

# Merino Lifetime Productivity Project Newsletter No.18

## That's a wrap!

The last of the Merino Lifetime Productivity (MLP) project data was collected in July 2024, rounding out nearly 10 years of data collection which has seen the creation of 2,000,070 data points.

The project will now focus on the core project analysis, generating outcomes to help enhance breeding and selection systems to select rams and ewes at young ages that are more productive through life.

## Last New England Field Day

**The final MLP project sheep field day was held at the New England site, where research breeding values for fleckstrike were also launched.**

Ahead of the final shearing event at the New England site in July, an enthusiastic crowd of over 100 attendees gathered on May 29 for the final sheep field day at CSIRO's Chiswick property. The display of 30 pens of ewes, the daughters of industry sires, garnered significant interest along with the newly released breech strike research breeding values.

In the sheep yards, presentations were given by the sheep classers involved in the site, including Angus Carter from Nutrien and Andrew Calvert from Wool Solutions. The session also featured the final penside sire introductions for the project and the launch of the new breech strike breeding values.

During the afternoon presentations, Geoff Lindon from AWI outlined the next steps for the project's analysis. Amy Bell, a CSIRO researcher, also shared collaborative efforts with AWI to develop a method for selecting Merinos with enhanced resilience by evaluating immune competence and indicator traits.

## MLP quick facts

- The Australian Wool Innovation (AWI) funded MLP project is a \$8M (plus \$5M from partners), 10-year partnership between AWI, the Australian Merino Sire Evaluation Association (AMSEA), nominating stud Merino breeders and site hosts.
- The MLP project has run at five sites where sire evaluation trials operated for the first two years and then tracked the performance of ewe progeny through four to five joinings and annual shearings.
- **Balmoral, VIC** Host: Tuloona Pastoral  
**Committee:** Balmoral Breeders Association
- **Pingelly, WA** Host: Murdoch University / UWA  
**Committee:** Federation of Performance Sheep Breeders (WA Branch)
- **MerinoLink, Temora NSW** Host: Moses & Son  
**Committee:** MerinoLink Limited
- **Macquarie, Trangie NSW** Host: NSW DPI  
**Committee:** Macquarie Sire Evaluation Association
- **New England, NSW** Host: CSIRO  
**Committee:** New England Merino Sire Evaluation Association
- A full suite of assessments have been undertaken during the MLP project including visual trait scoring, classer gradings, the objective assessment of a range of key traits and index evaluations.
- A unique and extensive dataset will result and be used to enhance existing Merino breeding and selection strategies, for both ram sellers and buyers, to deliver greater lifetime productivity and woolgrower returns.



New England Field Day 2024

## Field Day Update Continued

Professor Daniel Brown detailed the AWI-funded efforts to develop ASBVs for flystrike, and Dr. Jen Smith, on behalf of Erin Smith, highlighted the crucial role udder structure plays in lamb survival and weaning weights and outlined three new udder and teat traits that have been developed using data collected on the New England MLP F1 ewes.

A dinner followed the day to celebrate the end of data collection in the project and to thank the contributors to the New England site.

Read more about what the New England classers had to say at the field day in [AWI's Beyond the Bale Issue 100 \(September 2024\)](#).



New England site chair Todd Whillock and AWI's Geoff Lindon

## How well does early reproduction performance predict the lifetime performance of MLP ewes?

On June 5th, AGBU Postdoctoral Research Fellow Dr. Peter Wahinya presented findings from the Merino Lifetime Productivity (MLP) project at the annual MerinoLink conference. His presentation focused on assessing the ability of early-life performance to predict lifetime performance at the MerinoLink MLP project site. As part of the presentation, Peter examined how estimates of genetic performance for reproduction (Weaning Rate) changed over time.

Reproduction is lowly heritable and sire breeding values are estimated from evaluating female progeny for conception, litter size and their ability to raise a lamb which is combined into the trait known as Weaning Rate (WR). To achieve an accurate estimate of a sire's breeding value for WR requires a sufficiently large number of daughters with reproduction records, ideally collected over repeat reproduction events.

At the MerinoLink site, thirteen sires were progeny tested in each drop, with 29 and 34 ewe progeny per sire for the 2016 and 2017 drops respectively.

### Weaning Rate - Flock Breeding Value Correlations Over Time

Figure 1 shows correlation plots between lifetime WR Flock Breeding Values (FBV) and FBVs estimated using cumulative reproduction data at each stage of assessment. In the charts, "Data up to A2" denotes FBVs based on the first joining. "Data up to A3" uses the first and second joining, "Data up to A4" uses data from the first to third joinings and "Data up to A5" uses data from the first to the fourth joinings. We refer to the "Data up to A5" FBV results as the lifetime data in this article.

