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DJ Cottle* J Hickson†

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Using Industry-Recommended Merino Link Sires to Benchmark On-Farm Performance

David J. Cottle and J. Hickson
Dept. Wool and Animal Science
The University of New South Wales, Sydney 2052

Summary

A wide cross section of Merino Studs have entered rams in the Merino Central Test sites which have been operating since 1987. Ram breeders can gain access to semen from proven, high quality sires from the Central Test Schemes which can be used to benchmark the performance of their own rams against a wide cross-section of rams evaluated at Central Test sites. Sires above average in performance from each site and year have been selected for benchmarking purposes by the various site management committees. The relative performances of sires used as central link sires or chosen as potential on-farm link/benchmark sires are summarised in this paper and recommended for widespread industry use.

Keywords: Link sires, Merino sire evaluation

Introduction

Not all ram breeders are aware that by using semen from a sire that has been progeny tested in one of the 8 central test sire evaluation programs, they can compare the performance of rams they breed or buy with a large cross section of rams in the industry. Any breeder can benchmark their rams by comparing the performance of their progeny with any centrally tested sire's progeny (Atkins 1991). The comparison is more valid if all sires used are given an equal chance to perform, i.e. equal genetic merit of ewes bred to each sire. This is best done by randomly allocating 50-60 ewes from the breeding flock to each sire. The comparative performance should be assessed on the basis of both objective measurements and visual classing of progeny (Kearins and Casey 1991). Assistance with the analysis of results is available if required.

A benefit of conducting periodic on-farm comparisons like this is that breeders can determine whether the rams they are using are keeping pace with the rest of the industry, i.e. benchmarking. If some of the rams are objectively progeny tested in more than 1 year (used 2-3 times) it is possible to calculate the actual change in genetic merit in the flock year by year (Atkins 1991). Breeders can then be certain that their flock is heading genetically in the desired direction.

After a breeder has decided that they wish to benchmark their home sires against the Central Test Sire Evaluation Scheme they have to choose a centrally tested sire to use. This is not a problem if the breeder has entered a ram in a central test scheme. The breeder can simply use their own tested ram. This is the approach regularly taken by studs such as Wanganella, One Oak and Hazeldean.

If a breeder does not have a tested sire available there is a wide choice of sires that could be used. Progeny testing of Merino rams on central test stations started at the UNSW Hay Field Station in 1987 (Roberts et al. 1991). The latest Merino Superior Sires report, covering the results from the last 5 years (Casey et al. 1995), contains the comparative objective measurements and subjective classing results for 123 Medium wool rams and 65 Fine wool rams. Although each year only 10-16 rams are compared directly at any one site, rams can be indirectly compared by the use of common link sires between years and sites.

An example of the way the comparisons work is as follows: If ram A progeny had 10% higher fleece weight than Ram B progeny at Hay in 1991 (after correcting for birth status, sex, number of progeny and heritability) and Ram A progeny had 5% higher fleece weight than Ram C progeny at Deniliquin in 1992, indirect comparison suggests Ram C progeny would have 5% higher fleece weight than Ram B progeny. This estimation can be made via the use of Ram A - the central link sire, despite the fact that Ram B and Ram C have not been directly compared at the same site.

Recommended Link sires

Central Test Site Linkage

The link sires used at Central Test sites (as recorded in the CSIRO database) are shown in Table 1. Choice of link sires should be made with a view to which linkages are considered most important, i.e. if Riverina breeders are mainly interested in Riverina and Macquarie tested rams, then these rams should be given preference as link sires. On average, 32% of progeny have been sired by link sires which is close to the theoretical optimum (Ashtiani and James 1991). It would assist the linkage of central test sites if 1or 2 rams were nominated by the Merino Stud Scientific Liaison Committee at the start of each year for use at all sites. It is also advisable to use some links rams more than twice. As breeders are likely to be mainly interested in the most recent results, not much attention needs to be placed on improving linkages to site/years from more than 5 years ago.

