

A photograph of a rural landscape featuring a green hillside. Two sheep are grazing on the grass. The sky is filled with large, grey, dramatic clouds, suggesting an overcast or stormy day. The overall tone is somewhat somber due to the dark clouds.

NEW ZEALAND

WOOL

New Zealand Wool



...it's more than just sheep

Text and photos by Eric M. Appleman

New Zealand Wool...it's more than just sheep.
by Eric M. Appleman

*Acknowledgements. The assistance of those who contributed
their time and knowledge to make this project happen is greatly
appreciated.*

Copyright © 1994. All rights reserved.
Published by the Good as Gold Publishing Company,
767 Radcliffe Ave, Pacific Palisades, Calif. 90272 U.S.A.

Cover: Two sheep grazing on a farm near Waipiata.

| | |
|-----------------------------------|---------------------------|
| ..... | Introduction |
| ..... | The farm |
| ..... | The woolbroker |
| ..... | A digression on testing |
| ..... | The auction |
| ..... | The woolbroker, continued |
| ..... | The woolscour |
| ...A second digression on testing | |
| ..... | The wool dump |
| ..... | To the port |
| ..... | Exports and Exporters |
| ..... | Domestic Processing |
| ...The New Zealand Wool Board | |
| ..... | Research |
| ..... | The future |
| ..... | Appendix: Testing |
| ..... | Notes |

Introduction

When one thinks of New Zealand, sheep likely come to mind...lots of sheep grazing in green fields. New Zealand does indeed have a lot of sheep. In mid-1993, the country had a sheep population of 50.3 million¹, compared with a people-population of slightly under 3.5 million.

New Zealand ranks second after Australia in wool production. Its total production for the 1992-93 season was 193.0 thousand tonnes (212.3 thousand tons) of clean wool.² This was the lowest level in 30 years,³ in part because of a difficult winter, but also because of a continuing weak market for wool.

As noted in the NZ Wool Board's Statistical Handbook, "New Zealand sheep are mostly dual purpose meat and wool animals, the majority of which are descended from the Romney Marsh... The Romney and related breeds, which account for nearly three quarters of New Zealand's sheep flock, produce 'Crossbred' wool, which ranges in diameter from 30 to 40 microns."⁴ These strong fibres are mainly used in carpets. An estimated 69% of New Zealand wool goes to the production of interior textiles (carpets, rugs, upholstery and blankets).⁵

Merinos produce a finer wool. They were the dominant New Zealand breed in the 19th century, but now account for about 4% of the flock.⁶

STOCK AUCTIONS

TRESKO ROMNEY STUDS

A/C HT & PI Brensell, Maa Flat
STUD AND FLOCK ROMNEY RAM SALE
Auction On Farm, January 17, 1994, 12 noon
Pre-Sale Inspection: January 10, 1.30-4.30pm

200 PERFORMANCE RECORDED RAMS FOR SALE
PURCHASE TRESKO RAMS FOR EXTRA LAMBS ON
GROUND, WOOL IN BALE, MEAT ON HOOKS.
DOLLARS IN THE BANK

- Maniototo clients achieving in excess of 150% lambing
- Canterbury clients achieving 8kg of wool per head
- Southland clients achieving 80% of male progeny hogging at 18kg
- Lawrence client achieved \$47 for store lambs at Auction in December

TRESKO ROMNEYS THE ADAPTABLE SHEEP FOR PERFORMANCE CONSCIOUS FARMERS

Inquiries to:
H. T. Brensell (03) 204-0812
G. R. E. Grayson (03) 204-0862
L. H. Brensell (03) 204-0806

Owlier Manager Stud Shepherd

ROMNEY RAM SALE

The Maniototo Romney Breeders Group are holding their third annual sale of selected Rams at the Maniototo A. & P. Showgrounds, Ranfurly, on Friday, January 14, 1994 at 2 p.m.

All rams will be:
1. Veterinary inspected
2. Accredited
3. In natural condition

Inquiries to:
REID FARMERS WRIGHTSON
J. L. Falconer

Advertisements for Romney ram sales from the *Otago Daily Times*.



Prize-winning Merino wool at the 1993 Canterbury Show.

The farm

Otago, in the South Island, is quite dependent on sheep farming. It has more sheep than any region of the country except Canterbury. Typical sheep country can be found in Central Otago on land fed by the Taieri River and overlooking the broad Maniototo Plain. The climate is dry, averaging about seventeen inches of rain per year.

Twelve km from Ranfurly, near Waipiata, is the farm Riverslea, a property of 6,000 acres (2,500 hectares) consisting of 2,000 acres on the flat near the river and 4,000 acres in the hills. The land supports 5,000 ewes; Romneys on the flat and Halfbreds in the hills. In addition, there is a herd of 150 cattle.

Although the flat country is a smaller area, it produces 80% of the farm's income. The ground in the hilly country is poorer and drier, and the sheep cannot be kept up there in the winter.

In late August, three weeks before lambing, the sheep are shorn so that the newly-born lambs will be able to get milk. Lambing begins in mid-September and continues for about six weeks. The 5,000 ewes produce 6,000 lambs.

