seasonal conditions, prepare and plan for the year ahead, and maximise returns for their sheep enterprises by taking advantage of the resilient wool and sheepmeat markets."

Also on the website are the Forum Booklets that include the presenters' key messages and links to further information.

Presentations at this year's forums include:

- Dry times decision making
- Maximising ewe performance
- Winning with weaners
- Making money from measuring
- Sheep health is your wealth
- Capitalising on positive price cycles.

Presentations from previous years are also available. Topics include:

- Managing ewes in dry times
- Maximising lamb and weaner performance
- Your sheep health is your wealth
- Effective integration of livestock and cropping
- Making sustainable financing choices
- Animal welfare market signals and non-mulesed case study.

A joint initiative of AWI and MLA, the It's ewe time! forums are part of the flagship Making More From Sheep program. B

MORE INFORMATION

www.makingmorefromsheep.com.au/presentations

AWI GROWER NETWORKS

PRODUCERS LEARNING FROM PRODUCERS

- **AWI grower networks are present in each wool-growing state.**
- **They aim to increase the long-term productivity and profitability of producers.**
- **All woolgrowers are encouraged to get involved.**

AWI-supported extension networks provide opportunities for producers to get involved in practical programs that focus on making positive changes to on-farm production and management practices.

Be involved as little or as much as you like: sign up for newsletters about local issues, attend local field days and workshops.

The networks are fundamental to:

- the spread of new ideas
- continuing education
- the adoption of best practice
- giving AWI a direct link to what is happening on-ground.

Ongoing strong partnerships with state departments of agriculture, private providers and woolgrowers help ensure the grower networks continue to generate increased participation and reported benefits by woolgrowers.

To learn more about the networks and how to get involved, refer to the website of your state network, or contact the network coordinator below.

NEW SOUTH WALES
Coordinator: Megan Rogers
0427 459 891
admin@sheepconnectnsw.com.au
www.sheepconnectnsw.com.au
@sheepconnectnsw
@sheepconnectnsw

TASMANIA
Coordinator: James Tyson
sheepconnect_tas@wool.com
www.sheepconnecttas.com.au
@sheepconnect

SOUTH AUSTRALIA
Coordinator: Ian McFarland
0437 659 353
ian.mcfarland@sa.gov.au
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WESTERN AUSTRALIA
Coordinator: Andrew Ritchie
(08) 9736 1055
andrew@sheepsback.com.au
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QUEENSLAND
Coordinator: Andrea McKenzie
(07) 4530 1262
andrea.mckenzie@daf.qld.gov.au
www.leadingsheep.com.au
@leadingsheep

VICTORIA
Coordinator: Lyndon Kubeil
(03) 5761 1649
lyndon.kubeil@ecodev.vic.gov.au
www.agriculture.vic.gov.au/bestwool-bestlamb

THE YARN

THE WOOLMARK COMPANY

THE YARN PODCAST

FOR WOOLGROWERS ON THE GO

Sheep producer and consultant Jason Trompf was featured in Episode 82.

Runners who wore Merino wool at the Boston marathon were featured in Episode 84.

THE YARN PODCAST IS AWI'S WEEKLY FREE AUDIO REPORT

- Hear the latest news, market intel and stories from woolgrowers and stakeholders along the global wool supply chain.
- Learn more about AWI's projects from the people at the cutting edge of R&D and marketing.
- Each episode averages about 20 minutes in length.
- It can be listened to on a smartphone, tablet or computer.
- There is an archive of more than 85 episodes.

RECENT EPISODES HAVE BEEN ON TOPICS INCLUDING:

- Rebuilding the Queensland wool industry.
- Kristin Lefroy from Cranmore in WA on the benefits of Merinos in a mixed farming operation.
- Legendary WA shearer Don Boyle, who now designs and builds wool sheds.
- How electronic tagging and the Lifetime Ewe Management course are benefiting woolgrowers.
- Epic stories on 'the road to Balranald' in south-west NSW.

