

MerinoLink Limited Sire Evaluation

Central Test Sire Evaluation *Within Flock Analysis*

2014 Drop
Yearling and Hogget Assessments

Conducted by



under the auspices of

The Australian Merino Sire Evaluation Association



March 2016

MerinoLink Sire Evaluation Sponsors and Supporters – 2014 drop



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Disclaimer

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The Australian Merino Sire Evaluation Association has approved the format used in this report. Australian Flock Breeding Values reported here are based on analysis conducted by Sheep Genetics.

MerinoLink Limited - Central Test Sire Evaluation

MerinoLink Limited embarked to run the South West Slopes sire evaluation site following the success of the South West Slopes Merino Breeders (2003, 2005 and 2008) and Bluechip Livestock (2011 x 2 and 2012) sire evaluations and young sire programs.

The MerinoLink Sire Evaluation site is an accredited Central Test Sire Evaluation (CSTE) site. It conforms to the requirement of the Australian merino Sire Evaluation Association (AMSEA).

We would like to thank and acknowledge the dedication of Dean and Mandy Bourlet for hosting the sire evaluation. Your enthusiasm and commitment to merino breeding is appreciated.

The classing for the first and second visual assessments was conducted by Mr Rick Baldwin, Bundilla Merino Stud and we would like to fully acknowledge Ricks professional contribution to the visual assessments.

The 12 Merino sires being evaluated includes a historical sire, 1988 drop, as part of the AMSEA Historical Sire Program (funded by Australian Wool Innovation). The Historical Sire program

aims to evaluate sires that have been previously entered in sire evaluation sites between 15 and 20 years ago. The progeny will be fully evaluated alongside the current industry sires.

Whilst providing a very interesting comparison between leading sire of the 80's and 90's with those of today, the main purpose of the Historical Sire Program is to provide further validation and confidence in the system of linkage that is used by MERINOSELECT to directly compare animals across drops.

Results from the Historical Sire program will be published by AMSEA at the conclusion of the program in addition to individual sire performance results for historical sires being published in the MerinoLink Sire Evaluation Site Reports and the annual Merino Superior Sires.

We trust that everyone has achieved something out of this program and we look forward to providing leading genetic evaluation tools into the future.

Sally Martin, MerinoLink CEO

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The information in this site evaluation report provides a comprehensive assessment of the 2014 drop 1st and 2nd stage assessments of the sire's progeny performance, both measured and visually assessed traits. **The information reported is based on a within flock analysis of the sire progeny being evaluated.**

The 1st Assessment was carried out at 10 months of age with 10 months of wool growth. The 2nd Assessment was carried out at 18 months of age with 8 months wool growth.

Contents

	Page
Sire details	4
Management report	5
Assessment and management program	6
Visual trait assessment and site Breeding Objective	7
Results – 1st and 2nd Assessment	
Summary	
Figure 1a: Combined measured and visual trait performance (DPP).....	8
Figure 1b: Combined measured and visual trait performance (MPP).....	8
Figure 1c: Combined measured and visual trait performance (FPP)	8
Table 1: Index values and Classer's Grades	9
Figure 2: Fleece Weight and Fibre Diameter	10
Figure 3: Classer's Grade: Tops and Culls - Hogget	10
Figure 4: Fleece Weight and Body Weight	11
Figure 5: Fleece Weight and Fat	11
Figure 6: Fleece Weight and Eye Muscle Depth	12
Figure 7: Body Weight and Eye Muscle Depth	12
Detail	
Understanding the results – Measured trait performance	13
Table 2: Major measured trait and Classer's Grade performance	14
Table 3: Other measured trait breeding values	15
Understanding the results – Scored trait performance	16
Table 4a: Wool quality	17
Table 4b: Wool quality & Pigmentation	18
Table 4c: Conformation	19
Table 4d: Breech	20
Other assessment results	
Table 5: Sire averages for measured traits	21
Understanding the results – Information to assist the use of results	
Index options	22
Accuracy of Flock Breeding Values (FBVs)	23
Link Sires	23
Calculation of combined information	23

Sire and owner details

Sire and owner details

Sire code	Breeders flock, Sire number Sire ID #, Breed [†]	Contact name, address Phone, Fax, Email
1*	Billandri Poll, 100701(Link) 600571-2010-100701 Poll Merino	Bill and Geoff Sandiland, Billandri, Kendenup WA 6323 P: (08) 9851 4030 F: (08) 9851 4264 E: csandilands@bordnet.com.au
2**	Centre Plus Poll, 907538 (Link) 601250-2009-907538	Robert Mortimer, Devondale, Tullamore NSW 2874 P: (02) 6892 8259 F: (02) 6892 8292 E: robert@centreplus.com.au
3	GRASS, 122165 503884-2012-122165 Merino	Graham Peart, GRASS Merinos Pty Ltd, PO BOX 216 Nambucca Heads NSW 2448 M: 0428 825 721 E: g.peart@icloud.com
4	Greendale, 120012 505069-2012-120012 Merino	Alan McGufficke, Willarney, 850 Maffra Road, Cooma NSW 2630 P: (02) 6452 3605 E: milliefarming@activ8.net.au
5*	Hazeldean, 8.3561 (Link) 500383-2008-003561 Merino	Jim Litchfield, Hazeldean Pty Ltd Cooma NSW 2630 P: (02) 6453 555 F: (02) 6453 5526 E: admin@hazeldean.com.au
6	Kerin Poll, 120425 601413-2012-120425 Poll Merino	Nigel Kerin, Karuga Park, 1142 Bournewood Road, Yeoval NSW 2868 P: (02)6846 4070 E: kerinag@bigpond.com
7	Identity With held at breeders request	
8	Pooginook Poll, 120506 601442-2012-120506 Poll Merino	John Sutherland, Paraway Pastoral Company, Pooginook, Jerilderie NSW 2716 P: (02) 6954 6145 F: (02) 6954 6168 E: pooginook@parawaypastoral.com
9^**	Roseville Park, 8-1232 (Link) 504166-1988-881232 Merino (Historical)	Matthew & Cherie Coddington, Glenwood, 39R Dilladerry Rd, Dubbo NSW 2830 P: (02) 6887 7286 F: (02) 6887 7103 E: rpmerinos@bigpond.com
10	Weealla Poll, 120117 600438-2012-120117 Poll Merino	Stuart McBurnie, Wealla, Millpulling Road, Balladoran NSW 2831 P: (02) 6887 9266 E: weealla4@bigpond.com
11	Willandra Poll, 120026 601610-2012-120026 Poll Merino	Ross Wells, Willandra, 477 North Coree Road, Jerilderie NSW 2711 P: (03) 5886 1223 F: (03) 5886 1605 E: rossirene@reachnet.com.au
12	Woodpark Poll, 120407 601151-2012-120407 Poll Merino	Stephen and Carol Huggins, Eurolie, HAY NSW 2711 P: (02) 6993 4616 F: (02) 6993 4122 E: woodparkpoll@bigpond.com

* Link sire: Sire evaluated to provide links between years and sites so that the all site results can be combined into a single report, e.g., *Merino Superior Sires*.

** Common sires (in addition to Link Sires) between this CTSE site and other sites.

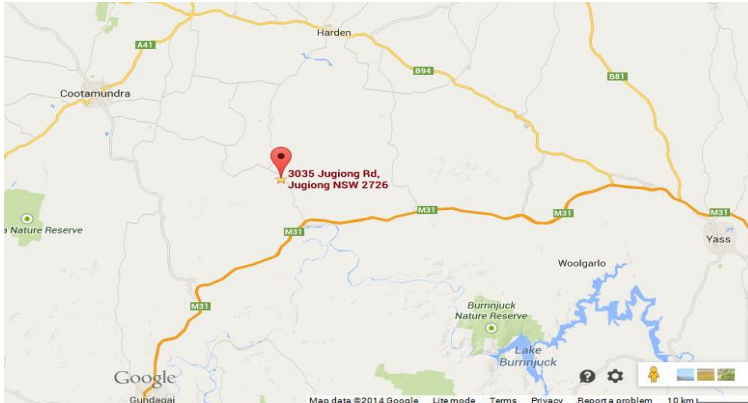
Sire ID provides a unique number for all sheep. A sire ID has 16 digits.
 - 2 for the breed of the flock, e.g., Merino (50), Poll Merino (60), Dohne (51), SAMM (48), Afrino (AF)
 - 4 for flock code, AASMB Registered flock code or unregistered code.
 - 4 for year of drop.
 - 6 for tag number used in the breeder's records.

Example 16 digit code: 50 - 4967 - 2009 - 090012
 Breed Flock Year of drop On-farm ID

[†] Breed of flock in which the sire was born.

[^] **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

1. Location



“Wynwood”, 3035 Jugiong Road, Jugiong is located 30km from Harden on the Jugiong/Harden Road or 6km from Jugiong.

“Wynwood” is a commercial farming operation operated by Dean and Mandy Bourlet.

2. Selection and mating

- 600 medium framed ewes with free growing soft handling wools and low wrinkle score were selected and classed to be free from visual and conformation faults.
- The ewes were mated by Artificial Insemination to 12 sires.
- The ewes were randomly allocated to each sire.
- The insemination program was conducted on 27th and 28th February, 2014.
- The insemination program was conducted by Livestock Breeding Services (LBS) Jerilderie.
- 55 ewes were allocated to each sire entered.

3. Pregnancy and lambing

- Pregnancy scanning took place on 19th May 2014.
- Ewes were managed as one contemporary group until 7 days before lambing.
- Adequate pasture and a supplementary feeding program ensured that nutritional requirements were met during all stages of pregnancy.
- Sire groups lambed down in separate paddocks.
- Lambs were tagged (visual and electronic) and weighed within two weeks of lambing and groups brought together and boxed into one contemporary group of ewes and lambs.

