Price premiums for high-bulk Perendale wools

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ABSTRACT

Prices paid at 6 sales for Perendale fleece wool assessed as having loose wool bulk values of 25 cm^3/g or more have been analysed to find what premiums were paid at auction for wools of high bulk. Differences in the subjectively assessed bulk, mean fibre diameter and staple length values together accounted for from 31 to 69% of the variation in clean wool prices. The price increased with increasing bulk, fineness and length, ranging between sales from 0.3 to 5.5 cents/kg per cm^3/g change in bulk, 3.7 to 7.3 cents/kg per micron change (decrease) in mean fibre diameter, and 3.2 to 9.1 cents/kg per 10 mm change in staple length. Implications of these results for clip preparation, shearing practices, and breeding are discussed.

Keywords Wool; prices; bulk; fibre diameter; microns; staple length; fleece weight; Perendale; clip preparation; classing

INTRODUCTION

The importance of wool bulk to the carpet industry was the subject of a previous paper presented to this Society (Carnaby and Elliott, 1980). In that paper both the high-bulk characteristic of Perendale wool, when compared with Romney, Coopworth, and Drysdale wools, as well as the large variation between fleeces within the breed was illustrated. It was suggested that this variation offered growers a potentially important opportunity to prepare specialty lines of higher-bulk wool to meet the requirements of semi-worsted yarn manufacture. Since then studies by Elliott (1980; 1981; 1982), Elliott and Carnaby (1980), Carnaby *et al.* (1984) have confirmed that the above suggestion is indeed valid.

In this paper prices for high-bulk Perendale wools are examined. The study arose as a result ot claims by some local manufacturers that exorbitant price premiums were being paid for the easily recognised 'crimpy' high-bulk Perendale wools, particularly those finer wools of good colour and length which were free of vegetable matter and tenderness and hence met the specifications for the manufacture of semi-worsted knitting yarns. More importantly the study was aimed at supplying price information to the IWS which was wishing to recommend such wools as a viable alternative to high-bulk wools grown in Europe.

ANALYSIS OF AUCTION PRICES

To determine the premium paid at auction a New Zealand Wool Board appraiser subjectively assessed the bulk value of all clearly recognisable Perendale fleece-wool lots offered at auction and considered to have a bulk value of 25 cm^3/g or more. This minimum value was chosen as it clearly distinguished such wool from the lower-bulk Romney- and Coopworth-type wools which seldom exceed 24 cm^3/g. The sale centres, dates, numbers of lots, and price information are shown in Table 1. Only those sales where there were more than 50 lots are included.

The subjective assessment of bulk was undertaken in the course of the Wool Board's routine typing of lots offered at auction. Hence data on the assessed mean fibre diameters (micron values), staple lengths and style grades were also available. Certified yield information enabled the greasy-wool prices to be converted to a clean-wool basis.

It is important to recognise that this analysis was

TABLE 1 Sales included in the price analysis.

Sale	Centre	Date	Number of lots	Price (cents/kg clean)		
				average	range	s.d.
1	Napier	15/10/82	104	392.5	369-410	8.4
2	Invercargill	22/10/82	102	371.2	336-415	15.5
3	Napier	4/11/82	62	369.4	338-432	16.8
4	Napier	18/11/82	127	363.7	316-399	18.1
5	Wellington	10/12/82	55	341.8	299-378	16.1
6	Napier	14/12/82	259	345.7	264-405	26.1

confined to a fairly well defined wool and it does not attempt to relate to the broader wool spectrum possible within the New Zealand industry. Micron values ranged from 31 to 37, staple length from 60 to 150 mm, style grades from 1 to 3, and loose wool bulk from 25 to 30 cm^3/g. (The range of staple length values for each code was averaged and the few lots with style grade 4 and 5 were excluded from the analysis.)

Correlation coefficients between clean price and micron, style, length and bulk were calculated within each sale and are shown in Table 2. Consistently good correlations were obtained for micron value and length, whereas those for bulk ranged from 0.00 to 0.44. The poor correlation with style grade indicated that this trait could safely be omitted from the subsequent multiple regression analyses and probably reflects the absence of noticeably tender and discoloured wools from those surveyed.

The results from multiple regression analyses of micron value, length and bulk on clean wool price are shown in Table 3. The R^2 values indicate that subjectively assessed micron, length, and bulk values accounted for from 31 to 69% of the variation in clean wool price, depending on the sale data analysed. Prices increased with increasing fineness (decreasing micron value), length and bulk, ranging from 3.7 to 7.3 cents/kg per micron change in mean fibre diameter, 3.2 to 9.1 cents/kg per 10-mm change in length, and 0.3 to 5.5 cents/kg per cm^3/g change in bulk.

TABLE 2 *Correlation coefficients with price.*

Sale	Micron	Style	Length	Bulk
1	−0.43**	−0.08	0.21*	0.00
2	−0.49**	−0.11	0.55**	0.34**
3	−0.55**	−0.06	0.30*	0.44**
4	−0.51**	−0.12	0.55**	0.40**
5	−0.41**	−0.12	0.50**	0.11
6	−0.40**	−0.12	0.63**	0.23**
Mean	−0.47	−0.10	0.46	0.25

IMPLICATIONS

There are possibly many reasons why large differences exist between sales with respect to the extent that fibre fineness, length and bulk collectively account for the variations in price. Lack of pre-sale objective measurement of staple length, bulk, and in some instances mean fibre diameter could be one of these. However, it would only be conjecture to try to put a value on this.