In the next steps, a small rubber ring is put on male and female lambs alike to remove their tails (tailing), all males are castrated, and the lambs' ears are cut for identification. The farmer can tell not only which sheep are his, but also their sex (males are cut on the right ear and females on the left ear, for example).

Weaning occurs around Christmas. The mobs of sheep are brought



Otago has about 3,500 sheep farms and 8 million sheep.⁷ Dunedin, Otago's largest city, is the second largest wool selling center in New Zealand.⁸



The farmer ready for a day's work.

into the sheepyards from different fields. Male lambs, female lambs and mother lambs are all separated. The farmer goes through the female lambs one at a time, looking at how strong they are, their frame, their wool, and their teeth and jaw. Based on their general configuration, he selects 1,500 for breeding.

The rest, those with faults, join the males. They are fattened for export or sent straight to the freezing works. By the end of the summer, in March or April, they are all gone. Over winter, the farm carries the breeding ewes and the selected lambs, now called hoggets.

Rams are put out around the beginning of May. These are purchased from stud farms. Each one impregnates about 80 to 100 ewes, and they go for about six working years. With the birth of lambs, the cycle begins again.

Of course, there are all sorts of refinements and intricacies to complicate the above description. For example, at Riverslea, of the 1,500 good lambs selected, the bottom one third, those with any faults, will later be put in with a Texil ram. Texil is a breed that produces meat that is low in fat. The sheep must also be treated for parasites. Drenching takes care of internal parasites. Dipping, spraying poison down the back of the sheep, kills the external parasites. It is important to treat every single sheep, otherwise the parasites will spread again.

The farmer is always busy -- moving mob of sheep to a different paddock, cutting or poisoning thistles, repairing equipment. It is necessary to store up hay for the winter because no grass grows in the period from May to August. A paddock will be left to grow long,

and will then be cut and formed into round bales.

Every five years the farmer must pay for a rabbit kill. These occur in the winter. An airplane is hired and does sequential carrot drops in the hills. In the last drop, the carrots are poisoned. A follow-up with guns is necessary to get any stragglers.

Shearing is a big event. The shearing is not done all at once, but is spread out so that the shorn animals can take shelter. Some will be done, and ten days later another batch will be done. The farmer hires a contractor and pays him about NZ\$2 (\$US1.12) per sheep. The shearing gang includes four shearers, three or four rousies and a press operator. Rousies spread the wool out on a big metal table and separate the neck wool from the fleece from the belly wool from the daggy wool (wool from the rear end). In addition to the pre-lamb shearing, the sheep are also trimmed later in the year; this is known as crutching.

The shearing shed reverberates with loud, fast-paced music. The shearer uses his elbows and knees keep the sheep in position. A good shearer can do 200 sheep in a day; a really good shearer can do 250. The shearer receives about NZ\$0.90 (\$US0.50) per sheep.



The lambs' ears are cut for identification.



A farmer moving a mob of sheep up the road to a different paddock -- near Waipiata.



Shearing competition at the 1993 Canterbury Show. The same basic scene, minus the judges and advertisements and plus loud music, is found in a typical shearing shed. The metal table in front of the raised platform is used by rousies to sort out the fleece. In the old days, the floor was at the same level as the platform and the rousies had to do a lot of bending over.



Hard work.



The farmer gets income from meat as well as wool. Here drivers unload sheep at the Alliance freezing works in Dunedin. A two-trailer truck can hold about 350 to 450 sheep or 600 lambs.



The Alliance Group is the South Island's largest meat company. Alliance's Dunedin plant is located off Kaikorai Valley Road, a few kilometres from the city centre. A nauseating odor fills the air downwind from the plant.

The woolbroker

The woolgrower has three ways to sell wool. He can sell through a broker at a public auction, through private sale to a buyer, or indirectly as part of the animal sold to a meat processor. Wool removed at the freezing works is called *slipe* and is of lower quality. *Slipe* accounts for 13% of wool sales. However, the dominant method is to sell through a broker. In the 1992-93 season, 61% of the New Zealand wool clip (by clean weight) was sold at auction.⁹

The broker provides a number of services. Bales coming in to the inward processing store are assigned a lot number. A core is taken and sent off for testing, and preparations are made for the auction.



Wool arrives at the Wrightson inward processing store on Parry Street, Dunedin. As noted in the Wrightson prospectus, "Wrightson is New Zealand's leading wool broker, handling approximately 534,000 bales on behalf of wool growers during the year ended 30 June 1993."¹⁰



Trucks waiting to unload inside the processing store.



Coring machine takes samples to be tested.



Wool is classed into different bins.



Lots are set out for buyers' inspection.

A digression on testing

Since the 1960s, the industry has come to rely on objective measurement based on testing of the core sample. New Zealand has two wool testing companies, New Zealand Wool Testing Authority Ltd and SGS Wool Testing Services (NZ) Ltd. NZWTA's main laboratory is at Napier, on the North Island, and it has half dozen branch offices around the country.

The testing company, using methods set by the International World Textile Organization, measures yield, fibre fineness, colour and a number of other characteristics.

The company then issues a certificate. The information goes into the auction catalogue and is used by buyers to make decisions.