4. Weaning and seasonal conditions

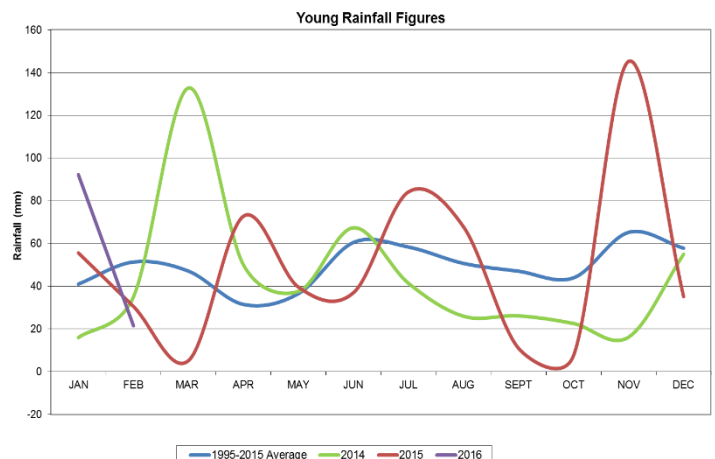
- The lambs were marked and visually scored on 28th August 2014.
- The lambs were weaned onto improved and native pastures on 20th November, 2014.

5. Visual Assessments

- The 1st and 2nd stage visual assessment was carried out by Mr Rick Baldwin.

6. Rainfall – Young (closest weather station)

	2012	2013	2014	2015	2016	Median
Jan	30.2	7.0	16.0	55.6	92.2	26.0
Feb	168.6	42.6	35.0	30.6	21.6	32.6
Mar	162.6	60.6	132.8	5.2		30.2
Apr	15.2	12.2	50.0	72.8		22.2
May	37.0	28.0	37.6	39.6		28.0
Jun	56.6	108.8	67.4	37.0		52.4
Jul	62.4	58.2	41.4	84.2		55.8
Aug	45.2	36.8	26.0	67.8		48.4
Sep	35.8	27.8	26.2	11.0		40.6
Oct	14.0	20.0	22.6	7.6		44.6
Nov	41.6	26.8	16.2	145.2		50.6
Dec	43.0	16.0	55.0	35.2		40.2
Totals	712.2	444.8	526.2	526.2		613



*Source: BOM - Median 1995-2016.

Assessment and management program

Activity	Date/s	Age (months)	Wool (months)
Selection of ewes & allocation of ewes for mating	10.01.2014		
Artificial Insemination	27.02.2014 28.02.2014		
Pregnancy scanning	19.05.2014		
Separated into sire lambing groups	17.07.2014		
Lambing: start – finish	27 to 03.07.2014		
Lambing mobs boxed to 1 management group	14.08.2014	14-21 days	
Tagging/pigment scores (age in days)	14.08.2014	14-21 days	
Marked and scored for breech traits	28.08.2014	32 days	
Weaning (age in days)	20.11.2014	116 days	
Pre assessment (even-up) shearing	NA		
Crutching			
• Post Weaning (PW)	02.02.2014	6.5	6.5
Fat and eye muscle scanning			
• Hogget (H)	22.01.2016	18	
Fleece sampling assessment			
• Yearling (Y)	20.05.2015	10	10
• Hogget (H)	22.01.2016	18	8
Staple length assessment			
• Yearling (Y)	20.05.2015	10	10
Classer's Grade assessment			
• Yearling (Y)	20.05.2015	10	10
• Hogget (H)	07.01.2016	18	8
Pre shearing scoring assessment			
• Yearling (Y)	20.05.2014	10	10
• Hogget (H)	07.01.2016	18	8
Assessment shearing			
• Yearling (Y)	21.05.2015	10	10
• Hogget (H)	22.01.2016	18	8
Post shearing scoring assessment			
• Yearling (Y)	22.05.2015	10	0
• Hogget (H)	22.01.2016	18	0
Body weigh assessment			
• Weaning (W)	20.11.2014	4	
• Post Weaning (PW)	04.04.2015	8.3	
• Yearling (Y)	20.05.2015	10	
• Hogget (H)	07.01.2016	18	
Worm egg count sampling	Little challenge to date; still to be measured.		
• Yearling (Y)			
Sire's Progeny Group Evenness assessment			
Vaccination	Marking, weaning, post shearings		
Drench	As required based on worm egg counts		
Supplementary feeding: start – finish			
Field day or public display of sheep	20.11.2014 (weaning); 21.01.2016 (pre 2 nd stage shearing)		

Visual Trait Assessment and site Breeding Objective

Visual trait assessment

1st Stage Assessment (Yearling) and 2nd Stage Assessment (Hogget)

Classer's Grade: Rick Baldwin **Trait Scores:** Rick Baldwin **Breech Scores:** Sally Martin

Site Breeding Objective used to assess the Classer's Grades – 1st and 2nd Stage Assessment

The Breeding Objective used to select the Classer's Tops (23%), Flock (47%) and Cull (30%) was based on a visual assessment where the animal performed well for growth (meet minimum body weight suitable for joining), were structurally sound with good wool quality traits including long soft handling wool and fleece weight. *(No reference was made to measured performance at the time of classing and was based on the visual presentation of all traits).*

Within Site Analysis

This report provides information within site on the performance of the progeny of the sires being evaluated. The ASBVs have not been taken into consideration in the within site analysis, however will be used in the across site (MSS) analysis.

The information presented is a reflection of one sires performance, not the bloodline.

Publication of results in both Merino Superior Sires (MSS) and MerinoSelect will be presented as across flock Australian Sheep Breeding Values (ASBV's) and will included additional data collected on farm, at other sire evaluation sites and the Information Nucleus Flock sites (Resource Flock).

Figure 1a, 1b and 1c. Combined measured traits and visual trait performance

Summary graph: visual and measured performance

Each sire meeting the AMSEA index accuracy threshold assessed at 1st Assessment is located on Figure 1a, 1b and 1c and describes the performance for combined measured traits and combined visual assessment.

A different graph is provided for each of the three production indexes reported. In each graph the combined measured traits are based on the AMSEA index and the visual trait performance is a combination of Classer's Grade performance (Tops and Culls). More information is found in "Calculation of combined performance" (page 23).

Sires that are above average performers for combined measured traits and Classer's Grade are located in the top right hand quarter.

Sire code	Breeders flock, Sire number	Sheep Genetics ID	Sire of Sire
1*	Billandri Poll, 100701	600571-2010-100701	601139-2008-082017 (Windarra Poll)
2*	Centre Plus Poll, 907538	601250-2009-907538	601250-2007-707221
3	GRASS, 122165	503884-2012-122165	609040-2006-066533 (MerinoTech WA)
4	Greendale, 120012	505069-2012-120012	503298-2008-080121 (Nerstane)
5*	Hazeldean, 8.3561	500383-2008-003561	500383-2002-009558
6	Kerin Poll, 120425	601413-2012-120425	601332-2010-100456 (Wallaloo Park)
7	Identity withheld	-	-
8	Pooginook Poll, 120506	601442-2012-120506	601332-2009-090717 (Wallaloo Park)
9^*	Roseville Park, 8-1232 (Historical)	504166-1988-881232	504166-1985-853088
10	Weealla Poll, 120117	600438-2012-120117	
11	Willandra Poll, 120026	601610-2012-120026	
12	Woodpark Poll, 120407	601151-2012-120407	601151-2010-100057

* Link sire: Sire evaluated to provide links between years and sites so that the all site results can be combined into a single report, e.g., *Merino Superior Sires*.

^ **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Figure 1a. Combined visual and measured performance

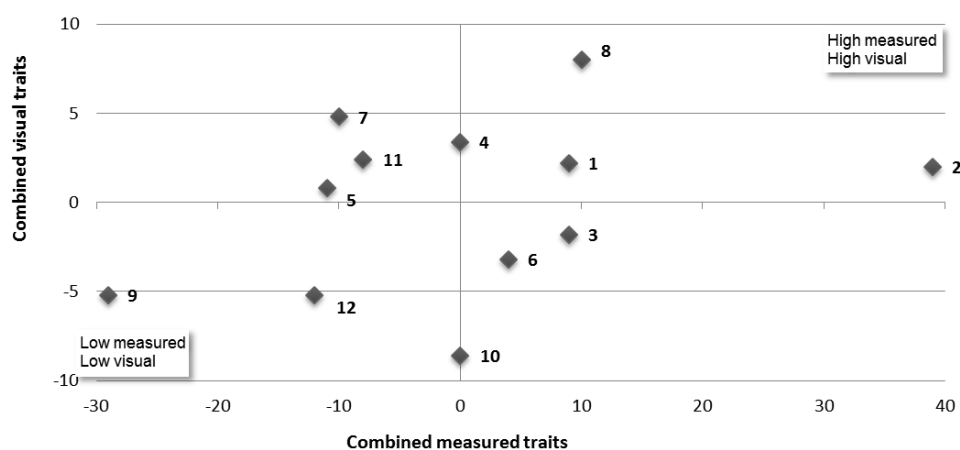


Figure 1a is based on an **AMSEA Dual Purpose Plus (DP+) index** – (Based on a meat focused production system where surplus progeny are sold as lambs and a portion of ewes are joined to terminal sires).

