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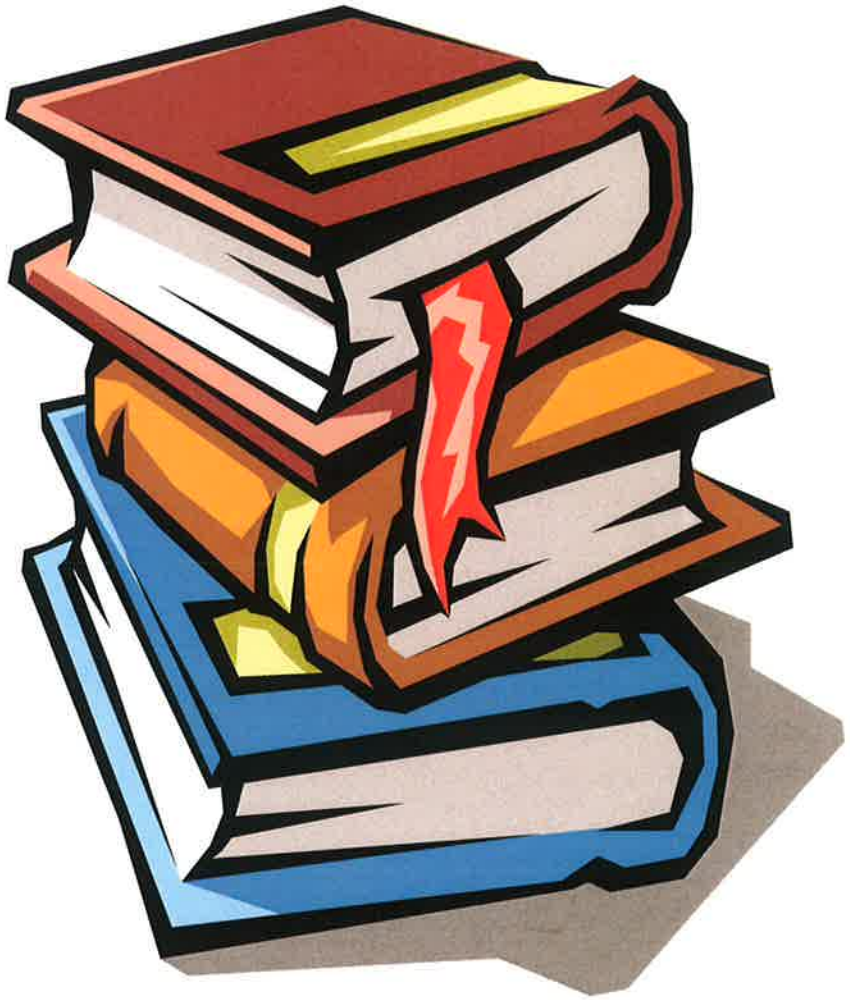
Wool Production

Readings



AgFact

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Clip preparation for crossbred wools

Good clip preparation involves removing faults that affect processing performance, and leaving even lines of wool for processing. Wool is removed because of the fault, not because it comes from a particular part of the sheep. In well-prepared lines, portions of fleeces or entire fleeces with faults are removed from fleece lines. This AgFACT assumes that the ***woolgrower's main aim is to maximise overall wool returns****, ahead of other aims, such as to top the sale with their main line.*

What is a fault?

Faults are the same for all types of crossbred wool, whether full wool, second shear or lambs wool. These include:

Short wool

Wool shorter than the main body wool can affect spinning performance, and hence the quality of the end product. "Short wool" is 50 mm (or more) shorter than the fleece for full wool; 25 mm (or more) shorter than the body wool for second shear and lambs wool.

Short wool is found around the crutch, legs and neck, and on the brisket. Another source is shearers' second cuts that fall on the shearing board and under the wool table. Flystrike on the body may be a cause of short wool.

Permanent discoloration

"Permanent discoloration" is any coloration in the wool not removed with scouring. Only the whitest wool will dye to fashionable light or pastel shades.

If in doubt, a sample of wool can be tested by washing with warm water and soap. Grease that may look yellow will wash out, but permanent colour will remain. Grease that is yellow is not a fault. Permanent yellowing usually occurs in wool around the brisket, legs, and on the belly, and occasionally with higher rainfall along the midline. Second shear, or lambs wool may have very little discoloration, whereas late-shorn full wool may be badly discoloured over the whole fleece. Remove only the wool that is obviously inferior to the main fleece. If there is no difference between the wool to be taken out and the remaining fleece, then leave it in.

