North East Victoria
Merino Sire Evaluation
Site Report

Within-Site Results
August 2020

2018 Drop

Adult Assessment

Conducted by

NORTH EAST VICTORIA SIRE EVALUATION

Under the auspices of

AUSTRALIAN MERINO SIRE EVALUATION ASSOCIATION

MERINO Superior Sires

With support from

awi Australian Wool Innovation Limited

North East Victoria Merino Sire Evaluation

The North East Victoria (Dookie) site is an accredited AMSEA Merino Sire Evaluation site. It conforms to the requirements of the Australian Merino Sire Evaluation Association (AMSEA).

A subcommittee of the North East Merinos group and other co-opted members run the North East Victoria Sire Evaluation site.

The North East Victoria Sire Evaluation started in 1997. The 2018 drop progeny are the progeny of the twenty-first evaluation since 1997 and the trial is located at The University of Melbourne Dookie Campus. A total of eleven sires were evaluated in this trial comprising three sires from NSW, whilst the remainder were from Victoria.

The 2018 drop unfortunately met with some management difficulties and some losses were incurred. A change in farm management staff at the University in mid-2019 resulted in the progeny receiving the correct attention from this point on.

Additional preventative measures and management checks are also now in place at Dookie and across the Merino Sire Evaluation program. For further information please contact Ben Swain (details on page 5).

This trial aims to evaluate industry leading merino sires from throughout Australia. Each trial runs for two years which includes two shearings of each year drop. Results are distributed to our participants and via the Australian Merino Sire Evaluation Association (AMSEA) with an annual open day held at the Melbourne University Dookie campus.

This trial also provides students attending the Dookie campus valuable hands on learning experiences as well as numerous final year projects.

Murray McKenzie
Chairman

Contents

2018 Drop Adult Assessment

The information in this Site Report provides an update of the assessment of the 2018 drop, including the Post Weaning and Adult assessments of the sire's progeny performance for measured and visually assessed traits.

The Post Weaning fleece and visual assessments were made at 7 months with 7 months of wool growth and the Adult fleece and visual assessments were made at 19 months of age with 12 months of wool growth. The Post Weaning shearing was carried out at 7 months of age with 7 months of wool growth. Adult shearing was then carried out at 19 months of age, with 12 months of wool growth.

The Post Weaning and Adult assessments included both the ewe and wether progeny.

Site Committee

Murray McKenzie	Nathan Anderson	Lisa Warn
Anna Toland	John Geddes	Paul Wallace
Phil Toland	Paul Cheng	Lyndon Kubeil
Simon Riddle	Jane Court	Paddy McCarthy

For further information on this report please contact:

Murray McKenzie (Site Chair)   kilpark@people.net.au
Anna Toland (Sire Coordinator)   anna@tolandmerino.com.au
Ben Swain (AMSEA Executive Officer)   ben.swain@bcsagribusiness.com.au

Sire Codes and Pedigrees

Sire Code	Breeders flock, Sire number	Sheep Genetics ID	Sire of Sire
1	Bindawarra, 000036	503892-2014-140036, Merino	Connewarran, 062097
2	Connewarran, 015024 (Link)	504704-2015-015024, Merino	Connewarran, 062097
3	Dunbrae, 150510	503364-2015-150510, Merino	Hazeldean, 11.3542 (Hugh)
4	Ewe Wish Poll, 160057	604214-2016-160057, Poll Merino	Unknown
5	Kilfeera Park, 160358	503425-2016-160358, Merino	Kilfeera Park, 120018
6	Kilfeera Park, 170010	503425-2017-170010, Merino	Roseville Park, 140019
7	Pooginook Poll, 161153 (Link)	601442-2016-161153, Poll Merino	Pooginook Poll, 140603
8	The Yanko, 130003 (Link)	504694-2013-130003, Merino	The Yanko, 090064
9	Toland Poll, 151042 (Link)	601082-2015-151042, Poll Merino	Anderson Poll, 120103
10	Toland Poll, 171011	601082-2017-171011, Poll Merino	Anderson Poll, 120282
11	Trigger Vale Poll, 160095	609251-2016-160095, Poll Merino	Moojepin, 120652

Breeders flock, Sire name Sire ID #, Breed †	Contact Details
Bindawarra, 000036 503892-2014-140036, Merino	**Steven Harrison** 72 Giffard West Road, Giffard West VIC 3851 P: (03) 5146 8303, M: 0427 46 8303, E: slhgiffard@bigpond.com
Connewarran, 015024 (Link) 504704-2015-015024, Merino	**Hamish Weatherly** Connewarran, PO Box 21, Mortlake VIC 3272 P: (03) 5599 7276, M: 0423 07 3328, E: hamishweatherly@hotmail.com
Dunbrae, 150510 503364-2015-150510, Merino	**John McCracken** Dunbrae, 533 Upton Road, Avenel VIC 3664 P: (03) 5796 2386, M: 0427 05 1937, E: john.mccracken7@bigpond.com
Ewe Wish Poll, 160057 604214-2016-160057, Poll Merino	**Matthew Ipsen** 912 Maryborough - St Arnaud Rd, Wareek VIC 3465 P: (03) 5461 2016, M: 0417 51 6640, E: ewewish@bigpond.com
Kilfeera Park, 160358 503425-2016-160358, Merino	**Murray & Fiona McKenzie** 131 Brock Rd, Lurg VIC 3673 P: (03) 5766 6278, M: 0428 48 1961, E: kilpark@people.net.au
Kilfeera Park, 170010 503425-2017-170010, Merino	**Murray & Fiona McKenzie** 131 Brock Rd, Lurg VIC 3673 P: (03) 5766 6278, M: 0428 48 1961, E: kilpark@people.net.au
Pooginook Poll, 161153 (Link) 601442-2016-161153, Poll Merino	**John Sutherland** Pooginook , Jerilderie NSW 2716 P: (02) 6954 6145, M: 0428 95 3017, E: pooginook@parawaypastoral.com
The Yanko, 130003 (Link) 504694-2013-130003, Merino	**Hugh, Heather and Tim Cameron** The Yanko, Jerilderie NSW 2716 P: (02) 6956 1142, M: 0427 56 1142, E: theyanko@bigpond.com
Toland Poll, 151042 (Link) 601082-2015-151042, Poll Merino	**Anna Toland** 1888 Feltrim Rd, Violet Town VIC 3669 M: 0438 98 1605, E: anna@tolandmerino.com.au
Toland Poll, 171011 601082-2017-171011, Poll Merino	**Anna Toland** 1888 Feltrim Rd, Violet Town VIC 3669 M: 0438 98 1605, E: anna@tolandmerino.com.au
Trigger Vale Poll, 160095 609251-2016-160095, Poll Merino	**Andrew and Mandi Bouffler** Valera, Lockhart NSW 2656 P: (02) 6920 7656, M: 0427 20 7656, E: info@triggervalesheepstuds.com.au

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

†   Breed of flock in which the sire was born

The 16 digit Sire ID is a unique number for all sheep.
   - 2 for the breed of the flock, eg. Merino (50), Poll Merino 60), Dohne (51)
   - 4 for flock code, AASMB Registered flock code or unregistered code.
   - 4 for year of drop & 6 for tag# used in the breeder's records.

Host Property and Ewe Base

The host property for the North East Victoria (Dookie) trial is situated at the Melbourne University Dookie campus, located 30km east of Shepparton, off the Midland Highway.

The Dookie farm is 2440 hectares of undulating country with sheep and cropping the two main enterprises. The sheep are Toland Poll blood which is predominately a self-replacing flock of 3000 ewes.

Pastures range from phalaris/sub clover to annual grasses/sub clover, with some Lucerne available, and soil type is predominantly clay/loam.

2018 and 2019 saw below average rainfall (refer to rainfall table), resulting in very challenging conditions. 2018 was the most challenging with very little autumn and spring rainfall resulting in early, and prolonged, supplementary feeding taking place. Wheat and barley hay were primarily used as the supplements fed.

Month	2017	2018	2019	2020	Average
January	29.4	26.8	10.4	17.6	21.1
February	30.0	0.8	2.8	13.8	11.9
March	37.2	7.6	1.0	69.4	28.8
April	49.6	3.6	10.4	124.6	47.1
May	24.8	23.0	49.8	28.0	31.4
June	2.4	20.4	29.6	32.2	17.5
July	36.8	13.0	47.4		32.4
August	63.6	34.6	21.6		39.9
September	6.8	4.8	14.0		8.5
October	36.6	19.6	1.4		19.2
November	38.6	51.0	0.6		30.1
December	28.6	71.6	12.6		37.6
Total	**384.4**	**276.8**	**201.6**	**253.4**	**287.6**

Farm Management

During the 2018 drop trial period there were significant issues with the farm management at Dookie College including poor feeding during tough seasonal conditions and also flystrike, this resulted in a 10% overall loss of trial progeny. These losses did not occur in any one event and were not reported to the site committee by the farm manager, so only became apparent late in the sire evaluation process.

Subsequently the NEV site committee reported to the Dean of the University and met with the Melbourne University Farm committee (who were also unaware of farm management issues). Strategies have now been put in place to ensure adequate reporting and monitoring between sire evaluation assessments, including full EID.

In addition, Nathan Anderson was appointed towards the middle of 2019 as the new farm manager. Nathan has extensive industry experience and has shown a commitment to sire evaluation with regular communications to the site committee.

2018 Drop Summary

Selection, joining and lambing
529 ewes were inseminated on February 28, 2018 to 11 sires. Ewes were selected to provide a uniform line with good conformation, even wool quality and productivity. These were allocated randomly ensuring that each sire had an even balance of age groups. The lambing period was July 26 – August 3, 2019.

Progeny management
The progeny were trail fed with wheat prior to weaning to make the transition to supplementary feeding smoother; allowing them to get used to the feed cart and other equipment entering the paddock. Weaning occurred on October 23, where they were weighed and also received a body / breech CLIK application. Progeny received ongoing supplementary feeding post weaning and over the summer of 2019/20.

A worm egg count (WEC) was undertaken on December 13, 2019 to assess possible worm burden.

Progeny were crutched on January 21, 2019.

First assessment
Progeny were weighed at the post weaning stage and Midside sampling was completed, just prior to shearing in March 2019. Wool assessment of greasy / clean fleece weight, fibre diameter plus coefficient of variation and curvature were tested / measured.

Second assessment
Weights were taken in September 2019, at the hogget stage, in conjunction with muscle and fat scans. A further weight was collected once the progeny reached the adult stage in January 2020.

In March 2020 midsides were collected and progeny were individually classed for visual traits just prior to the adult shearing. The wool measurements included those previously collected, plus the addition of staple length and staple strength.

