Wool Technology and Sheep Breeding

Volume 42, *Issue* 3 1994 *Article* 6

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ISSN 0043 - 7875/94 Wool Tech. Sheep Breed., 1994, 42 (3), 263 - 267

Australian Merino Central Test Sire Evaluation Schemes : Operational Issues

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Summary

Practical and theoretical problems encountered with the running of Merino sire evaluation schemes in Australia are discussed. It is suggested that if strict user-pays principles are to be applied to sire evaluation schemes than the separation of private and public benefit needs to be quantified.
Keywords: Merino sire evaluation.

Introduction

Merino central test sire evaluation schemes (CTSES) started in Australia in the Riverina area of NSW in the mid 1980s. Currently there are schemes operating in the Riverina, Macquarie and New England districts of NSW, Hamilton in Victoria and in WA. The CTSES in NSW are serviced by UNSW and NSW Agriculture in a cooperative effort. The management of the schemes is overseen by a Policy Committee with representatives from the Stud Merino Breeder Associations, UNSW, NSW Agriculture and CSIRO. The progeny test results have evolved to include both objectively measured and visually assessed traits (Cottle et al. 1993). Rams which breed progeny that are not visually acceptable are of limited use to a studbreeder.

There is an increasing demand from purchasers of semen for objective data on the relative genetic merits of rams from different studs. SES are the only valid sources of such information. The number of CTSES is increasing and every year since 1987 each CTSES has had a full 'book' of rams (10-16/site). The President of the Australian Association of Stud Merino Breeders has stated that the policy of all CTSES being self-funded (because commercial gain is thought to go directly to ram entrants) is working well and that there is a healthy interest in CTSES by studbreeders (Beveridge et al. 1994). On the surface the CTSES appear to be running smoothly. However there are a number of economic, practical and theoretical issues which need resolving if CTSES are to prosper.

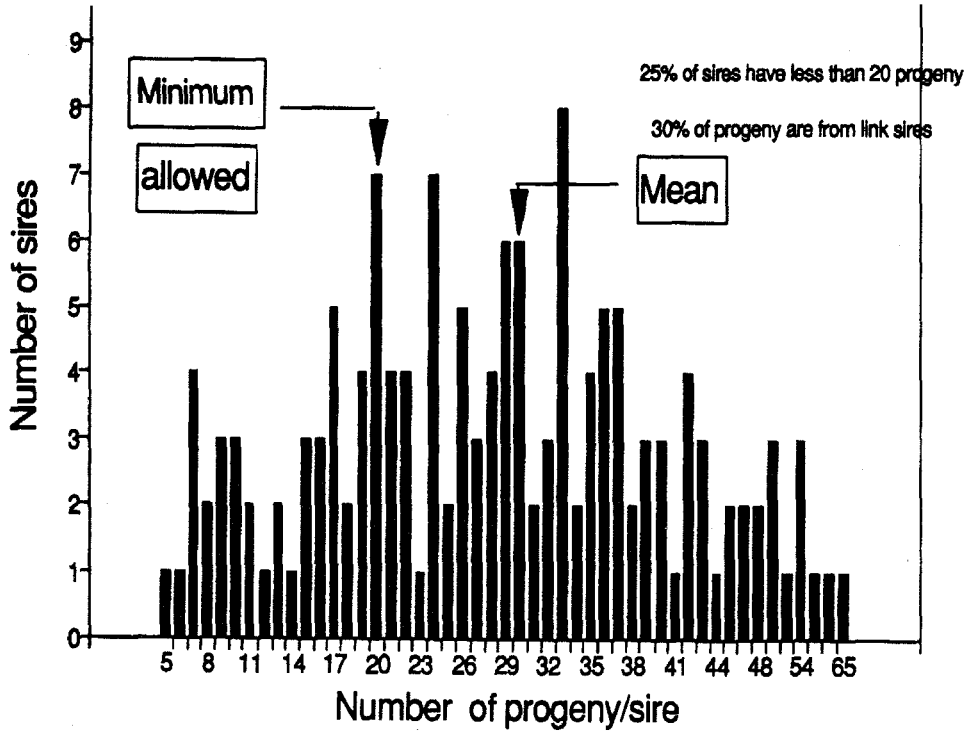
Paper presented at the 5th World Congress on Genetics Applied to Livestock Production, Guelph, 1994

Economic problems

The CTSES are run on a fee for service basis with ram breeders currently paying about $2,000 per ram entered. This is thought to be the limit ram breeders are prepared to pay and is perceived to cover the costs of AI programs, wool testing, sheep classing, data collection and analysis, report generation and management for the 2.5 years each program runs. However there are hidden costs in running CTSES which not everyone appreciates. These include:

1) The CTSES site manager often carries most of the financial risk of poor conception rates in ewes or high death rates in progeny. The CTSES policy committee has decided that a minimum of 20 hogget or 15 adult progeny are needed before a sire's results are published in a linked register of results. This number has not always been achieved from the 55 ewes/sire usually inseminated (Figure 1). Ram owners with low numbers of progeny often receive a subsidised entry into a future CTSES to maintain their interest and confidence. This results in a future financial loss to the site manager, who also carries the risk of occasional non-payment of fees.