Discoloration also includes black or other pigmented wool. Urine stain is also permanent. Remove urine stain from ram and wether bellies as well as from ewe crutchings.

Penstain

Penstain or faecal contamination can affect the performance of textile dyes. Heavily contaminated wool must be removed from the fleece. Avoid penstain by dagging at least 1 week before shearing, and let the sheep empty out on a bare area for at least 8 hours before penning up.

Dags

Remove dags carefully, as fragments can disperse in the wool during scouring and affect dyeing. Dag chip is a serious problem in lambs wool and oddments, including crutchings.

Vegetable matter

Vegetable matter (VM) comes in various forms, such as pieces of hay and straw, grass seeds, thistles, briar, gorse and matagouri twigs, clinging clumpy burrs like trefoil, and matted seeds like "bidi-bidi". Amounts of VM should be as low as possible because it is hard and expensive to remove during processing. If the VM is spread throughout the fleece, leave it – you cannot improve the wool. If the VM is in patches among good wool, remove the clumps. Keep VM-contaminated wool separate – do not mix with permanently yellowed wool.

Non-faults

Some woolgrowers and handlers insist on removal of wool from certain areas, or because it looks different, without thought that the apparent colour will wash out. This merely reduces the weight of wool in the valuable main line without increasing the price per kg. Typical "non-faults" include dust, dirt and grease, all of which will wash out, and "skirtings" automatically taken from the edge of the fleece. Unless a real fault is present, like short wool or unscourable yellow, leave the fleece margin alone.

What are the wool lines to make?

The following lines should be made from the shorn fleece and oddments wool.

Full wool

The belly is shorn first, so take out the short yellow brisket wool, and make a line of **bellies** and a line of **fribs**. When shearing rams or wethers, remove any **urine stain**.

Short wool from the crutch and legs (i.e., socks) falls clear with the pass of the shearer's handpiece. Remove this coarser wool as it comes off. Leaving the **socks** on the sheep will avoid the risk of contamination and downgrading the value of the fleece. Remove **dags** and **urine stain** and sweep the very short wool into the **locks** or **second pieces**. Short wool from second cuts falls on the board or through the slats of the wool table and this wool goes into the locks. Most woolhandlers remove the short **eye clips** and **topknots** or **wigs** as it is shorn and put them into a separate line.

Hold the fleece wool shorn from the back legs and gather the shorn fleece in your arms. Throw the fleece onto the wool table for inspection with the staple uppermost. Check for yellow discoloration. Take out short or yellow portions from the margins and put in the **first pieces**. If the back wool is heavily contaminated with VM, remove entire

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clumps or portions and make a line of **backs**. The neck wool may be shorter than the main fleece, be matted and may contain VM. If so, separate the **necks**. Some full wool clips will not have "necks".

Make a line of **brands** for raddle marks and ram crayon, and another for **penstain**. **Black wool** is a major processing fault that restricts end product options. This wool is downgraded and discounted. It occurs on the body in patches or as isolated fibres. It is easier to detect on the shearing board, so encourage the shearers to identify it. Be generous when removing black wool and include a good margin around it.

Second shear and lambs wool

Take out short, yellow brisket wool and make a line of **fribs**. The better-coloured belly wool goes into a **bellies and pieces** line (providing length and colour of pieces are similar).

Sort second shear and lambs wool as it comes off the sheep on the board. Take out any short wool, e.g., from the crutch and legs, and unscourable yellow areas. Both of these faults go into the **bellies and pieces** line.

If the **eyeclips** and **topknots** or **wigs** are distinct and shorter, they can be put into a separate line.

If **penstain**, **brands** or clumps of **VM** are not routinely present in the bellies and pieces, make separate lines for them. It is a mistake to throw all faults into the bellies and pieces line.

What about classing or grading?

In both full wool and second shear, only fleeces that are very different should be separated, especially if quantities of these other wools are large. Separate lines might include:

- very yellow fleeces.
- very short fleeces or wool from sheep with different shearing dates, e.g., wool from 2-tooths (i.e., 2-year-olds) last shorn in March, when mixed-age ewes are shorn once a year in November. Draft and shear these separately if possible.
- cotted fleeces or cotted portions of fleeces.
- tender wools with an obvious "break" along the staple.
- wool from distinctly different breeds, e.g., Lincoln among Romney fleeces.
- very fine or very coarse fleeces – this is necessary only when dealing with good lines of hogget fleece or very fine crossbreds.