Available on iTunes

Subscribe at the iTunes Store
OR simply listen at **www.wool.com/podcast**

AVERAGE MONTHLY EMI COMPARISON

EMI'S STRONG PERFORMANCE CONTINUES

The chart opposite provides a snapshot of how well the AWEX monthly Eastern Market Indicator (EMI) and a range of microns have performed for the past three months (February 2019 – April 2019) in Australian dollar terms compared with the previous five years February 2014 to January 2019 (circles) and the decade previous to that, February 2014 – January 2014 (squares).

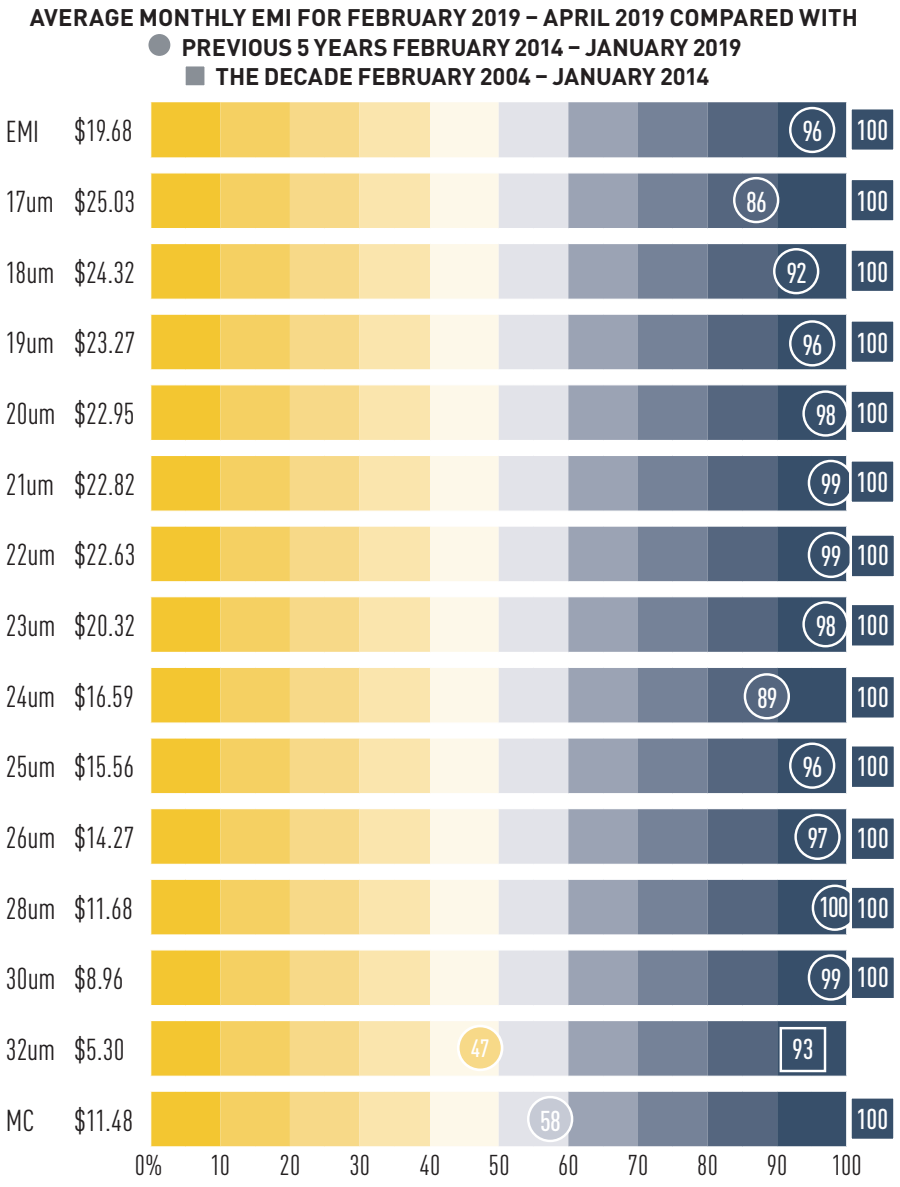
For the past three months, the monthly EMI averaged at $19.68, tracking at the 96th percentile against the previous five-year monthly EMI. This means that in the previous five years the monthly EMI has recorded a lower price than the current $19.68 (February 2019 – April 2019) for 96% of the time.