Certificate
NEW ZEALAND WOOL TESTING AUTHORITY LTD
Incorporated in New Zealand

WTO TEST CERTIFICATE
WTO 19/253 DATE 07/02/00
POP GREASY WOOL TEST No. 2-290010-10

Sale at: CHRISTCHURCH
On: 12/12
Broker: NZWTA
Lot No: T 1254

FIELD TEST RESULTS
Wool Sample: 2 Subsamples: 09, 24 &
Vegetable Matter: 0.3 %
(Inc: 0.0 % N.S. & Tergin)

Gross Mass: 1250 g
Declared Tare: 7 g
Net Mass: 1243 g

WTO SPECIFICATIONS (AS BELOW)
Mean Fibre Diam. (2 Spins): 25.6 microns

ADDITIONAL INFORMATION

COLOUR (N.Z.S. 0707(1994))

| |
|--------------------------------|
| 1. W.T.O. S.V. 4 17% 63.2 1030 |
| 2. W.T.O. S.V. 4 17% 63.2 1030 |
| 3. W.T.O. S.V. 4 17% 63.2 1030 |
| 4. W.T.O. S.V. 4 17% 63.2 1030 |
| 5. W.T.O. S.V. 4 17% 63.2 1030 |
| 6. W.T.O. S.V. 4 17% 63.2 1030 |

General Manager: [Signature]
Branch Manager: [Signature]
CERT No. 290553-8

This certificate is issued in support of the New Zealand Wool Testing Authority Ltd, which confirms the above and certified analysis only if membership is substantiated.

The testing company issues a certificate and the information is entered into the auction catalogue.

REID FARMERS LIMITED
DUNEDIN WEEK 29 WOOL SALE 1993/94 SEASON

| BRAND | NET WEIGHT | LOT | 18% 17% V.M. SD | 18% 17% V.M. SD | DESCRIPTION | BLS | VALUATION | PRICE | BUYER |
|-------------------|------------|-----|-----------------|-----------------|----------------|-----|-----------|-------|-------|
| 1 BRISTOL | 590 | 61 | 76.9 | 37.6 | Y 63.4 Y-Z 1.5 | | | | |
| | 782 | DN | 77.5 | 0.1 | A X | 4 | | | |
| 2 WENDOUREE | 782 | 62 | 82.4 | 36.2 | Y 66.6 Y-Z 1.6 | | | | |
| R/C H799 | 968 | DN | 81.4 | 80.8 | A M X | 8 | | | |
| 3 T UNDER EYEBROW | 1678 | 63 | 79.5 | 37.0 | Y 62.7 Y-Z 1.8 | | | | |
| | 2148 | DN | 80.3 | 0.1 | PS | | | | |
| | | | 78.8 | 78.2 | A ROMPPER 2 | 13 | | | |
| 4 DIAMOND | 3423 | 64 | 72.1 | 34.9 | Y 64.5 Y-Z 1.9 | | | | |
| | 3447 | DN | 72.7 | 0.3 | PS | | | | |
| | | | 71.2 | 70.3 | A X | 19 | | | |
| 5 BELLEVUE | 811 | 65 | 78.1 | 36.5 | Y 67.0 Y-Z 1.3 | | | | |
| | 1057 | DN | 78.8 | 0.1 | PS | | | | |
| | | | 77.4 | 76.7 | AA F X B/S | 8 | | | |
| 6 CRAIGNEY | 1437 | 66 | 79.0 | 35.5 | Y 63.6 Y-Z 1.8 | | | | |
| | 1864 | DN | 79.6 | 0.4 | PS | | | | |
| | | | 77.9 | 77.1 | A ROM | 10 | | | |
| 7 LAKEHOLM | 409 | 67 | 75.6 | 32.8 | Y 62.4 Y-Z 1.4 | | | | |
| | 554 | DN | 76.3 | 0.3 | PS | | | | |
| | | | 74.7 | 73.9 | A X HOG | 4 | | | |
| 8 | 1913 | 68 | 78.4 | 38.3 | Y 62.4 Y-Z 1.8 | | | | |
| | 2485 | DN | 79.1 | 0.2 | PS | | | | |
| | | | 77.6 | 76.9 | A X | 16 | | | |
| 9 | 1116 | 69 | 70.3 | 36.4 | Y 57.6 Y-Z 2.8 | | | | |
| | 1624 | DN | 70.9 | 0.2 | PS | | | | |
| | | | 69.6 | 68.7 | A X PCS | 10 | | | |
| 10 FINE | 589 | 70 | 81.8 | 37.5 | Y 63.5 Y-Z 1.8 | | | | |
| | 1101 | DN | 82.5 | 0.0 | PS | | | | |
| | | | 81.2 | 80.7 | A X 2/S | 6 | | | |
| 11 II. | 591 | 71 | 77.2 | 30.8 | Y 66.3 Y-Z 2.0 | | | | |
| | 781 | DN | 77.9 | 0.2 | PS | | | | |
| | | | 78.4 | 75.7 | A F X LBS | 5 | | | |
| 12 RA. | 2508 | 72 | 78.9 | 36.4 | Y 65.9 Y-Z 1.8 | | | | |
| | 3504 | DN | 75.6 | 0.2 | PS | | | | |
| | | | 74.1 | 73.3 | A ROM | 19 | | | |
| 13 HOLBROOK | 418 | 73 | 71.4 | 31.0 | Y 62.6 Y-Z 2.7 | | | | |
| | 607 | DN | 72.0 | 0.4 | PS | | | | |
| | | | 70.4 | 69.4 | A X HOG | 4 | | | |
| 14 RP OVER BAR | 3053 | 74 | 78.7 | 37.3 | Y 61.6 Y-Z 1.7 | | | | |
| | | | 80.4 | 0.2 | PS | | | | |

Part of a page from an auction catalogue.

