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2019-20 Highlights

500

COMMERCIAL AND
SEEDSTOCK BREEDERS
ATTENDED A SHEEP
GENETICS WORKSHOP

90%

OF SHEEP GENETICS CLIENTS
AGREE OR STRONGLY AGREE
THAT AUSTRALIAN SHEEP
BREEDING VALUES (ASBVs)
HELP THEM ACHIEVE THEIR
BREEDING OBJECTIVES

85%

OF SHEEP GENETICS CLIENTS
AGREE OR STRONGLY
AGREE THAT USING ASBVs
HAVE HELPED THEM
ACHIEVE A HIGHER RATE OF
GENETIC GAIN

THE RATE OF GENETIC GAIN
DOUBLED,
BASED ON THE MAIN
SELECTION INDEXES

THE ANNUAL
CUSTOMER SERVICE
SURVEY REVEALED THAT STAFF
**MAINTAINED
OR INCREASED**
THEIR SERVICE ACROSS
ALL AREAS

5%

INCREASE IN THE NUMBER
OF BILLABLE ANIMALS FROM
2018-19 TO 2019-20

**MORE THAN
DOUBLE**

THE AMOUNT OF
GENOTYPES WERE
SUBMITTED COMPARED
TO 2018-19

>350

SIRES WERE NOMINATED FOR
THE MLA RESOURCE FLOCK

AN ADDITIONAL
5,700

EWES WITH LIFETIME
PERFORMANCE TRAITS AND
GENOTYPES WERE INCLUDED
IN THE MERINO LIFETIME
PRODUCTIVITY DATA

FIVE

KEY ENHANCEMENTS TO THE
GENETIC EVALUATION
WERE MADE

THE REFRESHED
SHEEP GENETICS
SEARCH SITE
WENT LIVE IN
AUGUST 2020

COMPLETION
OF THE SHEEP
GENETICS DATABASE
REDEVELOPMENT
PROJECT - PHASE 1



Operations Manager's report



**Operations Manager -
Sheep Genetics, Gus Rose**



The Sheep Genetics team

Front row (L-R): Fiona McLoughlin, James Taylor, Emma McCrabb and Ermias Zerazion

Back row (L-R): Nicole Williams, Peta Bradley, Stephen Field and Gus Rose

I am pleased to share the Sheep Genetics 2019-20 Annual Report. We have had a big year delivering our service to our clients. This includes improving our genetic evaluation and Meat Livestock Australia's (MLA) investment into research and development, and adoption.

2020 has been a unique year and for the last four months of 2019-20 we were grounded and separated as a team. The Sheep Genetics team have done a brilliant job at keeping connected to each other and to our clients. We have also used this as an opportunity to improve our communication material and how we communicate with clients into the future.

The biggest highlights for 2019-20 have been:

- **The Sheep Genetics search website** (released in August 2020) and the on-going development of the site.
- **The database re-development project** – we have combined all of our databases to make them easier to use and better linked.
- **Data quality index** – the first stages of this project have already illustrated some of the benefits of improving data collection and submitting data quickly.

The increase in new members, animals submitted and traits recorded was a highlight from the past year. The efforts of clients have contributed to doubling the rate of genetic gain across all the standard indexes for all analyses.

Despite not being able to travel since March, we managed to reach more than 500 seedstock and commercial sheep producers in 2019-20. We have been sharpening our skills at getting information out to clients using webinars, videos and online tutorials. These have been successful and we will keep using these in the future to complement forums and workshops.

The improvements to our genetic evaluation in May were extensive. Thank you to the Animal Genetics and Breeding Unit team for your extra efforts to push through more improvements than we had planned. Read more about these improvements in the Research and Development section on page 9.

Thank you to everyone who contributed to the Sheep Genetics program over the past year. We look forward to working with you over the next 12 months.





Membership growth

The number of flocks subscribed to Sheep Genetics increased by 6% in 2019-2020. And the number of billable animals increased by 5% compared to the previous year. Sheep Genetics flocks are distributed throughout the main sheep producing regions of Australia.

