



**REPEATABILITY OF PERFORMANCE RANKINGS AND  
WOOL PRODUCTION CHARACTERISTICS OF MERINO  
EWES IN A SEMI-ARID FARMING ENVIRONMENT**

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**by**

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## **ABSTRACT:**

A flock of 205 strong wool South Australian bloodline Merino sheep was run in a semi-arid cereal/sheep farming environment at Wanbi in the Murraylands area of South Australia. Shearing and collection of performance records occurred on five separate occasions at successive ages ranging from 6 months to 42 months. Characters examined were body weight, greasy fleece weight, clean fleece weight, mean fibre diameter and eight Woolplan selection indices.

Four key indicators were used to assess the most appropriate age of measurement and selection, in order to provide the best compromise between selection accuracy and minimisation of the period that sheep must be retained until selection is undertaken. These key indicators were; estimated repeatability of each character; phenotypic correlation of character between age of measurement and adult performance; phenotypic correlation of character between adjacent measurement ages; and accuracy of producing ability.

The quality of performance records for within-flock selection remained unaffected by non-genetic between-year variation imposed evenly across the entire flock. Between-year variation was induced by animal age and environmental factors such as season and nutritional status. Provided that non-genetic between-animal variation is excluded and data collection procedures are sound, producers can have a high degree of confidence in the reliability of objective performance measurements collected within their flocks.

Repeatability estimates and phenotypic correlation coefficients from this trial indicated that the South Australian strong wool Merino strain is in the low to medium range in comparison with other Merino strains present in Australia. Performance measurements collected on sheep at the 6 month age did not provide a satisfactory indication (not significant) of relative performance superiority of the animals during later adult life.

However single performance measurements collected at 12 months of age provided a reliable and accurate ( $P < 0.001$ ) indication of later performance for body weight, mean fibre diameter and all Woolplan selection indices apart from the CFW options for indices #1 & #2. A second performance measurement of clean fleece weight, greasy fleece weight and Woolplan CFW indices #1 & #2 at the 18 month age provided an accurate ( $P < 0.001$ ) indication of later adult performance.

Two sheep selection systems are available to producers. The first recommended system is a two-stage selection procedure involving assessment of the flock at 12 months of age for greasy fleece weight and body weight, followed by culling and a second assessment of the remaining animals for greasy fleece weight and fibre diameter at the 18 month age. The second recommended system involves the once-off use of a selection index, using performance measurements collected at the single measurement age of 12 months. Selection indices suitable for this system are the GFW option for Woolplan indices #1, #2, #3 and #4, and the CFW option for Woolplan indices #3 and #4.