Fig. 1 Number of progeny per sire. Medium wool schemes 1989-1993.



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If a binomial distribution for the production of hogget progeny is assumed, than the 95% CI for number of progeny/ewe inseminated from the 1989-93 NSW schemes is 0.528 ± 0.141 (see Fig. 1).

Calculations using these values suggest that if 47, 52 or 58 ewes are inseminated one could be 95%, 97.5% or 99% confident respectively of obtaining 20 or more progeny. However the distribution in Fig. 1 is not binomial due to the occasional poor conception rates in individual programs caused by various factors, eg. non-fertile ewes. Thus when 55 ewes were inseminated less than 95% of sires in the 1989-82 CTSES had at least 20 progeny.

2) The site manager has to cover the costs of the two link sires for which no fee is paid. A minimum number of paying entrants is needed to cover these costs. If ram entry numbers are low close to the AI date (a common event) this increases the pressure to increase entrant numbers with rams subsidised for various reasons. Obtaining a full book of rams has always been a time consuming business, despite there being 5-600 active Merino studbreeders in Australia.

3) The site manager foregoes income by running the progeny at conservative stocking rates. Studbreeders desire progeny to be in excellent condition at classing and shearing. The progeny probably return less income than a mob of wethers run at optimum stocking rates. The site manager also usually loses income when trading stock. The ewes used in AI should be turned over every 2-3 years and a large, even replacement line of younger ewes sourced and purchased. The progeny are uneven, due to sire groups, and have to be sold in smaller groups. Some site owners have been enticed with offers of free semen from the tested ram of their choice. This cost has to be met by ram entrants.

4) the site manager has to provide a large number (>20) of lambing paddocks which reduces flexibility with other stock operations on the property. CTSES are more labour intensive than normal commercial operations.

5) the site manager is expected to run Field Days, publicise results and deal with any public criticism of the results by traditional studbreeders. The site manager is expected to take part in all technical and policy committee meetings. These activities all take time and money and travel costs can be substantial.

Practical Problems

Practical problems include;

1) By the time CTSES results are available some studbreeders have finished using the ram on test. In this case the results are mainly for the benefit of their clients. For insurance against a poor result many breeders only consider entering homebred, progeny-tested rams, thus slowing the theoretical rate of genetic progress in the industry.

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2) There is a bigger element of risk for a stud with an excellent industry reputation to enter a ram, but these are the rams for which other entrants and semen purchasers most desire comparative data.

3) There has been no analysis of the cost-benefit of CTSES to entrants and other breeders. There is anecdotal evidence that only a few studbreeders in the NSW CTSES have benefited from large increases in semen sales generated from CTSES results.

4) It is difficult finding two sheep classers, respected by all the entrants, who understand and use the same terminology and who are available at the same time for group classing. The need for more than one classer is questionable (Atkins et al. 1993).

5) It is impossible to guarantee a minimum number of progeny for every ram even when large numbers of ewes/sire are inseminated and ewes are flushed.

6) Establishing a consistent format for CTSES results is difficult as some breeders prefer EBVs, most EPVs; some prefer to have hogget and adult results reported separately, some combined; some prefer a calculated selection index, most are strongly opposed to the publication of Woolplan index values because they do not include some traits, eg. fleece rot. This results in many circuitous arguments and changes to report formats. Information overload with visual classing traits is possible. Some breeders do not understand that EBVs can change as more information becomes available on rams.

Theoretical Problems

Theoretical problems include;

1) The methods of analysis are continually evolving. Currently the multi-trait BLUP program BVEST (Gilmour 1993) is used and clean fleece weight is expressed as a percentage rather than absolute value. This helps correct for differences in seasons and shearing intervals. An arbitrary subset of data has to be chosen to create a constant baseline for linked analyses. Changes in methods of analysis can create confusion with the presentation of results to breeders. Results are published annually in the journal Wool Technology and Sheep Breeding.

2) The optimal methods to link sites and years requires further study. Two link sires must be used to insure against poor semen from one ram. The linking of fine and medium wool sites with different sets of genetic parameters needs study. The impact of G X E interactions and group effects on estimates of breeding value needs further study.

3) The cost/benefits of recording birth and rearing status and measuring adult wool production are not quantified.

4) The precision of EBV estimates with 20-40 progeny per sire may not be as good as breeders or scientists expect or desire (James 1994), but the EBVs are better than no estimates.

5) The shearing interval needed for sheep born from an AI program, not shorn as lambs, to achieve repeatable, accurate wool production results is not well defined. An Australian Standard for flock testing is being drawn up by the TX12 Raw Wool Standards Committee without the necessary documented data.

6) The best procedure for dealing with data from flystruck sheep is unresolved.

Discussion

The Merino CTSES have a number of important problems which have the potential to severely limit their progress. The end result of the schemes of providing information on central test and homebred rams by progeny comparisons is highly desirable. For CTSES to prosper each sector of the wool industry needs to be aware of all the costs, benefits and problems of CTSES. The separation of the private and public benefit of sire evaluation has not been quantified. It is the basis on which the funding of CTSES by studbreeders and the woolgrowers' funding organisation (AWRAP) needs to be determined.

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