Figure 1b. Combined visual and measured performance

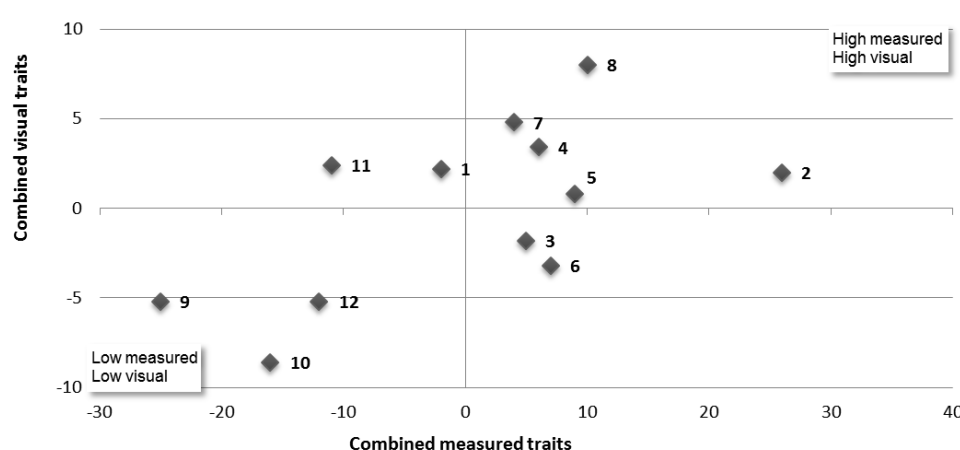


Figure 1b is based on an **AMSEA Merino Production Plus (MP+) index** – (Based on a balanced wool and meat production system where surplus progeny are sold as hoggets).

Figure 1c. Combined visual and measured performance

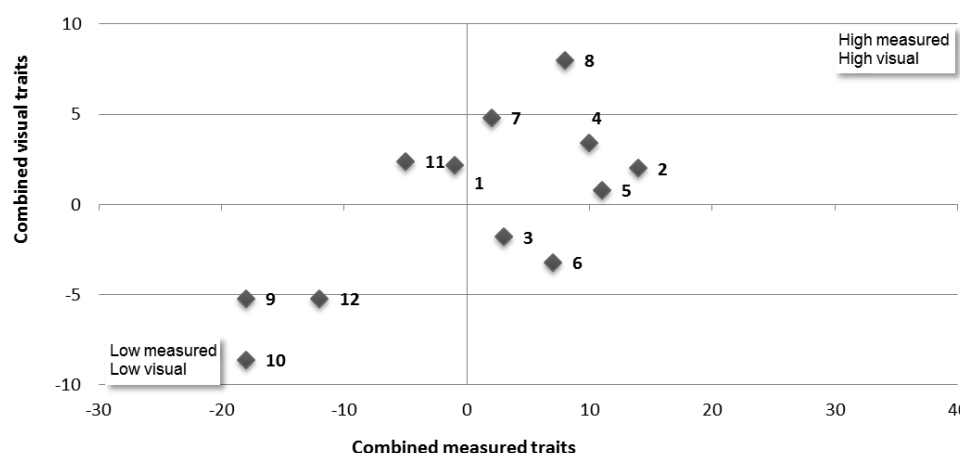


Figure 1c is based on an **AMSEA Fibre Production Plus (FP+) index** (Based on a wool focussed production system where wethers are retained, operating in an environment where worms cause economic losses).

Table 1. AMSEA Index values and Classer's Grade

The highest performing 3 sires for each trait (i.e. trait leaders) are highlighted by shading. Each sire is listed for Classer's Grade and the same three indexes at all site evaluations. The index values reported are based on Flock Breeding Values (within flock) measured trait performance with varying emphasis on fleece weight, fibre diameter, body weight, staple strength and worm egg count. (See 'Index Options' on page 22 for more information on the indexes presented in the table below.) **AMSEA Indexes are the same as MERINOSELECT Indexes apart from NLW (Number of Lambs Weaned) which is given a zero FBV value in AMSEA calculations.**

Dual Purpose Plus (DP+)	Based on a meat focused production system where surplus progeny are sold as lambs and a portion of ewes are joined to terminal sires.
Merino Production Plus (MP+)	Based on a balanced wool and meat production system where surplus progeny are sold as hoggets.
Fibre Production Plus (FP+)	Based on a wool focussed production system where wethers are retained, operating in an environment where worms cause economic loss

Sire code	Breeder's flock, Ram number	No of Progeny	Horn or Poll (DNA)	AMSEA Indexes values			Classer's Grade			
				Fibre Production Plus	Merino Production Plus	Dual Purpose Plus	Tops % (dev)	Tops % (dev)	Culls % (dev)	Culls % (dev)
							Y^	H	Y	H
1*	Billandri Poll, 100701	33	PH	99	98	109	-11	11	15	0
2*	Centre Plus Poll, 907538	30	PP	114	126	139	18	11	-6	1
3	GRASS, 122165	27	HH	103	105	109	-10	-11	3	-2
4	Greendale, 120012	45	HH	110	106	100	4	1	-5	-16
5*	Hazeldean, 8.3561	34	-	111	109	89	4	-3	-11	-7
6	Kerin Poll, 120425	21	PP	107	107	104	5	-13	-4	3
7	<i>Withdrawn Identity</i>	20	PH	102	104	90	9	20	-7	-4
8	Pooginook Poll, 120506	28	PH	108	110	110	12	25	-17	-15
9^*	Roseville Park, 8-1232 (Historical)	33	HH	82	75	71	-24	-16	16	10
10	Weealla Poll, 120117	33	PP	82	84	100	-8	-13	15	30
11	Willandra Poll, 120026	39	PP	95	89	92	8	0	-4	-12
12	Woodpark Poll, 120407	29	PH	88	88	88	-7	-14	6	12
Average performance		31		100	100	100	22	23	31	30

* Link sire: Sire evaluated to provide links between site evaluations and sites so that the all site results can be combined into a single report, e.g., *Merino Superior Sires*.

1 Classer's Grade is expressed as the percentage deviation of average Tops% and Culls%

2 Y = Yearling (300 to 400 days). H = Hogget (400 to 540 days)

^ **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Figures 2. And 3. Summary Graphs: Fleece Weight by Fibre Diameter, Tops by Cull Grade

Figure 2 Fleece weight by fibre diameter FBVs (Hogget) – describes performance for fleece weight on the side axis and fibre diameter on the bottom axis. Sires that are above average for fleece weight and below average fibre diameter are located in the top left hand quarter.

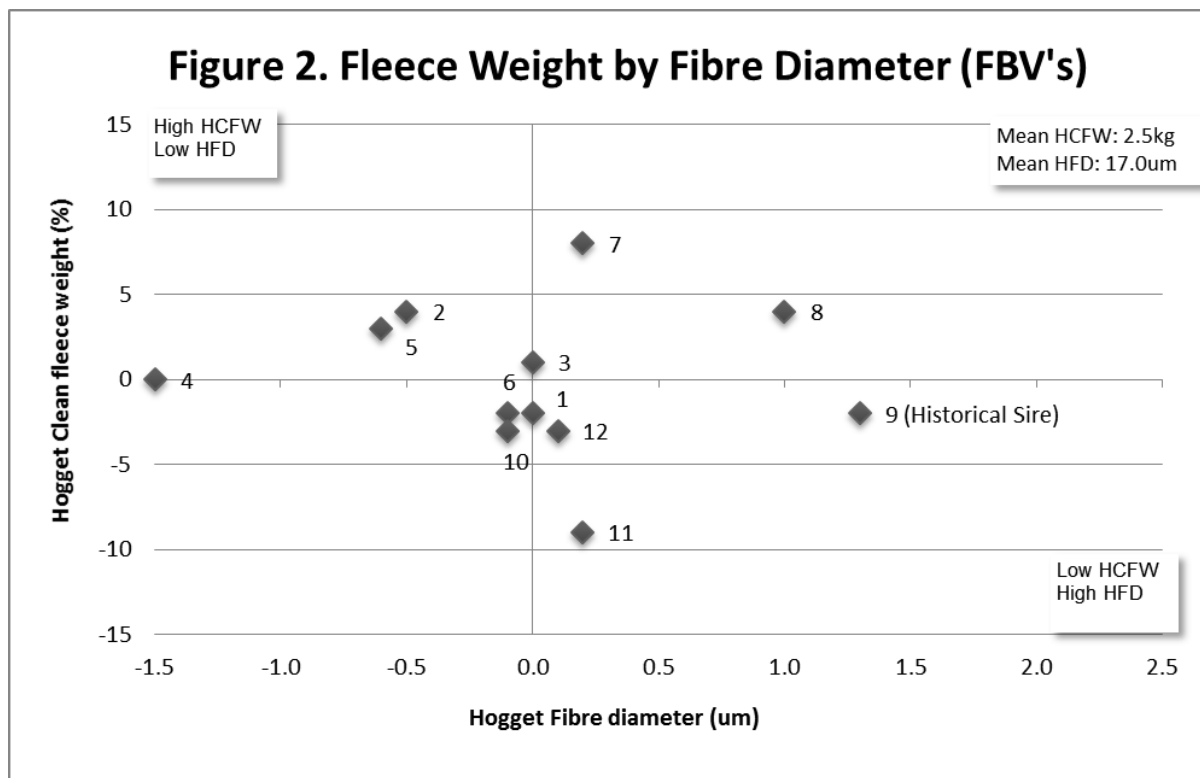


Figure 3 Classer's Tops by Cull Grade – describes performance for Classer's Tops Grade on the side axis and Cull Grade on the bottom axis. Sires that have above average Tops and below average Culls are in the top left hand quarter. Classer's Tops (23%), Flock (47%) and Cull (30%) is based a visual assessment where the progeny performed well for growth, structurally sound with good wool quality traits including long soft handling wool and fleece weight.

