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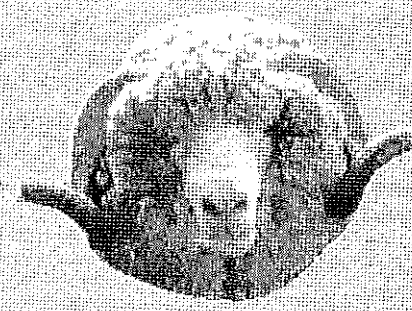
Finewool Newsletter



Issue 4

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CSIRO

PREMIUM QUALITY WOOL COOPERATIVE RESEARCH CENTRE

WOOLMARK

In this Issue:

The members of the Fine Wool Project would like to extend to all readers their best wishes for 1993. May it rain when you want it to and fine up without floods; may the wool market rise and stay risen; may we achieve several GREAT BREAK-THROUGHS IN SCIENCE and continue to be funded. St Patrick is being consulted on these matters.

COOPERATIVE RESEARCH CENTRE (CRC) FOR PREMIUM QUALITY WOOL

The wool industry which is suffering severe financial hardship at the present time, has been heartened by the government's announcement on 14 December 1992 of the establishment of a Cooperative Research Centre for Premium Quality Wool.

Australia will now have a unique facility which draws together the specialist skills of people in all sectors of the wool industry under the directorship of Dr Laurie Piper of CSIRO Division of Animal Production, Armidale.

"Research to improve the quality and international competitiveness of Australian wool will be the central focus of this new Centre" said Dr Oliver Mayo, Chief of the Division of Animal Production.

Research programs will be directed to develop genetic technologies to improve wool and fabric quality, to increase wool staple strength, to determine the impact of fibre structure and function on wool quality, and to educate and train people in all sectors of the wool industry.

Two Divisions of CSIRO, Animal Production and Wool Technology, the Western Australian Department of Agriculture, Universities of New England, Western Australia and New South Wales will join forces with the Wool Research and Development Corporation in a concerted effort to add value to wool.

With the worldwide trend towards lightweight fabrics and softer fabrics that can be worn next to the skin, the CSIRO Division of Wool Technology will be strengthening its emphasis on the efficiency of textile processing to further enhance the position of wool fabrics.

The core partners of the CRC have combined the research and development program with a highly innovative education and technology transfer program.

Dr David Lindsay of the University of Western Australia said "The use of a modem computer-based communications network will simultaneously link all participants on a regular basis. This approach will provide a quantum leap in the human and infrastructure resources available to train students and to disseminate technology to all sectors of the wool pipeline".

The on-farm sector of the wool industry will be strengthened by greater financial support for extension services and by a greater emphasis on technology transfer" said Dr Kelly of the Western Australian Department of Agriculture.

The news of the CRC for wool quality was warmly welcomed by the Wool Research and Development Corporation. It will be a new initiative linking research, extension and education with industry partners in a major thrust to restore wool to the forefront of the textile industry.

Laurie Piper

CSIRO Division of Wool Technology (DWT), Ryde Laboratory, Raw Wool Group Wool Metrology

Diameter Instrumentation and Metrology

A new instrument called SIROLAN LASERSCAN developed for the measurement of fibre diameter and diameter distribution by DWT has been released and is now commercially available to industry. This new instrument supersedes the FDA-200 instrument and is marketed independently by CSIRO. It offers

significant advantages over other instruments in its improved discrimination against invalid measurements for diameter and diameter distribution measurement, combined with rapid and simple sample preparation and automatic snippet transport through the measurement cell. Errors due to measurement dependence on ambient temperature and humidity (sample conditioning) have been minimised.

In the development of LASERSCAN, superfine wools were among those used to evaluate and test its performance. It goes without saying that diameter measurement is of utmost importance to the fine and superfine wool grower and DWT believes that LASERSCAN measurement of diameter and diameter distribution, when combined with the appropriate sampling procedures, should prove valuable for both flock testing and sale lot measurement.

To illustrate the precision and use of LASERSCAN for flock testing the following table presents the diameter and diameter distribution results for repeat testing of 2000 fibre snippets from minicored midside samples for eight sheep within a superfine flock (covering a range of mean diameters).

Repeat LASERSCAN Measurements

	Test 1			Test 2		
Fleece	MFD µm	SD µm	CV %	MFD µm	SD µm	CV %
A	14.7	2.7	18.2	14.6	2.5	16.9
B	15.2	2.6	16.8	15.2	2.7	17.5
c	15.5	2.5	16.4	15.5	2.6	16.6
D	16.0	2.6	16.2	16.1	2.7	16.6
E	16.6	2.5	15.0	16.7	2.6	15.5
F	16.8	2.8	16.7	17.0	2.9	17. 1
G	17.1	2.3	13.7	17.2	2.3	13.7
H	17.8	3.4	19.2	17.9	3.3	18.4

During August and September 1992 international trials on wool top have been conducted using five instruments in independent laboratories in Germany, France and Australia. Using a new calibration procedure, instruments were independently calibrated by the laboratories using 1991 Interwoollabs (IH) airflow standard tops, with the calibrations validated using a different set of standard tops of known diameter values.

