DETERMINANTS OF RAM SALE PRICES FOR FINE WOOL NEW ZEALAND MERINOS

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SUMMARY

Ram sale catalogues from 1995-1998 for a New Zealand fine wool Merino breeder were used to identify factors that have influenced ram sale prices. Estimated genetic merit and phenotypic measurements at several ages were provided in the catalogue. In total, 512 complete records were used in the analysis. Multiple regression analysis showed a combination of estimated genetic merit and 2 yr old phenotypic measurements influenced ram sale prices. Across years, $769 was paid for an average ram. A one micron reduction in mean fibre diameter (MFD) relative to the year average was worth $793 for MFD estimated breeding value (EBV), and $209 for 2 yr old MFD. An additional kilogram of clean fleece weight (CFW) relative to the year average was worth $659 for CFWEBV, and $690 for 2 yr old CFW. Sire also had a significant effect on sale price across years.
Keywords: Finewool, rams, breeding value, prices

INTRODUCTION

Rams offered at the Annual Sale of Forest Range Merinos are sold under the Helmsman auction system. This system is characterised by the simultaneous sale of all lots on offer. The auction commences with all animals offered at a reserve price, or lowest acceptable bid, and ends when no bid has been placed on any lot for a pre-specified period of time. Throughout the auction, active bids on all animals are concurrently displayed to buyers. Major advantages of this system over conventional bidding systems are that all buyers have the same opportunities to purchase and have more time to contemplate their purchase, without the pressures associated with constant, intense bidding.

Historically, all animals offered had a reserve price of $450. This reserve price serves to ensure the vendor recovers costs. However, setting a single reserve price for all animals has certain disadvantages. Some animals may not achieve a price reflective of their genetic merit, while time spent "price-climbing" on popular lots results in an extended auction period. The following study used ram sale records to identify factors that have influenced sale prices achieved by rams sold at the Annual Sale of Forest Range Merinos, with a view to identifying factors that should be used to predict prices for future sales. Such price predictors could be used to set individual reserve prices.

MATERIALS AND METHODS

Sale catalogue data. Ram sale data from the Annual Sale of Forest Range Merinos, from 1995 to 1998, was analysed using the details presented in the catalogues. Forest Range Merinos, located in Otago, New Zealand, is a sheep station composed of a commercial flock of 8,000 ewes and an elite flock of 2,000 ewes. The breeding includes an open nucleus and selective artificial insemination policy, similar to the description in Sherlock & Garrick (1995). This strategy is designed to

maximise the rate of genetic gain in reducing micron fibre diameter (MFD), while holding clean fleece weight (CFW) constant. Some 100 to 150 rams are offered for sale each year. Rams are sold at approximately 2_ years of age.

Sale catalogues contained both estimated genetic merit and phenotypic information. Estimated breeding values (EBV) for MFD and CFW were presented, where a more negative MFDEBV denoted superior genetic merit for finer wool, and a more positive CFWEBV denoted superior genetic merit for heavier fleece weight. Index values derived through a linear combination of CFWEBV and MFDEBV were also given, to indicate the aggregate merit of animals. This index used weightings of +1 and -1 for CFWEBV and MFDEBV, respectively. An explanation of index and breeding values, and how they might be used to determine the price that should be paid for a ram, was provided in the sale catalogue. Phenotypic measurements collected on rams as hoggets, at 18 months and 2 yr of age contributed to the estimation of breeding values. The phenotypic measurements provided in the catalogue are detailed in Table 1. The coefficient of variation (CV) for MFD, as an indicator of the uniformity of MFD for an individual, and the sire of an individual, were also provided. A few individual rams with incomplete data sets, including those that failed to sell, and those without final phenotypic measurements, were discarded from the analysis. This left a total of 512 complete records, out of 607 rams offered over this period. Of these, 122 animals sold at the reserve price of $450, while 113 achieved prices of $1,000 or greater, of which six sold for $3,000 or greater.

Table 1. Phenotypic measurements collected on sale rams for estimation of breeding values

	Age(s) of ram at time of phenotype collection		
	Hogget	18mo	2 yr
Mean fibre diameter (MFD) [A]	3	3	3
Clean fleece-weight (CFW)	3		3
Yield [A]	3	3	3
Greasy fleece-weight (GFW) [B]	3		3

[A] Measured from a mid-side sample.
[B] Data in 1998 catalogue only.

