Volume 1.6

Wool Testing Services Info-bulletin

Selecting sheep for staple strength

Introduction

Staple measurements (length and strength) can be undertaken on any fine wool lots intended for the worsted sector. The measurements are undertaken on samples taken from the grab sample. Unlike core tests (yield & Laserscan), they are not compulsory for auction. Staple strength is one of the quality components used to predict the processing ability of greasy wool intended for topmaking. Whilst initially intended to be used together with other components to predict hauteur and romaine in the top, it has evolved to become a primary parameter on which combing wool lots are priced.

In Australia over 80% of all fleece lots are measured for staple length and strength. The adoption rate for New Zealand merinos is significantly less. The Woolmark Company has shown that testing for staple length and strength produces a cost benefit (after allowing for the cost of testing) irrespective of the actual staple strength, because processors automatically discount for untested wool, suspecting that it might be tender. Nevertheless, some producers continue to try and save money by not testing. In the majority of cases, this is completely false economy since premiums exist even for small lots and skirtings and pieces. With respect to the plots of the Woolmark data, testing costs are less than 10 Ac/kg clean.

Processors now expect to see staple test data available. It therefore makes sense for growers to ensure that they try to control staple strength.

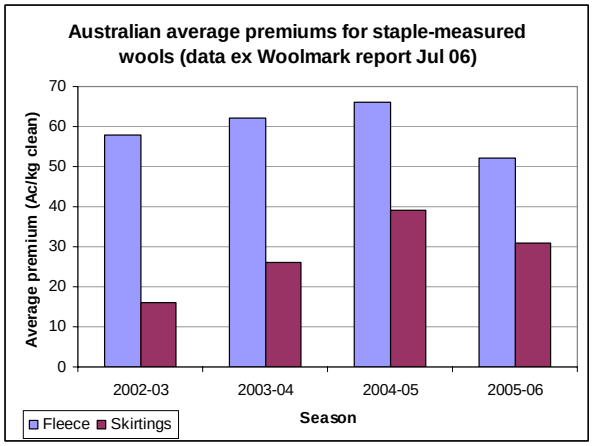
How can we control staple strength?

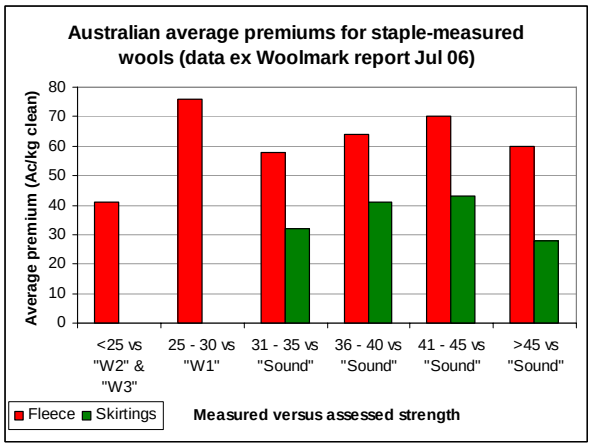
In simple terms, staple strength is determined by the fibre diameter profile along the staple (see Info-bulletin 1.5). Whilst this has been reasonably well established, reliably predicting staple strength from the length-diameter profile has so far eluded researchers, although there is promise that this will be achieved shortly. Whilst the OFDA2000 can be used to predict hauteur, which was originally considered more important than staple strength, the market actually demands a staple strength prediction, so research is continuing in this area.

Info-bulletin 1.5 discusses how staple profiles can be manipulated by altering shearing patterns. However, this isn't always practical, so selection methods must be employed.

Staple profile is partly determined by genetics and partly by environment – if there's a drought, for example, most sheep will produce "hunger-fine" wool which is often tender, since the fibre profile develops "thin" sections during periods of poor feed. (It has been shown that the rate of change of diameter is important to predicting staple strength.) Some sheep are more resistant to environmental effects than others, so we can select for this characteristic.

An animal which is less susceptible to environmental effects will produce a smaller variation in the staple profile. This is obviously desirable and can be selected for by using the





OFDA2000 staple profile data (e.g., minimum along-fibre diameter is strongly correlated with staple strength r – 0.70 to 0.85 in several studies). However, a greater variation in the staple profile also affects the total fibre diameter variability, so these sheep can also be selected, albeit less efficiently, by using the overall coefficient of fibre diameter variability (CvD), which can be conventionally measured by the Laserscan or OFDA100 in the laboratory (r – 0.20 to 0.51).

Of course, animals can also be selected more directly on the basis of staple strength measurements undertaken on midside samples. Typically, a minimum of 10 staples would need to be measured in order to obtain a meaningful result – but whilst this is a more direct measurement, it is less precise than diameter-based measurements.

Benefits of selecting for staple strength

Selecting for staple strength as well as diameter and length (and not neglecting style) will produce more uniform lines of wool. Since there is now more focus on variability of strength within lines ("Avg N/ktex of weakest 25%" is now routinely reported), there will be discounts for lines that have more strength variability.

The economics speak for themselves.

48 Kemp Street, Kilbirnie (PO Box 15062), Wellington, New Zealand
Tel: +64.4.387.8565 Fax: +64.4.387.8651 eMail: NZ.wool@sgs.com Website: www.wooltesting.sgs.com