Table 1 Number of adult progeny evaluated for each central link sire used (as recorded in CSIRO database)

Sire	Hay			Deniliquin							Dubbo					Yardstick		New England						Hamilton			Balmoral	Geelong	
	1989	1990	1991	1989	1990	1991	1992	1993	1994	*1995	1990	1991	1992	1994	*1995	1993	1994	1990	1991	1992	1993	1994	*1995	1992	1993	1994	*1995	*1995	
Auchen Dhu Red 13																		19	33										
Boolading 373																46	26												
Coonong 8.82			17												29														
CSIRO 89L8484																					29				43				
CSIRO 91A0819																					35				34				
Cranmore Park 6.5					15											32													
Cranmore Park 7.1							39										33												
Darajohn Red	43			26																									
East Roseville 3178														18							38				32				
Europambela B742																					41							50	
Grass Sirius 6.1					33						50																		
Grathlyn Super Blue																		23	23										
Hazeldean 4.139	32	20	30	16	11	29					46	13																	
Hazeldean 6.40					29		35						37			36	19												
Hazeldean 7.1048																				28				16					
Kurra Wirra G542																								11			15	21	
Merignee Brilliant Example 170																					34	27							
Mirani 174.9																					41		30						
Mirani 214.5																		24	23	33	37	39		31	40	34			
NRF 6.066	33	24	15	31	18	33																							
Nerstane 225																			29		33		30		32				
Nerstane 697																		22		31		35		28		33			
One Oak Poll 003							48								44														
Parakeelya 141									39							36													
Pemcaw 6.123								20	43		65		30	35															
Rambouillet 8766																					42				24				
Roseville Park 0133						27						50																	
Roseville Park 0936													48		39												26		
Roseville Park 3253								19				39																	
Roseville Park 44									37													31							
Roseville Park 88					21						39																		
Strathcluan W305		36		26	35						43																		
Sunset 9.14										43			35																
Wanganella 6.377		36		17																									
Wanganella 6.596			26	30		20	44	17				22	31	29															
Wanganella 9.3316							36		31	9																			
Woolaroo Blue 203					32													28											
Woolaroo Blue 237					40															29									Total
Total progeny	505	466	231	336	362	312	412	231	386	406	526	426	372	484	506	501	302	376	450	476	561	450	460	169	318	258	272	475	11053
% Link progeny	21	25	39	43	60	35	49	24	39	13	46	29	49	17	22	30	26	31	24	25	59	29	13	51	64	26	15	15	32

* Preliminary figures.

Table 2 Medium Wool link Sires (EPVs) - Hay (1987-91), Deniliquin (1989-94), Macquarie (1990-1994) and Yardstick (1993-1994). Derived from Casey et al. 1995