While the EMI is tracking at the 96th percentile over the previous five years, it is at the 100th percentile when compared to the decade February 2004 – January 2014. This means the current EMI of $19.68 (February 2019 – April 2019) is higher now than it was for all that decade.

The finer, mid and all but the most broad microns have performed well recently.

For the past three months, 18 micron averaged at a monthly value of $24.32 (92nd percentile for the previous five years and 100th percentile for the decade before that), 21 micron averaged at $22.82 (99th percentile for the previous five years and 100th percentile for the decade before that), and 28 micron averaged at $11.68 (100th percentile for both the previous five year and the decade before that).

However, the recent good performance of Merino Cardings (MC) has slipped somewhat. For the past three months, Merino Cardings averaged at $11.48, operating at the 58th percentile for the previous five years but still at the 100th percentile for the decade before that. B



MARKET INTELLIGENCE: FREE VIA SMS

In an initiative launched in 2017, AWI is sending wool prices and market intelligence direct to about 5,000 woolgrowers' mobile phones.

The woolgrowers receive the latest movements in the EMI in a simple text message (see left image), including a link to a full price report that provides more detail about price movements (see right image).

If you would like to subscribe to the free SMS service, visit **www.wool.com/sms** where you will be asked to input your name and the mobile phone number to receive the SMS.

You can unsubscribe from the service at any time by replying to the AWI SMS message. B

MORE INFORMATION
www.wool.com/sms

WOOLQ MAKES SHEDWORK EASIER

It wasn't until the team at 'Mine Creek' on Kangaroo Island incorporated WoolQ into their recent shearing, that they observed the true value the digital tool will add to each of their businesses.

Classer and woolgrower **Brenton Putland:** "The WoolQ eSpeci is a great tool to have in the shed; it improves my ability to do my job better."

Keen to trial the WoolQ eSpeci, experienced classer and woolgrower Brenton Putland was impressed with how easy it was to understand and navigate. He quickly recognised the efficiencies that come with eliminating the need to keep track of paper and pens in the shed, saying: "I can just walk over to the classers' table, tap into it and put my bales in."

Martin Kay from Elders was onsite during shearing and shared an equally positive view of the role that WoolQ can play in the industry going forward.

"I think the missing piece in the puzzle has been to offer the digital side with the reporting and tracking of the wool all the way through," Martin said. "WoolQ is helping the wool industry stay up to date with other industries and what they are doing. Using the technology to bring those people who are more remote closer to the end user of the wool has been the big advantage."

There is no doubt that the entire team at Mine Creek saw the elimination of manual data-capture errors and handwriting illegibility problems as a huge benefit of WoolQ.

"The old wool speci being handwritten is open to bad hand-writing and mistakes – it can be quite a headache for the wool store handlers," Brenton commented. Martin agreed: "We do have a hall of shame of classer species that are pretty hard to read and pretty hard to interpret. By having this system, everyone's reading the same thing."

THOUSANDS SIGN UP AND LOG ON

Thousands of woolgrowers have jumped on board the WoolQ platform since its launch last year and have started using the WoolQ eSpeci to capture and store their clip data in their own, personal WoolQ dashboard.

A significant number of brokers are also now connected to WoolQ, enabling the completed eSpeci to be automatically sent electronically to the broker's system. An increasing number of brokers can also automatically send back the test and sale results of the wool electronically to the woolgrower. As this information builds after each clip that's entered, it creates a valuable reference that will enable year on year comparisons and inform better decision making.