The auction

The open cry auction is still the dominant method for selling wool in New Zealand, attracting exporters and buyers from domestic firms. Napier on the North Island is the largest wool selling center followed by Dunedin, Invercargill and Christchurch.

Seven sales were held in Dunedin from August through November 1993. For the rest of the season, Dunedin brokers joined brokers from Christchurch and Invercargill at the Christchurch sales.

The woolbroker, continued.

While awaiting the buyer's instructions, the wool may sit in storage for a month or more. It is then transported to either the wool dumper or the woollscour.



The auctioneer for Reid Farmers (Dunedin) at the 13 January 1994 sale at Southern Wool Auctions, Opawa, Christchurch. Brokers from Christchurch, Dunedin and Invercargill participated. Along with another sale conducted at Napier, about 55,000 bales were offered on the day.



Buyers during the auction. The prices shouted about are for greasy wool; the buyers use calculators or tables to figure out the clean price. For the day, the Wool Board's indicator price (an average which encompasses the different types of wool) was NZ\$3.97 a kg (US\$1.00 a lb) clean.



Wrightson wool storage facility on Strathallan Street, Dunedin.



A particular lot can be located by the row number and area where it has been placed. The markings on the bales indicate the farm, lot number, and number of bales in the lot. At this stage, a typical bale weighs 160-180 kg (350-400 lbs).



When the buyer's instructions are received, the bales are loaded and transported to either the wool dumper or the woolscour.

The woolscour

About 80% of New Zealand wool fibre exports are scoured (cleaned) wool. New Zealand has become an international leader in scouring technology.

The wool is put into bunkers and then fed into a machine which loosens it up and passes it into hot water containing detergent and an acid. Metal prongs agitate the mix. The wool then passes through a dryer and out to the baler. It is quite expensive to operate a scour.



RF Woollscour at Parry Street. The plant operates around the clock.



Unloading wool at the scour.



Wool is fed into the scouring machine...



...enters the hot water bath...



...is agitated...



...by metal prongs...



...comes out of the dryer and is put into bales.



A worker paints details on a closed bale.



By-products of the scouring process are lanolin...



and waste-water effluent.

A second digression on testing

In addition to tests done on greasy wool, the scoured wool must also be tested. Wool absorbs moisture. The moisture can cause significant changes in the weight of a consignment and must be corrected for.



Custom-built oven at the NZWTA branch office on Portsmouth Drive, Dunedin is used to dry wool in order to determine regain. Regain is a percentage figure which is used to correct the weight of a consignment for changes caused by moisture.

Certificate
 NEW ZEALAND WOOL TESTING AUTHORITY LTD
 Registered Office of New Zealand
 Laboratories & Facilities: Hamilton, Napier, Auckland, Christchurch, Timaru, Dunedin & Invercargill

IVTQ TEST CERTIFICATE
 IVTQ-19/25/331 DATE 06/09/99
 100% SCOURED WOOL

Brand: 1
 NZWTA LTD
 NAPIER

YIELD TEST RESULTS (IVTQ-19)
 Wool Bale (2 Subsamples): 64.62 %
 Vegetable Matter Bale: 0.1 %
 (Inc. 0.0 % S.S. & Twigs)

FIBRE FINENESS (AIRFLOW) (IVTQ-26)
 Mean Fibre Diameter (6 Spec): 24.4 Microns

ADDITIONAL INFORMATION
 COLOUR (S.S.B. 8707-1984)
 Y: 60.5 T: 60.0 S: 50.0
 Y-2 3.0

Moisture Content: 15.35
 Regain: 15.35
 Ethyl Alc. Extractable: 1.05
 Ash Content: 0.75

Residual Grease: T 8750-04
 (Dichloromethane)
 @ 10% 0.165
 @ 17% 0.165

CALCULATED COMMERCIAL YIELD
 1. IVTQ S.V. @ 10% : 100.0 32904
 2. SE Process Yld : 99.6 32647
 3. IVTQ S.V. @ 17% : 101.7 33286
 4. ASTR C.V.F.P. : 98.6 32274
 5. JAP. C.N.Y. : 99.9 32669

CONDITIONING TEST: T 872-01
 @ 10% 100.565 or 32912 Kg
 @ 17% 101.425 or 33197 Kg

1 SPECIMEN 1

General Manager: [Signature] Authorisation: [Signature]

This certificate is invalid if altered. The New Zealand Wool Testing Authority Ltd will confirm the above data provided suitable proof of ownership is substantiated.

Certificate for scoured wool.

The wool dump

Twenty-percent of wool exports are greasy (uncleaned) wool. A large proportion of this unscoured wool is fine wool that overseas mills want to scour to their own specifications. In addition, the Chinese often take slipe -- wool from the freezing works -- unscoured to save on labor costs.