Unfortunately, Covid 19 restrictions were enforced shortly after the second shearing in March 2020. The result was that the 2018 progeny were not assessed for shoulders/back and body wrinkle. In addition, a further adult weight was not taken prior to the progeny being sold.

Collated by Anna Toland
North East Victoria's Site Coordinator
(with input from Nathan Anderson, Dookie Farm Manager).

Visual Trait Assessment and Site Breeding Objective

Visual trait assessment
Classer's Grade: James Osborne (AWN)
Trait Scores: James Osborne (AWN)

Site Breeding Objective used to assess the Visual Classer's Grades
The Breeding Objective used by the classer/s when selecting the Classers Tops, Flock and Cull grades is described below. The Breeding Objective for both measured and visual assessed traits was developed by the site committee in consultation with the classer prior to the grading.

> **Breeding Objective**
> The breeding objective is to produce fast growing, heavy cutting, plain bodied, medium framed sheep with fine-medium (18 micron) long stapled wool with good style and staple strength. Sheep should be mules free compatible with high worm resistance and positive genetic fat and muscle, encouraging high fertility and high number of lambs weaned.

In regard to Classer's Visual Grades the expectation is at the start of grading that there will be a ratio of 25% Top, 50% Flock and 25% Cull. However, the sheep performance relative to the above breeding objective determines the final proportion allocated to each grade.

Assessment and Management Program

Activity	Date/s	Age	Wool
Selection of ewes	December 2017		
Allocation of ewes for mating	February 2018		
Pregnancy scanning	May 11, 2018		
Allocated to lambing paddocks	July 21, 2018		
Lambing: start – finish	July 26 – August 3, 2018		
Lambing mobs boxed into singles and twins management groups	August 9, 2018		
Tagging, pigmentation and breech scoring	August 9, 2018		
Marking	August 9, 2018		
Weaning	October 23, 2018	2 months	
Mid side fleece sampling (P) Mid side fleece sampling (A)	March 22, 2019 February 20, 2020	7 months 19 months	7 months 12 months
Visual trait scoring (A)	February 20, 2020	19 months	12 months
Shearing (P) Shearing (A)	March 22, 2019 March 23, 2020	7 months 19 months	7 months 12 months
Fat and eye muscle scanning (H)	September 18, 2019	12.5 months	
Worm egg count	May 21, 2019		
Body weight (W) Body weight (P) Body weight (H) Body weight (A)	October 23, 2018 May 21, 2019 September 18, 2019 January 28, 2020	2 months 9 months 13 months 17 months	
Drench / Vaccination	Cydectin & Glanvac 6 in 1, May 2019 Triguard, November 2019.		
Fly treatment	October 2018, December 2019, January & March 2020.		
Supplementary Feeding	October – February 2019 and then January – March 2020.		
Field day or public display	Showcase at Dookie Open Day, Melbourne University, September 9 2018. March 2020 scheduled Sire Evaluation field day – postponed due to COVID.		

Explaining the Different Types of Results Reported

Raw Data » **Adjusted Sire Means** » **Flock Breeding Values.**

Merino Sire Evaluation produces a variety of result types which are all connected. The types of data produced include **Raw Data**, **Adjusted Sire Means**, **Flock Breeding Values** and **Indexes**. Initial measurements taken during sire evaluation assessments are used as the first level of results (Raw Data), then adjustments are made to increase the selection accuracy and better enable the comparison of results and sires (Adjusted Sire Means and Flock Breeding Values and Indexes).

Where possible, AMSEA publishes **Adjusted Sire Means**, **Flock Breeding Values** and **Indexes** in Site Reports as they offer a higher level of accuracy**.** Visual Traits are reported as **Raw Data**; this is because Adjusted Sire Means and Flock Breeding Values are not currently available for those traits.

Raw Data
Raw data is unadjusted results as measured in the yard, paddock or wool testing facility.

Adjusted Sire Means
These are raw data results that have been adjusted for the effect of sex, birth type/rear type, age of dam, dam source, age at measurement and management group.

Flock Breeding Values (FBVs)
These results have been adjusted in the same way as Adjusted Sire Means, then further calculations have also been made to account for the level of heritability of a trait (some are more heritable than others), correlations between traits and the number of progeny a sire has.

FBVs are within site and within drop. As such they do not include data from other sources as is the case with Australian Sheep Breeding Values (ASBVs), which are reported in Merino Superior Sires.

Indexes
A breeding index is the combination of breeding values into a single value that reflects a certain emphasis on those traits.

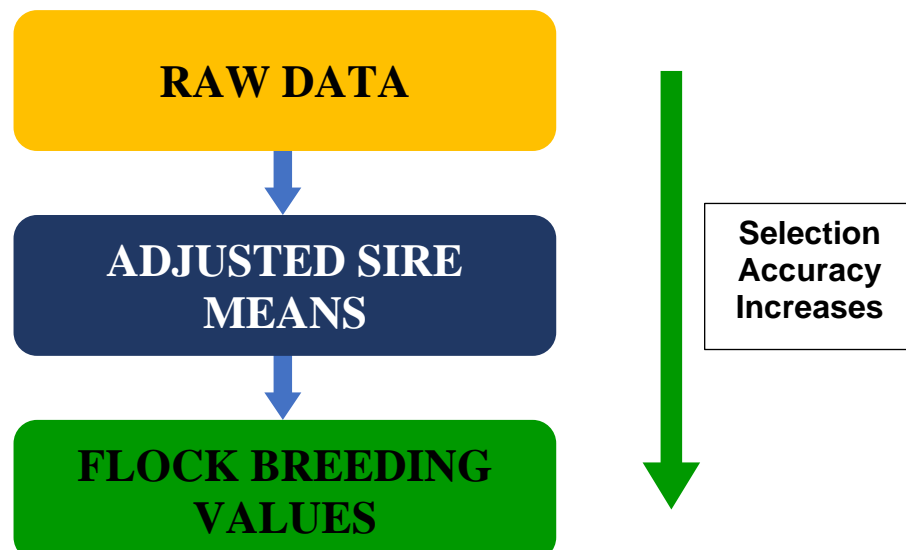For more information about each Index see the page in this report titled 'Index Options'.

RAW DATA

↓

ADJUSTED SIRE MEANS

↓

FLOCK BREEDING VALUES

Selection Accuracy Increases

Table 1. Adjusted Sire Means for Measured Traits

Adjusted Sire Means are the average performance of all the progeny of a sire adjusted for all available information on sex, birth type, rear type, age of dam, age of measurement and management group, in order to improve the accuracy. No account is made for trait heritability and genetic correlations between traits that can improve the breeding value accuracy, as is the case in Tables 2, 3 and 4.

The highest performing sires for each trait (trait leaders) are highlighted by shading. The **Progeny group average** listed at the bottom of the table is the actual mean of the progeny group which includes both ewes and wethers.

Sire Code	Breeders flock, Sire name	Number of Progeny*	GFW kg P^	GFW kg A	CFW kg P	CFW kg A	FD µm P	FD µm A	FDCV % P	FDCV % A	SL mm P	SS N/ktex P	WT kg W	WT kg P	WT kg H	WT kg A	FAT mm H	EMD mm H
1	Bindawarra, 000036	27	3.1	6.3	2.0	4.3	16.9	18.1	21.4	17.3	98.8	27.3	31.1	30.4	49.3	55.0	2.8	26.4
2	Connewarran, 015024	31	2.9	6.2	1.9	4.1	16.1	17.5	21.8	17.5	90.9	23.3	30.9	30.5	52.6	55.9	2.9	26.4
3	Dunbrae, 150510	9	*Unreported due to insufficient progeny numbers.*															
4	Ewe Wish Poll, 160057	30	2.6	5.5	1.7	3.7	16.9	18.5	19.5	16.6	85.8	28.0	30.3	30.8	51.7	55.9	3.0	25.9
5	Kilfeera Park, 160358	26	3.0	6.3	2.0	4.2	16.6	18.0	21.0	16.3	89.7	23.9	30.2	29.5	49.2	53.8	2.5	24.0
6	Kilfeera Park, 170010	18	2.7	5.4	1.8	3.6	17.3	17.8	20.9	16.4	90.9	24.5	29.8	29.6	48.6	54.0	2.9	25.7
7	Pooginook Poll, 161153	33	2.9	6.4	1.8	4.0	16.7	18.1	21.6	17.7	91.8	22.7	30.5	30.6	51.3	57.1	2.8	25.8
8	The Yanko, 130003	28	2.8	6.0	1.8	4.1	17.1	18.3	20.9	16.7	85.7	27.4	32.5	31.9	55.1	59.9	2.7	25.5
9	Toland Poll, 151042	25	2.8	6.1	1.7	3.8	16.8	18.3	20.9	16.4	93.6	30.7	30.7	33.0	54.9	60.6	3.3	27.0
10	Toland Poll, 171011	21	2.7	5.6	1.8	3.6	16.6	18.1	20.5	16.8	94.2	22.8	30.7	32.2	51.2	57.0	2.9	26.1
11	Trigger Vale Poll, 160095	42	2.7	5.5	1.7	3.6	17.8	18.8	20.0	16.4	98.9	30.9	28.9	31.4	51.8	57.0	3.0	26.2
	Progeny group average	**26**	**2.8**	**5.9**	**1.8**	**3.9**	**16.9**	**18.1**	**20.9**	**16.9**	**91.5**	**26.0**	**30.7**	**30.9**	**51.6**	**56.7**	**2.9**	**25.9**
			kg		kg		µm		%		mm	N/ktex	kg				mm	mm

*Number of progeny is at weaning.

^ W = Weaning (42 to 120 days); P = Post Weaning (210 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

MERINOSELECT Indexes

A guide from Sheep Genetics

Why use a selection index?

Indexes are an important tool to drive genetic improvement in ram breeding programs. Each index combines multiple measured traits, or breeding values, into a single value that reflects a certain production emphasis on these traits. A range of traits are included which are of economic or functional importance. Collectively, these traits make up the "breeding objective" of the index which aims to improve profitability in commercial sheep enterprises.

Indexes are useful because they balance genetic improvement appropriately across a range of traits with the emphasis of each individual trait determined by it's relative importance to a selection approach for a particular style of production system.

> " **Appropriately designed indexes are central to the goal of breeding more profitable sheep.**

However, it is recommended that the performance of individual measured and visually assessed traits also be used in conjunction with indexes.

Choosing the right index

This report includes four indexes based on four commercial production systems, these are outlined in the figure below.

The Sheep Genetics website gives further index descriptions and explains that there are 'base' and 'plus' levels for each index with the latter including the breeding values of additional traits. Sires reported within this document have accurate breeding values for these additional traits and so the plus indexes are reported; DP+, MP+, FP+ and WP+.