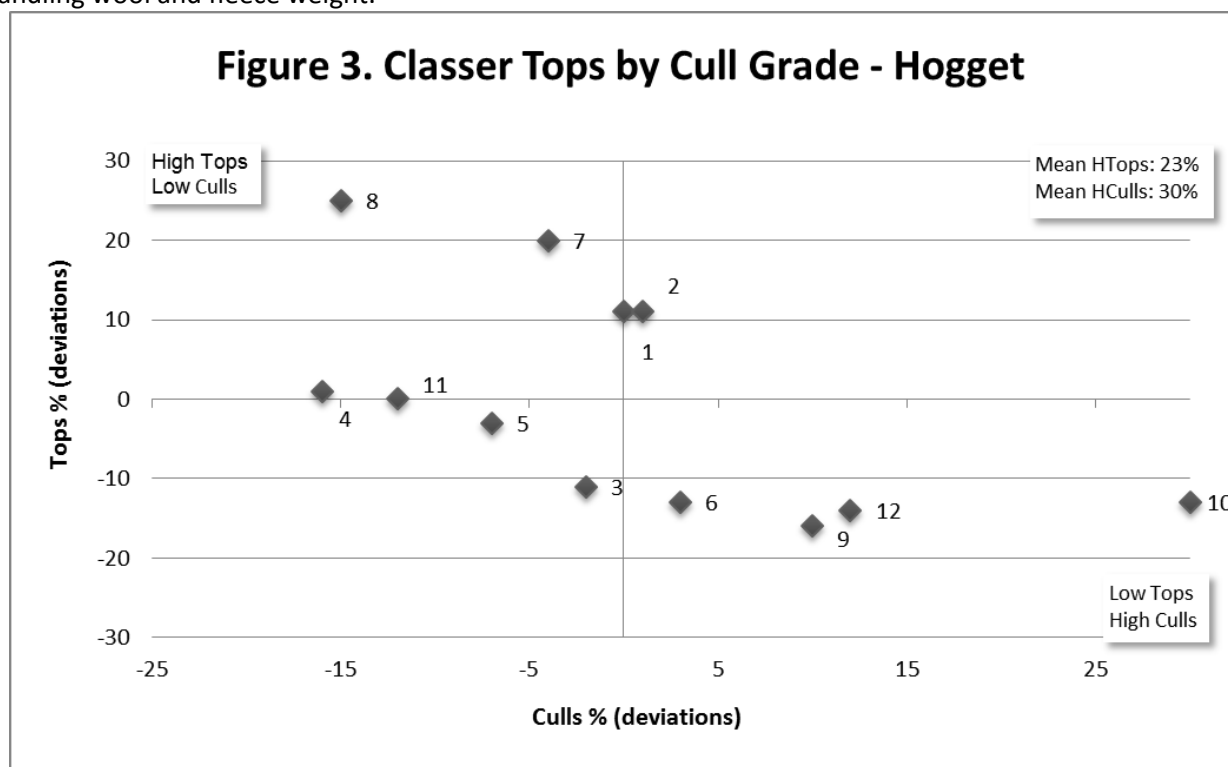


Figure 4. Fleece weight by body weight (FBV's) – describes performance for fleece weight on the side axis and body weight on the bottom axis. Sires that are above average for fleece weight and above average for body weight are located in the top right hand quarter.

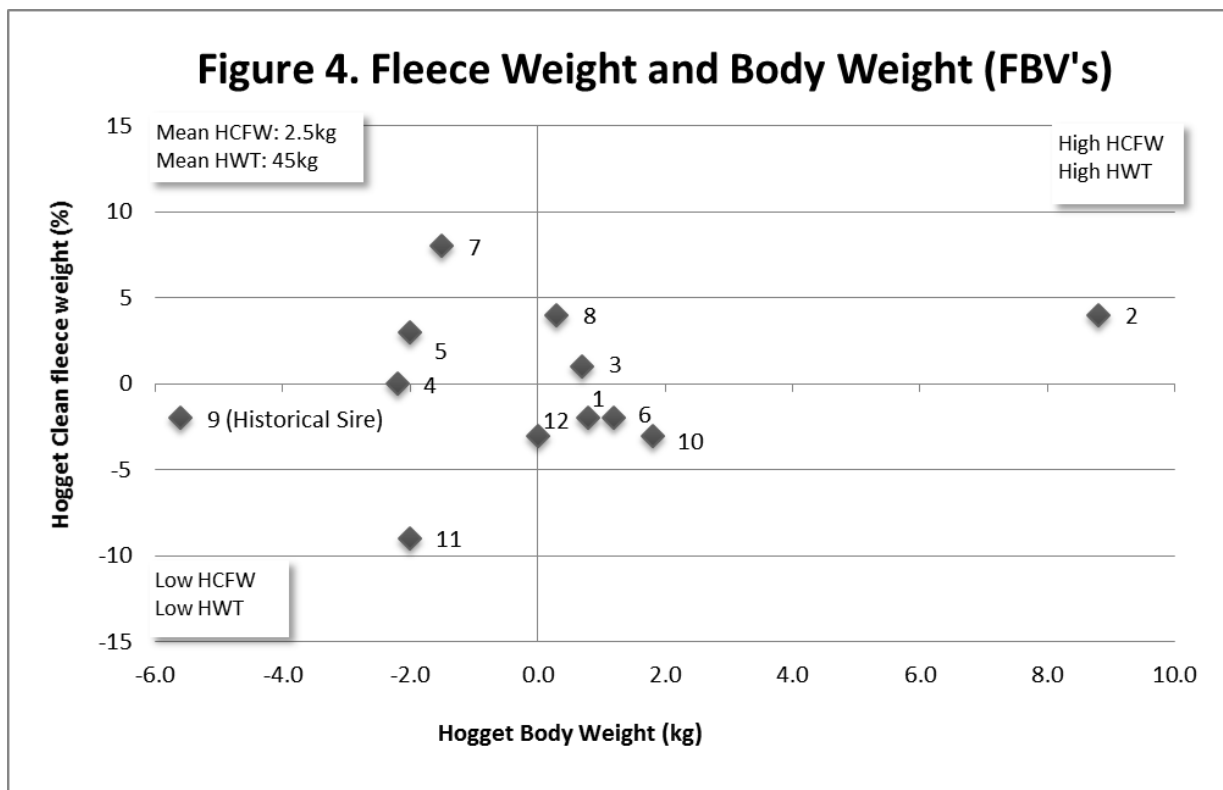


Figure 5. Fleece weight by fat (FBV's) – describes performance for fleece weight on the side axis and fat on the bottom axis. Sires that are above average for fleece weight and above average for fat are located in the top right hand quarter.

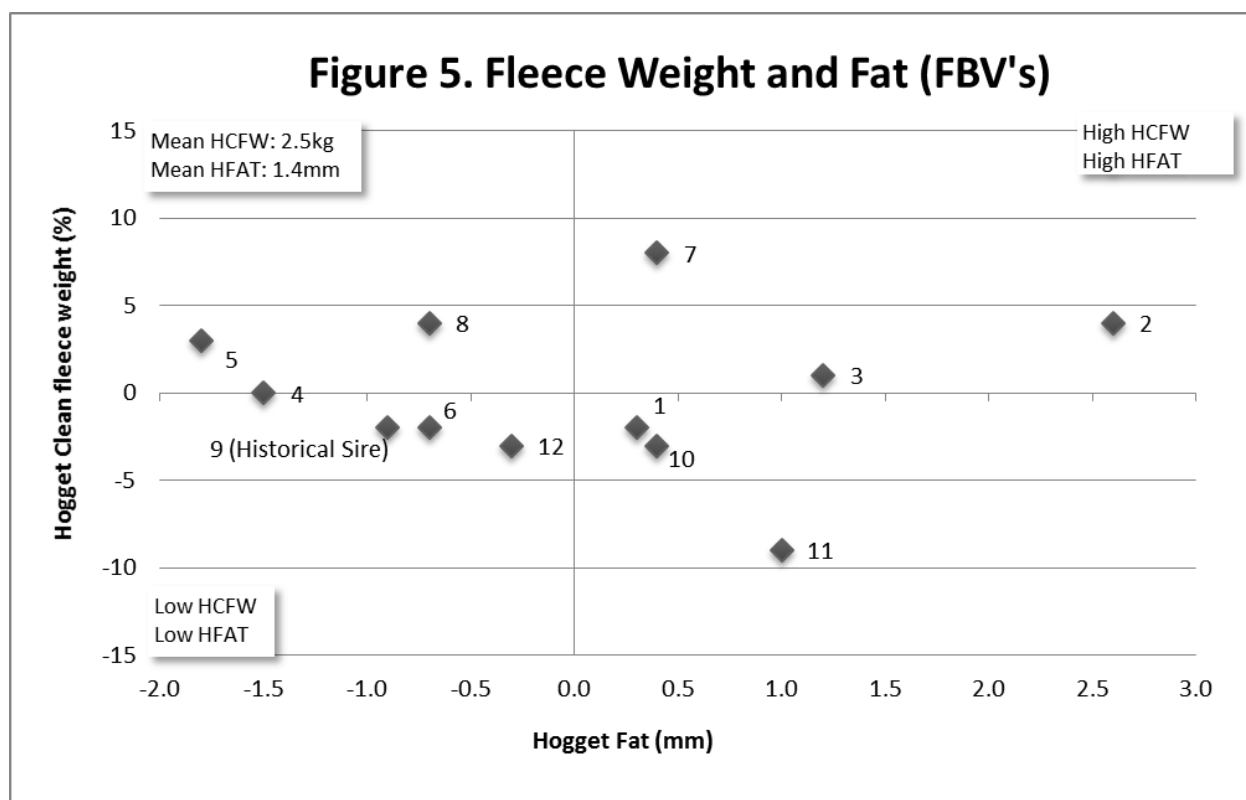


Figure 6. Fleece weight by eye muscle depth (FBV's) – describes performance for fleece weight on the side axis and eye muscle depth on the bottom axis. Sires that are above average for fleece weight and above average for eye muscle are located in the top right hand quarter.