The wool dumper liaises with the exporter, transports the wool and consolidates it into a shipping container. Two or three bales are pressed into a single bale (two-bale or tri-pac).

About 600 tonnes (660 tons) of pressure squeeze the bales together; a worker then straps metal bands around the combined bale. A tri-pac can weigh up to 600 kg (about 1,320 lbs).

The bales are then loaded into shipping containers. A container (whether 20' or 40') can carry up to 18 or 19 tonnes (20 tons). Over the years, the number of bales that are put in a container has increased from 96 to as many as 148.

To the port

The packed container is hauled from the scour or the dumper to the port.



Dunedin Wool Dumpers on Parry Street.



Bale moving up a conveyor belt and into the press.



Forklift loading two-bales into a 40' container bound for Philadelphia. (In the background are bales of slipe which must sit at the dumpers for a few weeks because the traces of blood remaining in them lead to microbe activity).



A truck bearing a container filled with wool bales arrives at Port Chalmers, the container port that serves Dunedin.



Details of arriving containers are taken from the docket and entered into a computer. Here the screen shows that the container on the truck is bound for La Spezia, Italy (SPE).



Port workers discussing what to do with a container that has been stuffed so full that its sides bulged out. Some firms have less modern presses and may have to use a tractor to shut the door.

Exports and Exporters

Wool is a major earner of export income for New Zealand. In the 1992-93 season, New Zealand exported 180.4 thousand clean tonnes (198.4 thousand tons) of wool fibre with an FOB value of NZ\$887 million (US\$494 million).¹¹ The bulk of New Zealand wool goes to countries in Asia and the Indian subcontinent for processing (see Table 1) and then on to eventual customers in Europe and Japan.

Table 1. Top Destinations for New Zealand Wool Exports actual tonnes (includes greasy and scoured)

| | | | |
|----------------|--------|-----------|--------|
| China | 40,246 | India | 11,482 |
| Nepal | 17,711 | Germany | 11,182 |
| United Kingdom | 17,153 | U.S.A | 9,705 |
| Japan | 15,828 | Hong Kong | 8,915 |
| Belgium | 12,688 | Australia | 7,785 |

Source: NZWB Statistical Handbook 1992-93 season, page 75.¹²

The exporter makes a contract with the overseas buyer, and then buys the wool at auctions and from private merchants. In the vast majority of cases, amounting to perhaps 90% of the exporter's business, the wool is pre-sold. Forward selling works because the exporter knows by experience what wool is going to be coming into the market during the year. The exporter must see to it that the type and quantity of wool contracted for are delivered.

¹¹FOB -- free on board -- means that the figure includes all costs necessary to bring the commodity on board the ship.



Stencils for marking bales at RF Woolscour show some of the many overseas destinations for New Zealand Wool.



New Zealand Wool Services International Limited has been a pioneer in that the New Zealand wool industry in terms of quality, value for money and service.

This means a commitment to source and supply the best wool, to use the latest technology and, as a result, to enable customers to produce through our services internationally.

How are the wool services to promote New Zealand wool as one of the world's premium wool fibres.

NEW ZEALAND WOOL SERVICES
INTERNATIONAL

Promotional material for New Zealand Wool Services International Limited. The company, based in Christchurch, is a wholly-owned subsidiary of the New Zealand Wool Board. It was set up in 1992 because of concerns about European dominance among exporters.

Domestic Processing

In addition to wool fibre, New Zealand exports a variety of intermediate and final wool products. For example, for 1992-93 about 30% of carpet yarn production and a quarter of carpet production were exported.¹³ As shown in Table 2, the total value of wool sector exports in 1992-93 was \$NZ1.145 million (US\$637.8 million) FOB or 6% of total merchandise exports.¹⁴

Table 2. Value of Wool Sector Exports. (\$NZ million FOB).

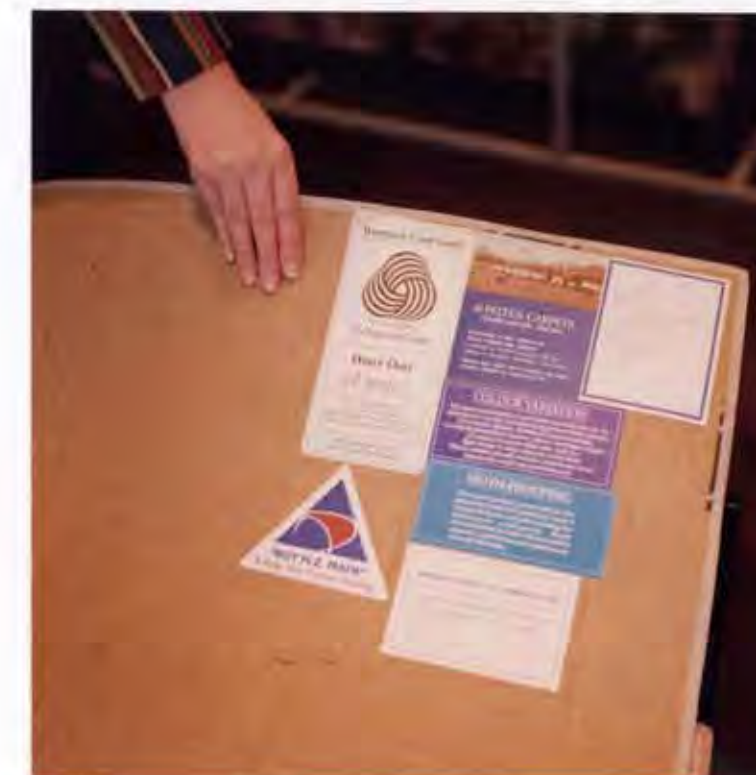
| | |
|--|--------------|
| Wool fibre | 900 |
| Final products (carpets and rugs, apparel, etc) | 91 |
| Intermediate products (carpet and other yarn, sliver, etc) | 85 |
| Sheepskins | 67 |
| Total | 1,145 |

Source: NZWB Statistical Handbook 1992-93 season, page 77.