MLA introduced the Accelerated Adoption Initiative in November 2019 to encourage adoption of MLA programs by levy payers, which waived flock subscription fees and animal submission charges. Sheep Genetics tracked billable animals but only invoiced clients from overseas after this date.

Figure 1. Number of billable animals over time

↑ **4.55% to 322,000**

Number of Billable animals



This graph includes NSIP animals processed by Sheep Genetics.

Figure 2. Number of subscribed flocks over time

↑ **5.91% to 985**

Number of Subscribed Flocks



Table 1. Number of animals from each breed group billed in 2019-20

Breeds	Billable
Merino	145,316
Terminal	101,726
Maternal	37,283
Dohne	10,682
Goats	377

Table 2. Location of breeders by state submitting data to Sheep Genetics

State	Proportion of breeders %
New South Wales	20
South Australia	16
Victoria	16
Western Australia	13
Tasmania	3
Queensland	1

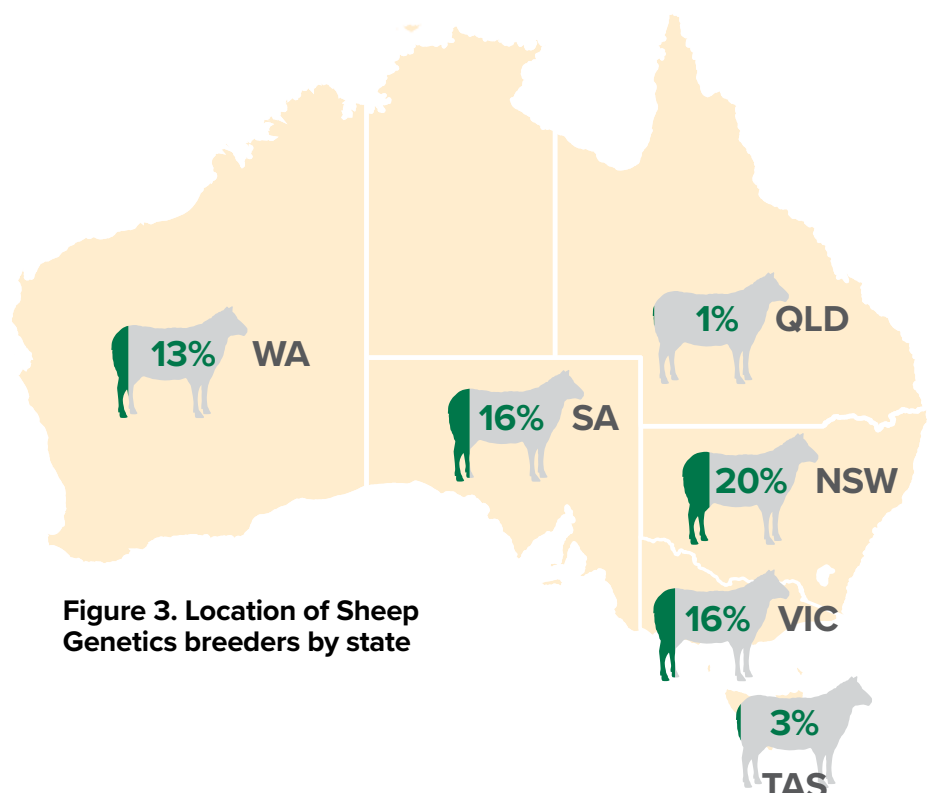


Figure 3. Location of Sheep Genetics breeders by state



Genetic trends

In 2019-20 all standard indexes increased across all the major analyses. Improvements both in genetic trend and recording were noted in key trait groups including:

- increased reproduction trend in Merinos and Maternal
- decrease in early breech wrinkle in Merinos
- maintaining intramuscular fat and shear force while increasing lean meat yield in Terminals
- improved growth across all analyses.

