

RELATIONSHIP BETWEEN STAPLE LENGTH GROWTH AND WOOL GROWTH IN THREE MERINO STRAINS IN A MEDITERRANEAN ENVIRONMENT

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Studies by Wheeler *et al.* (1977) in a non-Mediterranean environment found that the correlation between fleece weight growth and staple length was too variable for length growth to be used to estimate the wool production rate. The aim of this study was to examine this relationship in a seasonal environment using three groups of thirty 15-month Merino wethers, WA strong wool, NSW medium wool and NSW fine wool (n=90). The sheep were run as a flock at Yalanbee Research Station, CSIRO, Bakers Hill, WA and dyebanded at two monthly intervals for a period 12 months.

The ratio of clean wool growth to staple length varied significantly between the six seasonal periods ($P < 0.001$) (Table 1) but genotype had no effect on these ratios ($P = 0.27$). The greater relative length growth during autumn and early winter complements the observations of Schlink *et al.* (1996) and relates to the lower diameter they observed at the time. Within each dyeband period, the relationship between wool growth and length was shown by simple correlation analysis (Table 2).

Table 1. Flock ratio of clean wool growth and staple length through the year (g/mm)

Spring 1	Summer	Autumn	Early Winter	Late Winter	Spring 2
41.9	37.3	30.4	29.5	35.1	39.0

Table 2. Simple correlation coefficients of clean wool growth to length growth within seasons

	Spring 1	Summer	Autumn	E Winter	L Winter	Spring 2
Strong	0.44*	0.05	0.39*	0.45*	0.37*	0.79**
Medium	-0.35	0.10	0.15	0.19	0.47**	0.59**
Fine	0.37*	0.82**	0.76**	0.24	0.51**	0.81**

Significant at * $P < 0.05$ and ** $P < 0.001$

The genotypes differed in the relationship between clean fleece weight and staple length. The strongest relationship was seen in the NSW fine wool group where there was a significant correlation between wool growth and length in all periods except early winter. In contrast, in the other two groups there was little relationship between fleece growth and length growth rate, particularly during summer (Table 2). Overall, the correlations of clean fleece weight and staple length for the strong, medium and fine wool groups were 0.36 ($P < 0.05$), 0.01, and 0.68 ($P < 0.01$) respectively.

A number of experiments examining supplements over summer have depended on length growth between dyebands as a measure of wool growth. We found that the ratio of wool weight to length was poorly correlated in most cases, particularly during the summer period. The overall correlations indicate the variability of the relationship between staple length and wool growth, and thus the unsuitability of length growth alone as a measure of wool growth. The results suggest that the observations of Wheeler *et al.* (1977) are equally applicable to a highly seasonal environment.

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