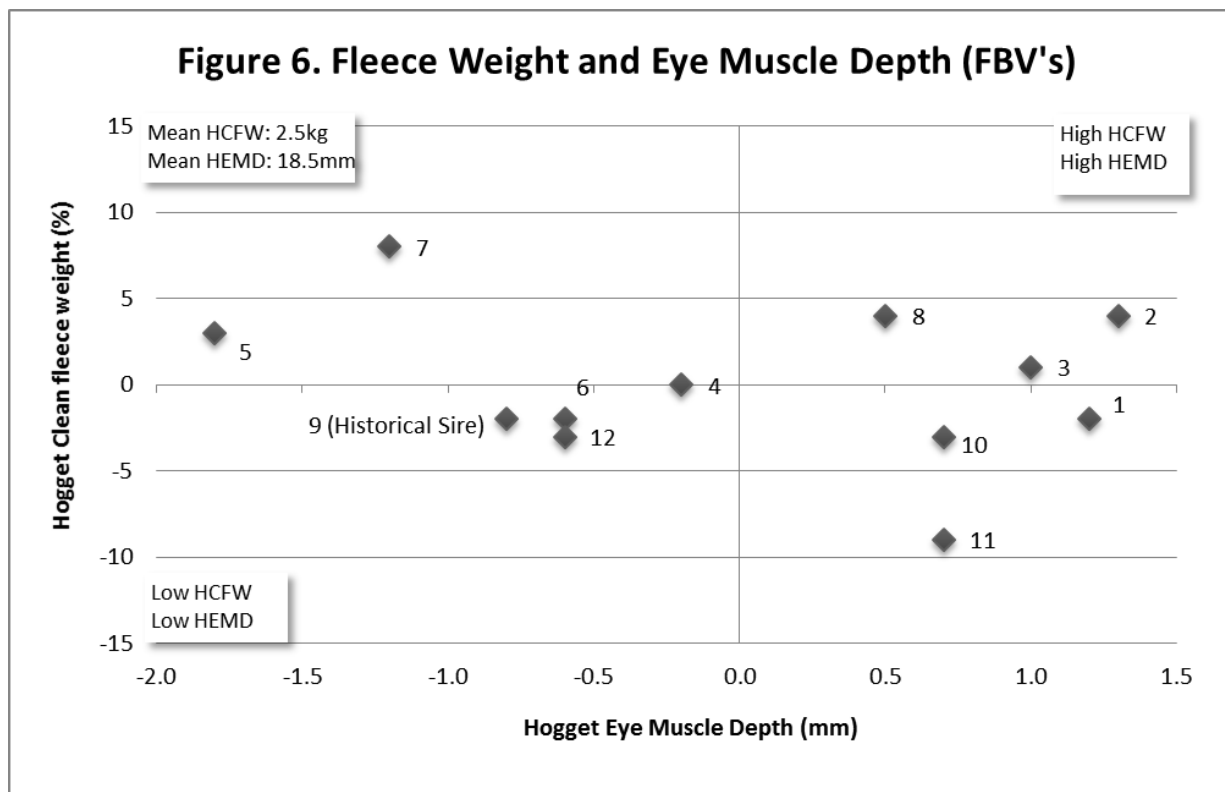
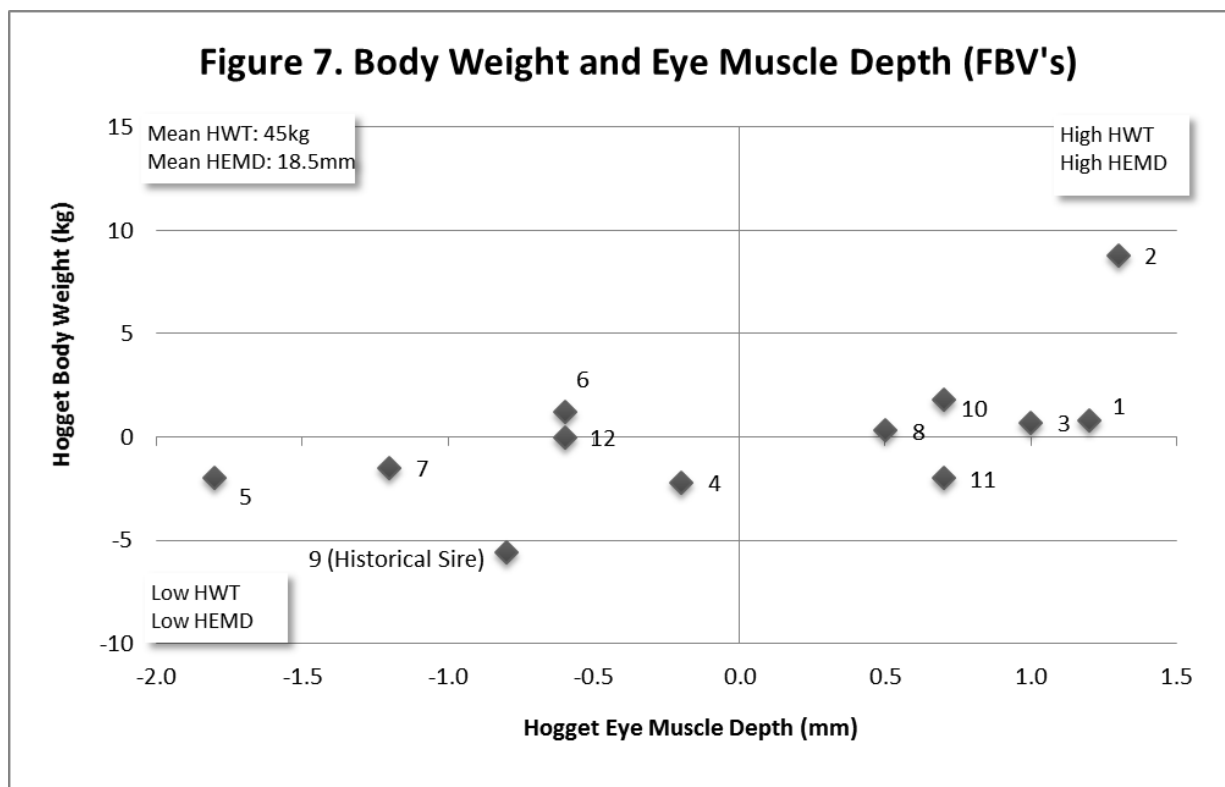


Figure 7. Body weight by eye muscle depth (FBV's) – describes performance for body weight on the side axis and eye muscle depth on the bottom axis. Sires that are above average for body weight and above average for eye muscle depth are located in the top right hand quarter.



Understanding the results – measured trait performance

Measured trait performance and Classer's Grade – Tables 2 and 3 – pages 14 and 15

Sire code:	Allows a sire to be located on the summary graphs and some tables.	
Sire name:	Identity of the breeder's flock and the sire's number or name.	
Number of progeny:	The number of progeny a sire had at the most recent measured analysis.	
Horn/Poll:	The Poll test has been developed by the Sheep CRC using measurements and DNA tests on animals in the Information Nucleus Flocks. The test is based on two genetic markers that are very close to the Poll gene. PP = Polled; PH = Half Poll; HH = Horned; blank = test failed	
Flock Breeding Values:	Flock Breeding Values (FBVs) are Estimated Breeding Values (EBVs) calculated by Sheep Genetics for the sire's evaluated in this report. Only data from this site evaluation is used in the calculation of these FBVs. FBVs describe the relative breeding value (genetic performance) of the sires (in this case based on the performance of their progeny). A sire's progeny will express half of their sire's FBV. FBVs do not necessarily reflect the sires observed performance, which is a combination of both genetic and environmental influences. FBVs are an estimate of the genetic component of the sheep's performance.	
Traits: Abbreviation, trait and the (units reported)	GFW: Greasy fleece weight (percentage). CFW: Clean fleece weight (percentage). FD: Average fibre diameter (micron). WT: Body weight (kilograms). FDCV: Fibre diameter coefficient of variation (percentage). SL: Staple length (mm) at the mid-side.	SS: Staple strength (N/ktex) at the mid-side. EMD: Eye muscle depth (mm) at the 'C' site. FAT: Fat depth (mm) at the 'C' site. CURV: Fibre curvature (degrees) WEC: Worm egg count (% deviation in worm burden of sire's progeny)
Age at assessment:	W = Weaning - 42 to 120 days (6 weeks to 4 months of age) E = Early Post Weaning - 120 to 210 days (4 to 7 months of age) P = Post Weaning - 210 to 300 days (7 to 10 months of age) Y = Yearling - 300 to 400 days (10 to 13 months of age) H = Hogget - 400 to 540 days (13 to 18 months of age) A = Adult - 540 days or older (18 months and older)	
Classer's Grade:	A Classer grades all progeny as either, Tops, Flocks or Culls based on their visual assessment of all traits relative to the site's Breeding Objective. The percentage deviation from the average of Tops and Culls is presented in this report. Average percentage of Tops and Culls for the entire drop is included in Table 1.	