Sire Breeding Identity	Prog. No.- Accuracy	GFW % (dev) 1st	GFW % (dev) 2nd	CFW % (dev) 1st	CFW % (dev) 2nd	FD µm (dev) 1st	FD µm (dev) 2nd	BWT % (dev) 1st	BWT % (dev) 2nd	Tops % (dev) 1st	Tops % (dev) 2nd	Culls % (dev) 1st	Culls % (dev) 2nd	Conf.	Qual.
Boolading 373	74 - H		-0.7		-3.2		-0.2		2.1		-14		-2		- -
Boonoke 9.1847	28 - M	0.7	1.6	2.1	3.3	-0.2	-0.3	3.2	3.3	+7	+12	-2	-12		++
Coonong 8.82	17 - M	4.6	4.0	2.9	3.1	0.4	0.1	3.2	1.8	+22	+1	-6	-3		
Cottage Park 9.631	41 - M	3.3		2.9		-0.7		4.2		+14		-13			++
Cranmore Park 6.5	49 - M	1.3	-0.6	-1.4	-4.6	-0.5	-0.5	-0.4	0.0	+14	-5	-1	-4	-	+
Cranmore Park 7.1	72 - H	-1.2	-2.1	-3.0	-3.9	-0.5	-0.5	6.6	5.2	-4	-6	-12	-7		
Darijon Red	69 - H	-2.6	3.0	-1.1	3.8	1.2	1.1	-3.3	-2.8		-8		+9		- -
GRASS Sirius 6.1	83 - H	3.0	3.8	-0.3	0.2	0.6	0.5	1.4	1.5	0	0	-3	-7		
Goolgumbla True Blue	30 - M	1.9	5.7	2.6	5.5	0.2	0.4	4.4	6.8		+22		-22	++	
Hazeldean 4.139	197 - H	7.9	9.9	10.6	13.2	0.2	0.3	1.3	0.8	+4	+4	-4	+1	+	
Hazeldean 6.40	158 - H	2.4	0.7	2.4	1.0	-0.6	-0.6	-2.4	-2.8	+4	+5	-13	-10		++
Hazeldean 7.329	16 - M	3.7	3.2	4.0	4.0	-0.3	-0.4	-1.1	-0.7	+28	+16	-19	-22	+	++
N.R.F. 6.066	154 - H	-1.7	-2.5	-1.4	-2.1	0.3	0.1	3.1	3.0	-6	-9	+10	+10		- -
Old Cobran Big Mac	24 - M	1.0	1.7	2.7	3.5	-0.4	-0.1	1.1	0.8	-2	-8	+8	+3		
One Oak 00.400	36 - M	1.3	0.8	1.3	1.8	0.4	0.4	0.6	0.1		0		-5		
One Oak 009	26 - M	-0.0	1.8	1.4	4.3	-0.5	-0.4	0.6	0.5	+5	+14	-4	-18		++
One Oak Atlas 438	19 - M	2.4	1.7	3.8	3.0	0.0	0.1	1.6	0.5	+24	+21	-26	-6	++	++
One Oak Poll 003	48 - M	4.5	7.8	4.3	7.1	0.4	0.4	-1.1	-1.4	+9	+12	-8	-13		++
Parakeelya 141	75 - H		6.3		2.6		-1.2		2.0	+3	-8	+16	+14	- -	-
Pemcaw 6.123	194 - H	-2.3	-1.7	-1.6	-1.3	-0.2	-0.6	-0.6	-1.5	+6	+13	-5	-8	+	++
Roseville Park 0.938	49 - M	-0.3	-2.1	0.9	0.2	-0.6	-0.8	-1.1	-1.6	+7	+18	-20	-31		++
Roseville Park 0133	77 - H	-2.3	-2.5	-3.3	-3.9	-1.1	-1.6	-4.3	-4.2	0	+16	-4	-13	-	++
Roseville Park 1232	48 - M	1.8	0.3	1.0	0.4	-0.6	-0.6	-0.3	1.1	+4	+32	-13	-17	+	++
Roseville Park 3253	58 - H	4.8	6.2	4.2	6.5	-0.6	-0.5	-3.3	-3.6	+4	+12	+4	+2		++
Roseville Park 44	37 - M	0.6		0.6		-1.1		-3.7		+18		-13			++
Strathcluan W305	140 - H	-1.3	-4.1	-2.3	-4.9	-0.0	-0.4	1.2	2.0	-6	-4	+1	+2		-
Sunset 9.14	35 - M	5.0	1.6	3.4	0.4	0.8	0.9	-0.5	-2.2	+28	+10	-20	-16	++	++
The Grange GR80068	22 - M	0.5	3.5	2.5	5.1	-0.2	-0.0	-3.7	-4.1	0	+9	+5	+1		+
Wanganella 5.43 x807	17 - M	3.2	0.9	4.3	3.1	0.4	0.8	2.6	2.1	+1	+9	-10	+6	+	
Wanganella 6.377	53 - M	-0.2	-0.6	0.5	0.9	-0.3	-0.2	-0.1	0.9	-6	-10	+6	+19		-
Wanganella 6.596	221 - H	3.1	-2.0	5.7	2.7	-0.2	-0.1	-1.7	-3.7	+9	+6	-13	-6	++	++
Wanganella 9.3316	67 - H	2.5	1.6	4.5	3.8	-0.5	-0.5	-1.9	-2.3	+17	+4	-5	+3	+	+

Table 3 Fine Wool Link Sires (EPVs): New England (1990-1994). Derived from Casey et al. 1995.