Twelve top samples covering a diameter range from 17.0 to 40.0µm were prepared and measured by each laboratory. The trial indicated that very good agreement was obtained between laboratories when measuring different samples taken from the same samples of top. The mean diameter values for tops for each laboratory are presented below.

Mean Diameter (µm) Values for Tops

	Laboratories				
Sample	*1*	*2*	*3*	*4*	*5*
1	17.8	17.9	17.7	17.9	17.8
2	22.1	22.3	22.2	22.3	22.0
3	18.9	18.8	18.6	18.6	18.6
4	33.5	33.9	33.9	33.7	33.5
5	20.6	20.7	20.5	20.6	20.6
6	22.4	22.4	22.4	22.3	22.3
7	29.1	29.1	29.1	29.1	29.1
8	30.1	30.3	30.0	29.8	29.7
9	21.7	22.1	21.9	21.9	21.9
10	40.7	40.8	40.3	40.4	40.3
11	20.2	20.3	20.4	20.4	20.4
12	32.8	32.7	32.7	32.3	32.5
Lab. Mean	**25.8**	**25.9**	**25.8**	**25.8**	**25.7**

Twenty LASERSCAN instruments have been sold to test houses, processing mills, and research and educational institutes in Australia, New Zealand, Argentina and Europe. Recently AWTA Ltd has purchased several LASERSCAN instruments. However, prior to incorporation of LASERSCAN measurements into the current Core Test Procedures, a full International Wool Textile Organisation (IWTO) Test Method must be approved. DWT is confident that this will be achieved in 1993.

Style Instrumentation

The development of an instrument to objectively measure wool style is receiving research priority. This image analysis system is designed to characterise style components such as greasy colour, crimp definition and frequency, dust content and colour, and the tip and staple characteristics of greasy wool staples. For fine and superfine wools, considerable attention has been focused on the development of algorithms to correctly characterise the crimp characteristics of these wools. As well as the development of algorithms, the instrument is being constructed to fit into a test-house environment. This includes the automation of the system through the use of tray stacking and bar-code identification. (See separate report for progress on handle research.)

Processing Experimentation for Fine Wools

Blended fine-wool processing batches derived from the Fine Wool Project Flocks have been prepared for use in a trial designed to investigate the effect of card, gill and comb factors on card waste, length after carding, Hauteur (length after combing) and combing yields, and nep content for the Ryde mini-mill facility. The trial is aimed at optimising and standardising the top-making performance of the Ryde mill prior to its use in the development of prediction equations for fine and superfine wools.

The 1992 adult Fine Wool Flock bloodlines are being prepared into processing batches, with complete objective specification nearly complete. The DWT Geelong Laboratory has also purchased wool from the Fine Wool flocks for use in their processing investigations. This will effectively link the processing prediction work at Ryde to the processing technology research at Geelong.

Visit by the Council of the Australian Superfine Wool Growers Association

In November DWT (Ryde) hosted a visit by the Council of the Australian Superfine Wool Growers Association; the council members, led by Barry Walker and Tony Gall, included studbreeders who have their bloodlines represented in the Fine Wool Flocks. This visit gave staff members of the Division, particularly the Raw Wool Group, the opportunity to demonstrate and present to the Council the more recent developments in raw wool marketing, objective specification

and processing. Specific presentations were in the areas of diameter and diameter distribution measurement (SIROLAN LASERSCAN) and its application, handle, style, dark fibre and vegetable matter contamination, computerised sale lot information system (SIROSYS), processing prediction and technology, and fabric assessment (FAST). Although the visit was tightly timetabled, it was structured to facilitate a two-way flow of information between Council members and staff; with this interaction being an important and valuable feature of the visit. DWT staff certainly appreciated the opportunity to discuss and gain feedback on their research, and now look forward to closer ties with the Association in the future.

As a means of improving the transfer of research information, we hope that Association members approach the Council to discuss the various research programmes presented during this visit. We also extend an open invitation to individuals or groups to visit our Laboratory in Sydney.

