NATIONAL RECOMMENDATIONS FOR THE CONDUCT OF SIRE EVALUATION SCHEMES IN THE WOOL INDUSTRY

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INTRODUCTION

Sire evaluation schemes, also called sire referencing schemes, started operating in the Australian Merino breeding industry in 1984. They compare rams born in different flocks or lambings using a system of linked progeny tests. The schemes involve either "central tests" (tests at a central site) or "on-farm tests", or both. On-farm sire evaluation involves progeny testing rams on breeders' farms, with "link" rams used in most or all of the participating flocks. Some on-farm schemes also test all "link" rams on a central test site. All schemes can be integrated by using "link" sires.

In 1990, the Wool Research and Development Corporation (WRDC) requested the WOOLPLAN Management Committee (WMC) to focus on sire evaluation as a national issue. The WMC decided to coordinate a national workshop involving breeders, research and extension people to obtain industry agreement on the conduct of sire evaluation schemes.

This paper contains a summary of the aims, recommendations and agreed protocols from the workshop on the conduct of sire evaluation schemes and their future funding and research requirements. The recommendations reflect the wool industry needs for effective sire evaluation.

AIMS AND OBJECTIVES

With respect to Merino sire evaluation schemes, the aims of the project were to:

- review their current status in Australia;
- obtain national agreement on their design, conduct, data collection and analysis, and format for publication of results; and
- identify research needs to help refine already established protocols.

A WMC-appointed steering committee set the following objectives for the project:

1. Collection of protocols for existing programs.
2. Identification of data to be collected within such programs.
3. Identification of data processing requirements
4. Identification of the procedures for creating links within and between programs.
5. Identification of a suitable format and vehicle for dissemination of results.
6. Organisation of a national workshop, to develop recommendations on the conduct of sire evaluation programs and on research to enhance their application to the industry.

CONCLUSIONS AND RECOMMENDATIONS FROM THE WORKSHOP

1. The workshop agreed that sire evaluation is a process by which objective comparisons can be made between rams from different flocks and breeding through the performance of their progeny.

These comparisons are based on the principles of progeny testing and can be undertaken by either central or on-farm tests, with the possibility of combining data from both systems.

The combining of on-farm and central-test data attracted lengthy discussion. The validity of on-farm data was questioned by breeders and given as reason for their support of the continuation of central test sites and the exclusion of on-farm data from a central register.

It was ***recommended*** that:

i. An independent register of evaluated sires be established. Criteria for the entry of sires to the register be developed in collaboration with the Australian Association of Stud Merino Breeders (AASMB), the Australian Federation of Performance Sheep Breeders (AFPSB) and the Animal Production Committee genetics group. Nominations to the central register would be the responsibility of the owners of the sires.

ii. Breeders be encouraged to use the central test guidelines when designing and conducting on-farm sire evaluations. Although on-farm (private) sire evaluations currently lack credibility with breeders, they represent the cheapest way of evaluating large numbers of rams.

iii. The credibility of on-farm (private) tests be heightened. This is best achieved by collaboration between Breeder bodies and State Departments of Agriculture in the development of an on-farm test accreditation procedure. The most direct links could then be developed between central and on-farm tests.

2. Participants reached agreement on the data to be collected in both central and on-farm tests. These data relate to management, objective and visually assessed records which are common to both central and on-farm tests. Minimum records for on-farm tests and additional records for the more rigorous central tests were defined (see Kearins and Casey, 1992).

It was ***recommended*** that:

i. Central test data, when entered on the central register, be available to interested parties for linked analyses of on-farm tests and future research requirements.

ii. An agreed set of estimates of genetic parameters (heritabilities and correlations) for the standard visually assessed traits and their genetic relationships with production traits be established to allow improved methods of assessing sires.

iii. Visual assessment of undrafted individual progeny for industry acceptance of conformation, wool quantity and wool quality traits be conducted by recognised sheep classers. If evenness of type is to be assessed, it should be done within sire progeny groups.

iv. The re-establishment of neck and body fold and face cover photographic standards be given a high priority.

v. Computerised and manual systems for capturing classer comments be made available to parties interested in sire evaluation to ensure the standardisation of data collection.