Dual Purpose (DP+)	**Merino Production (MP+)**
Income is a balance of wool from breeding ewes and meat production from lambs by Merino and terminal sires.	**Income is a balance of wool and surplus Merino sheep sales with balanced improvement of fleece weight and fibre diameter.**
Fibre Production (FP+)	**Wool Production (WP+)**
Income is mainly from the wool clip with a focus on superior wool quality through improving fibre diameter, CV and staple strength.	**Income is a balance of wool and surplus Merino sheep sales with greater emphasis on increasing fleece weight.**

> " **When selecting on these indexes the long-term responses will vary depending on the traits measured, available pedigree, use of genomics, flock structure and selection emphasis on the index.**

The changes in individual traits from using an index depend on the information you record in your flock. If you want to improve, or even just maintain a trait, you must record it to ensure breeding values are sufficiently accurate for the index to do its job.

For detailed explanations and further information on indexes visit:

www.sheepgenetics.org.au

Sheep Genetics have resources available for both ram breeders and ram buyers.

Table 2. AMSEA Index Values and Classer's Visual Grade

The index values reported are based on measured traits FBV performance with varying emphasis on fleece weight, fibre diameter, body weight, staple strength and worm egg count. See the MERINOSELECT Indexes page for more information on the indexes presented in the table below.

The highest performing sires for each trait (trait leaders) are highlighted by shading. Each sire is listed for Classer's Visual Grade and the same four indexes are reported at all site evaluations.

Sire Code	Breeders flock, Sire name	Number of Progeny*	AMSEA Index Values				Classer's Visual Grade[1]	
			Dual Purpose Plus	Merino Production Plus	Fibre Production Plus	Wool Production Plus	Tops % A^	Culls % A
1	Bindawarra, 000036	27	115	114	117	117	-1	-7
2	Connewarran, 015024	31	126	127	123	125	7	3
3	Dunbrae, 150510	9	*Unreported due to insufficient progeny numbers.*				*Insufficient progeny.*	
4	Ewe Wish Poll, 160057	30	88	85	88	83	6	2
5	Kilfeera Park, 160358	26	85	112	113	113	18	-5
6	Kilfeera Park, 170010	18	72	74	84	74	1	-7
7	Pooginook Poll, 161153	33	100	103	98	107	12	-4
8	The Yanko, 130003	28	123	123	113	123	8	-6
9	Toland Poll, 151042	25	125	115	109	110	-11	3
10	Toland Poll, 171011	21	91	81	86	83	-3	-5
11	Trigger Vale Poll, 160095	42	85	80	79	80	-20	15
	Average performance	**26**	**100**	**100**	**100**	**100**	**29**	**15**

*Number of progeny is at weaning.

^ W = Weaning (42 to 120 days); P = Post Weaning (210 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

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

Sire codes listed in the Tables are used to locate sire performance in the following figures.

Figure 1a. Combined measured traits (DP+ index) and combined visually assessed traits for the site objective.

Figure 1a. Visual and measured performance (DP+ index)
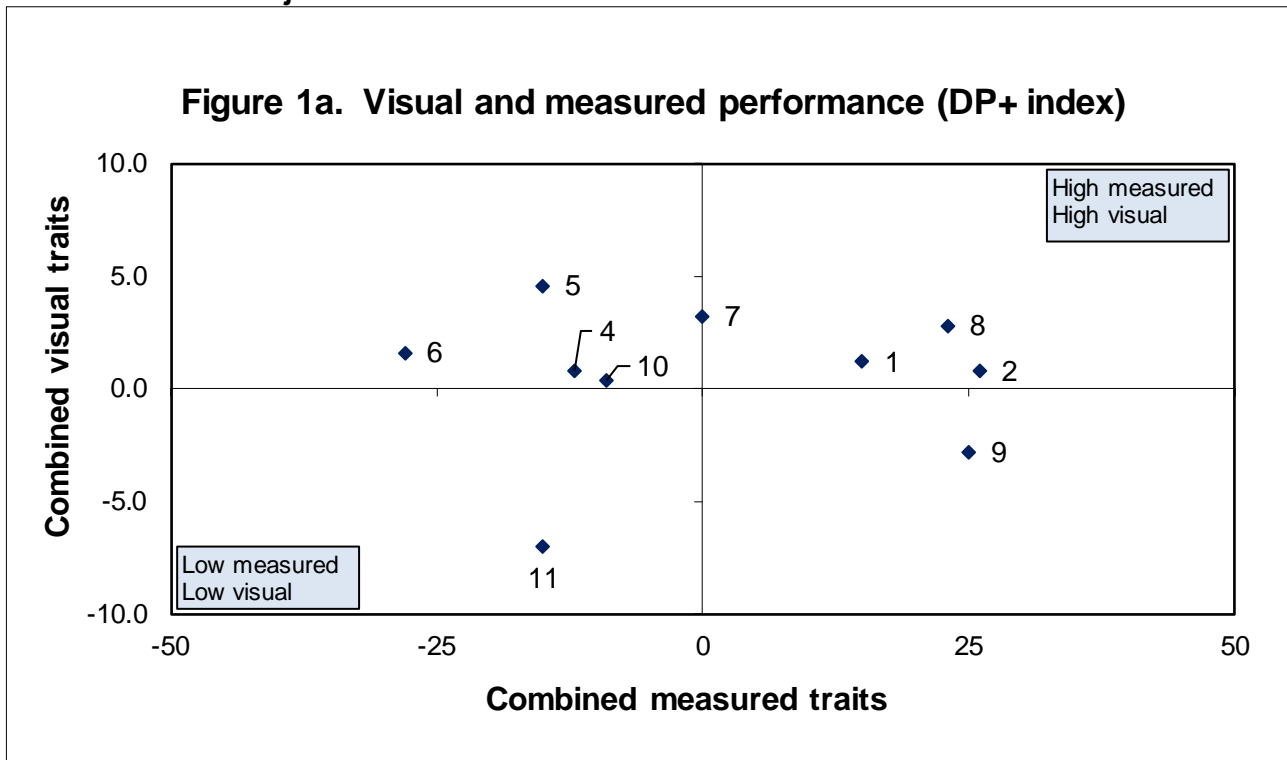
Figure 1b. Combined measured traits (MP+ index) and combined visually assessed traits for the site objective.

Figure 1b. Visual and measured performance (MP+ index)
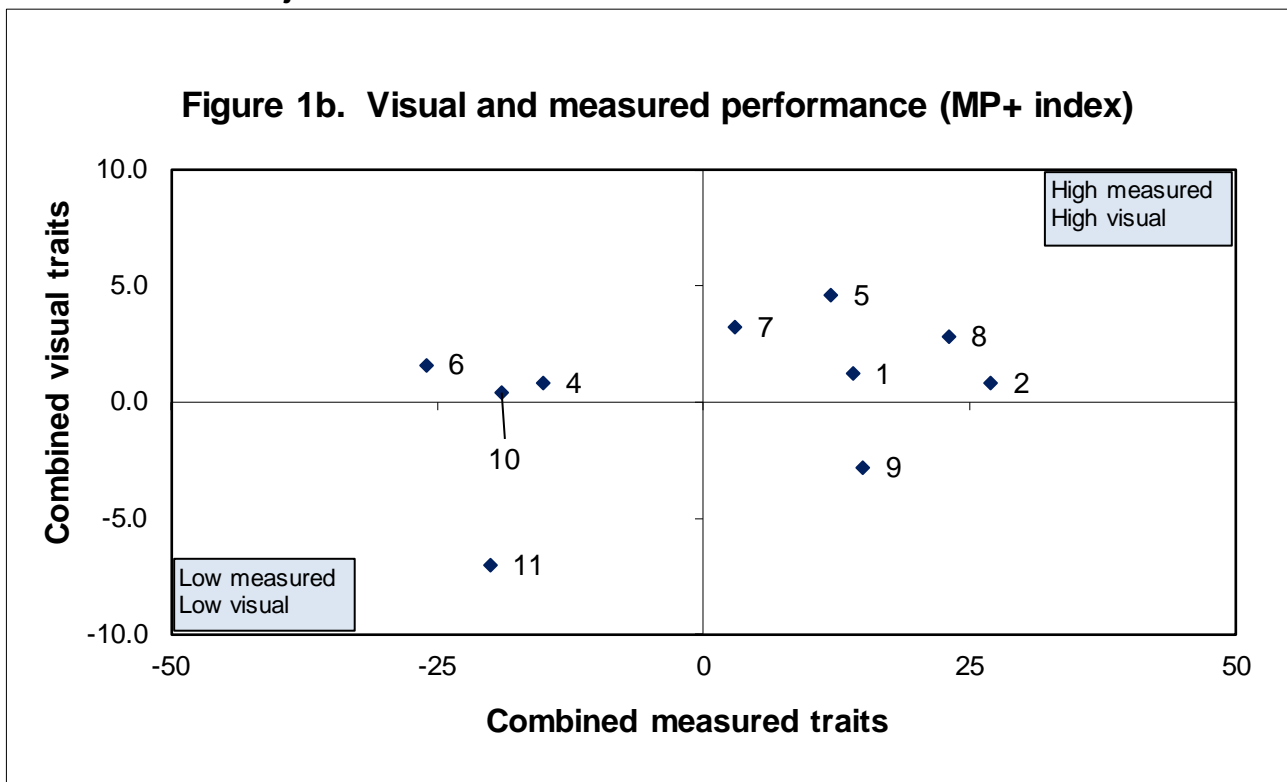
Figure 1c. Combined measured traits (FP+ index) and combined visually assessed traits for the site objective.