The regression equation for sale 4 had the highest R^2 value, and indicates that on some occasions buyers are prepared to pay real price premiums for different wool features. The extent of this, and some implications that it has with respect to production and clip preparation, can be seen (Table 4) by using the regression equation for sale 4 (Table 3) to evaluate various alternative wools, i.e.,

Clean wool price (cents/kg) $= 339 - 5.6 \times \text{micron} + 0.71 \times \text{length} + 5.5 \times \text{bulk}$.

TABLE 3 Multiple regression analysis of micron, length, and bulk on clean wool price.

Sale	Clean price (cents/kg)				Micron		Length (mm)		Bulk (cm^3/g)	R^2
1	Y	=	475	−	3.8 X_1	+	0.32 X_2	+	0.3 X_3	31.3
2	Y	=	400	−	3.7 X_1	+	0.46 X_2	+	1.8 X_3	56.0
3	Y	=	406	−	5.7 X_1	+	0.34 X_2	+	4.4 X_3	47.9
4	Y	=	339	−	5.6 X_1	+	0.71 X_2	+	5.5 X_3	69.0
5	Y	=	411	−	5.8 X_1	+	0.64 X_2	+	2.8 X_3	53.4
6	Y	=	443	−	7.3 X_1	+	0.91 X_2	+	2.6 X_3	55.1

TABLE 4 *Price premiums for alternative wools.*

Strategy and Alternatives	Micron	Length (mm)	Bulk (cm^3/g)	Price (cents/kg)	Difference (%)
Production objective					
woollen-spun carpet yarn	35	70	25	330	+21
semi-worsted-spun knitting yarn	32	120	28	399	
Shearing frequency					
second-shear	34	70	26	341	+11
full fleece	34	120	26	377	
Clip classing					
lower bulk	33	120	25	377	+4
higher bulk	32	110	28	392	

Production Objective

Wools meeting the specification (shown in Table 4) suitable for manufacturing knitwear via the semi-worsted system commanded a premium close to 70 cents/kg clean wool (about 21%) when compared with those more suitable for manufacturing carpet yarns via the woollen system. To achieve such a premium would require attention to be paid to both breeding and shearing practices.

Shearing Frequency

For what could be described as typical Perendale wool, quite substantial price premiums were being paid for full-length fleece wools compared with those for 'second shears' when style categories were not substantially different.

Clip Classing

Trials where clips have been classed into higher-bulk and lower-bulk lines by subjective appraisal tend to result in different average fineness and length values (Elliott, 1980; 1982). Hence, different micron and length values which would be expected to correlate with an improvement in bulk of 3 cm^3/g have been used in this simulation. In this instance a 15 cents/kg premium is shown. The financial gain resulting from classing a clip will however, be dependent on the extent to which the weighted average value for the 2 lines is likely to exceed that for the unclassed clip and any preparation costs (Street, 1982) apportioned to classing.

Fleece Values

This same multiple regression equation was used to determine the price for clean wool and subsequently the values of individual fleeces, given objectively measured data for fibre diameter, staple length, bulk, and clean fleece weight. The data used came from Perendale breeding ewes for which the distribution in bulk values was illustrated by Carnaby and Elliott (1980).

Table 5 shows the fleece weights, fibre properties, and calculated fleece values for the top 10 and the bottom 2 sheep, together with the mean and standard deviation for each variable. The importance of high fleece weight is clearly evident, differences in greasy fleece weight accounting for nearly 80% of the variation in fleece value. However, animals with both a high fleece value and a satisfactory level of loose wool bulk can be found. When selecting for fleece weight breeders of Perendale sheep should not lose sight of the possibilities of using independent culling levels (Rae, 1982) in order to retain loose wool bulk at a desirable level and thus obtain the price premiums when available.

CONCLUSIONS

Price differentials have been examined within a fairly well defined wool type, namely Perendale fleece wool, which is essentially free from discoloration, tenderness, and vegetable matter. The data obtained from 6 sales have indicated that quite substantial price differentials are being paid for such wools which could be related to differences in fineness, length, and bulk. Wool price differentials are very dependent on end-product suitability (Stanley-Boden, 1984) and in this case the premiums probably reflected a suitability for manufacture into knitwear.

While the premium for bulk alone was not large nor consistent, the various price differentials were such that at times growers could gain financially from shearing and clip-preparation practices which result in longer and finer wools of higher bulk being offered at auction.

TABLE 5 Value, weight, fibre properties, and clean price data for individual fleeces.

	Fleece value ($)	GFW (kg)	CFW (kg)	Fibre diameter (μm)	Length (mm)	Bulk (cm^3/g)	Price clean (cents/kg)
	11.45	4.4	3.1	38.3	155	24.5	369.3
	11.41	4.1	3.1	36.0	135	24.5	368.0
	11.34	4.0	3.0	34.5	110	28.0	377.9
	11.00	4.1	3.0	37.9	135	26.2	366.7
	10.40	3.9	2.8	35.4	135	24.5	371.4
	10.27	3.8	2.6	35.4	110	32.0	394.9
	10.01	3.7	2.7	36.6	155	23.0	370.6
	9.97	3.8	2.8	38.9	145	24.0	356.1
	9.86	3.7	2.5	35.8	105	33.0	394.6
	9.80	3.8	2.7	35.7	130	23.9	362.8
	.	.	.	.	.	.	.
	6.70	2.5	1.7	31.5	125	26.0	394.4
	6.17	2.7	1.6	34.3	135	26.0	385.8
Mean	9.12	3.51	2.41	34.7	131	25.9	380.5
S.D.	1.14	0.40	0.34	2.0	16	3.1	16.0

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