These extra lines are most important for clips of good length and whiteness, but not necessary for clips of poor quality yellow wool. Remember the golden rules: If you are not improving the main line, don't do it. If you cannot see a difference then leave it intact. In most crossbred clips 90% of fleece wool should go into the main line.

How many woolhandlers?

To achieve the standards set out here, you should employ a minimum of one woolhandler for each 250 sheep shorn per day, plus the presser(s). This requirement is highly variable, depending on shed layout, woolhandlers' experience, wool type, and grower or buyer requirements. Staffing levels are especially important for good quality clips, but they may be reduced when shearing very inferior, yellow or extremely short wools.

Where can I get more help?

Your Wools of New Zealand production officer or wool broker's representative can help you set preparation standards for your clip.

For further information, contact:

Roland Sumner
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Private Bag 3123
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AgFact

agresearch

Clip preparation for fine wools: Merino and halfbred

Good clip preparation involves removing faults that affect processing performance, and creating even lines of wool for processing. Wool is removed because of the fault, not because it comes from a particular part of the sheep. In well-prepared lines, portions of fleeces or entire fleeces with faults are removed from fleece lines. This AgFACT assumes that the ***woolgrower's main aim is to maximise overall wool returns****, ahead of other aims, such as to top the sale with their main line.*

What is a fault?

Faults are the same for all types of fine wool, whether they are from hoggets, mixed-age ewes, wethers or rams. These include:

Short wool

Wool shorter than the main body wool can affect spinning performance, and hence the quality of the end product. "Short wool" is 15 mm or more shorter than the rest of the fleece.

Short wool is found around the crutch, legs and neck, and on the brisket. Such wool is often skirted-off as oddments, but care should also be taken to ensure that other areas within the fleece, e.g., backs, are of the same length as the rest of the fleece. Another source is shearers' second cuts that fall on the shearing board and under the wool table. Flystrike on the body may be a cause of short wool.

Permanent discoloration

"Permanent discoloration" is any coloration in the wool not removed with scouring. Only the whitest wool will dye to fashionable light or pastel shades.

If in doubt, a sample of wool can be tested by washing with warm water and soap. Grease that may look yellow will wash out, but permanent colour will remain. Grease that is yellow is not a fault. Permanent yellowing usually occurs in wool around the brisket, legs, and on the belly, and occasionally with higher rainfall along the midline. Second shear or lambs wool may have very little discoloration, whereas late-shorn full wool may be badly discoloured over the whole fleece. Remove only the wool that is obviously inferior to the main fleece. If there is no difference between the wool to be taken out and the remaining fleece, then leave it in.

Discoloration also includes black or other pigmented wool. Urine stain is also permanent. Remove urine stain from ram and wether bellies, as well as from ewe crutchings.

Penstain

Penstain or faecal contamination is hard to scour, and it can affect the performance of textile dyes. Heavily contaminated wool must be removed from the fleece. Avoid penstain by crutching at least 1 week before shearing, and let the sheep empty out on a bare area for at least 8 hours before penning up.

Dags

Remove dags carefully, as fragments can disperse in the wool during scouring and affect dyeing.

Vegetable matter (VM)

Vegetable matter (VM) comes in various forms, such as pieces of hay and straw, grass seeds, thistles, briar, gorse and matagouri twigs, clinging clumpy burrs like trefoil, and matted seeds like "bidi-bidi". Amounts of VM should be as low as possible because it is hard and expensive to remove during processing. If the VM is spread throughout the fleece, leave it – you cannot improve the wool. If the VM is in patches among good wool, remove the clumps. Keep VM-contaminated wool separate – do not mix with permanently yellowed wool.

Non-faults

Some woolgrowers and handlers insist on removal of wool from certain areas, or because it looks different, without thought that the apparent colour will wash out. This merely reduces the weight of wool in the valuable main line without increasing the price per kg. Typical "non-faults" include dust, dirt and grease, all of which will wash out, and "skirtings" automatically taken from the edge of the fleece. Unless a real fault is present, like short wool or unscourable yellow, leave the fleece margin alone.

What are the wool lines to make?

The following lines should be made from the shorn fleece and oddments wool.