3. Sufficient knowledge exists to allow the establishment of procedures for the analysis of central test data. Further research and software development are required to allow meaningful linkages to be established with on-farm evaluations. In addition, further work is required for the establishment of effective links between test sites and years (see Atkins, 1992).

It was ***recommended*** that:

i. The central register provide credible performance indicators of superior sires in the industry as well as being a valuable resource base for research. On this basis funding for the central register should come from both breeders and industry based funding bodies.

ii. An agreed set of genetic parameters for fine, medium and strong woolled Merinos be developed for use in software required for enhanced sire evaluation. Multi-trait BLUP analysis is preferred.

iii. The Wool Research and Development Corporation fund research on the magnitude and nature of any sire by environment interactions. This information is critical to the application, methods of analysis and publication of sire evaluation results on a national basis.

iv. Wherever possible the transfer of data from fleece testing laboratories to evaluation sites and the central register should be by electronic means in an agreed format.

v. Estimates of genetic trends and evaluations of sires within flocks across years and management groups should be offered by the CSIRO, Departments of Agriculture or universities. If rams from flocks so evaluated are entered into a central test, this would provide a link with all those rams centrally tested.

4. Working within the current framework and knowledge base of sire evaluation, participants have developed the guidelines for the publication of results. The principles presented here should form the basis for developing improved methods for transferring this vital information to the wool industry.

It was ***recommended*** that:

i. All results be published from public and accredited private sire evaluations. These results could eventually be produced from the central register.

ii. A booklet containing accredited results on all sires be published. Information is to be listed alphabetically in the booklet to avoid any inference of merit for any trait reported. Trait leaders would be highlighted by emboldening the sire and the particular trait record (e.g. see Appendix I of Maxwell et al. 1992).

iii. Single sheets reporting the detailed results of individual sires could be provided to the owner. If these sires were trait leaders, this would be highlighted by annotating the relevant trait records (e.g. see Table 6 and 7 and Figure 4 of Maxwell et al. 1992).

iv. Credibility of sire evaluation results would be ensured if the breeder bodies (AASMB or the AFPSB) agreed they be published as accredited Merino Values (e.g. Merino Breeding Values, Merino Progeny Values, or Merino Progeny Performance figures).

AGREED PROTOCOLS

A full account of agreed protocols for sire evaluation is given by MacLeod (1992). The main points not already mentioned in the main workshop recommendations are summarised below:

Two or more link sires should be used by each breeder conducting on-farm sire evaluations. All such link sires should have well above average Estimated Breeding Values as well as conforming in visually assessed traits.

- Protocols for on-farm tests should be the same as for central tests, except to allow for some compromises on the number of progeny tested per ram and the age at testing and months of wool growth measured. This grants some discretion to the breeder, depending on the accuracy and credibility he or she wishes to attach to the data.

- The aim should be to test an average of 40 progeny per ram (with a minimum of 30), requiring between 55 to 65 adult ewes to be mated to each ram. A declaration is to be made of the number of progeny tested for each sire.

- In general, progeny should be assessed at 15 months of age or older with at least 10 months of hogget wool growth (i.e. post lamb shearing). If ram progeny have to be shorn earlier, then the minimum acceptable is 10 months of age with 6 months of hogget wool growth, but female progeny should be shorn at the later time.

- Ewe allocation to sires must be completely at random.

- All ewes and progeny must be subject to equal management.

- No culling of ewes or progeny is allowed except for humane reasons.

CONCLUSIONS

The Merino breeding industry now has a set of nationally agreed protocols for sire evaluation.

Although sire evaluation programs are only currently operating in NSW, with an improvement in the rural economy it is anticipated that further programs will be initiated in other states (several are currently under active consideration). This set of national recommendations on sire evaluation should form the basis of any new scheme being initiated and could be used to help adapt any existing scheme where changes are possible. If this is done, the full potential of sire evaluation on genetic progress in the Australian wool industry is much more likely to be realised.

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