

NUMBER OF LAMBS PER SIRE REVEALED BY DNA TESTS

Research associated with the Merino Lifetime Productivity (MLP) project has revealed significant differences in the number of lambs per sire in syndicate joinings. How these differences vary between joinings is now being explored as this may have implications for sire management and selection.

AWI and the Australian Merino Sire Evaluation Association (AMSEA) have teamed up with five sire evaluation sites to deliver the MLP Project 2015-25.

The project is designed to capture lifetime data across diverse environments and Merino types to help better understand and deliver Merino ewe lifetime performance outcomes for the Australian Merino industry. This will include developing a better understanding of what can be done to improve selection at young ages for lifetime Merino ewe productivity. The vast volume of data being collected through MLP also provides an unprecedented opportunity for additional research into reproductive phenomena such as sire dominance.

Central to the MLP project are the 5,500 F1 ewes that have been bred through artificial insemination (AI) using 135 industry sires. These 5,500 F1 ewes will be syndicate joined 4-5 times during the life of the MLP project. DNA parentage is being used to identify the sire and dam of their F2 progeny with the aim to generate repeat reproduction records.

Early DNA parentage results of the F1 ewe

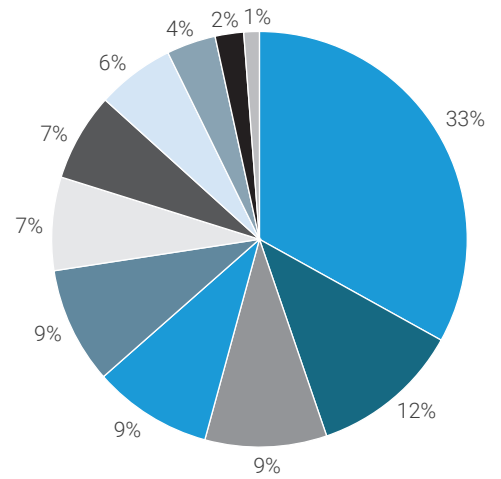
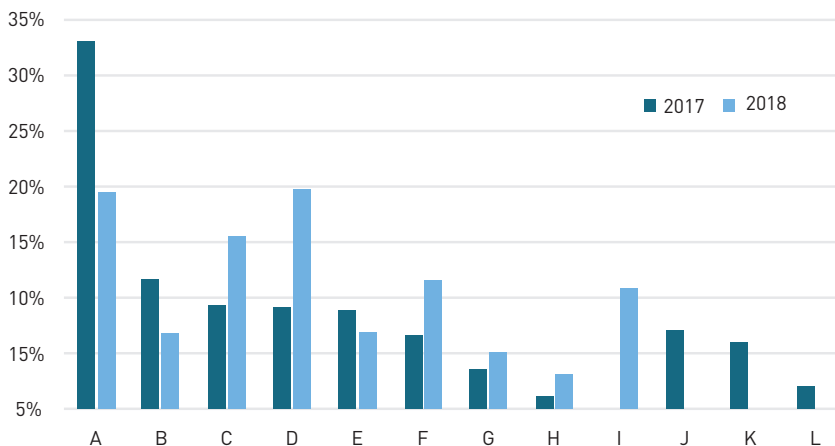
joinings has occurred at three of the five sites to date and show that, within a syndicate, there are often rams that sire a large number of lambs and others that sire very few lambs.

Research previously undertaken by MerinoLink and co-funded by AWI showed that when the same syndicate was joined for a second time, the dominance patterns can change.

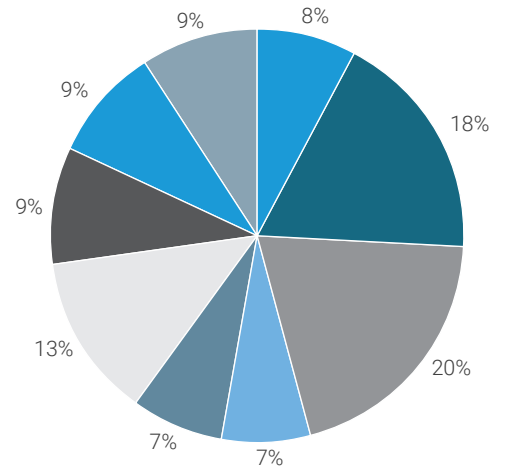
The three pie charts to the right from the MLP project show the percentage of progeny per sire from maiden joinings at Balmoral (the 2015 drop F1 ewes in the 2017 joining) with a joining percentage of 1.9%, and MerinoLink and Pingelly (the 2016 drop F1 ewes for the 2018 joining) both with a joining percentage of 2.3%.