The belly is shorn first, so take out the short yellow brisket wool, and make a line of **bellies** and a line of **fribs**. When shearing rams or wethers, remove any **urine stain**.

Short wool from the crutch and legs (i.e., socks) falls clear with the pass of the shearer's handpiece. Remove this coarser wool as it comes off. Leaving the **socks** on the sheep will avoid the risk of contamination and downgrading the value of the fleece. Remove **dags** and **urine stain** and sweep the very short wool into the **locks** or **second pieces**. Short wool from second cuts falls on the board or through the slats of the wool table

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and this wool goes into the locks. Most woolhandlers remove the short **eye clips** and **topknots** or **wigs** as it is shorn and put them into a separate line.

Hold the fleece wool shorn from the back legs and gather the shorn fleece in your arms. Throw the fleece onto the wool table for inspection with the staple uppermost. Check for yellow discoloration. Take out short or yellow portions from the margins and put in the **first pieces**. If the back wool is heavily contaminated with VM, remove entire clumps or portions and make a line of **backs**. The neck wool may be shorter than the main fleece, be matted and may contain VM. If so, separate the **necks**. However, some clips will have few backs or necks and these oddments can be put together as one line.

After the fleece has been skirted, it can be rolled up for presentation to the classer. While rolling it up, look for and remove any patches of contamination such as dermatitis, fleece-rot or pieces of skin that have been cut off by the handpiece.

Make a line of **brands** for raddle marks and ram crayon, and another for **penstain**. **Black wool** is a major processing fault that restricts end product options. This wool is downgraded and discounted. It occurs on the body in patches or as isolated fibres. It is easier to detect on the shearing board, so encourage the shearers to identify it. Be generous when removing black wool and include a good margin around it.

What about classing?

Classing is the procedure of separating fleeces for fineness, length and strength, colour and style. Its importance increases with fineness and the value of the wool. For clips over 22 microns (μm), aim for a clear distinction of 2 μm. For clips of 20 to 22 μm, a 1 μm difference between lines is enough. Clips finer than 20 μm may require a 0.5 μm difference. For clips with an average fibre diameter of less than 19 μm, it may be profitable to identify the finest sheep with the help of fleece-testing.

Experienced classers use handle and visible features such as crimp to assess fineness. Fine wools are softer and may have a more closely spaced crimp than coarser wools.

Fleeces that are very different should be kept separate, especially where quantities of these other wools are large. Separate lines might include:

- very yellow fleeces
- very short fleeces or wool from sheep with different shearing dates, e.g., wool from 2-tooths (2-year-olds) compared with wool from mixed-age ewes
- cotted fleeces, or cotted portions of fleeces
- tender wools with an obvious "break" along the staple
- wool from distinctly different breeds, e.g., Corriedale among Merino fleeces

These extra lines are most important for clips of good length and whiteness, but not as necessary for clips of poorer quality yellow wool. Remember the golden rules: If you are not improving the main line, don't do it. If you cannot see a difference then leave it intact.

Employ a good classer and work with them if you want to learn to class your own fine wool.

How many woolhandlers?

To achieve the standards set out here, you should employ a minimum of one woolhandler for each 200 sheep shorn per day, plus the presser(s). This requirement is higly variable, depending on shed layout, woolhandlers' experience, wool type, and grower or buyer requirements. Staffing levels are especially important for good quality clips, but they may be reduced when shearing very inferior, yellow or short wools.

Where can I get more help?

Your Wools of New Zealand or Merino New Zealand production officer or wool broker's representative can help you set preparation standards for your clip.

For further information, contact:

Tim Harrison
AgResearch
PO Box 60
Lincoln
Phone (03) 325 6900 Fax (03) 325 2946

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DURING SHEARING

The classer should set up and class to the minimum number of lines required to adequately present the clip for sale. The classer should supervise and monitor all aspects of woolhandling, pressing and recording of bales, ensuring that:

- *The shed equipment is arranged to give the best possible work flow.*
- *The agreed woolhandling procedures are followed consistently by the woolhandling team.*
- *The wool is classed consistently to standards appropriate for the particular clip, taking into account variations of mob and environmental effects.*
- *The presser records the bale number and its contents correctly in the bale book and the branding of bales is done accurately and clearly.*
- *Specifications are prepared to present to the grower.*

PRESSING

The classer is responsible for the overall presentation of the clip. This includes the packaging, branding and recording. Care and accuracy is essential.