"If I were to come to the shed for the first time, I could look at last year's results through the WoolQ eSpeci," Brenton commented. "It would help me put lines together or keep lines apart."

The WoolQ platform has been designed to be very user friendly.

"It's been really good, you can't really blow anything up in there. Like anything, the more you use it, the better you get at it," Martin said.

Woolgrower Matthew Kelly of 'Mine Creek' describes WoolQ as simple and straightforward to use: "I picked it up pretty easily", he said, whilst his father commented: "Yes I think WoolQ's just a really good way to simplify the process and make it a lot better."

If you are yet to register for WoolQ, head to **www.woolq.com** to get started. The value of the WoolQ platform and the insights it can provide to aid your business decisions builds year on year, so the sooner you start, the sooner you will reap the benefits.

You will find helpful tutorials that will help guide you through the process. A WoolQ Starter Pack can also be mailed out to your address, to further support you in getting prepared prior to shearing commencing.

Once you've registered at www.woolq.com, you'll find the Starter Pack order form in the education section of the WoolQ portal. B

MORE INFORMATION
www.woolq.com

WoolQ supports all key stages of the growing and selling cycle, enabling woolgrowers to store and easily access a digital record of all their shearing information, from clip data through to test and sales results.

FOREX EFFECTS AND IMPLICATIONS

In this article, we examine the marked and significant fluctuations in the foreign exchange (forex) cross rates used in the wool trade.

Amidst all the turmoil created by major global trade issues such as the two-month ban on imports of South African wool into China, followed by the sudden reversal of that ban, and the re-emergence of the USA-China tariff war, a devaluing of the Chinese Yuan (CNY) against the US dollar (USD) has also been occurring for the past year and more.

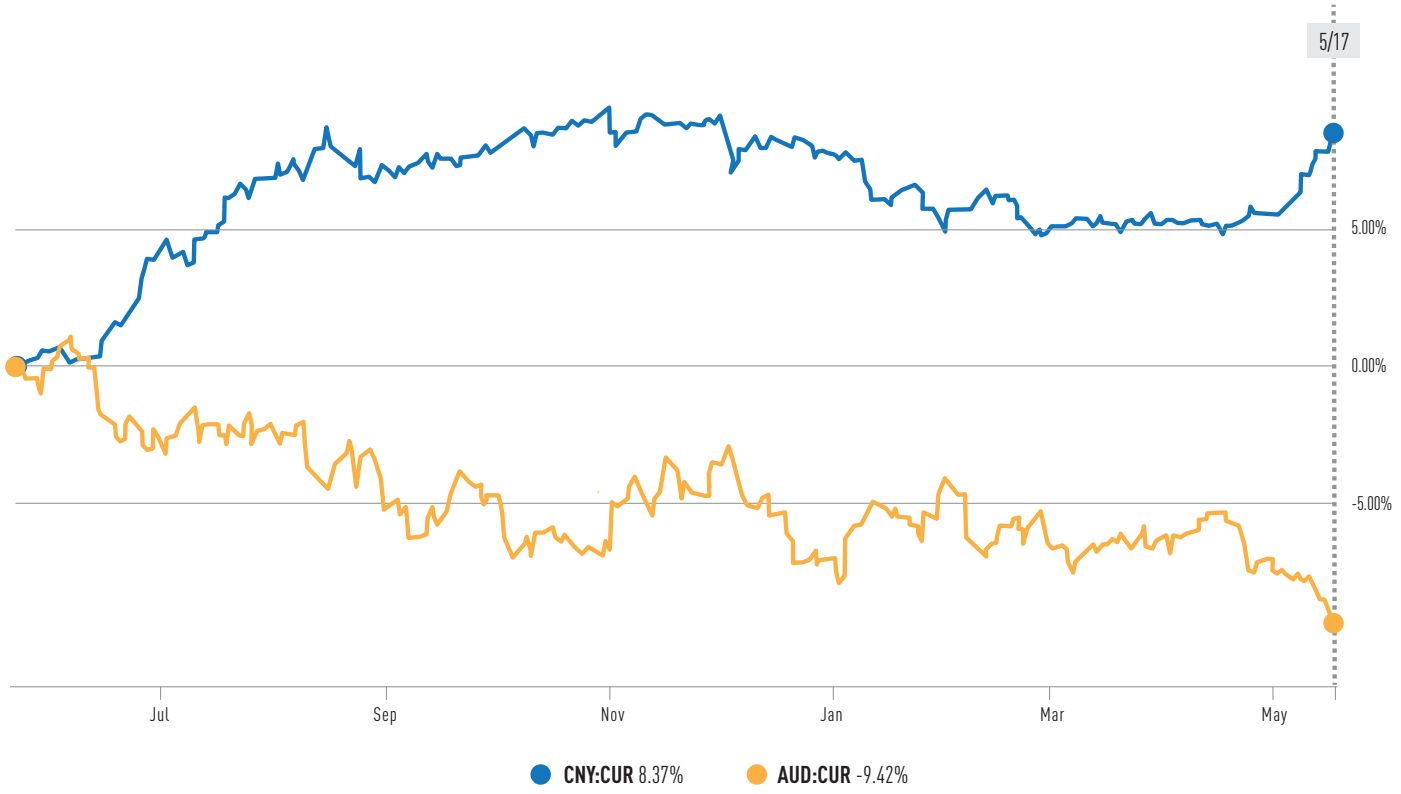
Marked and significant fluctuations in all the foreign exchange (forex) cross rates used in the wool trade with China has been the norm.