Of course wool carpets, upholstery, jerseys and sheepskins are also consumed by the domestic market -- and by tourists visiting from overseas.



Summit Wool Spinners in Oamaru, 115 km north of Dunedin, produces carpet yarn. It expected to process about 3 million kg (6.6 million lb) or 23,000 bales of wool in 1993¹⁵. The Japanese conglomerate Sumitomo has a controlling interest in the company.



The back of a carpet sample. Feltex Carpets is the largest carpet manufacturer in New Zealand. According to the company profile, Feltex "specializes in the production of pure wool and woolblend carpet made from New Zealand wools." Feltex is a unit of the British firm BTR.



Circular machine for knitting jerseys at Tamahine Knitting Co. Limited off Kaikorai Valley Road in Dunedin. The company also has computerized long-bed machines. CAD will soon allow Tamahine to scan photos and produce patterns with up to 27 colors.



Woman at work at Tamahine Knitting. The company uses a piecework payment system. As part of its quality control, any faults discovered along the line must be corrected by the previous person to work on the item.



The Mackenzie Country label. Tamahine is one of two suppliers of Mackenzie Country wear.



Lambskins for sale in an Auckland shop. Tasman is based in Mosgiel, a rapidly growing area not far from Dunedin.

The New Zealand Wool Board

"To increase demand for New Zealand wool and the efficiency and effectiveness of the industry to maximise the long-term returns to New Zealand woolgrowers."

The Board obtains most of its revenue from growers through a 6% levy imposed on wool sales. Its activities focus on promotion, research and development. An example is the Board's "Let's Get Real" advertising campaign. The Board has a field staff which teaches courses in shearing, woolhandling and wool classing and organizes various field days and seminars. Wool Board personnel are present at auctions, where they appraise lots and keep track of the types of wool being offered, the prices obtained, and the percent of lots passed.

One of the ways in which the Board sought to fulfill its mandate was through minimum price and market support schemes, abandoned in February 1991. The Board essentially guaranteed growers a minimum price and made up the difference or bought wool outright if the price was not met.

Table 3. Producer Board Stockpiles in Australia and New Zealand. (thousand tonnes clean at beginning of season)

| | 87-88 | 88-89 | 89-90 | 90-91 | 91-92 | 92-93 | 93-94 |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| AWRC stockpile | 38 | 1 | 22 | 354 | 532 | 470 | n/a |
| NZWB stockpile | 4 | 13 | 12 | 61 | 72 | 53 | 46 |

Source: NZWB Statistical Handbook 1992-93 season, page 9.¹⁶

As shown in Table 3, use of such schemes in Australia and New Zealand led to the accumulation of huge stockpiles. The NZ Wool Board stockpile amounted to 655,000 bales at its peak in February 1991, although by the middle of 1993 it had been reduced to 342,700 bales (46,000 tonnes/50,600 tons).¹⁷ The existence of large stockpiles naturally had adverse effect on the price paid for wool. Nonetheless, the Board holds the view that the program itself was not a mistake, but it ran into problems when the line between income stabilization and income subsidization was crossed.

A large portion of the Board's expenditures have been going to the International Wool Secretariat, an Brussels-based organization that works on international marketing of wool. IWS owns and licenses the famous Woolmark symbol. In recent years as much as 80% of the IWS budget went to apparel. Given New Zealand's focus on textiles, an agreement was reached for the Board to take over control of the interior textiles division of the IWS in mid-1994.



A beautiful carpet graces the entrance of the New Zealand Wool Board's offices at Wool House on 10 Brandon Street in Wellington.



NZ Wool Board Wool Store on Portsmouth Drive in Dunedin.



The Wool Board's "Let's Get Real" advertising campaign, begun in 1993, stresses wool's naturalness and its warmth, comfort and performance.

Research

The Wool Research Organization of New Zealand (WRONZ) seeks to develop new products, processes and technologies in order to "create new international demand for New Zealand wool and to increase the value added on-shore."¹⁸ WRONZ receives major support from the Wool Board and additional support from the government (through the Foundation for Research Science and Technology) and from industry. About 130 scientists, technicians and administrators work at the WRONZ facilities at Lincoln, near Christchurch.

The WRONZ complex houses laboratories for doing basic science and machinery used in all stages of wool processing from carding weaving. Thus WRONZ has an electron microscope for looking at staple structure, and also it has its own scour, used, for example, in work on cleaning up effluent. Scientists on their way to their offices may tread on carpet squares being used in a floor trial or walk past a laboratory where a device is pulling the backing off a piece of carpet.