Top tip

For more information on Sheep Genetics selection indexes go to sheepgenetics.org.au

Figure 4. Merino Indexes

↑ 2.80% to 147

Dual Purpose Plus (DP+) Index

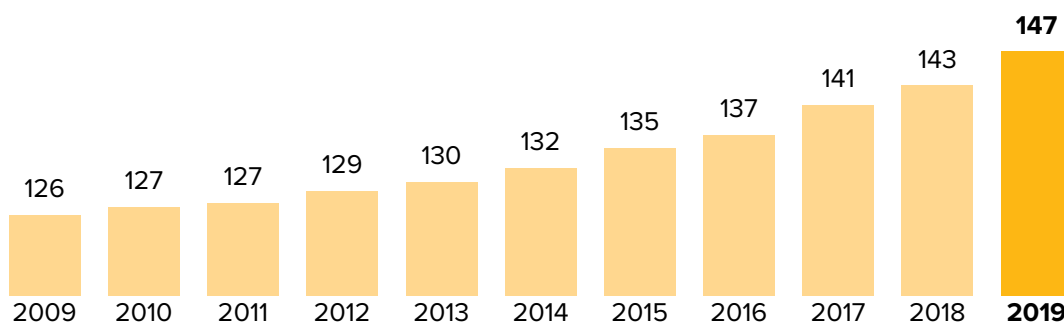


Figure 5. Terminal Indexes

↑ 1.49% to 136

Terminal Carcase Production (TCP) Index

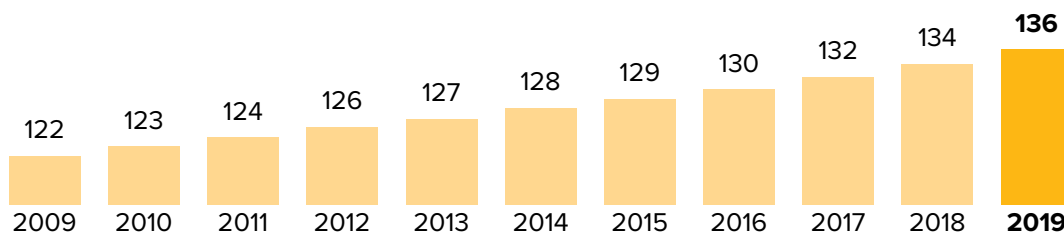


Figure 6. Maternal Indexes

↑ 1.49% to 136

Maternal Carcase Production Plus (MCP+) Index

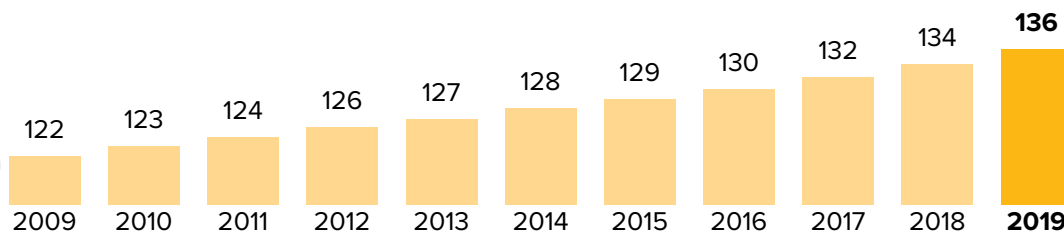
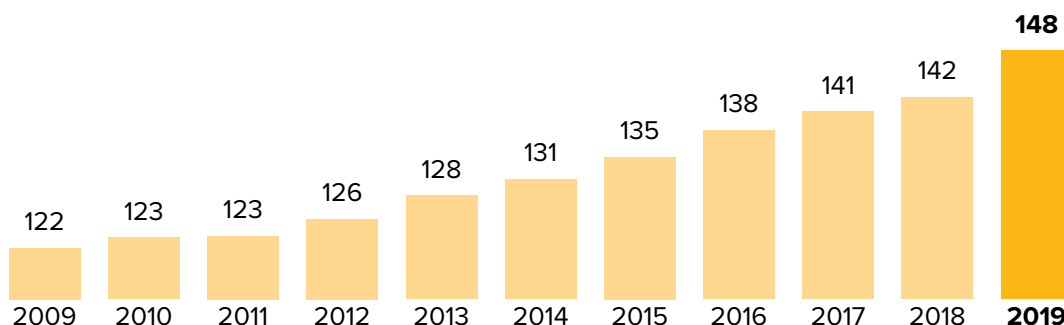