In 2018, the Balmoral site rejoined eight of the same 11 rams used the previous year to the same 2015 drop ewes. Three rams from the previous year were unavailable and one new ram was added. The chart below suggests that sire A, the outstanding ram from 2017, is again a dominant ram the following year producing 101 lambs compared to sire H who only produced 6 and 17 progeny.

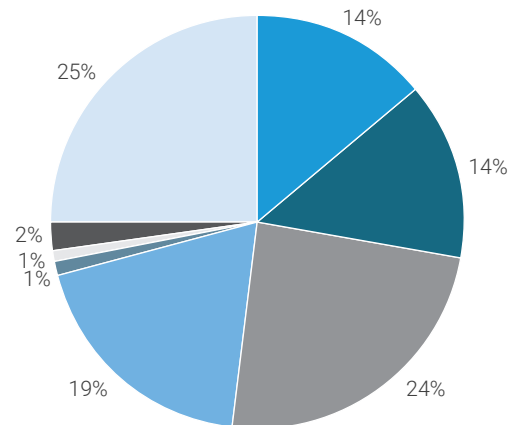
Balmoral 2015 Drop F1 – Portion of F2 Lambs Per Sire (2017 Versus 2018)



Balmoral 2017 F2 Lambs Per Sire
Range: 6 - 164 lambs



Pingelly 2018 F2 Lambs Per Sire
Range: 27 - 75 lambs



Merinolink 2018 F2 Lambs Per Sire
Range: 3 - 88 lambs

The above figures demonstrate the disproportionate contribution of dominant (high serving capacity and fertile) sires relative to other sires within a syndicate. Of particular note is the sire at Balmoral who produced 33% of the progeny in 2017 amounting to 164 lambs, compared with only six lambs by another sire in the syndicate.

While there is on-going natural selection for male and female fertility within syndicate paddock joining, since 1982, artificial insemination and embryo transfer has been adopted with reduced natural selection for male fertility and serving capacity.

The impact of this reduced natural selection is unclear; however, the repeat records generated over time through MLP will provide an insight into the variability that exists in flock rams regarding the number of lambs they sire per year and its repeatability. (The heritability of 'ram mating success' is 0.3 in prime lamb breeds.)

Smart tagging ewes and sires may give earlier information about serving capacity as

well as fertility if the ewe cycles for a second or third time. AWI has recently received a project proposal on this topic.

In the meantime, breeders can continue to visually cull for low scrotal circumference and select sires for higher scrotal circumference as this leads to more fertile rams and daughters. Where a ram breeder measures this trait, ram and semen buyers can use MERINOSELECT ASBVs for scrotal circumference.

Another interesting observation from DNA parentage is that a significant proportion of twins are sired by different sires (see table below). MerinoLink Site Manager, Sally Martin, confirmed that 32% of twins

were sired by two different sires at the MerinoLink site. This increased to 36% at Balmoral and 63% at Pingelly. These figures are consistent with previous research reported by MerinoLink.

While the outcomes of syndicate joinings are not a key focus of MLP, these preliminary results demonstrate the strength of the volume of data being collected during the project as well as the opportunity to leverage this data through additional research. **E**

MORE INFORMATION:
wool.com/MLP

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YEAR JOINED	EWES JOINED	NUMBER OF SIRES	PROGENY TAGGED	SETS OF TWINS	% TWINS BY TWO SIRES
Balmoral 2017	584	11	498	92	36
Pingelly 2018	386	9	368	49	63
MerinoLink 2018	348	8	353	87	32

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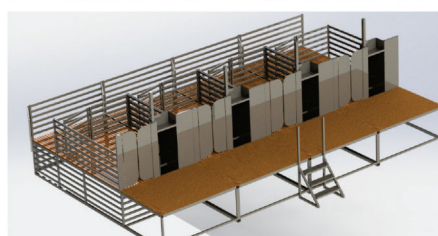
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