One reproduction event record produced a correlation of 0.72 with lifetime performance, while two records increased this to 0.85. This is often the case, as the first or maiden performance can be affected by physical and behavioral immaturity.

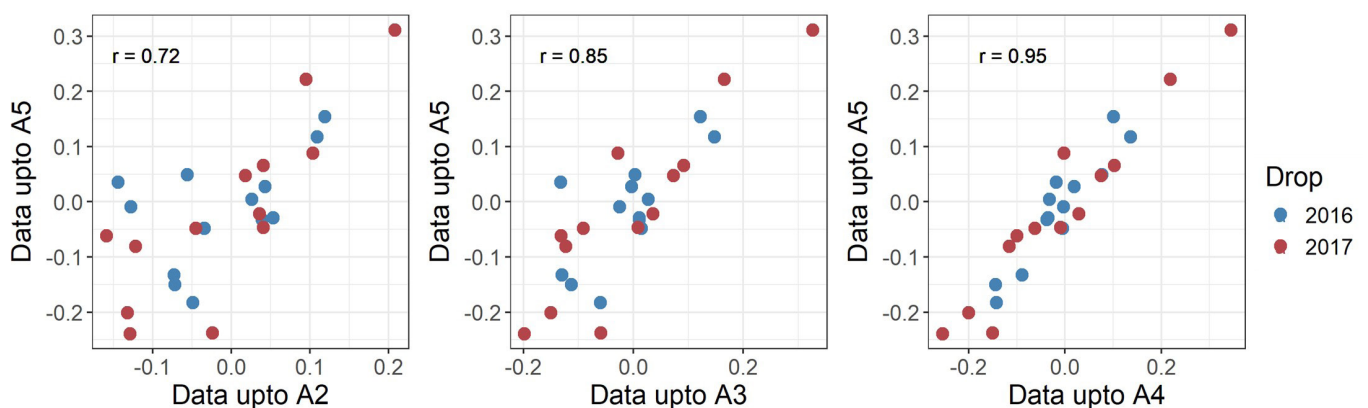


Figure 1: MerinoLink Weaning Rate FBVs change over time

Peter has also looked at how breeding values change across all the MLP sites and has shown that the relationship between lifetime WR and each stage of reproduction assessment ranged from 0.61 to 0.96 for FBVs and 0.89 to 0.99 for ASBV, with the lowest correlations observed in breeding values estimated from reproduction data of maiden ewes.

### Weaning Rate - Flock Breeding Value Accuracy

At the conference Peter also shared a simulation study that used data from the MLP project to estimate how accurate the WR FBVs are when different numbers of ewe progeny are evaluated and with varying numbers of repeat joinings. He then compared these results to the accuracy of ASBVs for the same scenario and assumed that all sires and ewe progeny had been genomically tested.

Breeding value accuracies range from 0% to 100%, indicating how closely the estimated breeding value aligns with the true breeding value. An accuracy of 100% means the estimated breeding value perfectly matches the true value. If the accuracy is below 100%, there is a likelihood that the estimated breeding value may change.

The simulation study indicated a significant improvement in the accuracy of WR FBV estimates as the number of ewe progeny assessed per sire increased, particularly when repeat joinings were available (refer to the charts in Figure 2). The most significant impact of repeat joinings is observed when fewer ewe progeny are evaluated per sire. When compared to ASBVs for reproduction, which include genomic data, it was found that high accuracy can be achieved with a smaller number of ewe progeny evaluations and fewer reproduction events.