Figure 7. Dohne Indexes

↑ 4.23% to 148

Dohne Plus (DOHNE+) Index





Genotyping

Strategic genotyping enables breeders to more accurately select animals at a younger age for hard-to-measure traits e.g. eating quality, or traits that are measured later in life such as reproduction. Accurately selecting animals and using them at a young age e.g. using ram lambs, drives genetic gain.

There are two key genomic services used by Sheep Genetics clients:

- DNA Parentage
- Genotyping (50K SNP Chip).

There has been a significant increase in both DNA Parentage and Genotyping. This is reflected in the growing number of genotypes used in the genetic evaluation. Genomic information is included and used in the three main evaluations MERINOSELECT, LAMBPLAN – Terminal, and LAMBPLAN – Maternal.

Why use Genomic Selection?

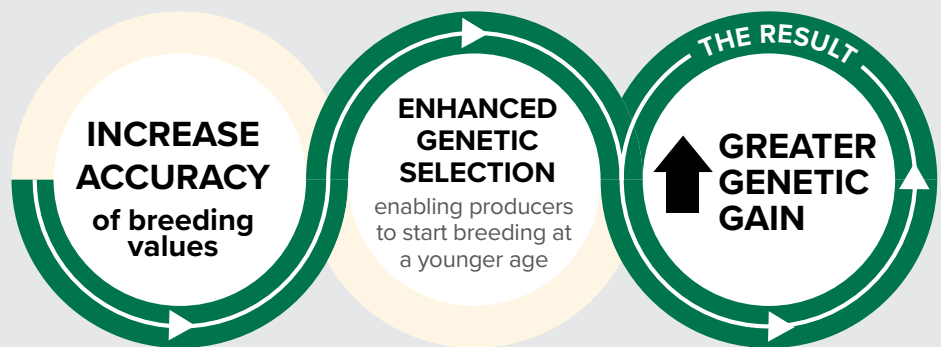


Figure 8. Genotyping over time

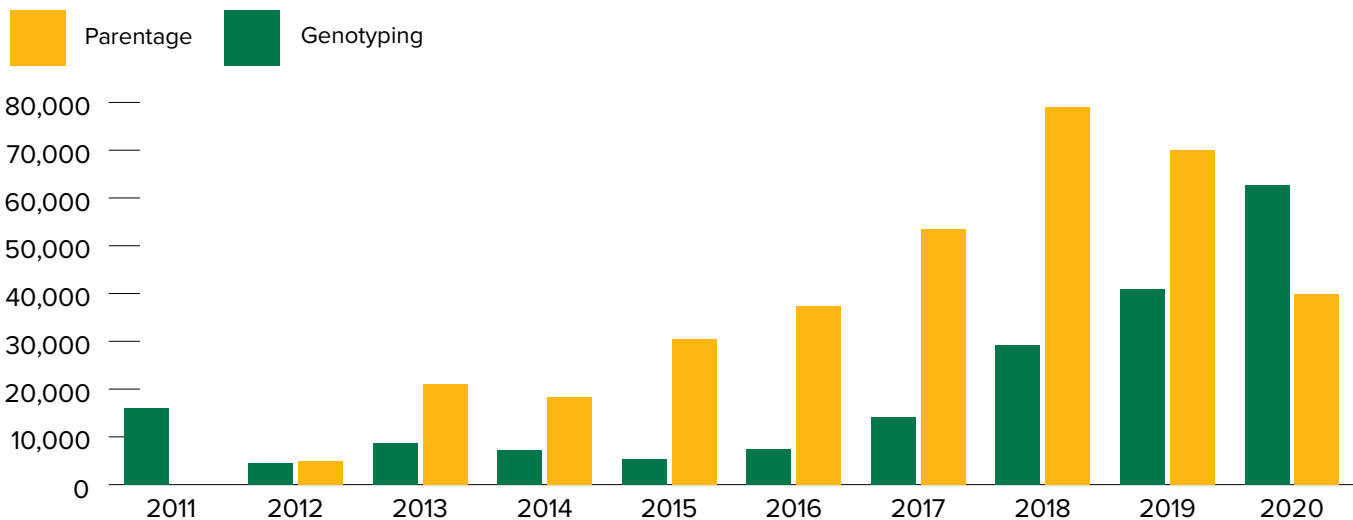
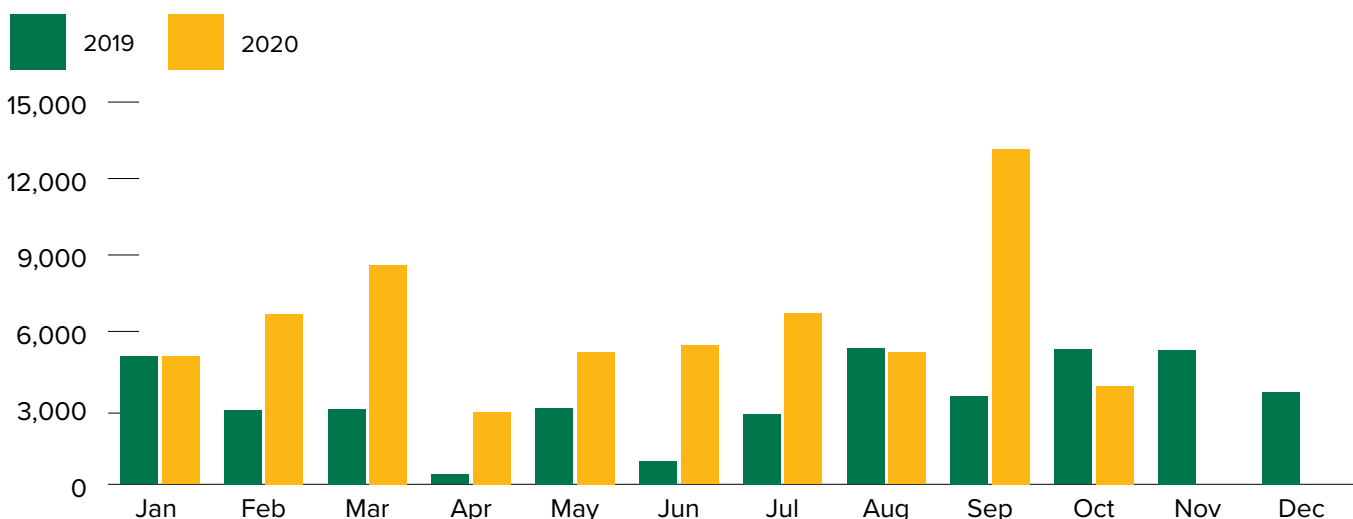


Figure 9. Genotyping by year and month





Education and events

More than 500 commercial and seedstock breeders received in-person and online education from Sheep Genetics at producer workshops and information sessions held throughout 2019-20.

Sheep Genetics also had a presence at several key industry events including the Bendigo Sheep and Wool Show, Hamilton Sheepvention and the Association for Advancement of Animal Breeding and Genetics (AAABG) Conference.

The Sheep Genetics program hosted the following events with key service providers:

- Scanner Accreditation Workshop
- Online workshops with our four commercial software providers
- 53 service providers attended the Sheep Genetics online Service Provider training.

Key events for Sheep Genetics members included:

- MateSel training – allowing more members access to the analytical software to guide mating decisions
- Breeder group conferences and webinars
- A Zoom release of the Merino RBVs
- Analysis Enhancement and R+D update.