Table 2. Major measured traits and Classer's Grades

Breeder's flock, Ram number	No. of prog.	Flock Breeding Values (deviations)										Classer's Grade ¹			
		GFW %		CFW %		FD um		WT kg				Tops % (dev)	Tops % (dev)	Culls % (dev)	Culls % (dev)
		Y [^]	H	Y	H	Y	H	W	P	Y	H	Y	H	Y	H
Billandri Poll, 100701	33	-1.0	0.0	-3.0	-2.0	0.1	0.0	-0.3	0.1	0.6	0.8	-11	11	15	0
Centre Plus Poll, 907538	30	7.0	4.0	4.0	4.0	-0.4	-0.5	2.9	5.0	7.4	8.8	18	11	-6	1
GRASS, 122165	27	2.0	-1.0	3.0	1.0	0.1	0.0	0.3	0.2	0.1	0.7	-10	-11	3	-2
Greendale, 120012	45	2.0	2.0	0.0	0.0	-1.4	-1.5	-0.9	-1.6	-1.9	-2.2	4	1	-5	-16
Hazeldean, 8.3561	34	6.0	6.0	5.0	3.0	-0.7	-0.6	-0.9	-1.4	-1.5	-2.0	4	-3	-11	-7
Kerin Poll, 120425	21	-1.0	-2.0	0.0	-2.0	0.1	-0.1	1.1	1.7	1.6	1.2	5	-13	-4	3
<i>Withdrawn Identity</i>	20	7.0	8.0	9.0	8.0	0.3	0.2	-0.5	-0.7	-1.3	-1.5	9	20	-7	-4
Pooginook Poll, 120506	28	5.0	3.0	7.0	4.0	0.9	1.0	0.2	0.2	0.3	0.3	12	25	-17	-15
Roseville Park, 8-1232 (Historical)	33	-4.0	-1.0	-3.0	-2.0	1.1	1.3	-2.1	-3.3	-4.4	-5.6	-24	-16	16	10
Weealla Poll, 120117	33	-8.0	-5.0	-7.0	-3.0	-0.2	-0.1	0.7	1.3	1.6	1.8	-8	-13	15	30
Willandra Poll, 120026	39	-10.0	-11.0	-10.0	-9.0	0.1	0.2	-0.8	-1.5	-2.3	-2.0	8	0	-4	-12
Woodpark Poll, 120407	29	-5.0	-3.0	-4.0	-3.0	0.0	0.1	0.5	0.2	0.0	0.0	-7	-14	6	12
Average performance	31	3.5 kg	3.4 kg	2.4 kg	2.5 kg	16.6 um	17.0 um	29.1 kg	38.6 kg	37.6 kg	45.0 kg	22 %	23 %	31 %	30 %

* Link sire: Sire evaluated to provide links between site evaluations and sites so that the all site results can be combined into a single report, e.g., *Merino Superior Sires*.

¹ Classer's Grade is expressed as the percentage deviation of average Tops% and Culls%

² Y = Yearling (300 to 400 days). H = Hogget (400 to 540 days)

[^] **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Information on how to use the results in the table above can be found on page 13.

Table 3. Other measured traits

Breeders flock, Ram number	No. of prog.	Flock Breeding Values (deviations)								
		FDCV %		SL mm	SS N/ktex	Curv deg/mm		Fat mm	EMD mm	WEC%
		Y^	H	Y^	Y^	Y^	H	H	H	Y^
Billandri Poll, 100701	33	-1.1	-1.0	7.1	-0.5	-2.4	-1.9	0.3	1.2	Not measured at time of publication
Centre Plus Poll, 907538	30	-1.1	-1.2	5.7	-2.8	1.5	1.5	2.6	1.3	
GRASS, 122165	27	0.4	0.4	0.1	0.7	1.8	2.6	1.2	1.0	
Greendale, 120012	45	1.1	0.9	-3.9	-3.1	4.6	5.5	-1.5	-0.2	
Hazeldean, 8.3561	34	-0.4	-0.6	4.8	0.7	-0.9	-0.9	-1.8	-1.8	
Kerin Poll, 120425	21	-1.3	-1.1	0.8	4.1	-1.0	-0.1	-0.7	-0.6	
Withdrawn Identity	20	0.5	0.9	1.0	-0.9	-6.5	-6.7	0.4	-1.2	
Pooginook Poll, 120506	28	-0.8	-0.8	7.6	7.9	-5.6	-5.0	-0.7	0.5	
Roseville Park, 8-1232 (Historical)	33	0.8	1.3	-1.9	2.9	-1.9	-3.0	-0.9	-0.8	
Weealla Poll, 120117	33	1.2	1.2	-5.3	-9.2	0.5	-0.5	0.4	0.7	
Willandra Poll, 120026	39	-0.3	-0.7	-6.6	3.8	4.6	4.5	1.0	0.7	
Woodpark Poll, 120407	29	1.0	0.7	-9.4	-3.8	5.4	4.3	-0.3	-0.6	
Average performance	31	18.8	18.8	80.3	29.2	92.8	91.5	1.4	18.5	
		%	%	mm	N/ktex	deg/mm	deg/mm	mm	mm	%

² W = Weaning (42 to 120 days); P = Post Weaning (120 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

[^] **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Information on how to use the results in the table above can be found on page 13.

Understanding the results – scored performance traits

Scored trait performance – Tables 4a to 4d – pages 17 to 20. The following description of trait scores is a summary of the detailed word and diagrammatical description of these scores in the Visual Sheep Scores booklet (free on application to AWI or downloadable at www.merinosuperiorsire.com.au). A deviation from the average trait score for all progeny is reported as well as the percentage of the sire's progeny recorded for each trait.

■ Fleece rot:	The severity of fleece rot from 1 (no fleece rot), 2 and 3 (bands of bacterial staining but no crusting), and 4 and 5 (bands of crusty fleece rot).
■ Wool colour:	Greasy wool colour scored from 1 (whitest) to 5 (yellow).
■ Wool character:	Definition and variation of crimp between and along the staple scored from 1 (well defined and regular) to 5 (undefined and large variation).
■ Dust penetration:	Degree of dust penetration from 1 (only tip <5%) to 5 (80 to 100% of staple).
■ Staple weathering:	The deterioration due to light and water from 1 (least, <5% of staple) to 5 (most, 30 to 50%) reflect the depth and degree of deterioration.
■ Staple structure:	The size and diameter of each staple from 1 (<5mm) to 5 (30 to 50 mm)
■ Face cover:	Wool cover on the face scored from 1 (open face) to 5 (fully covered face).
■ Feet/Legs:	Conformation of feet and legs scored from 1 (very good) to 5 (very poor).
■ Body wrinkle:	The degree of body wrinkle from 1 (no wrinkle) to 5 (extensive wrinkle).
■ Jaw:	Under- or over-shot lower jaw (and teeth) relative to the top jaw. Three scores: 1 (very well aligned), 3 (marginally under or over) and 5 (heavily under or over).
■ Back/Shoulder:	Conformation of the back and shoulder from 1 (very good) to 5 (very poor).
■ Fibre pigmentation:	The percentage of dark fibres on any part of the sheep from 1 (0 pigmented fibres at any site) to 5 (76 to 100% pigmented fibres at one or more sites). This trait does not include random spot or recessive black.
■ Non-fibre pigmentation:	The percentage of pigmentation on the areas not shorn from 1 (0 pigmentation at any site) to 5 (76 to 100% pigmented area on one or more bare skin sites, and/or 76 to 100% of the total hoof area).
■ Recessive black: (black)	Recessive black (black) is identified by relatively symmetrical markings on both sides of the face. There are two scores 1 (no recessive markings) and 5 (recessive markings). This trait does not include random spot or fibre pigmentation.
■ Random spot: (spot)	Random spot (spot) is identified by rounded wool or hair spot/s, not symmetrical. There are two scores 1 (no spot/s) and 5 (spot/s). If both sides of the face or body are spotted the sheep should be scored as a recessive black.
■ Breech cover	Size of natural bare area around the breech from 1 (large) to 5 (no bare).
■ Crutch cover	Size of natural bare area in the pubic and groin region from 1 (large) to 5 (no bare).
■ Breech wrinkle	Degree of wrinkle at the tail set and hind legs from 1 (nil) to 5 (extensive).
■ Dag	Degree of dag adhering to the breech and legs from 1 (nil) to 5 (extensive).
■ Urine	Degree of urine stained wool in the breech area, including the hind legs from 1 (nil) to 5 (extensive).

Table 4a. Visual trait assessments – Wool quality

Traits are reported as a deviation (Dev) from the average trait score for all progeny. The percentage of a sire's progeny assessed for each score is also reported. For the majority of breeder's objectives a negative deviation would be considered favourable and the larger the deviation the better.

Breeder's flock, Sire number	Wool Quality																							
	Fleece Rot						Wool Colour						Wool Character						Dust Penetration					
	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5
Billandri Poll, 100701	-0.2	41	32	15	9	3	0.0	0	82	15	3	0	0.2	3	56	32	9	0	0.1	3	85	12	0	0
Centre Plus Poll, 907538	0.3	31	31	7	25	6	-0.1	12	72	16	0	0	-0.3	16	72	9	3	0	-0.2	25	69	6	0	0
GRASS, 122165	-0.2	50	18	18	14	0	-0.1	14	71	11	4	0	0.1	3	61	32	4	0	0.0	14	68	18	0	0
Greendale, 120012	-0.2	40	36	13	7	4	-0.1	15	67	18	0	0	-0.1	16	51	31	2	0	-0.3	33	60	7	0	0
Hazeldean, 8.3561	0.0	38	32	12	12	6	0.1	3	71	26	0	0	-0.1	0	82	18	0	0	0.0	6	88	6	0	0
Kerin Poll, 120425	0.4	19	38	14	24	5	0.1	0	81	14	5	0	-0.1	0	76	24	0	0	0.0	5	90	0	5	0
Identity withheld	-0.3	55	15	15	15	0	-0.1	10	70	20	0	0	-0.1	15	55	30	0	0	0.0	25	55	20	0	0
Pooginook Poll, 120506	-0.4	46	39	8	7	0	-0.1	7	79	14	0	0	-0.1	0	86	11	3	0	0.1	7	79	11	3	0
^Roseville Park, 8-1232 (Historical)	-0.1	30	48	9	7	6	0.1	3	70	27	0	0	0.5	0	33	52	15	0	0.2	6	67	27	0	0
Weealla Poll, 120117	0.7	21	18	24	24	13	0.1	6	61	30	3	0	0.3	0	48	42	10	0	0.1	12	70	18	0	0
Willandra Poll, 120026	-0.4	44	36	15	5	0	0.0	5	77	13	5	0	-0.4	21	67	12	0	0	-0.1	18	79	0	3	0
Woodpark Poll, 120407	0.4	24	24	28	14	10	0.1	4	62	34	0	0	0.1	6	59	28	7	0	0.1	4	86	10	0	0
Avg.	2.2	37	31	15	13	4	2.2	7	72	20	1	0	2.3	7	62	27	4	0	2.0	13	75	11	1	0

^ **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Information on how to use the results in the table above can be found on page 16.