Over the past 12 months, the CNY has weakened to the current level of CNY 6.9179 against the USD compared to CNY 6.3675 back in May 2018. This means China's exported product is worth 8.64% less in CNY if sold at a similar same price to 12 months ago, which is almost certainly a 'best case' scenario given the tough trade conditions of the period.

Concurrently the Australian dollar (AUD) has fallen from the May 2018 average of around 0.7576 against the USD to today's rate of 0.6868 – a 9.35% drop. So, in net terms, the Chinese are still a little ahead in terms of the using CNY to buy USD then using that USD to buy AUD to pay for greasy wool.

This cross rate situation has helped in maintaining the relatively stable wool market at relatively high price levels under the softening of the retail price and demand scenario of the past 12 months which saw the market peak in August 2018 at 2116ac EMI. Most foreign textile trade companies express opinions that a stable exchange rate is best for profits across the industry, but at present the cross rates favour slightly a vertical Chinese wool manufacturer paying in USD and getting paid in USD or the equivalent for their end product.

FIGURE 1: EXCHANGE RATE OF CHINESE YUAN (CNY) AGAINST THE US DOLLAR INDEX (BLACK LINE) AND AUSTRALIAN DOLLAR (AUD) AGAINST THE US DOLLAR INDEX (ORANGE LINE) DURING THE PAST 12 MONTHS.

