Selecting for non-shrink sheep

The days of shrinking woollen garments in the wash may soon be over, thanks to new research revealing that wool shrinkage (felting) is a heritable trait that could be manipulated through conventional breeding techniques.

According to CSIRO Livestock Industries scientist Dr Tony Schlink, felting, due to the realignment of wool fibres, causes significant problems in the manufacture of knitted and woven wool products, and particularly fine wool products.

The discovery that felting is a moderately heritable trait opens the door to the selective breeding of sheep with low-felting wool. It came after Schlink, in collaboration with geneticist Dr Johan Greeff, of the Western Australian Department of Agriculture, analysed more than 2000 wool samples from pedigreed animals for various wool fibre traits and 'feltball density'.

'To perform the feltball density test we put one gram of clean, hand-carded wool in a container with 25 millilitres of water, then placed that in a front-loading tumble drier at 20°C for 30 minutes,' Schlink says.

'It comes out as a nice round ball and the smaller the ball, the greater the felting.'

Using pedigree information and adjusting for the effects of fibre diameter, fibre curvature and yield (the amount of dirt a fleece holds) on felting, the pair estimated a moderate heritability of 0.39 for felting. Geneticists can now use this figure to help woolgrowers design breeding programs for reduced felting.

'Breeding offers the potential to produce wool that does not need to be chemically treated to achieve desirable fabric characteristics,' Greeff says.

Preliminary processing studies carried out in collaboration with CSIRO Textile and Fibre Technology have also shown that knitted fabric made from low felting wool has reduced pilling and shrinkage.

Low felting wool also produced a longer 'hauteur' (length) and less entanglement during scouring, and resulted in fewer breakages during spinning.

'These studies demonstrate that differences between low and high felting wools are preserved through the wool processing chain,' Schlink says.

'Altering the ability of wool to felt, through breeding, may make a considerable contribution to wool processing and will enhance wool's clean and green image.'

Schlink and Greeff are now investigating the underlying causes of felting, which is thought to be due to variations in the size, shape and/or structure of wool fibres.

'If the biological basis for felting can be identified, then tests could be developed for wool felting, or it may provide information for new methods of shrink-proofing wool,' Schlink says.

Contact: Dr Tony Schlink, (08) 9333 6000, tony.schlink@csiro.au; or Dr Johann Greeff, (08) 9821 3215, jgreeff@agric.wa.gov.au

Wendy Pyper

Vlad Matveev, CSIRO Land and Water

Which sheep produce shrink-prone wool? A feltball density test was used to provide woolgrowers with the information they need to select sheep for reduced felting.

Butterfly booklet

BIRDWING butterfly enthusiasts will love the new birdwing information booklet, *Conservation of Birdwing Butterflies*, edited by CSIRO entomologist, Dr Don Sands, and scientific writer Sue Scott.

The 48-page colour booklet provides a snapshot of worldwide birdwing conservation projects, including that for the Richmond birdwing butterfly (*Ornithoptera richmondia*) reported in *Ecos* 106. It is packed with photographs, illustrating eight of some 34 birdwing species in the genus *Troides, Trogonoptera* and *Ornithoptera*. As well as the conservation projects, details of the birdwing larvae, food plants, distribution, biology and life cycles are provided. A chapter by entomologist Dr Tim New, of La Trobe University, discusses the value of butterfly conservation in promoting broader conservation goals.

Copies of Conservation of Birdwing Butterflies *can be obtained from SciComEd Pty Ltd, 2 Emily Street, Marsden, Qld, 4132, or www.scicomed.com.au, for $26.*

Wendy Pyper