Figure 1c. Visual and measured performance (FP+ index)
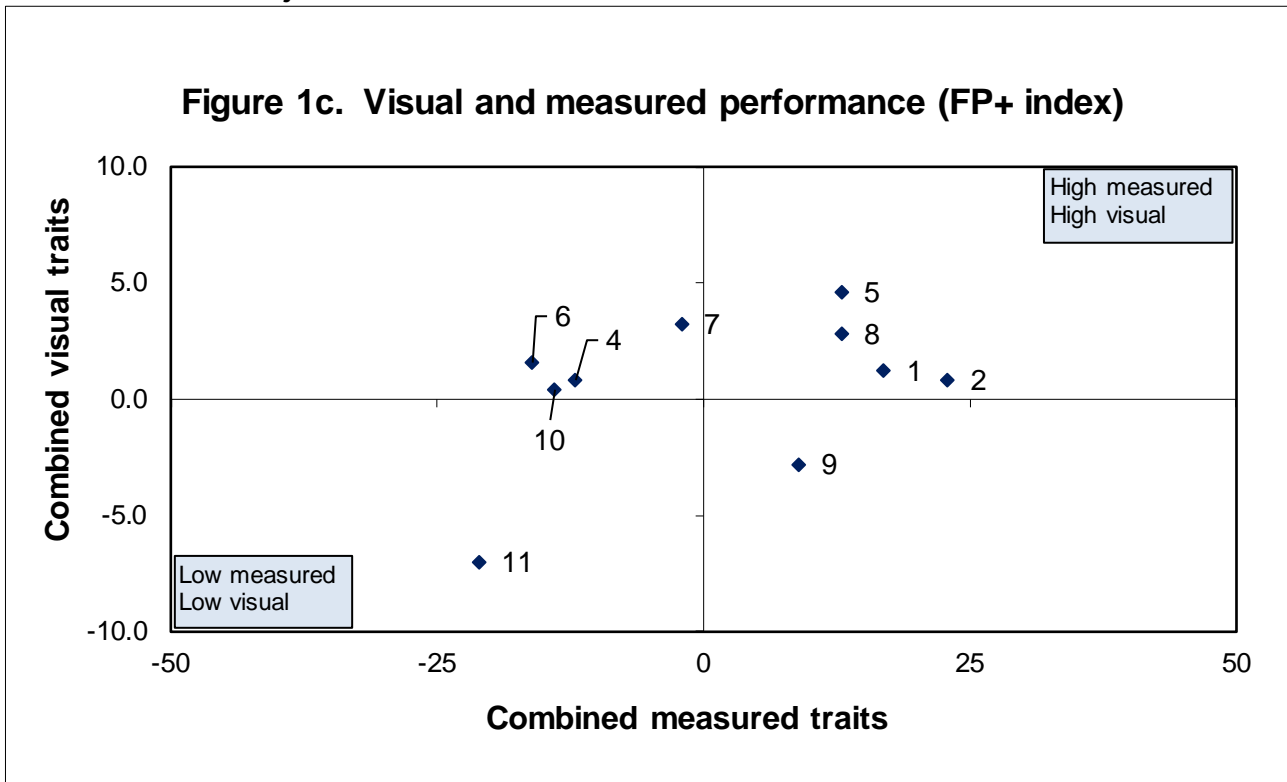
Figure 1d. Combined measured traits (WP+ index) and combined visually assessed traits for the site objective.

Figure 1d. Visual and measured performance (WP+ index)
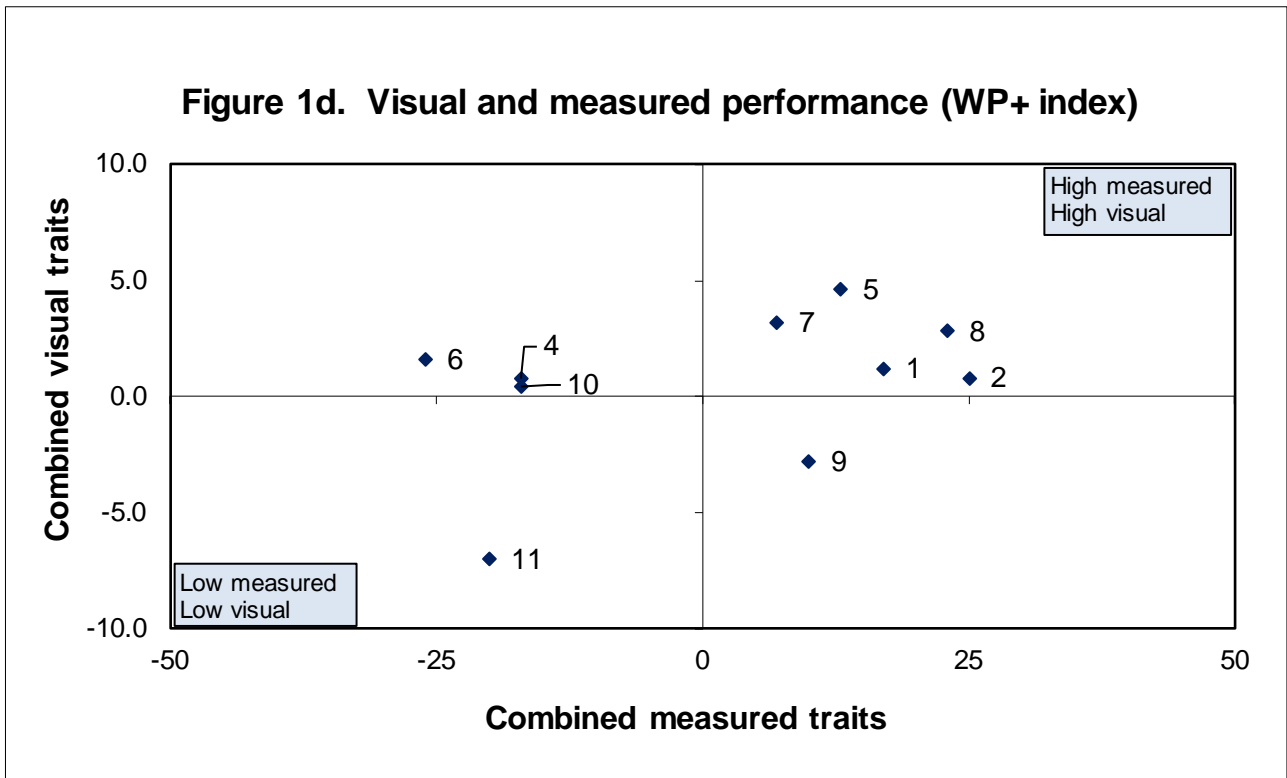
Figure 2. Classer's Visual Grade - Tops and Culls
The graph describes performance for Classer's Visual Tops Grade on the side axis and Culls Grade on the bottom axis. Sires that have above average Tops and below average Culls are in the top left hand quarter.

Figure 2. Classer's Visual Grade: Tops and Culls

Figure 3. Fleece Weight and Fibre Diameter (FBVs)
The graph describes performance for clean fleece weight (CFW) on the side axis and fibre diameter (FD) on the bottom axis. Sires that are above average for clean fleece weight and below average fibre diameter are located in the top left hand quarter.

Figure 3. Fleece Weight and Fibre Diameter (FBVs)

Figure 4. Fleece Weight and Staple Length (FBVs)
The graph describes performance for clean fleece weight (CFW) on the side axis and staple length (SL) on the bottom axis. Sires that are above average for clean fleece weight and above average for staple length are located in the top right hand quarter.

Figure 4. Fleece Weight and Staple Length (FBVs)
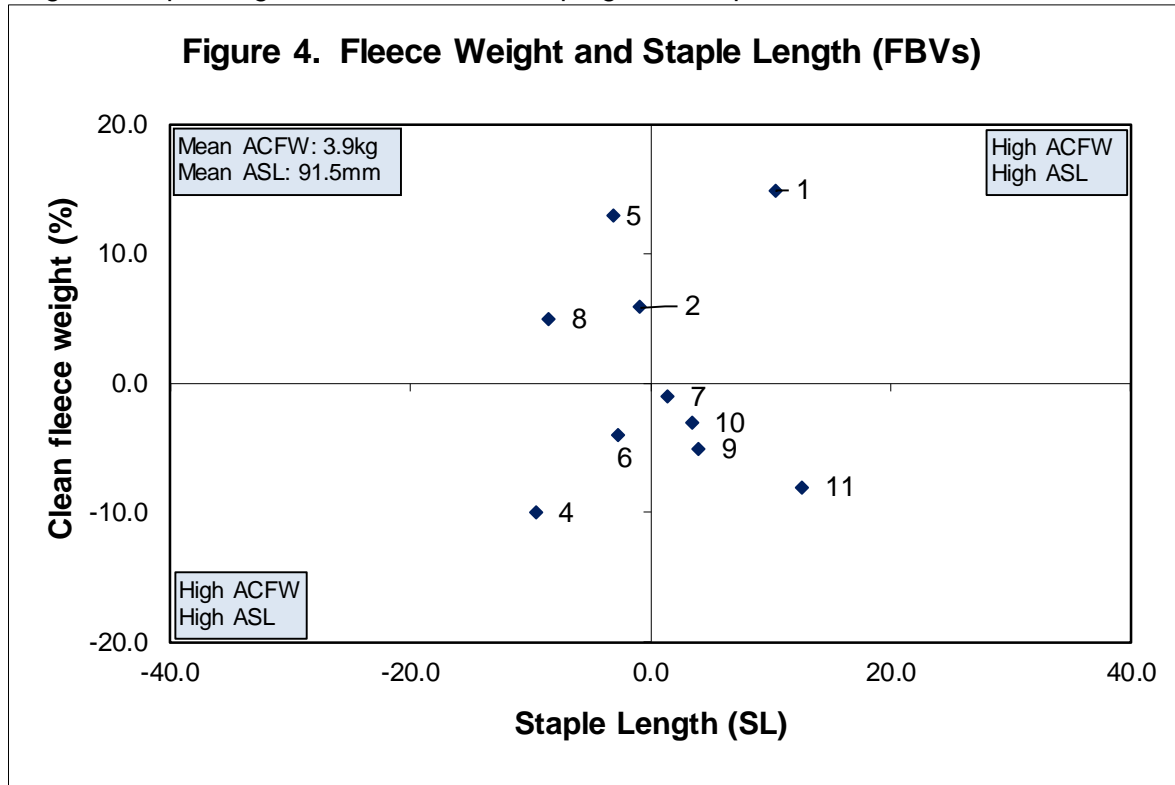
Figure 5. Fleece Weight and Body Weight (FBVs)
The graph describes performance for clean fleece weight (CFW) on the side axis and body weight (WT) on the bottom axis. Sires that are above average for clean fleece weight and above average for body weight are located in the top right hand quarter.
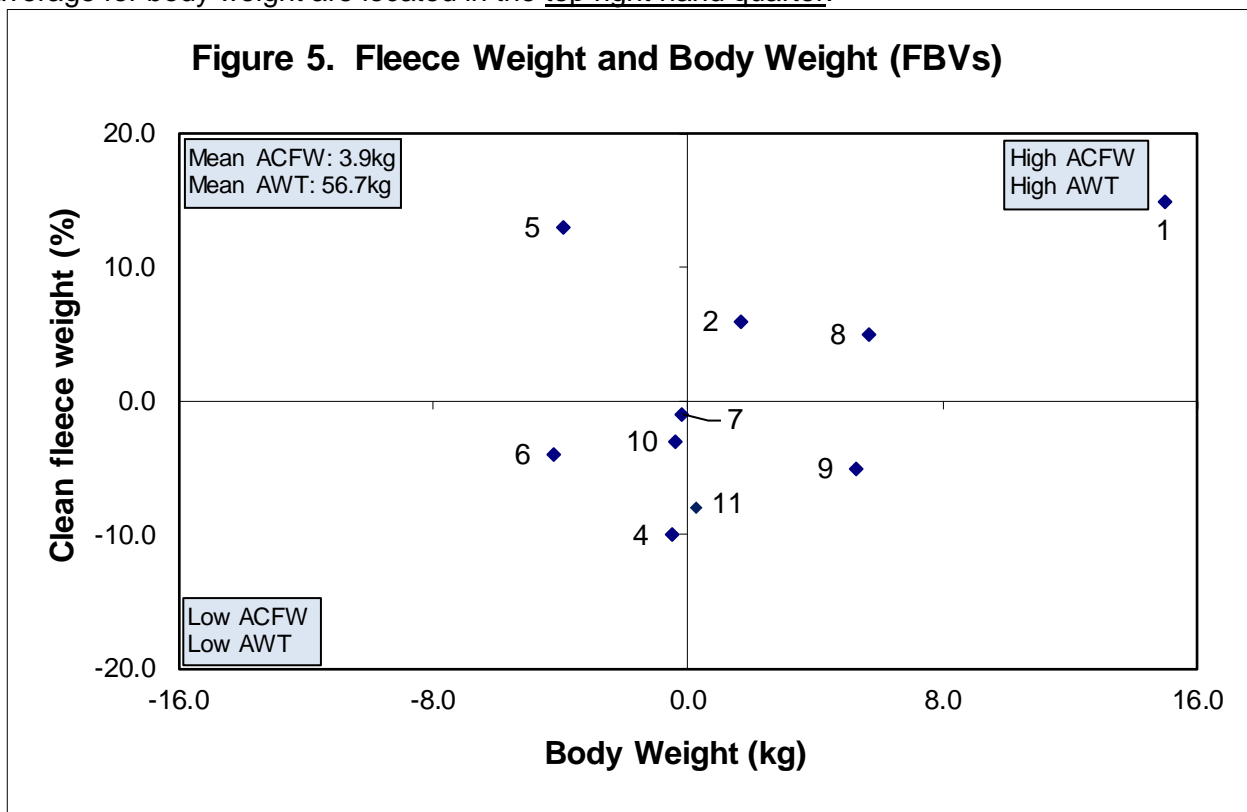
Figure 5. Fleece Weight and Body Weight (FBVs)