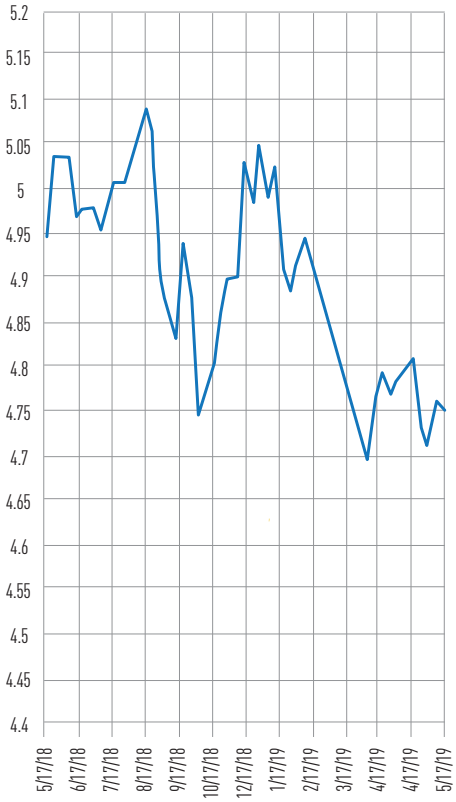


STABLE DOMESTIC CHINESE MARKET

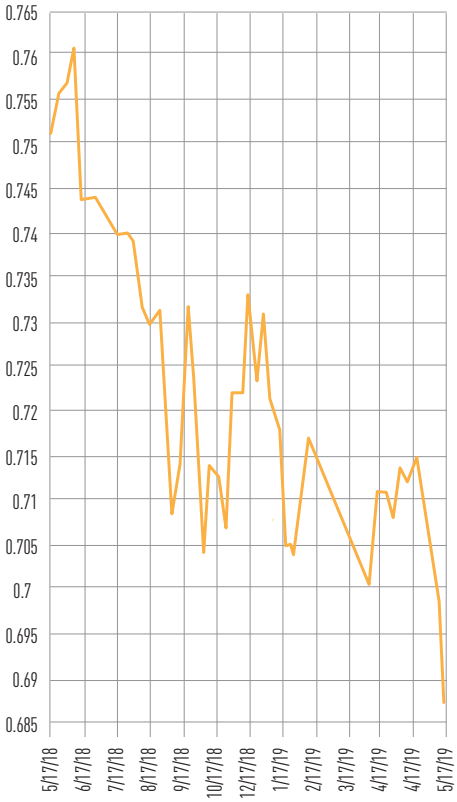
For the domestic Chinese consumer of wool garments, the CNY against the AUD has been erratic at times, but in reality, remarkably stagnant. The mid-May timeframe of 2018 saw the CNY v AUD at 4.9534 and today, 12 months on, sees that rate at 4.7528. The effect of the more advantageous forex (-4.05%) rate through that period was slightly outweighed by an AUD EMI that barely moved from 1943 to a current season average 1958, a slight increase of 0.77%.

No reports of increasing fabric or garment price at wholesale or retail have been reported for 12 months, so the supply chain must be utilising the theoretical 3.28% decrease to the first costs of raw material to discount at retail to keep product flowing.

CHINESE YUAN (CNY) VERSUS AUSTRALIAN DOLLAR (AUD)



US DOLLAR (USD) VERSUS AUSTRALIAN DOLLAR (AUD)