The classer will work in close liaison with the presser to ensure as even a flow in his work as possible.

The classer should be conscious of the presser's difficulties, especially as classing can add a stop/go element to the pressing. This is especially so as cut-out approaches, and requires careful planning by the classer.

Presser's Responsibilities

- *To maintain a tidy work area and avoid contamination.*
- *To quickly master the safe and efficient operation of whatever type of press he encounters.*
- *To know and apply the requirements of the Code of Practice in respect to the baling of wool.*
- *To have the stamina to press to optimum weights, 180kg.*
- *To organise the pressing of oddments to avoid unnecessary mixed bin bales.*
- *To be aware of the need of careful individual fleece packing for bin and reclass fleece lines and of the need for paper divisions between layers in bin bales.*
- *To fill up the catching pens (pen up) when called upon.*

(For further information, refer to Wool Presser Handbook).

1. Preparation – General

The aim is to produce lines of wool that have a uniform colour, length, fault and fibre diameter (in the case of fine wools). To achieve this, processing faults should be kept separate.

Listed below are the processing faults that may be present and require separation:

- *Dags*
- *Urine stain*
- *Mixed length – particularly short*
- *Cotted portions*
- *Clumps of vegetable matter*
- *Mixed fibre diameter*
- *Non-scourable stains, particularly canary yellow*
- *Clumps of pen stain*
- *Patches of pigmented fibres*
- *Heavy contamination by mud, earth or other non-wool substances*
- *Skin pieces*
- *Rubbish*

Adequate labour is essential for effective woolhandling. The shedhand must:

- *Separate the permanently discoloured belly wool.*
- *Keep the board clear of short crutch wool and second cuts.*
- *Keep dags and stains separate.*
- *Separate locks and second cuts from the body wool, both on the board using a broom or scraper, and when the fleece is thrown.*
- *Shedhands must pick up and throw each fleece to ensure that it is evenly spread over the table, to allow for easy identification and separation of processing faults.*
- *Short wools are usually better handled on the board as the sheep are shorn.*

The level of fleece preparation required to remove processing faults will depend on the type of wool and extent of fault.

Part One: **RESPONSIBILITIES**

The Contractor's or Employer's Responsibilities

To arrange and provide:

- *The agreed number of competent shearers.*
- *The agreed number of woolhandlers, including at least one leading hand capable of taking responsibility and of assuming a training role.*
- *A presser (or pressers) capable of pressing to the required standards of the NZ Code of Practice for Wool Packaging and who will record bale details in the pressing book and pen up as required.*

To ensure:

- *That key wool woolhandling personnel do not change during the shearing and that a consistent standard of staff is maintained.*
- *Continued liaison with the grower.*

THE SPECIFICATIONS

If this role is not taken over by the grower, the classer will be responsible for preparing the specification form to cover each consignment of bales leaving the shed, ensuring that all the required information is neatly and accurately recorded.

Leading Shedhand's Responsibilities

The leading shedhand is subject to the direction of the grower or classer but may be asked by the grower to advise on the preparation required. Arrangements for control will vary from shed to shed, but the basic objectives of the leading shedhand should be:

- *To ensure that the shed equipment is arranged to give the best possible work flow.*
- *To see that the agreed woolhandling procedures are followed consistently by the woolhandling team.*
- *To ensure that the wool is graded consistently to a standard appropriate for the particular clip.*
- *To guide the presser and ensure that the bale number and its contents are entered correctly in the bale book.*
- *To ensure the branding of bales is done accurately and clearly.*

Q Stencil Holder's Responsibilities

Q Stencil holders are registered with the Classer Registration Advisory Committee and their work is monitored in the same way as that of registered classers.

Q Stencil holders have responsibilities to over-see the preparation of the clip when a classer is not considered necessary. Their basic objectives should be:

- *All the responsibilities noted under the section "Leading Shedhand's Responsibilities".*

Plus:

- *To consult with the grower before shearing and be familiar with the grower's clip preparation requirements.*
- *To use a check list on all clips under their control.*
- *To be familiar with and adhere to the standards set out in this Code of Practice.*

