

**AWARENESS, UNDERSTANDING AND ADOPTION OF BREEDING TECHNOLOGIES
BY WESTERN AUSTRALIAN MERINO RAM BREEDERS**

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SUMMARY

A survey of Western Australian Merino ram breeders was conducted to assess their level of awareness, perceived understanding and adoption of genetic technologies. Both registered stud breeders and independent ram breeders reported a high level of awareness of most genetic terms. A significant gap between awareness and perceived understanding existed for both groups. The main concepts that need to be addressed with group breeders are genotype, selection differential, Rampower and BLUP. For stud breeders phenotype, estimated breeding value, selection index and genotype x environment interaction should be added. Most respondents believe measurement is valuable in achieving genetic gain. Independent breeders are more likely than stud breeders to use a selection index.

Keywords: Breeder survey, genetics, sheep

INTRODUCTION

This survey was conducted to assist the Wool Program of Agriculture Western Australia to more effectively design and target its extension activities in sheep breeding and genetics and to provide benchmark information to assess progress in industry understanding and adoption of modern breeding technology. In 1991, a survey (Butler *et al.* 1995) of stud Merino breeders was conducted nationally. Changes in attitudes and knowledge of stud breeders, but not independent or group breeders (referred to as "independent" breeders hereafter) could be assessed against the WA data from the 1991 survey.

The survey aimed to provide a benchmark for identifying the current (1997) levels of awareness and perceived understanding of, attitudes to, and application of modern animal breeding methods by members of the different sectors of the Western Australian wool industry.

This paper discusses responses to those of the survey questions which addressed awareness, perceived understanding and adoption of genetic technologies by Western Australian Merino ram breeders.

MATERIALS AND METHODS

A draft survey instrument was pilot tested with three focus groups, each consisting of two stud breeders, two independent breeders and two commercial breeders before mailing to 100 randomly selected ram breeders (70 stud, 30 independent). Non-returns were followed up by mail and phone as necessary. Data were grouped and compared according to ram breeding sector. Awareness and understanding for stud and independent breeder were compared using chi-squared analysis. Average

levels of awareness and understanding were compared within stud and independent breeder groups by paired t-test.

RESULTS AND DISCUSSION

Valid responses were received from 48 Stud Merino Breeders (69% response) and 20 independent breeders (67%). This is estimated to represent about 10% of each sector in Western Australia.

Level of awareness and understanding. Breeders' perceptions of their level of understanding of genetic terms are summarised in Table 1. Without exception the independent breeders claimed a higher level of perceived understanding of terms than did the stud breeders. Awareness of terms was generally high, with the exception of BLUP, interactions and phenotype. However the level of perceived understanding was lower than the level of awareness claimed by both sectors ($P < 0.05$). This analysis did not attempt to differentiate perceived understanding from actual understanding.

The main concepts that need to be addressed with independent breeders appear to be genotype, selection differential, Rampower and BLUP. For stud breeders phenotypes, estimated breeding value, selection index and genotype x environment interaction should be added to this list.

Table 1. Awareness and understanding of genetic terms (% of respondents)

Term	Stud		Independent	
	aware	understand	aware	understand
Heritability	88	73	95	85
Genetic correlation	77	48	85	65
Phenotype	46	19	70	65**
Genotype	54	25	70	45
Selection differential	65	33	70	40
Estimated breeding value	79	44	75	65
Rampower	67	21	65	35
Selection index	63	33	75	60
GxE interaction	44	23	70	55*
Breeding objective	77	60	90	85
Genetic progress	75	56	80	65
BLUP	33	10	65*	40*

Stud vs. Independent: * $P < 0.1$ ** $P < 0.05$ *** $P < 0.01$

Adoption. The majority (80-85%) of stud and independent breeders are comfortable with the use of measurement or performance records and incorporate measurements in their breeding program. More than 85% of both Stud and Independent breeders believed that measurement is valuable for achieving genetic gain in their flocks.

Independent (65%) breeders were more likely than Stud breeders (27%) to combine measured traits in a selection index ($P < 0.01$). Neither group makes extensive use of BLUP or EBVS, reflecting the low level of understanding of these techniques. Few respondents used records of environmental effects (30% of stud and 40% of independent breeders) to improve selection accuracy. Independent

breeders were more likely to have participated in sire referencing or central progeny testing (50% vs. 11%; $P < 0.01$). Independent breeders were also more likely to use BLUP genetic trends to monitor genetic progress (31% vs. 3%; $P < 0.01$).

These results indicate that the rates of adoption for a range of powerful genetic evaluation techniques remain low despite relatively high levels of awareness of genetic concepts and a high recognition of the value of performance measurements.

The future. Neither group made extensive use of genetic evaluation services, but both groups indicated a desire to use such services in the future. Agriculture Western Australia tended to be the preferred supplier of genetic or breeding program services for those breeders prepared to pay for such services. Two thirds of both stud and independent breeders expressed their willingness to use a genetic evaluation service if it was offered free of charge by Agriculture Western Australia.

Answers to qualitative questions indicated a high level of interest in selection techniques to increase disease and parasite resistance. There was also considerable interest in the use of DNA fingerprinting to provide pedigree information.

These data suggest that past extension activities have been successful at raising breeder awareness of modern animal breeding principles and techniques but have been less effective in increasing the understanding of these techniques or supporting their adoption. Future extension activities will need to focus more directly on increased breeder understanding and technology adoption.

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REFERENCES

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