Identification of factors that have influenced sale price. Estimated genetic merit and phenotypic measurements were considered as determinants of sale price. A linear model was used to analyse the data, with year and sire treated as class effects. The model in which the multiple correlation coefficient was a maximum, and contained only variables that had a significant effect on price, was deemed the most suitable. Any variable not significant at the 10% level (P>0.10) was discarded from the model.

RESULTS AND DISCUSSION

Results from the best models fitted separately for each year and all years pooled are detailed in Table 2. The general trend was for index value, or a combination of MFDEBV and CFWEBV, and the most recent (2yo) phenotypic measurements of MFD and CFW to influence price. Sire also had a significant effect on price in 1996 (P<0.0001), 1998 (P<0.01) and overall (P<0.0001). The size and significance of individual sire effects varied considerably (data not shown). Intercept values reflected the price paid for an average animal in each year, ranging from $738 in 1997, to $973 in 1995.

Table 2. Estimates of multiple regression coefficients for ram performance on ram sale price

Year	1995	1996	1997	1998	All
Number of rams	140	120	121	131	512
Mean price	$975	$748	$732	$782	$815
Model					
Multiple correlation coefficient	0.623	0.734	0.440	0.657	0.581
Root MSE	$386	$240	$404	$200	$334
Regression coefficients					
Intercept	$973	$803	$738	$791	$769
Index	$486	-	-	$463	-
MFDEBV	-	-$984	-$1174	-	- $793
CFWEBV	-	$723	$1602	-	$659
Sire	-	**	-	*	**
2yo MFD	-$557	-	-	-$194	-$209
2yo CFW	$893	$586	$509	$496	$690

* P<0.01, ** P<0.0001. Individual sire effects ranged in size and significance (data not shown).

Greater prices were paid for animals with superior (above average) genetic merit estimates or phenotypic measurements for performance, ie., finer wool and heavier CFW, or greater overall genetic merit (index value). The value of an additional unit of these measurements varied between years. For example, in 1997, each kilogram CFWEBV above the year average was worth an additional $1602, compared to $723 in 1996. Such differences may reflect variation in buyer confidence about future wool prices, at the time of sale. Estimated breeding values for traits were typically worth more per unit than the equivalent most recent phenotypic measurements. One interpretation of this is that buyers place more emphasis (value) on these values as an indicator of an animal's worth than phenotypic measurements.

The amount of variation explained by the model varied across years, with multiple correlation coefficients ranging from 0.44 in 1997, to 0.73 in 1996. Removal of data pertaining to rams sold at the reserve price, or at $3,000 or greater, did not improve the amount of variation explained by any of the models (data not shown). It is likely that additional subjective traits, such as conformation, are influencing price. Additional variation may also be explained by buyer circumstances, which were not considered in the current study. Breeding objectives of buyers are likely to vary and, consequently, the relative emphasis (value) placed on traits will vary between buyers. The expected number of progeny for a ram will also affect a buyer's return on investment and should, therefore, influence the value of a ram's genetics.

It was perhaps disappointing that phenotypic measurements still appeared to influence buyers' decisions, after adjusting for genetic merit, given the solid explanation of index and breeding values in the sale catalogues. Furthermore, the Helmsman auction system is designed to allow greater contemplation of purchases than conventional bidding systems. This suggests a further need for buyer education on the merit of using these values to make purchase decisions. However, beyond providing relevant information in the catalogue and educating farmers, there is little more the vendor can do; it is ultimately the buyers' responsibility to best utilise the information available to maximise returns from their ram purchases. A similar analysis of Australian bull sale prices by Robinson *et al* (1992) also found that although EBVs influenced price, phenotypic measurements also impacted on price. Of the phenotypic measurements provided in the ram sale catalogue, only those taken at 2 yr of age influenced price. These are the most recent measurements among the phenotypic measurements provided in the catalogue, and are therefore likely to have the highest phenotypic correlation with the physical attributes of the animal on sale day.

Estimated breeding values are the most accurate predictor of an animal's genetic merit and are, therefore, the most justifiable measurements to use to predict price. Predicted prices are unsuitable for use as individual upset prices, as they may overestimate the reserve price. Overestimation occurs when the reserve price is set at a value greater than the true value of the animal; this may result in the failure of an animal to sell at all. Calculating reserve price by subtracting a value from the predicted price that reflects the amount of residual variation in predicted price should reduce the likelihood of overestimating reserve prices. Setting individual reserve prices is likely to reduce the auction period, and better ensure that prices paid reflect a ram's genetic worth.

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