WRONZ often works closely with industrial partners to test new machinery and develop new products. For example, working with Feltex, WRONZ developed Pebblemill™, a carpet with an interesting pebble-like texture. A spinning technology developed by WRONZ is now being used to produce strong, lightweight upholstery fabrics suitable for use in airline and ferry passenger seats.

Ideas to improve efficiency spring up at all points of the industry. For example, the manager at Dunedin Wool Dumpers has been toying

with the idea of electronically tracking wool from the farm to the processor. Ink used to brand bales can sometimes become illegible, and with 3-bales one cannot tell the origin of the bale in the middle. If this idea were to prove practical, bales could be tracked by inserting in them a device such as a black plastic disk, about 2 cm in diameter, or a tiny pellet less than 1 cm long. WRONZ is a logical partner to test and develop ideas from throughout the industry.

WRONZ also has a subsidiary which conducts a full range of tests on wool fibre, yarn, fabric and carpet samples. For example, there are about twenty different carpet tests ranging from pile thickness to static generation.



Entry to the WRONZ facilities at Lincoln.



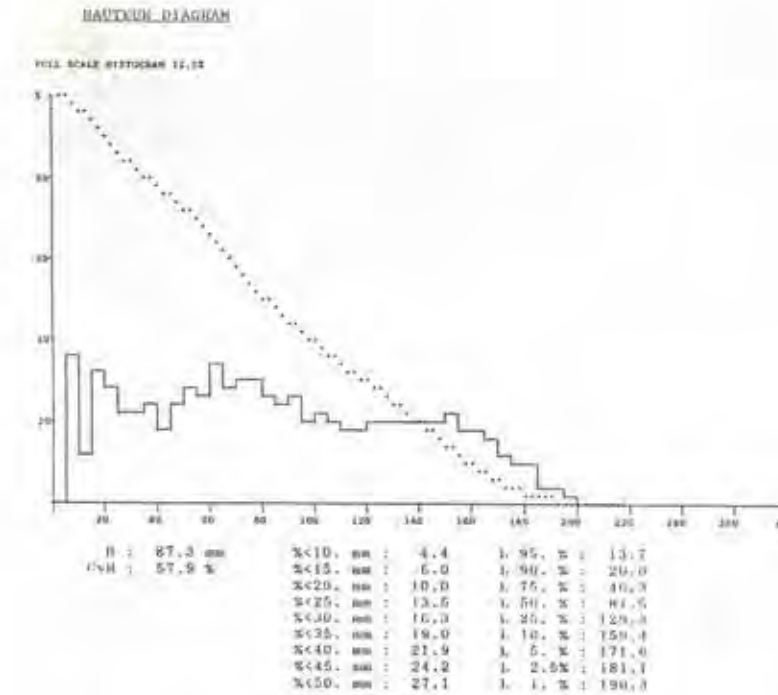
A small machine for making tufted carpets.



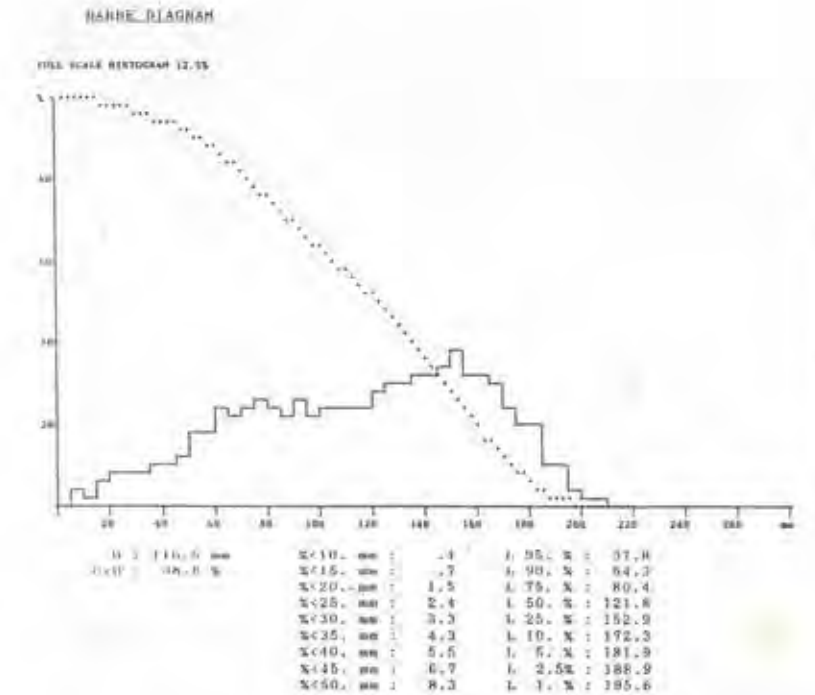
Bales containing wool samples used to calibrate various equipment.



A technician displays wool nonwoven wrappings being tested as replacements for the traditional polyethylene and polypropylene coverings. If a piece of poly gets in with the wool, brown flecks can end up throughout a carpet or piece of fabric and it is very expensive to pick them out; wool would eliminate this problem. The wool wrappings are also recyclable.



Two of many tests done by WRONZ Developments Ltd., the WRONZ commercial subsidiary, are fibre length tests. Hauteur is the percent of fibres of a certain length by number.