Figure 6. Fleece Weight and Fat (FBVs)
The graph describes performance for clean fleece weight (CFW) on the side axis and fat depth (FAT) on the bottom axis. Sires that are above average for clean fleece weight and above average for fat are located in the <u>top right hand quarter</u>.
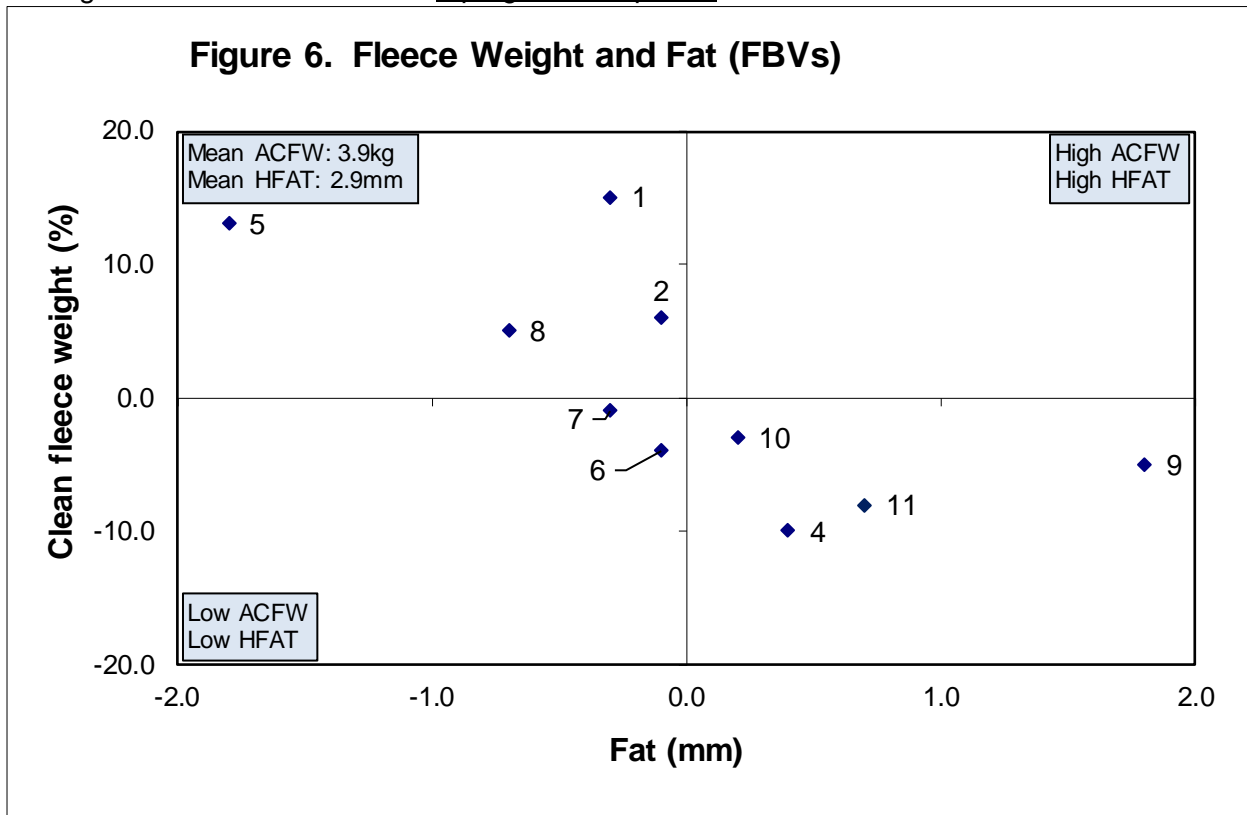
Figure 6. Fleece Weight and Fat (FBVs)