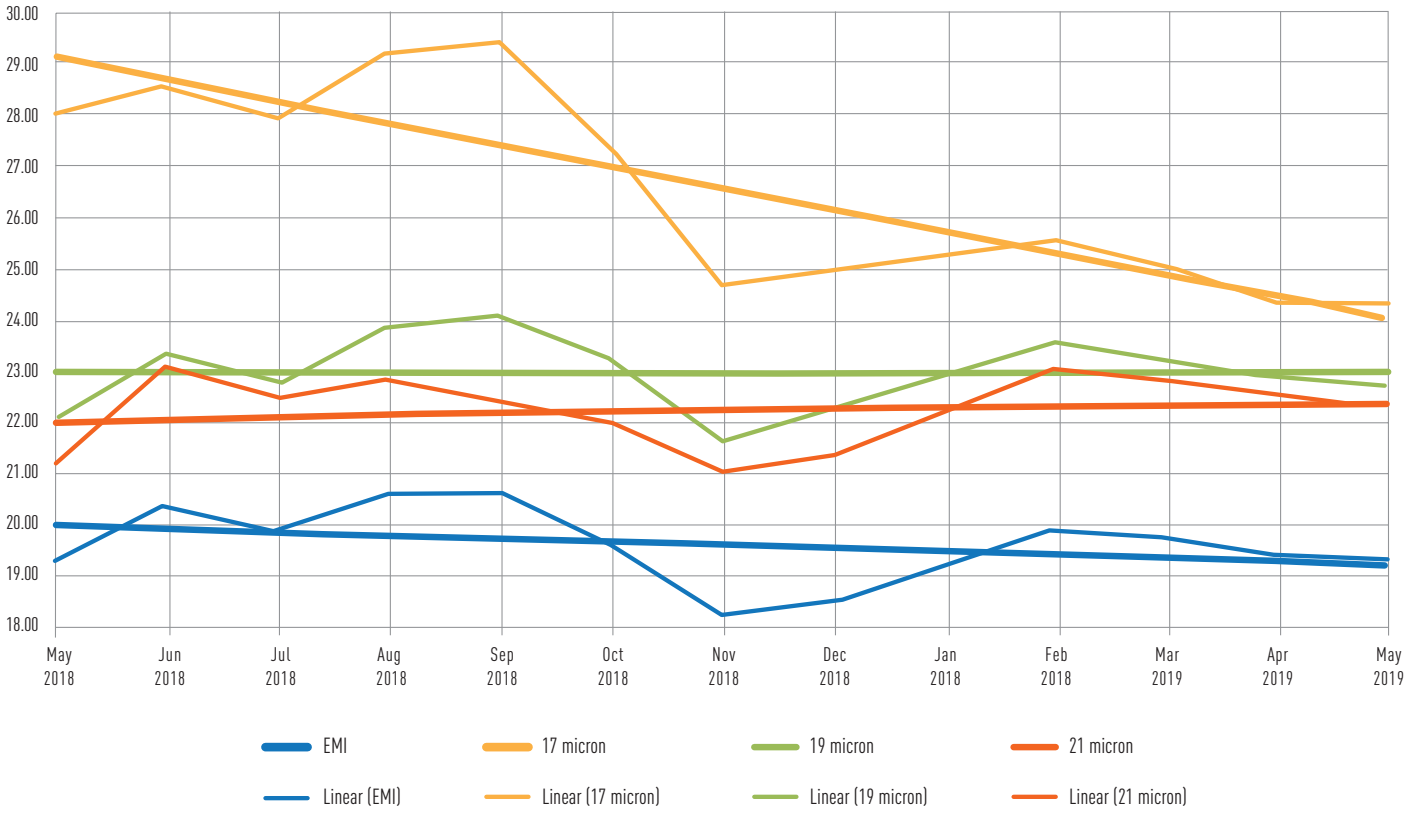


MORE SEVERE EFFECT IN EUROPE

In fact, at face value, the situation may be far more severe as the European users are anecdotally reporting a double whammy of a 20% fall in sales accompanied by an as yet unvalued drop in retail price. In opposing that though, the Europeans largely concentrate at the superfine and ultrafine (wools finer than 18.5 micron) top end of the Merino market which has seen significant price falls across their greasy wool market supply sector, lessening the subdued demand influence.

For example, the 17 micron indicator was at 2786ac in mid-May 2018 and sits at 2418 a year later in mid-May 2019 (-13.2%). Conversely the more suited-to-China types have maintained or increased during the same time period, and in certain types substantially. 19 micron has risen from 2204 to 2231 which is +1.23% and even more exaggerated is the 21 micron which has risen from 2128 to the mid-May 2019 price of 2200 which is a 3.4% increase. B

12 MONTH PRICE MOVEMENT IN AUSTRALIAN DOLLARS (AUD)



WIN!!!

If you submit a photo that gets published in Readers' Photos, you'll receive a copy of Dan McIntosh's *'Outback Mates'.*

This 208-page hardback book is a celebration of outback Australia and the bonds of friendship that are forged living and working on the land.

READERS' PHOTOS!