Barbe is the percent of fibres of a certain length by weight.

The future

The price paid for New Zealand wool in the early 1990s stood at less than half of what it was in the late 1970s. By early 1994, prices seemed to be firming and people in the industry expressed hopes that the market was moving up from the bottom of a cycle.

Two big factors affecting the market are whether wool can maintain its qualitative edge against synthetics and whether some of the new uses for New Zealand wool will achieve significant volumes.

A significant change in marketing will likely occur in the next few years as a result of the Wool Board's takeover of the IWS's internal textiles division. This may lead to the creation of a brand identity for New Zealand wool similar to the red and green Enza label used in marketing New Zealand apples. A distinct New Zealand brand could appeal to environmentally conscious consumers overseas.

In terms of the mechanics of the industry, there will increasingly be direct contact between buyer and grower instead of "everyone punching the ticket along the way." For example, Summit Wool Spinners buys 70% of its wool directly from farmers.¹⁹ Also smoothing the path to the processor could be the growth of an electronic trading system. One such system, The New Zealand Wool Exchange, Ltd, began operations on a very small scale in 1993. Ultimately one auction center could replace the eight centers where sales are now held.

The industry will no doubt change in other, unforeseen ways, but in the end, it all starts...



Appendix: Testing

Greasy Wool

Yield is the weight of clean wool with grease, impurities and moisture removed expressed as a percentage of the raw wool weight. For the 1992-93 season, the greasy to clean yield for NZ wool averaged 75.5%²⁰. (Complicating matters, there are a number of different yield measurements to meet the needs of different end-users. The most significant of these, the Schlumberger dry yield (SD) is used at auctions. The clean price is calculated by dividing the greasy price, which is the price offered, by the SD).

Fibre fineness, measured in microns, is determined by an airflow test. Merino wool ranges in diameter from 17-20 microns while crossbred wools generally fall in the 30-40 micron range. The difference is such that an untrained person can quickly learn to distinguish between a fine and a coarse wool sample.

Colour is important because "wool cannot be dyed to a shade paler than the colour of the fibre itself..."²¹ In the colour test, light shined on the wool sample reflects different colour bands, referred to as x, y and z. Wool with a y-z value of less than 2 is characterized a super white while wool with a y-z of 10 or more is deemed yellow.

Scoured Wool

By calculating regain it is possible to determine the "true weight" of a consignment of scoured wool. Regain is similar to moisture content, but the base is oven dry weight rather than sample weight.

$$\text{Moisture content} = \frac{\text{sample weight} - \text{oven dry weight}}{\text{sample weight}} \times 100$$

$$\text{Regain} = \frac{\text{sample weight} - \text{oven dry weight}}{\text{oven dry weight}} \times 100$$

The net weight on the initial invoice generally assumes that regain is 16%. However, the resulting invoice weight can be too high or too low because the dryer at the scourer may be running a bit hot or a bit cool. The figure must corrected so it is spot on.

Notes

1. sheep population of 50.3 million... New Zealand Wool Board. 1992/93 Annual Report, page 2. The 50.3 million figure represents a drop of 4% from the estimated sheep flock size of 52.6 million on July 1, 1992, the beginning of the 1992-93 season. In turn, the 1992 figure was 4.7% lower than the 55.2 million sheep at the beginning of the 1991-92 season. In the early 1980s sheep numbers peaked at around 70 million (New Zealand Wool Board Statistical Handbook: 1992-93 season, pages 13, 84).
2. total production of 193.0 thousand tonnes... New Zealand Wool Board Statistical Handbook: 1992-93 season, page 21.
3. lowest level in 30 years... *ibid*, page 7.
4. Romney and related breeds... *ibid*, page 13.
5. end-uses of New Zealand wool... *ibid*, page 15.
6. Merinos... *ibid*, page 13.
7. number of sheep farms and sheep in Otago... *ibid*, page 14.
8. Dunedin is the second largest auction center... *ibid*, page 37.
9. percent of wool sold as slipe and at auction... *ibid*, page 15.
10. Wrightson Limited. Prospectus (1993), page 44.
11. FOB value of wool fibre exports... Statistical Handbook, page 71.
12. Table 1 adapted from Statistical Handbook, page 75.
13. exports of carpet yarn and carpet... *ibid*, page 65.

14. value of wool sector exports and Table 2 adapted from page 77.
15. "Japanese company right behind Summit." Wool Report September 1993, page 11.
16. Table 3 adapted from Statistical Handbook, page 9.
17. size of stockpile... Statistical Handbook, page 16.
18. WRONZ. 1992-93 Annual Report, inside front cover.
19. "Japanese company right behind Summit." Wool Report September 1993, page 11.
20. yield... Statistical Handbook, page 37. Another useful resource on testing is a series of fact sheets put out by the NZWTA "Wool...The Quality Test."
21. colour... *ibid*, page 51.

Ed. note: I wrote this account following my trip to New Zealand in the latter part of 1993, and posted it in June 2023 with a few very minor edits. Over those three decades, the NZ wool industry and sheep farming continued to decline. The mid-1993 numbers were 50.3 million sheep and slightly under 3.5 million people; by 2022, NZ had 25.3 million sheep and about 5 million people.