Table 4b. Visual trait assessment – Wool quality and pigmentation

Traits are reported as a deviation (Dev) from the average trait score for all progeny. The percentage of a sire's progeny assessed for each score is also reported. For the majority of breeder's objectives a negative deviation would be considered favourable and the larger the deviation the better.

Four pigmentation traits are reported as described on page 14. These are Fibre pigmentation, Non-fibre pigmentation, Recessive "black" and Random "spot". Fibre pigmentation and Non-fibre pigmentation are scored **1 to 5** however recessive black and random spot are scored **1** (no pigmentation of this type) or **5** (when the trait is expressed). Only the percentage scored 5 are reported for recessive black and random spot.

Breeder's flock, Sire number	Wool Quality												Pigmentation													
	Staple Weathering						Staple Structure						Fibre pigmentation						Non-fibre pigmentation						Black	Spot
	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	5	5
Billandri Poll, 100701	0.1	0	74	26	0	0	0.1	9	47	32	12	0	0.0	100	0	0	0	0	0.6	16	32	34	16	2	0	0
Centre Plus Poll, 907538	-0.1	7	84	9	0	0	-0.2	12	56	28	4	0	0.0	100	0	0	0	0	0.4	12	35	50	3	0	0	0
GRASS, 122165	0.0	8	71	21	0	0	0.0	7	50	36	7	0	0.1	97	0	0	3	0	0.0	42	32	13	13	0	0	0
Greendale, 120012	-0.2	13	76	11	0	0	-0.1	16	40	40	4	0	0.0	100	0	0	0	0	-0.5	67	20	11	2	0	0	0
Hazeldean, 8.3561	-0.1	9	76	15	0	0	0.0	6	59	29	6	0	0.1	97	0	0	0	3	0.2	33	31	19	11	6	0	0
Kerin Poll, 120425	0.1	0	71	29	0	0	-0.1	5	57	38	0	0	0.0	100	0	0	0	0	0.5	18	27	41	9	5	0	0
Identity withheld	0.0	10	65	25	0	0	-0.4	30	45	20	5	0	0.0	100	0	0	0	0	-0.4	60	28	8	4	0	0	0
Pooginook Poll, 120506	0.0	0	86	11	3	0	-0.3	14	64	18	4	0	0.0	97	3	0	0	0	0.0	40	33	17	10	0	0	0
Roseville Park, 8-1232 (Historical)	0.1	0	73	27	0	0	0.5	0	30	55	15	0	0.0	100	0	0	0	0	0.2	29	37	20	14	0	0	0
Weealla Poll, 120117	0.1	6	61	33	0	0	0.5	0	36	42	22	0	0.0	100	0	0	0	0	-0.2	27	61	12	0	0	0	0
Willandra Poll, 120026	-0.1	8	77	15	0	0	-0.2	15	59	21	5	0	0.0	100	0	0	0	0	-0.4	40	57	3	0	0	0	0
Woodpark Poll, 120407	0.1	3	69	28	0	0	0.1	7	52	28	10	3	0.0	100	0	0	0	0	-0.5	61	29	4	6	0	0	0
Averages	2.2	5	74	21	0	0	2.4	10	50	32	8	0	1.0	100	0	0	0	0	2.0	37	35	19	7	2	0	0

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Information on how to use the results in the table above can be found on page 16.

Table 4c. Visual trait assessments – Conformation

Traits are reported as a deviation (Dev) from the average trait score for all progeny. The percentage of a sire's progeny assessed for each score is also reported. For the majority of breeder's objectives a negative deviation would be considered favorable and the larger the deviation the better. Face cover and body wrinkle are possible exceptions when for many breeders the optimum score is in the middle of the range.

Breeder's flock, Sire number	Conformation																								
	Jaw	Legs and Feet						Shoulder and Back						Face Cover						Body Wrinkle					
		Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5
Billandri Poll, 100701	100% of progeny were 1 Score for Jaw	0.3	15	50	32	3	0	0.1	32	41	9	18	0	-0.2	0	47	53	0	0	-0.1	3	59	38	0	0
Centre Plus Poll, 907538		-0.1	34	44	19	3	0	0.3	25	38	12	25	0	-0.2	0	47	53	0	0	0.0	3	50	44	3	0
GRASS, 122165		0.0	21	61	18	0	0	0.0	32	39	21	8	0	-0.5	11	64	25	0	0	0.0	0	59	34	7	0
Greendale, 120012		-0.1	24	62	14	0	0	-0.2	36	51	11	0	2	0.3	0	11	76	13	0	0.3	0	38	47	15	0
Hazeldean, 8.3561		0.5	15	41	29	15	0	0.1	26	41	21	12	0	0.1	0	32	59	9	0	0.2	0	46	43	11	0
Kerin Poll, 120425		0.2	15	52	33	0	0	0.1	29	29	38	4	0	0.0	0	29	71	0	0	-0.1	0	68	27	5	0
<i>Identity withheld</i>		-0.1	30	50	20	0	0	-0.2	50	25	15	10	0	0.0	0	35	65	0	0	0.2	0	38	52	10	0
Pooginook Poll, 120506		-0.3	43	46	11	0	0	-0.5	61	29	3	7	0	0.0	0	32	64	4	0	-0.3	3	68	29	0	0
Roseville Park, 8-1232 (Historical)		0.1	24	45	27	4	0	-0.1	30	55	6	9	0	0.1	0	27	70	3	0	0.3	0	30	61	9	0
Weealla Poll, 120117		-0.2	36	48	16	0	0	0.5	24	33	15	21	7	0.2	0	24	67	6	3	-0.2	0	76	18	6	0
Willandra Poll, 120026		-0.2	36	54	10	0	0	-0.3	41	38	21	0	0	0.2	0	15	82	3	0	-0.2	2	63	32	3	0
Woodpark Poll, 120407		-0.1	34	45	17	4	0	0.3	31	28	20	21	0	0.0	0	34	66	0	0	0.0	0	50	47	3	0
Averages		2.0	27	50	20	3	0	2.1	35	37	16	11	1	2.7	1	33	63	3	0	2.5	1	54	39	6	0

^ **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Information on how to use the results in the table above can be found on page 16.

Table 4d. Visual trait assessments – Breech

Traits are reported as a deviation (Dev) from the average trait score for all progeny. The percentage of a sire's progeny assessed for each score is also reported. For the majority of breeder's objectives a negative deviation would be considered favorable and the larger the deviation the better. Breech scores were recorded at lamb marking.

Breeder's flock, Sire number	Breech																								
	Breech Cover - Marking						Breech Wrinkle - Marking						Crutch Cover - Marking						Dag - Yearling						Urine Stain
	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5	
Billandri Poll, 100701	0.2	0	29	45	24	2	0.0	13	47	26	8	6	0.2	0	29	45	24	2	0.3	54	23	11	6	6	Urine Stain was not scored
Centre Plus Poll, 907538	-0.3	3	50	41	3	3	0.2	9	38	32	21	0	-0.3	3	50	41	3	3	-0.3	84	9	7	0	0	
GRASS, 122165	-0.3	3	45	52	0	0	-0.7	32	52	16	0	0	-0.3	3	45	52	0	0	0.4	48	24	17	11	0	
Greendale, 120012	-0.1	8	29	47	16	0	0.6	7	27	33	22	11	-0.1	8	29	47	16	0	-0.1	69	20	9	2	0	
Hazeldean, 8.3561	-0.1	3	39	50	8	0	0.1	12	36	33	19	0	-0.1	3	39	50	8	0	0.2	63	20	9	2	6	
Kerin Poll, 120425	0.0	0	32	59	9	0	-0.3	4	73	18	5	0	0.0	0	32	59	9	0	-0.2	82	9	4	5	0	
Identity withheld	0.2	0	28	44	28	0	0.5	12	32	20	20	16	0.2	0	28	44	28	0	0.4	57	14	14	5	10	
Pooginook Poll, 120506	0.0	0	33	57	10	0	-0.3	23	43	27	7	0	0.0	0	33	57	10	0	-0.3	82	14	4	0	0	
Roseville Park, 8-1232 (Historical)	0.2	3	17	57	23	0	0.3	11	26	43	11	9	0.2	3	17	57	23	0	-0.3	84	13	3	0	0	
Weealla Poll, 120117	0.1	0	27	58	12	3	-0.3	24	36	33	4	3	0.1	0	27	58	12	3	0.4	62	12	9	8	9	
Willandra Poll, 120026	-0.1	3	48	33	14	2	-0.4	33	36	21	10	0	-0.1	3	48	33	14	2	-0.4	90	8	2	0	0	
Woodpark Poll, 120407	0.1	0	29	52	19	0	0.4	6	23	58	3	10	0.1	0	29	52	19	0	0.0	67	20	10	3	0	
Averages	2.8	2	34	49	14	1	2.5	16	39	30	11	4	2.8	2	34	49	14	1	1.5	70	16	8	3	3	

^ **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Information on how to use the results in the table above can be found on page 16.

Table 5. Sire means for measured traits

Sire means are the average performance of all the progeny of a sire. No account is made for factors that can improve the breeding value accuracy.