Figure 7. Fleece Weight and Eye Muscle Depth (FBVs)
The graph describes performance for clean fleece weight (CFW) on the side axis and eye muscle depth (EMD) on the bottom axis. Sires that are above average for clean fleece weight and above average for eye muscle depth are located in the <u>top right hand quarter</u>.
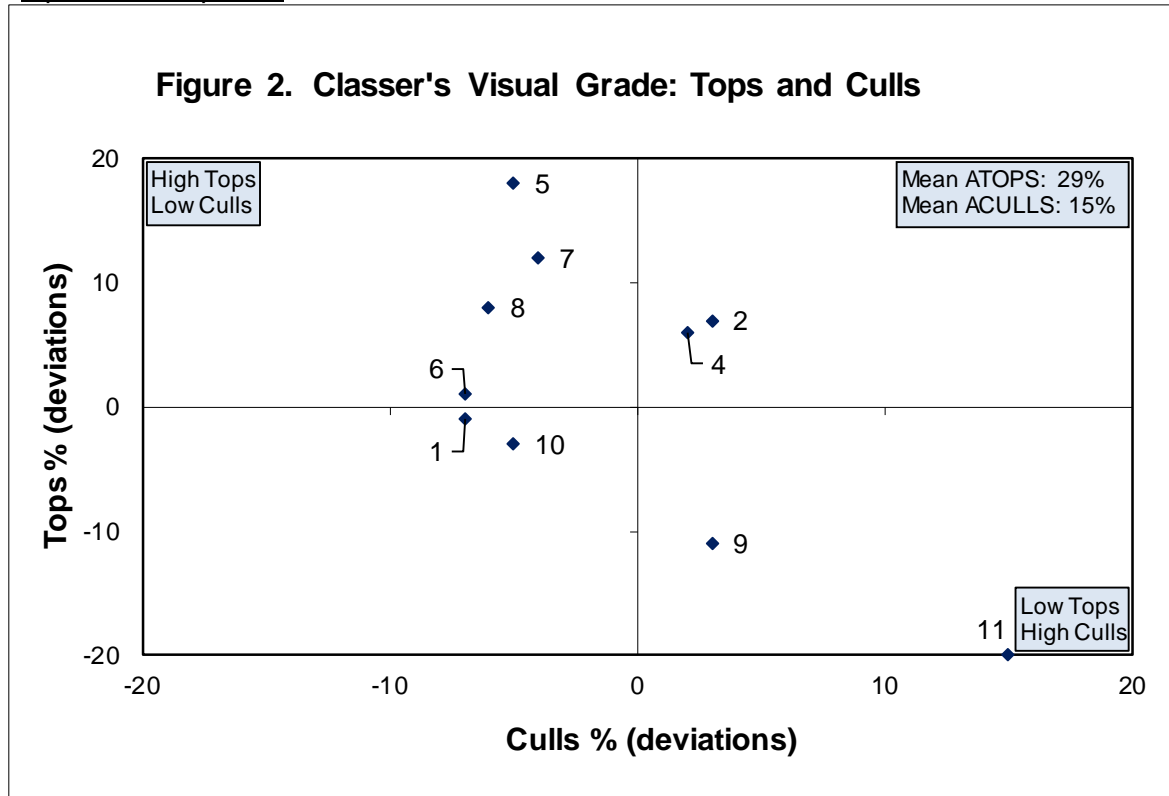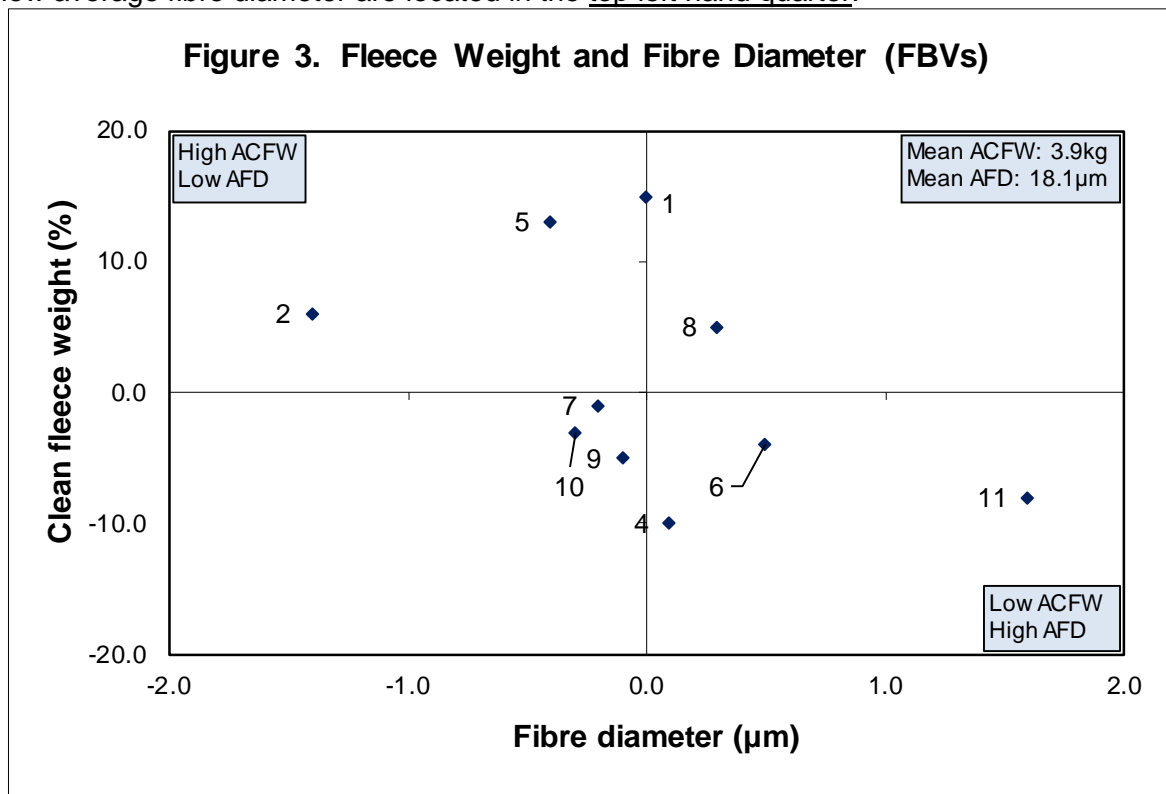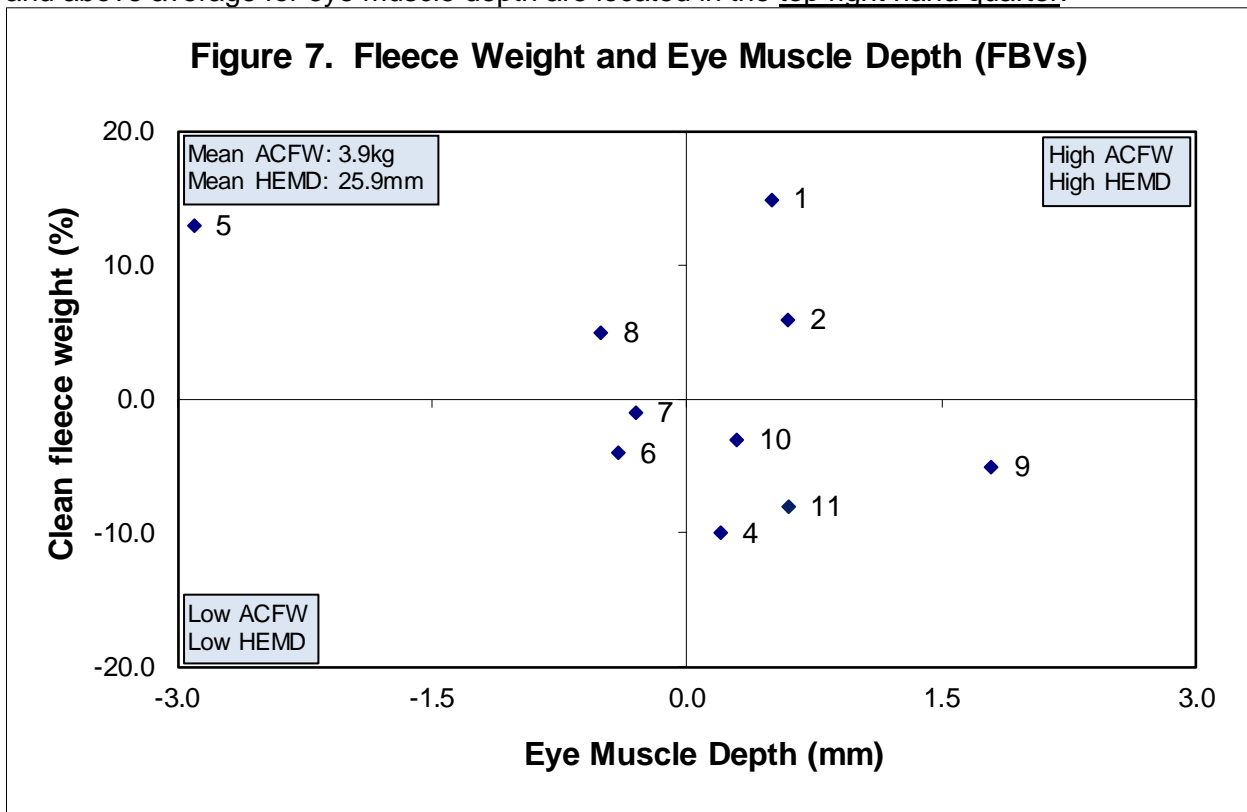

Figure 7. Fleece Weight and Eye Muscle Depth (FBVs)

Figure 8. Fleece Weight (FBV) and Breech Wrinkle (Dev)

The graph describes performance for clean fleece weight (CFW) on the side axis and breech wrinkle (BRWR) on the bottom axis. Sires that are above average for clean fleece weight and below average for breech wrinkle are located in the top left hand quarter.

Figure 8. Fleece Weight (FBVs) and Breech Wrinkle (Dev)
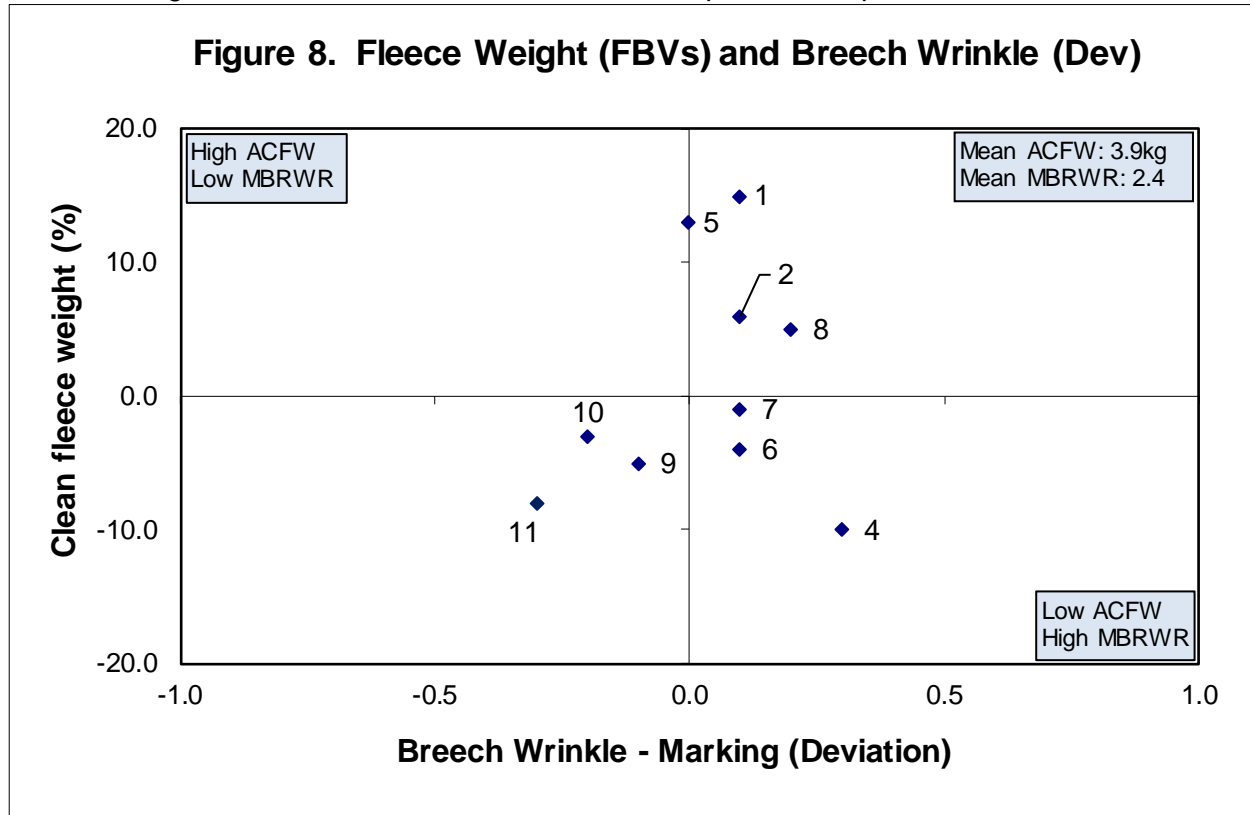
Figure 9. Body Weight and Eye Muscle Depth (FBVs)

The graph describes performance for body weight (WT) on the side axis and eye muscle depth (EMD) 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.

Figure 9. Body Weight and Eye Muscle Depth (FBVs)