Dr Peter Wahinya at the MerinoLink conference



MLP ewes at Macquarie in July 2022

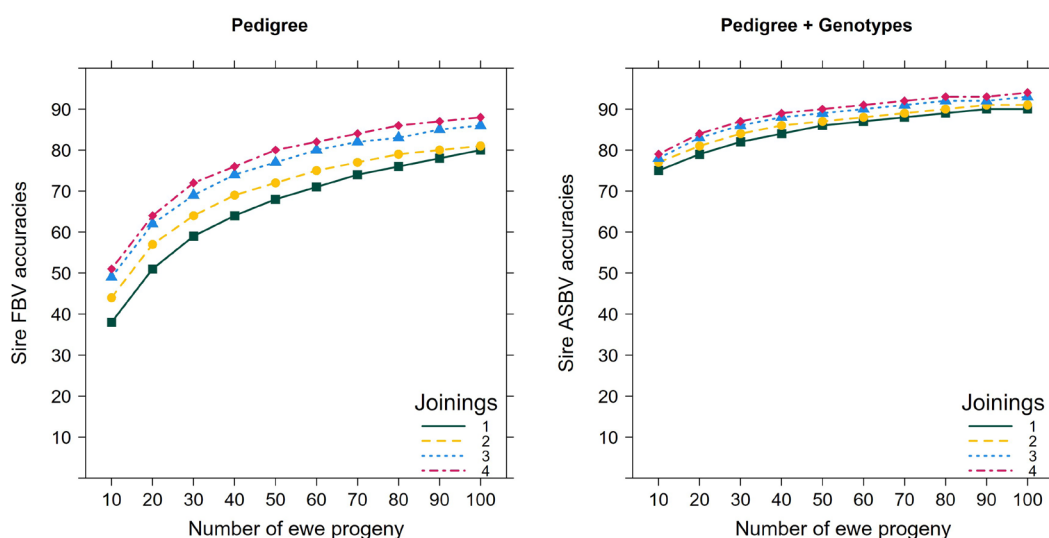


Figure 2: Benefits of genomics in estimating Weaning Rate, MLP Simulation Study

### Wrap Up

The key takeaway from Peter's work is that the accuracy of WR breeding values improves with the number of progeny evaluated. Genotyping is expected to lead to substantial accuracy gains for reproduction traits and recording multiple mating events will likely further enhance accuracy and reduce bias.

The MLP project has significantly contributed to the Merino reproduction genomics reference population by providing lifetime reproduction data for over 4,800 ewes (resulting in more than 20,000 weaning rate records). This contribution has enabled the industry to access more accurate reproduction estimates through genomic testing.

With the MLP dataset now complete, Peter is analysing correlations between all measured and visual traits across different age stages. He is also estimating the heritability of these traits and assessing the impact of factors like birth type, rear type, reproduction, and lactation on performance.

## Thanking the New England Site

A big thank you to the New England site that has been hosted by CSIRO in partnership with the New England Merino Sire Evaluation Association. The CSIRO team was led by Dr Jen Smith and supported by a highly capable technical team that included Amy Bell, Graham Acton, Duncan Elks, Grant Uphill and Heather Brewer. We also recognise the Chiswick farm staff for their support of the project, plus Angus Carter, Andrew Calvert and Harold Manttan for their valued involvement.

The New England site committee was initially chaired by Duncan Lance during which time several successful field days were held, including an online version during COVID. Midway through the trial, local stud breeder Todd Whillock took over the reins and led the site through the last two well attended field days. Many thanks to the site committee members who helped in the early stages of data collection, and with the success of the field days.

Thanks to the sire entrants for their willingness to have the progeny of their sires evaluated and compared through life.

Guiding the site through drought, flood, and COVID was no small feat. The project extends its thanks to Jen, the CSIRO team, the site committee for their dedication and for maintaining such a high standard of data quality.



New England Site Committee from left to right, Martin Oppenheimer, Dr Jen Smith, Professor Andrew Swan, Katrina Blomfield, Jock McLaren, Peta Bradley, Hugh Nivison, Duncan Lance and Kim Barnett in 2018



Dr Jen Smith at the New England Field Day 2024



Classers Andrew Calvert and Angus Carter at the New England Dinner 2024

### Catch MLP Project Updates at these events!

**Balmoral Field Day, Warooka, Melville Forest, Vic**  
7 March 2025

**AAABG, Queenstown, NZ**  
24 - 26 June 2025

### Would you like to find out more about Flystrike Breeding Values?

Contact Geoff Lindon  
E: [Geoff.Lindon@wool.com](mailto:Geoff.Lindon@wool.com)

[Or listen to AWI's The Yarn Podcast - Episode 260](#)

## Further information

Download MLP Reports from [www.merinosuperiorsires.com.au/mlp-project-reports](http://www.merinosuperiorsires.com.au/mlp-project-reports)

Feel free to contact the Site Managers, Project or AMSEA staff who are listed in reports for assistance with interpreting reported results.

Contact MLP Project Manager Anne Ramsay on **0400 368 448**

The Merino Lifetime Productivity Project is being undertaken in partnership between the Australian Merino Sire Evaluation Association Incorporated (AMSEA) and Australian Wool Innovation (AWI). AMSEA and AWI would like to acknowledge those entities who also contribute funding, namely Woolgrowers through sire evaluation entry fees, site hosts, site committee in-kind contributions, and sponsors of AMSEA. A special acknowledgement is also made to the Australian Government who supports research, development and marketing of Australian wool.



[www.wool.com/MLP](http://www.wool.com/MLP)