Breeders flock, Ram number	Ram averages for measured traits (deviations)																	
	GFW		CFW		FD		WT				Fat	EMD	FDCV		Curv		SL	SS
	Y^	H	Y	H	Y	H	W	P	Y	H	H	H	Y	H	Y	H	Y	Y
Billandri Poll, 100701	0.0	0.1	-0.1	0.0	0.0	-0.1	-0.7	0.1	0.3	0.8	0.0	0.8	-0.9	-0.7	-1.5	-1.4	5.7	-1.4
Centre Plus Poll, 907538	0.2	0.2	0.0	0.0	-0.4	-0.4	2.1	4.1	4.2	6.0	0.3	0.6	-1.1	-0.6	1.3	-0.4	4.0	-3.1
GRASS, 122165	0.0	0.0	0.1	0.0	0.2	-0.1	0.6	0.0	0.0	0.0	0.1	0.6	0.3	0.2	1.3	2.3	0.2	1.7
Greendale, 120012	0.1	0.1	0.0	0.0	-0.9	-0.8	-0.6	-1.5	-0.7	-1.8	-0.2	0.1	1.0	0.1	2.8	4.7	-2.1	-1.7
Hazeldean, 8.3561	0.2	0.1	0.1	0.0	-0.6	-0.3	-0.9	-1.3	-1.3	-0.6	-0.2	-1.0	-0.1	-0.6	0.5	-0.3	4.6	0.4
Kerin Poll, 120425	0.0	-0.1	0.0	0.0	0.1	-0.1	1.2	1.8	1.0	0.8	-0.1	-0.4	-1.0	-0.7	-1.7	0.4	0.4	3.8
Identity withheld	0.2	0.2	0.1	0.2	0.2	0.1	-0.7	-0.4	-0.8	-0.6	0.1	-1.0	-0.1	1.1	-5.3	-5.0	-0.4	-1.2
Pooginook Poll, 120506	0.1	0.0	0.1	0.0	0.5	0.7	0.4	0.3	0.1	0.3	-0.1	0.5	-0.4	-0.6	-3.4	-2.9	6.6	8.8
Roseville Park, 8-1232 (Historical)	-0.1	-0.1	-0.1	-0.1	0.8	0.9	-1.9	-2.9	-2.7	-3.7	-0.1	-0.5	0.5	1.2	-0.5	-2.2	-1.4	2.7
Weealla Poll, 120117	-0.3	-0.1	-0.2	0.0	-0.1	0.0	0.3	1.4	1.0	1.0	0.0	0.4	0.7	0.9	0.1	-0.8	-4.9	-9.8
Willandra Poll, 120026	-0.2	-0.2	-0.1	-0.2	0.1	0.0	-0.6	-1.4	-0.8	-2.0	0.1	0.4	0.2	-0.8	2.4	2.9	-5.1	4.2
Woodpark Poll, 120407	-0.1	-0.1	-0.1	-0.1	0.0	0.2	0.8	-0.2	-0.2	-0.1	0.0	-0.4	0.8	0.5	4.1	2.6	-7.7	-4.3
Average performance	3.5	3.4	2.4	2.5	16.6	17.0	29.1	38.6	37.6	45.0	1.4	18.5	18.8	18.8	92.8	91.5	80.3	29.2
	kg		kg		um		kg				mm	mm	%		deg/mm		mm	N/ktex

² W = Weaning (42 to 120 days); P = Post Weaning (120 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

[^] **Historical Sire** evaluated under AMSEA's R&D project to validate the system of linkage in MERINOSELECT that has operated over the past 15-20 years. These sires were generally widely used 15-20 years ago and were selected for the R&D program based on their high ASBV accuracies. They demonstrate the progress the industry has made over that period.

Understanding the results

Index Options – indexes reported on page 9.

Breeding Objective index options provide the relative value of sires based on a combination of the measured traits' genetic performance. The indexes used in this report are only some of the many indexes that can be used to describe an individual breeder's objective for measured traits.

If a breeder is considering using a sire in this report it is critical to consider the performance of the breeder's flock relative to the performance standard in this report. The relative performance must be considered to establish the result that can be expected when a sire is used in a breeder's flock.

All AMSEA site evaluation reports present 3 standard indexes to provide combined measured trait performance. These 3 AMSEA indexes are DP+; MP+; and FP+. These indexes are the same as MERINOSELECT indexes of that name however as there is no direct reproduction records captured by sire evaluation AMSEA do not include a Reproduction (NLW) FBV in their index calculations. As a result the 21% contribution by NLW in the DP+ index is not effectively applied by the index calculation.

Index production system and breeding objectives

AMSEA
DP+

Dual Purpose: Based on a meat focused production system where surplus progeny are sold as lambs and a portion of ewes are joined to terminal sires. Equal and high positive emphasis on CFW and meat traits (body weight, EMD). Maintain fibre diameter, staple strength and fat depth.

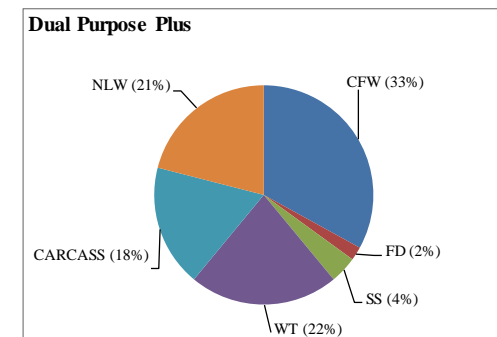
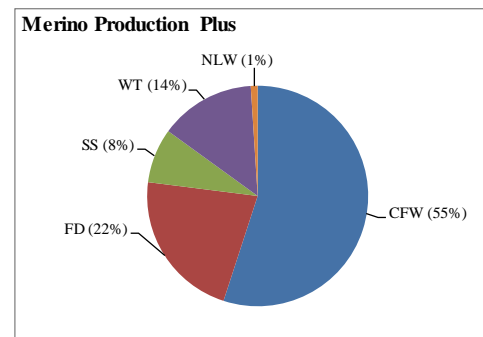
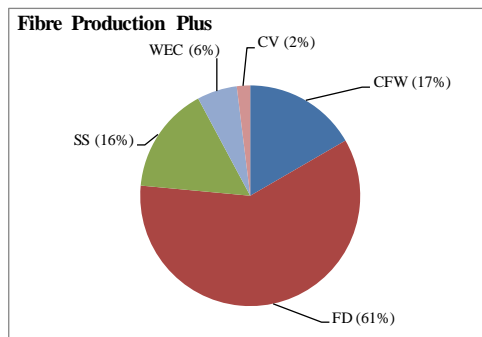
AMSEA
MP+

Merino Production: Based on a balanced wool and meat production system where surplus progeny are sold as hoggets. Large increase in fleece weight. Moderate increase, staple strength, carcass traits and reproduction. Moderate reduction in fibre diameter.

AMSEA
FP+

Fibre Production: Based on a wool focussed production system where wethers are retained, operating in an environment where worms cause economic losses. Large reduction in fibre diameter. Large increase in staple strength. Small reduction in WEC (if measured in the breeding program). Small increase in fleece weight. Little change in carcass traits and reproduction.

Traits contribution to economic gain: The percentage contribution of the traits listed to economic gain in a commercial flock that selects sires using the index.



Accuracy of Flock Breeding Values

Flock Breeding Values (FBVs) are reported by Sheep Genetics (SG). FBVs express the expected performance of progeny of a sire relative to another sire in the evaluation when mated to the same standard of ewes. FBVs improve the accuracy of sire results because they account for the association between traits, adjustment for birth effects and the number of progeny a sire has in the analysis.

True Breeding Values would be achieved if the number of progeny evaluated for each sire were infinite. Because the number of progeny in the evaluation is not infinite, performance shown in this report is described as *Flock* Breeding Values.

Without progeny test information the correlation between the *Flock* and *True* Breeding Value of sires from different sources would be zero (0.0%). The correlation between *Flock* and *True* Breeding Value improves rapidly from 0.0% with no progeny to 77% with 10 progeny. The rate of improvement in correlation slows from 86% with 20 progeny, to 90% with 30 progeny and 92% with 40 progeny. With an infinite population the correlation is 100%. Note that the correlation used in the above example is for a trait such as fibre diameter with a high heritability (0.5).

A heritability of 0.5 indicates that half or 50% of the measured performance is passed onto offspring. A heritability of 0.35 indicates 35% is passed on. The FBVs that are shown in this report have already accounted for heritability and therefore describe the performance that can be expected from a sire's progeny.

Link sires

Link sires provide the 'genetic link' between CTSE sites located across Australia to allow all sires entered in these site evaluations to have their performance reported relative to each other in *Merino Superior Sires*. *Merino Superior Sires* reports sires from across all effectively linked CTSE sites and across all evaluations at these sites. Link sires are therefore a vital component of the Central Test Sire Evaluation.

To be used as a link a sire must have at least 25 progeny assessed at 1st Assessment at one accredited site. Site reports provide valuable information not reported in *Merino Superior Sires* however *Merino Superior Sires* reports the performance of a large number of sires which can provide a wider perspective of the elite sires available across many flocks in Australia and New Zealand.

Calculation – combined measured traits and combined visual trait performance

Combined measured trait performance is calculated as Index – 100. Three different index options are provided to cater for breeders' different breeding objectives.

Combined visual trait performance is calculated as:
(Classer's Visual Grade Tops% - Culls%)/5, expressed as a deviation from the
(average Tops% - average Culls%)/5

Example

Sires Performance: AMSEA DP+ Index Value = 119.7
Tops % = 25.5 (average Tops% = 25.1)
Culls% = 17.6 (average Culls% = 16.4)

Combined Measured = 119.7 – 100 = 19.7
Combined Visual = ((25.5 - 17.6)/5) – ((25.1 – 16.4)/5)
= 7.9/5 – 8.7/5 = 1.58 – 1.74 = -0.1

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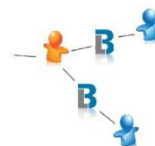
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