Figure 10. Staple Strength and Worm Egg Count (FBVs)
The graph describes performance for staple strength (SS) on the side axis and worm egg count (WEC) on the bottom axis. Sires that are above average for staple strength and below average for worm egg count are located in the top left hand quarter.
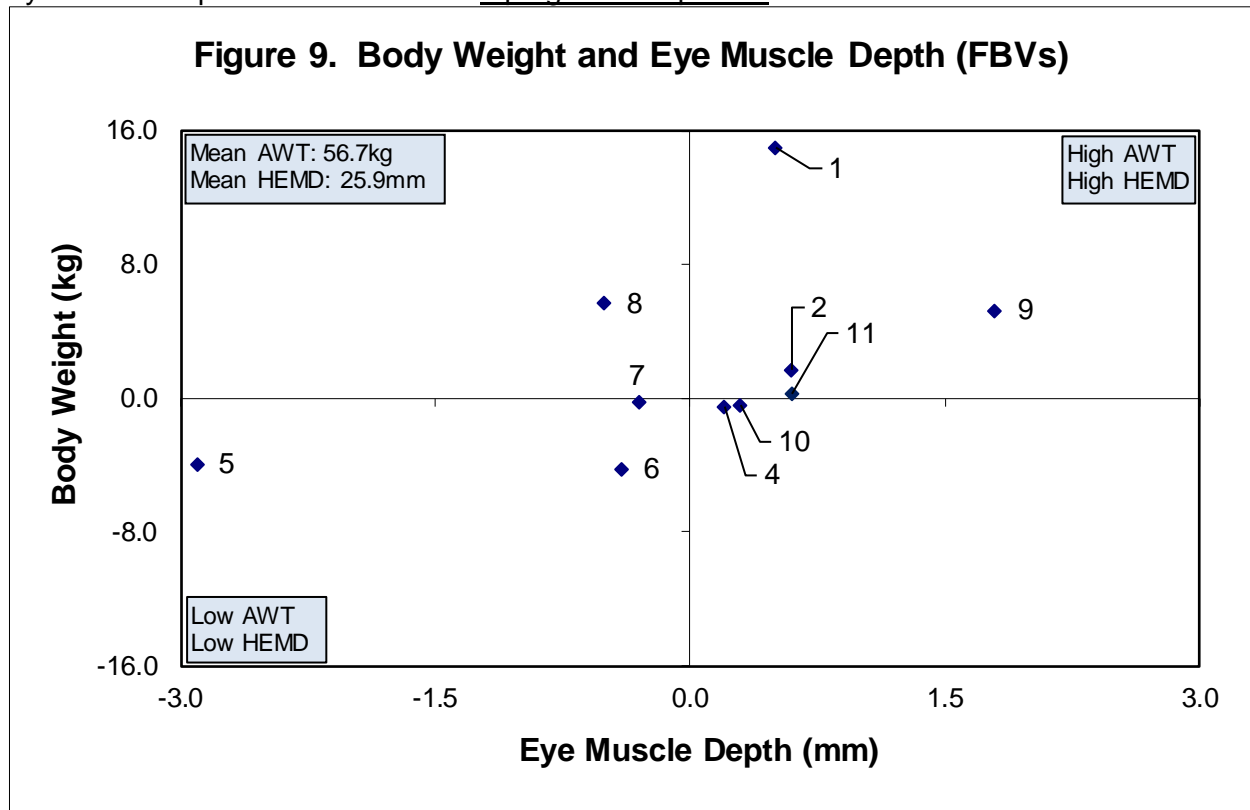

Figure 10. WEC and Staple Strength (FBVs)
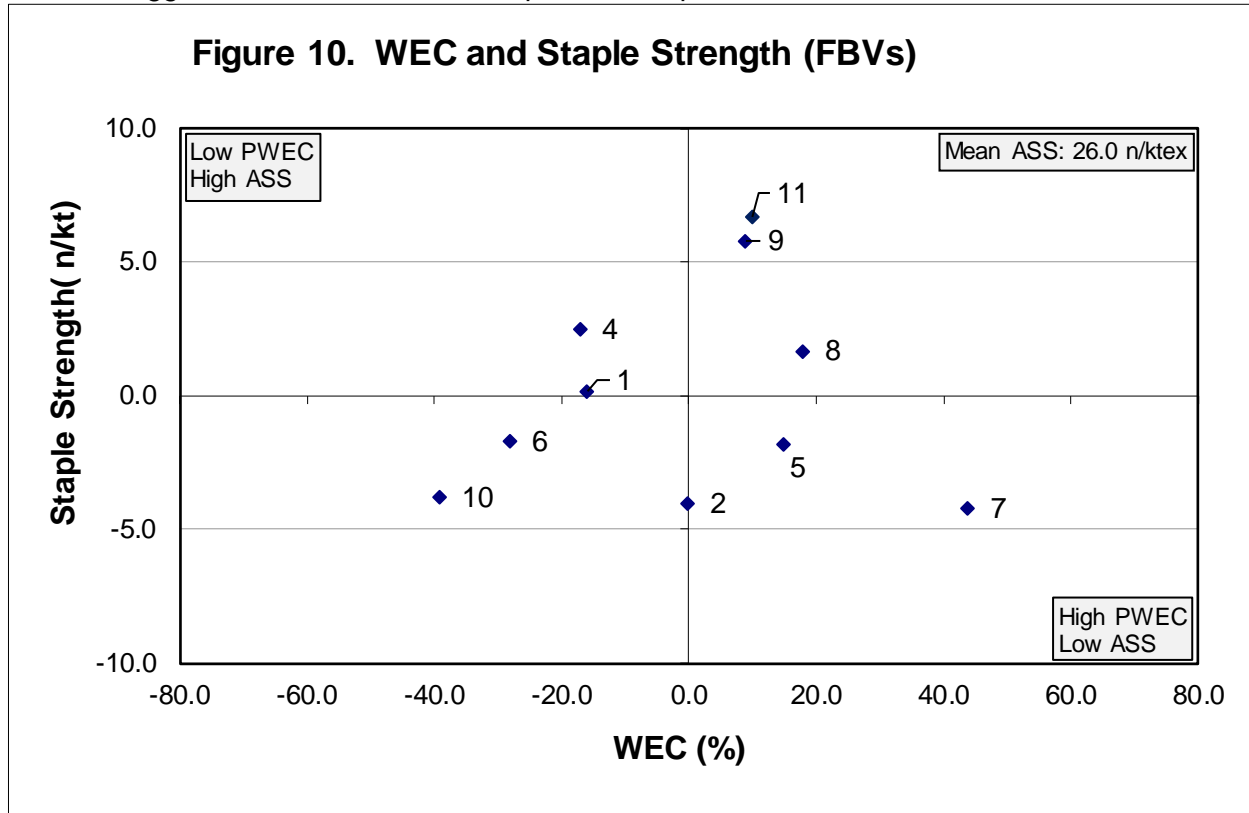
Understanding the Results – Measured Traits & Classer's Visual Grade

Breeders flock, Sire number:	Identity of the breeder's flock and the sire's number or name.
Number of progeny:	The number of progeny a sire had at weaning. Average number of progeny is included in Table 1.
Flock Breeding Values:	Flock Breeding Values (FBVs) are Estimated Breeding Values (EBVs) calculated by Sheep Genetics for the sires 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 sire's 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. The highest performing sires for each trait (trait leaders) are highlighted by shading. Curvature is the possible exception when for many breeders the optimum score is in the middle of the range therefore trait leaders have not been highlighted.
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:	M = Marking　　　　　　- 14 to 42 days (2 – 6 weeks of age) 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 Visual 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. Page 8 provides more detail on Classer's Visual Grade and the site's Breeding Objective.

Table 3. Wool Measured Traits plus Classer's Visual Grade

Sire Code	Breeders flock, Sire name	Number of Progeny*	GFW % P^	GFW % A	CFW % P	CFW % A	FD µm P	FD µm A	FDCV % P	FDCV % A	SL mm A	SS N/ktex A	CURV deg/mm A	Tops % A	Culls % A
1	Bindawarra, 000036	27	13	13	15	19	0	0.1	0.9	0.7	10.5	0.2	-11.7	-1	-7
2	Connewarran, 015024	31	6	8	6	13	-1.4	-1.2	1.4	1.0	-0.9	-4.0	-0.2	7	3
3	Dunbrae, 150510	9	*Unreported due to insufficient progeny numbers.*											*Insufficient progeny.*	
4	Ewe Wish Poll, 160057	30	-10	-13	-10	-13	0.1	0.5	-1.7	-0.8	-9.5	2.5	6.0	6	2
5	Kilfeera Park, 160358	26	11	12	13	16	-0.4	-0.3	0.1	-0.5	-3.0	-1.8	-0.7	18	-5
6	Kilfeera Park, 170010	18	-8	-12	-4	-13	0.5	-0.3	-0.2	-0.2	-2.7	-1.7	3.5	1	-7
7	Pooginook Poll, 161153	33	6	13	-1	9	-0.2	-0.1	1.1	1.3	1.5	-4.2	-5.2	12	-4
8	The Yanko, 130003	28	1	3	5	8	0.3	0.3	-0.1	-0.2	-8.4	1.7	4.4	8	-6
9	Toland Poll, 151042	25	0	5	-5	-2	-0.1	0.3	0.0	-0.7	4.1	5.8	4.2	-11	3
10	Toland Poll, 171011	21	-5	-9	-3	-12	-0.3	-0.1	-0.5	-0.2	3.5	-3.8	0.9	-3	-5
11	Trigger Vale Poll, 160095	42	-5	-11	-8	-16	1.6	1.2	-1.4	-1.1	12.7	6.7	-8.4	-20	15

*Number of progeny is at weaning.

^ W = Weaning (42 to 120 days); P = Post Weaning (210 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

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

Table 4. Carcase and WEC Measured Traits plus Classer's Visual Grade

Sire Code	Breeders flock, Sire name	Number of Progeny*	Flock Breeding Values (deviations)				FAT mm	EMD mm	WEC %	Classer's Visual Grade[1]	
			WT kg							Tops %	Culls %
			W^	P	H	A	H	H	P	A	A
1	Bindawarra, 000036	27	0.2	-1.1	-3.2	-2.8	-0.3	0.5	-16	-1	-7
2	Connewarran, 015024	31	-0.2	-0.1	1.7	-0.4	-0.1	0.6	0	7	3
3	Dunbrae, 150510	9	*Unreported due to insufficient progeny numbers.*							*Insufficient progeny.*	
4	Ewe Wish Poll, 160057	30	-0.3	-0.7	-0.5	-0.9	0.4	0.2	-17	6	2
5	Kilfeera Park, 160358	26	-0.9	-2.3	-3.9	-3.5	-1.8	-2.9	15	18	-5
6	Kilfeera Park, 170010	18	-0.8	-2.6	-4.2	-3.2	-0.1	-0.4	-28	1	-7
7	Pooginook Poll, 161153	33	-0.2	0.2	-0.2	0.3	-0.3	-0.3	44	12	-4
8	The Yanko, 130003	28	2.2	2.6	5.7	4.9	-0.7	-0.5	18	8	-6
9	Toland Poll, 151042	25	0.8	3.1	5.3	5.0	1.8	1.8	9	-11	3
10	Toland Poll, 171011	21	0.6	1.1	-0.4	0.2	0.2	0.3	-39	-3	-5
11	Trigger Vale Poll, 160095	42	-1.6	0.5	0.3	0.7	0.7	0.6	10	-20	15

*Number of progeny is at weaning.

^ W = Weaning (42 to 120 days); P = Post Weaning (210 to 300 days); Y = Yearling (300 to 400 days); H = Hogget (400 to 540 days); A = Adult (540 days and older).

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

The following description of trait scores is a summary of the detailed word and diagrammatical description of these scores in Version 2 (2013) of the Visual Sheep Scores booklet that is available free from AWI or at *www.merinosuperiorsires.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.