Key statistics:

- 53 service providers attended our online service provider training
- 29 service providers joined the Sheep Genetics Service Provider Facebook group
- Three MateSel workshops were held across Melbourne, Katanning and Dubbo. A further 20 breeders were provided access to MateSel
- More than 130 seedstock breeders and service providers have access to the MateSel software
- Multiple software provider meetings have been held with the four commercial software providers that breeders use to submit data to Sheep Genetics
- Sheep Genetics staff worked with six breeder groups that have more than 70 members through face-to-face and online meetings
- Two producer days attracting more than 80 commercial breeders were held in WA
- Sheep Genetics delivered workshops, field days and forums to more than 300 commercial breeders across the country
- Merino RBV workshop was delivered online to more than 30 seedstock participants
- The Analysis Enhancement update attracted 50 online attendees.



Research and development

Moving towards the goal set by the National Livestock Genetics Consortium (NLGC) to double the rate of genetic gain in the red meat industry by 2022, MLA continues to invest in the further development of the Sheep Genetics evaluation. In April 2020 there were several Analysis Enhancements implemented. Annual enhancements are made to the genetic evaluation to ensure that it remains a world leader, enabling our breeders to base selection decisions on the best predictions.

Enhancements made in 2020 include:

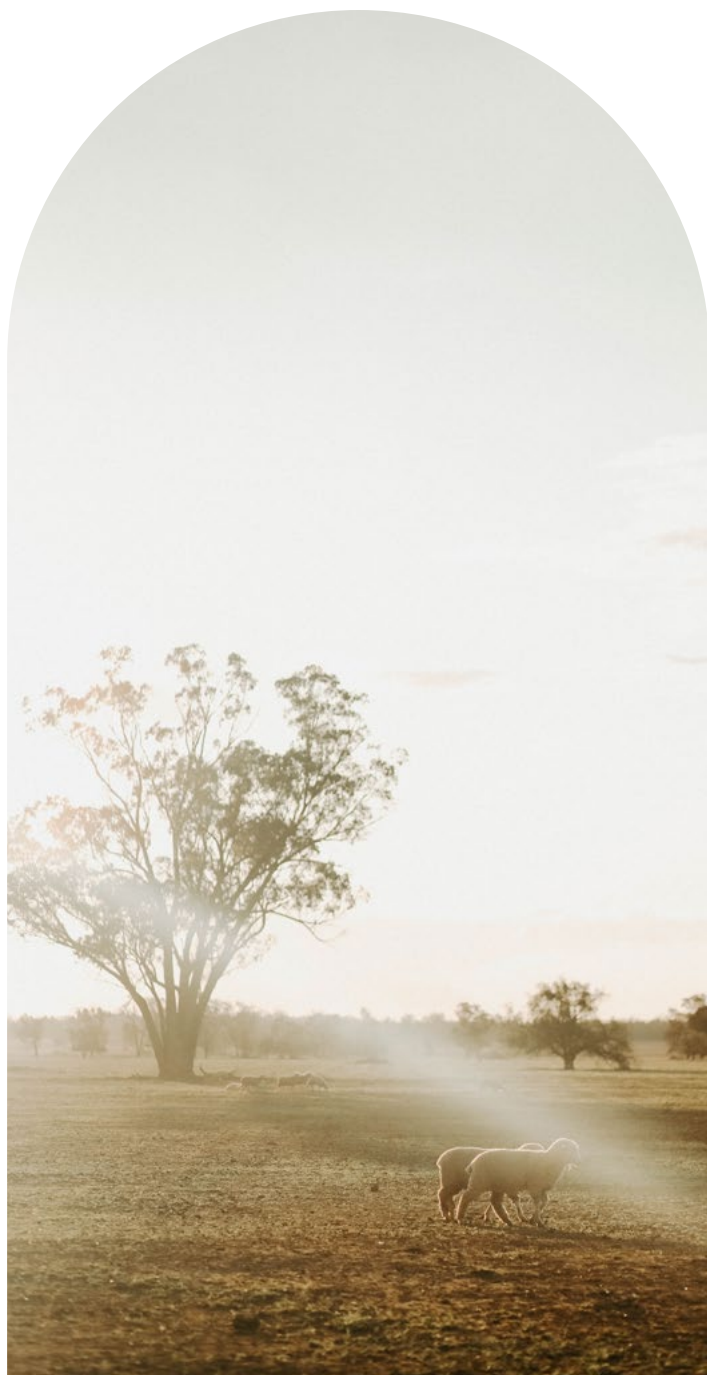
- New reproduction Research Breeding Values (RBVs) were released for merinos, giving producers the ability to target selection at different stages of the reproductive process
- Updates to fleece weight, which means that the analysis is more accurately describing the genetic differences between animals throughout their lifetime
- Updated accuracy algorithm, which helps reduce the time it takes for analysis to run and makes better use of genomics in the prediction of accuracy