Classer's Responsibilities

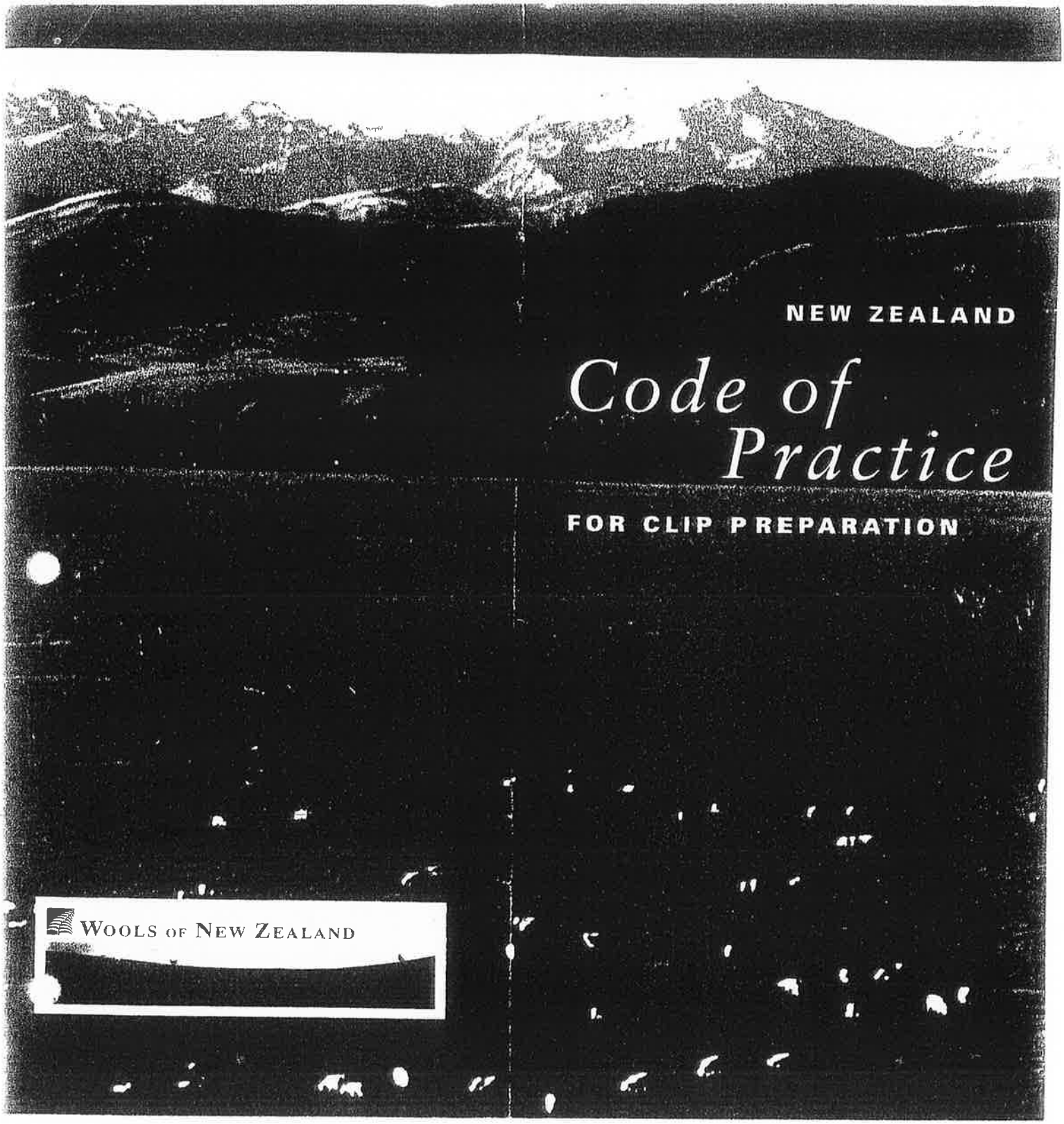
A classer has academic and practical qualifications in wool and is registered with the Classer Registration Advisory Committee. A classer has the responsibility for the management of the shed, ensuring the efficient and profitable woolhandling of the clip, especially in the classing of fine wools for fibre diameter, length and colour.

The classer's role is to have overall responsibility for all aspects of the preparation of the clip. The classer should endeavour to keep up to date with market requirements and be ready to prepare a clip accordingly.