Have you got any interesting photos that you'd like to share with other readers of *Beyond the Bale?*

If so, please email the image and a brief description to the editor of *Beyond the Bale* Richard Smith at **richard.smith@wool.com**.

Beyond the Bale has its very own Instagram account. You can follow **@beyondthebale** on Instagram and also tag us in your photos for your chance to be featured. We will also be showcasing on Instagram some photos emailed in to Readers' Photos (we'll ask your permission first), so you can keep emailing them in.

THE BIG DRY

The two sons and daughter of **Daryl and Lesley Honeysett** of **Tallawang**, north of Gulgong in **NSW – Rebecca, Brad,** and **Nat** – decided that feeding their sheep needed a little bit of light heartedness, to great effect!

WOOLMARK JACKET SETS SAIL

On the recent trip from Sydney to Hobart aboard the Soren Larsen tall ship, the Woolmark Optim WR Jacket showed its excellent characteristics, both warm and dry yet light and airy all in one, according to **William Bennett** of 'Raintree Farm' at **Cowra** in **NSW**. Deck hand **Kimmie** models the jacket.

SHEAR DELIGHT

Rachel Smart of 'Wilkatana Station' at **Port Augusta** in **South Australia** shared this picture of her youngest son Will who she said had an absolute ball learning all the tricks during shearing.

GETTING TO KNOW YOU

Brenton Heazlewood's 17-month-old granddaughter **Celia** getting to know one of his English Leicester rams at **Whitemore** in **Tasmania.**

DOG TIRED!

Anna Reeves of **Lankeys Creek** in the southern Riverina of **NSW** sent in this photo of her brother Tony and his dog Billie during smoko when shearing in southern WA. The photo was taken by **Joseph Dennis** who was on the shearing team.

HELPING DAD COUNT SHEEP

Glenn Simcock sent in this photo of young **Harry Simcock** joining in when his dad **Clayton** was counting out a mob of sheep from the yards on 'Wendouree Downs' at **Kojonup** in **WA.** Glenn said Clayton did well to not lose count.

FARM BOOT FOOT RACE

The Farm Boot Foot Race at **Darkan Sheepfest** in **WA** in February was won by local young farmer **Dan South** ahead of **Dan Chia** who have been running rivals since Darkan Primary School days, but they have never raced in farm boots before!

THE ONLY WAY TO LAND

Young **Beau Gemmell** of 'Radstock' at **Strathalbyn** in **South Australia** said: "I was flying down the fleeces in the woolshed, and what a great soft woolly landing. Good Aussie Merino wool!"

A PERFECT TECHNIQUE

Don Aroney sent in this photo of **Lester Jones'** perfect technique captured at shearing time at 'Letona', **Yass, NSW.**

EARLY MORNING YARD WORK

Early birds, worms and plenty of sheep. **Lexi Cesnik** (lexicesnik) posted on Instagram this photo of an early start for the team at the MerinoLink Merino Lifetime Productivity site, setting up the pens for the field day at **Temora** in **NSW.**

ARIAH PARK HERITAGE WOOL BRAND DISPLAY

Tricia Stubbs from the Riverina of **NSW** forwarded this photo of the **Ariah Park** community's effort to put a Heritage Wool Brand Display in their local park. The display shows the wool brands for Ariah Park & Districts both past and present, and each brand has been labelled with the name of the owner.

SUPREME CHOICE HORSEWEAR

Deb Cooper, who lives with her husband **Tim** on a small sheep property at **Holbrook** in southern **NSW**, runs a home business making quality bespoke horse products, specialising in wool rugs and horse sheepskin boots. The business has been running for 13 years and is going from strength to strength. Tim runs a shearing team, so wool is something about which they are both very passionate. Check out **Supreme Choice Horsewear** on Facebook to see Deb's great work.

Join the 'Q'

at www.woolq.com

WOOL Q

Creating opportunities | Increasing efficiencies | Securing the future