Sire Breeding Identity	Prog. No.- Accuracy	GFW % (dev) 1st	GFW % (dev) 2nd	CFW % (dev) 1st	CFW % (dev) 2nd	FD µm (dev) 1st	FD µm (dev) 2nd	BWT % (dev) 1st	BWT % (dev) 2nd	Tops % (dev) 1st	Tops % (dev) 2nd	Culls % (dev) 1st	Culls % (dev) 2nd	Conf.	Qual.
Auchen Dhu Red 13	52 - M	3.9	2.0	2.6	0.2	0.1	0.3	2.7	2.6	+3	0	+1	-1		
CSIRO 89L 8484	29 - M	-0.3	-2.9	0.5	-2.3	0.0	0.2	1.2	-0.6	-3	+1	0	-2		
CSIRO 91A 0619	35 - M	-2.9	-7.1	-5.0	-9.9	-0.2	-0.3	4.6	3.4	-2	-11	-9	+3	+	-
East Roseville 3178	40 - M	2.1	6.9	-0.2	3.7	-0.5	-0.3	3.4	2.4	-6	-4	+1	+6		- -
Europambela Blue 742	41 - M	2.0	1.0	-1.2	-1.9	-0.8	-0.9	0.6	0.7	-2	-9	-10	+3		
Grathlyn Super Blue	46 - M	-2.6	-4.5	-2.1	-5.1	1.4	1.0	0.1	-0.9	+2	+10	-5	-6	+	++
Hazeldean 7.1048	28 - M	11.5	10.8	8.9	7.5	-0.4	-0.4	4.2	2.2	+19	+4	-7	-6	+	
Merrignee Brill. Ex. 170	61 - H	-1.3	-4.4	-1.9	-3.4	-0.0	-0.1	-0.0	-1.3	-2	-4	+2	+7		
Mirani 174.9	41 - M	1.8	1.4	1.7	2.8	-0.4	-0.5	-1.5	-2.4	0	-8	-11	-1		
Mirani 214.5	156 - H	1.7	2.0	1.4	2.4	-0.5	-0.6	-2.3	-2.8	+3	+5	-4	-14	-	++
Nerstane 225	63 - H	17.5	16.6	17.5	17.3	0.4	0.6	3.7	4.3	+37	+34	-19	-19	++	++
Nerstane 697	88 - H	11.5	15.9	10.5	16.6	-0.5	-0.2	0.2	-2.2	+22	+28	-17	-17	++	++
Roseville Park 44	31 - M	8.3		8.1		0.1		2.5		+19		-5			
Woolaroo 237	29 - M	3.4	6.4	1.3	2.9	0.4	0.5	2.2	2.4	0	-13	+10	+7		- -
Woolaroo Blue 203	28 - M	4.4	2.9	1.5	0.6	0.1	0.1	2.3	0.6	-1	-2	+13	+8		-

On-Farm Benchmarking

Breeders should choose a sire from a Central Test scheme that is compatible with their breeding objective. Many traits have been assessed on each sires' progeny and breeders can choose sires with desirable characteristics for the traits they are trying to improve. In this way the genetic merits of the Central Test sire's progeny are likely to be greater than that of the home bred sires' progeny leading to increased rates of genetic gain. Overall linkage, in terms of the average prediction error variances of estimated progeny values (James 1994), is improved if a restricted number of link sires are used. If many different sires are used as link sires the percentage of progeny from common link sires over all Central Test and on-farm sites will be less than optimum.

The easiest way of choosing a link sire to use for on-farm testing is to use one of the rams chosen by the various sire evaluation committees for linkage purposes. These sires usually have progeny above average on both measurement and visual appeal in their site/year group.

Not all sires chosen as link sires (Tables 2 and 3) have been used as central link sires (Table 1) as only 2-3 are needed at each site each year, but all the sires listed are available for on-farm use. The relative performance of recommended link sires are shown in Tables 2 and 3. The values given in the Tables are the estimated progeny values from the 1st (10-16 months of age) and 2nd (17-24 months of age) assessments of progeny. The values are presented as deviations from the relevant base groups. Further details are available in the Merino Superior Sires booklet (Casey et al. 1995).

Link sire usage

Having selected one of these sires it is a good idea to check their performance in more detail by obtaining their site/year reports from the State Stud Associations, UNSW or Advanced Breeding Services. These reports give more details of sires' progeny performance, including staple length, fibre diameter variation, fleece rot score, conformation, pigmentation, wool quality, worm resistance, evenness etc.. Any faults in the ram's progeny should show up in these reports. Not all breeders are concerned by all faults, e.g. breeders in drier areas may not place much emphasis on worm resistance or fleece rot resistance. After consulting the site reports breeders can be confident that apart from the benefit of benchmarking, they will also be introducing genetic material from a proven high performance ram that suits their particular needs.

After conducting this on-farm benchmark testing breeders may then consider the final step - putting a home bred ram that has tested better than a link sire into a central test station. Central test Schemes widely publicise and highlight the performance of outstanding sires. It should be remembered that nearly all centrally tested rams are of good standard and to be outstanding amongst centrally tested sires is an achievement.

Any breeder can enter a ram into a central test scheme but it is best to notify site Managers as soon as possible as the sites are becoming increasingly well patronised. For example, the Riverina site run by UNSW at Falkiner Memorial Field Station can only test up to 12 rams annually (which requires 24 lambing paddocks for single and twin bearing ewes) and late entries can unfortunately miss a place.

Conclusion

If a breeder wants to be sure they are using rams that are amongst the best available, linkage into the sire evaluation schemes enables them to validly compare their rams with many other high quality rams following methods recommended and approved by both scientists and the State Merino Stud Associations.

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