- Inclusion of data from the Merino Lifetime Productivity data in the MERINOSELECT evaluation, which includes repeat adult measurements and genotypes on 5,700 daughters from 134 industry sires
- Aligning pedigree and genomic relationships in MERINOSELECT, which gives a more accurate prediction of breeding values for flocks that have done extensive recent genotyping that did not have a great depth of historical pedigree.

The MLA Resource Flock collects phenotypes for a range of hard-to-measure traits, including lean meat yield and eating quality. There is an annual call for breeders to submit sires into the Resource Flock – in 2019-20, 150 sires were selected from the 355 nominated.

Table 3. The number of sires from each breed selected for the 2020 Resource Flock joining

Breed	Count of sires
White Suffolk	22
Poll Dorset	22
Suffolk	9
Composite Terminal	3
Texel	4
Southdown	3
Corriedale	3
Composite Maternal/ Coopworth	14
Merino	22
SAMM	5
Dohne	12
Dorper/White Dorper	26
Border Leicester	9





Snapshot

Property name: Curlew

Breed: Merino

ENTERPRISE: 600 merino stud sheep, 12,000 self-replacing merino flock, Merino and White Suffolk cross lambs

Location: Edenhope, Victoria

Rainfall: 500mm



Bernie, Elise and Tony Kealy from Curlew Merinos

How long have you been using MERINOSELECT?

We began subscribing to MERINOSELECT in 2012 after participating in a pilot genetics workshop that year.

What are your breeding objectives, and how does it relate to your business direction?

Our business direction is to run a profitable self-replacing merino flock. We aim to breed the most profitable sheep we can for our western Victorian environment, and our stud provides our commercial flock with the genetics to achieve this goal. Our breeding objective is constantly evolving to incorporate new research based on feedback from end users, including ram clients, wool processors and meat processors.

Do you use any other programs or technology in your breeding program?

We have used MateSel this year for the fourth time and find it to be a great tool. It takes an enormous amount of work out of preventing inbreeding and coancestry and allows you to see the potential results of your matings before they occur. We also have used genomics the past couple of years to increase the accuracy of our stud rams and ensure we are making decisions based on the best information available. For data collection and recording we find a Datamars and an XR 5000 to be excellent tools.

How are your commercial clients using the genetic information that you provide them?

For our clients who select on ASBVs, it removes the environmental impact that influences the phenotype of the rams, enabling them to select genetically superior rams. There are also many traits that ASBVs enable genetic gain for, which cannot be assessed visually, such as worm resistance.

For our clients who don't select on ASBVs, they too have noticed the change. Prior to implementing ASBVs our genetic gain was quite small. Since we fully adopted ASBVs in 2012 our genetic gain has increased enormously. Clients who don't use ASBVs have commented on how much better their lambs grow out now. We have a long-term client who has marked 135% Merino to Merino. Our shearers have commented on how the sheep are becoming plainer, and we have been able to do this while increasing fleece weight.

What excites you about the future of sheep production?

We have only had ASBVs in our stud flock for the last seven to eight years and we can see a huge improvement in our stud sheep in this time. We are really looking forward to when the benefits of this are extrapolated out over our commercial flock of 12,000.