Trait	Description
■ 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 <6%) to **5** (71 to 100% of staple).
■ Staple weathering:	The deterioration due to light and water from **1** (least, <6% of staple) to **5** (most, 71 to 100%) reflect the depth and degree of deterioration.
■ Staple structure:	The size and diameter of each staple from **1** (<6mm) to **5** (>30 mm).
■ Fibre pigmentation:	The percentage of dark fibres on any part of the sheep from **1** (0 pigmented fibres at any site) to **5** (71 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** (71 to 100% pigmented area on one or more bare skin sites, **and/or** 71 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.
■ 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 straight) to **5** (very angulated).
■ Body wrinkle:	The degree of body wrinkle from **1** (no wrinkle) to **5** (extensive wrinkle).
■ Jaw:	The alignment of the lower jaw and its teeth relative to the top jaw from **1** (very well aligned) to **5** (heavily undershot or overshot).
■ Back/Shoulder:	Conformation of the back and shoulder from **1** (very square) to **5** (very dipped or high).
■ 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 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 5a. Visual trait assessments – Wool Quality

Visually assessed traits reported were scored at their latest assessment with the exception of pigmentation which was scored at marking (Spot updated on an ongoing basis) and breech traits recorded at marking time (or later in unmulesed flocks with the exception of Dag and Urine). 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. No adjustments are made to the data to improve the accuracy of the results as is the case with sire means or breeding values. For the majority of breeder's objectives a negative deviation would be considered favourable and the larger the deviation the better.

Sire Code	Breeders flock, Sire name	Wool Quality - *Adult*																								
		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
1	Bindawarra, 000036	0.0	100	0	0	0	0	-0.1	8	72	20	0	0	-0.2	0	88	12	0	0	0.0	0	76	24	0	0
2	Connewarran, 015024	0.0	100	0	0	0	0	-0.1	4	86	10	0	0	-0.2	0	90	10	0	0	-0.2	4	86	10	0	0
3	Dunbrae, 150510	*Unreported due to insufficient progeny numbers.*																							
4	Ewe Wish Poll, 160057	0.0	100	0	0	0	0	-0.2	12	80	8	0	0	0.0	0	68	32	0	0	-0.1	0	80	20	0	0
5	Kilfeera Park, 160358	0.0	100	0	0	0	0	-0.3	19	76	5	0	0	-0.2	0	95	5	0	0	-0.2	0	95	5	0	0
6	Kilfeera Park, 170010	0.0	100	0	0	0	0	-0.2	16	69	15	0	0	-0.1	0	85	15	0	0	-0.1	0	85	15	0	0
7	Pooginook Poll, 161153	0.1	96	0	4	0	0	0.1	0	70	30	0	0	-0.1	0	78	22	0	0	-0.1	0	81	19	0	0
8	The Yanko, 130003	0.0	100	0	0	0	0	-0.3	23	64	13	0	0	-0.1	0	77	23	0	0	-0.1	0	86	14	0	0
9	Toland Poll, 151042	0.0	100	0	0	0	0	0.5	0	41	55	4	0	0.2	0	55	45	0	0	0.1	0	64	36	0	0
10	Toland Poll, 171011	0.0	100	0	0	0	0	-0.1	0	95	5	0	0	0.0	0	70	30	0	0	0.2	0	55	45	0	0
11	Trigger Vale Poll, 160095	0.0	100	0	0	0	0	0.6	0	25	75	0	0	0.1	0	60	40	0	0	0.5	0	32	60	8	0
	Average performance	**1.0**	**100**	**0**	**0**	**0**	**0**	**2.2**	**7**	**69**	**24**	**0**	**0**	**2.3**	**0**	**73**	**26**	**1**	**0**	**2.3**	**0**	**74**	**25**	**1**	**0**

Table 5b. Visual trait assessments – Wool Quality and Pigmentation

For the majority of breeder's objectives a negative deviation for wool quality traits would be considered favourable and the larger the deviation the better. Staple Structure is the possible exception when for many breeders the optimum score is in the middle of the range therefore trait leaders have not been highlighted. Four pigmentation traits are reported. 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 progeny for each sire that a score 5 is recorded, are reported for Recessive black and Random spot.

Sire Code	Breeders flock, Sire name	Wool Quality - *Adult* Staple Weathering						Staple Structure						Pigmentation - *Adult* 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
1	Bindawarra, 000036							-0.1	4	88	8	0	0	0.0	100	0	0	0	0	0.0	67	33	0	0	0	0	0
2	Connewarran, 015024							-0.1	0	93	7	0	0	0.0	100	0	0	0	0	-0.1	75	25	0	0	0	0	0
3	Dunbrae, 150510							*Insufficient progeny.*						*Unreported due to insufficient progeny numbers.*													
4	Ewe Wish Poll, 160057							-0.1	0	92	8	0	0	0.0	100	0	0	0	0	0.5	27	63	10	0	0	0	0
5	Kilfeera Park, 160358							-0.1	0	100	0	0	0	0.0	100	0	0	0	0	0.1	62	38	0	0	0	0	0
6	Kilfeera Park, 170010	Staple Weathering not scored						-0.1	0	100	0	0	0	0.0	100	0	0	0	0	-0.2	89	11	0	0	0	0	0
7	Pooginook Poll, 161153							-0.1	0	93	7	0	0	0.0	100	0	0	0	0	-0.2	85	15	0	0	0	0	0
8	The Yanko, 130003							-0.1	0	91	9	0	0	0.0	100	0	0	0	0	0.0	75	21	4	0	0	0	0
9	Toland Poll, 151042							0.1	0	77	23	0	0	0.0	100	0	0	0	0	0.2	52	48	0	0	0	0	0
10	Toland Poll, 171011							0.2	0	65	35	0	0	0.0	100	0	0	0	0	0.2	62	33	0	5	0	0	0
11	Trigger Vale Poll, 160095							0.1	0	75	25	0	0	0.0	100	0	0	0	0	-0.2	88	12	0	0	0	0	0
	Average performance							2.1	0	85	15	0	0	1.0	100	0	0	0	0	1.3	71	27	2	0	0	-	-

Table 5c. 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. No adjustments are made to the data to improve the accuracy of the results as is the case with sire means or breeding values.

For the majority of breeder's objectives a negative deviation would be considered favourable and the larger the deviation the better. Jaw and Face cover are the possible exception when for many breeders the optimum score is in the middle of the range therefore trait leaders have not been highlighted.

Sire Code	Breeders flock, Sire name	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	Dev	1	2	3	4	5
1	Bindawarra, 000036	0.0	96	0	4	0	0	-0.1	96	0	4	0	0							0.2	4	48	44	4	0						
2	Connewarran, 015024	0.2	90	0	7	0	3	0.1	86	0	14	0	0							-0.2	3	83	14	0	0						
3	Dunbrae, 150510	*Unreported due to insufficient progeny numbers.*																		*Insufficient progeny.*											
4	Ewe Wish Poll, 160057	-0.1	100	0	0	0	0	-0.2	100	0	0	0	0							0.0	0	72	28	0	0						
5	Kilfeera Park, 160358	-0.1	100	0	0	0	0	0.0	90	0	10	0	0							-0.1	0	81	19	0	0						
6	Kilfeera Park, 170010	-0.1	100	0	0	0	0	0.1	85	0	15	0	0	Shoulder and Back not scored						0.0	0	77	23	0	0	Body Wrinkle not scored					
7	Pooginook Poll, 161153	-0.1	100	0	0	0	0	-0.2	100	0	0	0	0							0.3	0	44	56	0	0						
8	The Yanko, 130003	0.0	95	0	5	0	0	-0.1	95	0	5	0	0							0.0	0	73	27	0	0						
9	Toland Poll, 151042	-0.1	100	0	0	0	0	0.1	86	0	14	0	0							-0.2	9	73	18	0	0						
10	Toland Poll, 171011	-0.1	100	0	0	0	0	-0.1	95	0	5	0	0							-0.1	0	85	15	0	0						
11	Trigger Vale Poll, 160095	0.1	92	0	5	0	3	-0.1	95	0	5	0	0							-0.2	0	90	10	0	0						
	Average performance	**1.1**	**98**	**0**	**2**	**0**	**0**	**1.2**	**91**	**0**	**9**	**0**	**0**							**2.3**	**2**	**72**	**26**	**0**	**0**						

Table 5d. 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. No adjustments are made to the data to improve the accuracy of the results as is the case with sire means or breeding values.

For the majority of breeder's objectives, a negative deviation would be considered favourable and the larger the deviation the better.

Sire Code	Breeders flock, Sire name	Breech Visual Traits																	
		Breech Cover						Breech Wrinkle						Dag					
		Marking						Marking						Yearling					
		Dev	1	2	3	4	5	Dev	1	2	3	4	5	Dev	1	2	3	4	5
1	Bindawarra, 000036	0.1	0	7	63	30	0	0.1	0	63	30	7	0	0.5	24	32	28	12	4
2	Connewarran, 015024	0.5	0	0	38	62	0	0.1	0	59	31	10	0	0.6	20	40	23	7	10
3	Dunbrae, 150510	Unreported due to insufficient progeny numbers.																	
4	Ewe Wish Poll, 160057	-0.1	0	13	70	17	0	0.3	0	50	33	17	0	0.1	35	38	23	4	0
5	Kilfeera Park, 160358	0.2	0	7	58	35	0	0.0	0	73	19	8	0	0.2	19	57	24	0	0
6	Kilfeera Park, 170010	-0.2	0	26	58	16	0	0.1	0	63	21	16	0	-0.1	31	62	7	0	0
7	Pooginook Poll, 161153	-0.1	0	15	67	18	0	0.1	0	61	30	9	0	0.0	32	46	22	0	0
8	The Yanko, 130003	0.1	0	7	68	25	0	0.2	0	50	39	11	0	-0.4	55	41	4	0	0
9	Toland Poll, 151042	-0.2	0	20	64	16	0	-0.1	0	80	16	4	0	-0.4	68	23	4	5	0
10	Toland Poll, 171011	-0.3	0	19	76	5	0	-0.2	0	86	14	0	0	-0.4	55	40	5	0	0
11	Trigger Vale Poll, 160095	-0.2	0	31	48	21	0	-0.3	0	95	5	0	0	0.0	36	49	10	2	3
	Average performance	**3.1**	**0**	**14**	**61**	**25**	**0**	**2.4**	**0**	**69**	**23**	**8**	**0**	**1.9**	**39**	**40**	**17**	**3**	**1**

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 sire evaluation 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 sire evaluation sites and across all evaluations at these sites. Link sires are therefore a vital component of the 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.

Calculation of Combined Information

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 average
        (average Tops% – average Culls%)/5.

Example
Sire's performance:
        ☐ AMSEA DP+ Index value = 119.7
        ☐ Tops% = 25.5 (average Tops% = 25.1)
        ☐ Culls% = 17.6 (average Culls% = 16.4)

Combined Measured = 119.7.0 – 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