Kerry Hansford

HANDLE TRIALS

A large number of the renowned "touch-only" handle trials were conducted in October using samples selected by woolgrowers to indicate the ranges of softness normally encountered in a flock. To date 35 woolgrowers, several brokers and other people with less wool experience have participated in the trials which will help us learn how consistent handle assessments are between people and to test our developing theories about the basis of handle in greasy wool. As an example, shown below are the results for the same 3 anonymous woolgrowers, A, B, & C, who ranked the same set of 6 fine wool samples three times, twice when the samples were in their normal greasy form and once when they were scoured and carded. A rank of 1 indicates the softest wool in the set and a rank of 6 indicates the harshest.

Handle Ranks

	Greasy replicate 1			Greasy replicate 2			Clean		
Operator:	*A*	*B*	C	*A*	*B*	C	*A*	*B*	C
Sample									
3	5.5	1.5	3	5.5	2	3	2.5	2	2
1	3.5	5	5	4	3.5	5.5	5.5	3	6
7	5.5	6	6	5.5	5.5	5.5	4	6	5
4	2	3.5	2	1	3.5	1.5	2.5	4	4
5	1	3.5	1	2.5	1	1.5	2.5	2	2
6	3.5	1.5	4	2.5	5.5	4	5.5	5	3

On average sample 7 ranks as harshest and sample 5 softest but there is considerable variation both between people and for the same person on separate occasions. Overall, there was about 60% agreement between people when the samples were greasy and 70% when samples were clean. Repeat rankings for the same person on replicate sample sets was usually better than between people but not as perfect as you might imagine. There was also little difference between woolgrowers and non-woolgrowers. It is important to know the level of consistency between and within operators. Samples sometimes changed position in the rankings once they were scoured and this will provide very useful information in our search for an explanation of wool handle in terms of various fibre attributes.

Parallel sets of display samples are now being selected by brokers and buyers from among the offerings at recent Newcastle and Sydney wool sales for the next round of trials. Our thanks to everyone who has contributed their time, skills and ideas to this project

Denise Stevens

1992 Lambing & Sampling Details

Lambing

As with most of northern New South Wales, Longford suffered dry conditions for the first part of the year, with good rains from mid-September on. The drought-breaking rains came just in time for a successful lambing in October-November, with almost 80% lambs marked. Exact numbers of ewes mated and lambs marked in each bloodline are as follows:

Bloodline	Ewes mated	Lambs marked
1	163	107
2	183	145
3	174	168
4	187	155
5	176	129
6	201	139
7	155	107
8	151	128
9	145	125
10	162	112
11	155	146
Total	**1852**	**1461**

At face value, these numbers appear to reflect differences among bloodlines in marking percentages. However, there are other factors which have an influence. For example, several bloodlines with low marking percentages have large numbers of aged ewes. More definite conclusions cannot be made until the appropriate statistical analyses are finalised.

Several other interesting observations were made from this lambing. From the 190-odd maiden ewes, there was only one set of twins, while there were 315 sets from the older ewes. Also, in excess of 90% of the lambs were born in the first three weeks of lambing (as was the case in 1990 and 1991).

At mating in 1993, almost all bloodlines will be at full strength for the first time, with 550 1991-drop maiden ewes entering the breeding flock. The first mating of Fine Wool Project sheep in Western Australia began in December 1992. Two bloodlines are represented, with 200 ewes purchased from each of the contributors. Rams previously joined at Longford have been used, creating genetic ties between the flocks in both environments.

Sampling

Significant progress was made with the sampling schedule in 1992, on both 1990- and 1991 - drop animals. Following weaning in January, the 1991 - drop were artificially challenged, with *Haemonchus contortus* (Barber's Pole worm) and faecal samples taken. Analyses of faecal egg count data revealed significant differences among bloodlines in resistance to this parasite. The 1992-drop will similarly be challenged with *Trichostrongylus colubriformis* (Black Scour worm) in early 1993.

The 1991 -drop were also used in a nutrition trial in collaboration with the University of New England. This involved feeding different levels of protein supplement in order to investigate possible interactions between bloodlines and nutrition.

At pre-shearing sampling, a variety of subjectively scored fleece structure and quality traits were recorded on the 1990- and 1991 -drop animals. These included measures of handle, crimp definition, greasy colour, staple thickness and dust penetration. Midside and backline wool samples, and skin sections for histology were also taken at this time. The wool samples were prepared for a wide variety of measurements, including fibre diameter distribution, yield, length and strength, colour, and objective measurement of style and its components.

At shearing, fleece weights were recorded and Australian Wool Corporation wool types were assigned to each fleece. Preliminary analyses show significant amounts of genetic variation between and within bloodlines for a wide variety of the traits measured.

Following shearing, the surplus wethers were sent to NSW Agriculture's Condobolin field station in order to examine the performance of fine-wool bloodlines in traditional medium-wool growing areas. This will continue throughout the life of the Project

Andrew Swan and Heather Brewer