BEFORE COMMENCEMENT

The classer should discuss the clip with the grower and consider all relevant details:

- *Last year's lines and measurement details.*
- *Last shearing date.*
- *The current market – any premiums or discounts.*
- *Number of sheep and mob composition.*
- *Possible differences between mobs.*



NEW ZEALAND

Code of Practice

FOR CLIP PREPARATION

WOOLS OF NEW ZEALAND

This Code of Practice for Clip Preparation has been prepared by a group drawn from the Classer Registration Advisory Committee of the New Zealand Wool Board. The following organisations are represented:

- *New Zealand Woolbrokers' Association*
- *New Zealand Council of Wool Exporters Inc.*
- *Federation of New Zealand Wool Merchants Inc.*
- *Massey University*
- *Lincoln University*
- *Wools of New Zealand*

The intention is to bring consensus to wool preparation activity and advice, with clear messages going to sheep farmers, contractors and shed staff. The Code of Practice clearly states the responsibilities of each group involved with preparing the farm clip. If the recommendations are followed, the New Zealand clip will be consistently handled to a standard that meets both the needs of the textile processor and at the same time, maximises the wool returns to the grower. All involved in the presentation and marketing of the clip will benefit.

The Code of Practice is divided into two sections:

Part One: RESPONSIBILITIES

Sets out what each party can expect of the other parties involved and what others can expect of them. The responsibility for activities is an integral part of a profitable woolhandling operation.

Part Two: PREPARATION

Sets out minimum preparation standards that need to be followed to ensure that clips meet the requirements of the customer. Unnecessary subdivision must be avoided because this will not enhance the clip and will increase costs.

OBJECTIVES

- *To provide both the buyer and manufacturer with parcels of wool they can handle confidently, knowing they are uniform and meet the standards required for processing into quality yarns and textiles.*
- *To maximise the net returns of the wool grower.*

To achieve these objectives, it is first necessary that all involved in the preparation of a clip know what is expected of them and what they can expect of others.

Grower's Responsibilities

To make clear arrangements with the shearing contractor or open shed shearers in respect to:

- *Woolhandling requirements and number of woolhandlers.*
- *Full details of the classes and number of sheep to be shorn.*

To ensure that the shed is prepared for shearing. This means providing:

- *A working area that is of sufficient size, clean and tidy.*
- *Good constant light over working areas.*
- *Adequate bins, fadge holders, containers for dags, urine stain, black wool and rubbish.*
- *Sufficient approved packs, clips, branding inks and stencils.*
- *Recording book.*

To present the sheep in good order for shearing. The sheep must be:

- Dry – *Damp or wet wool should not be shorn.*
- Dagged – *Sheep should be dagged at least seven days prior to shearing.*
- Empty – *Sheep should be yarded at least eight hours prior to shearing; longer may be required, depending on feed conditions.*
- Drafted – *Sheep should be drafted, to separate:*
  - *Breeds.*
  - *Ages: lambs, hoggets and mature sheep.*
  - *Wool lengths: sheep previously shorn at different times.*
  - *Sheep brought onto the property since the previous shearing.*
  - *Any other significant differences.*

To meet the leading shedhand or classer to discuss the woolhandling requirements.

To provide the classer or leading shedhand with full information at the commencement of shearing, including:

1. *Age and sex of each mob.*
2. *Size of each mob.*
3. *Variations between mobs, if any.*
4. *If available, a copy of the previous season's specifications.*

To ensure that all wool baled complies with the NZ Code of Practice for Wool Packaging in respect to:

- *New packs or approved recycled packs.*
- *Clipping and labelling.*
- *Approved branding inks and recommended stencils.*
- *Bale weights not exceeding 200kg.*

Part Two: PREPARATION

2. Full Length Fleeces

The following guidelines show what should be removed from each fleece, according to the colour of the clip.

GOOD COLOUR	AVERAGE COLOUR	POOR COLOUR
Remove: ▪ *Neck collars with VM* ▪ *Permanently discoloured pieces* ▪ *Bellies* ▪ *Backs with VM* ▪ *Pieces with VM* ▪ *Urine stain* ▪ *Shed stain* ▪ *Locks and second pieces* ▪ *Dags*	Remove: ▪ *Neck collars with VM* ▪ *Heavily discoloured pieces* ▪ *Bellies* ▪ *Clumps of VM* ▪ *Urine stain* ▪ *Shed stain* ▪ *Locks and second pieces* ▪ *Dags*	Remove: ▪ *Bellies* ▪ *Locks, second pieces* ▪ *Stains* ▪ *Dags*

GRADING FULL FLEECE CROSSBRED WOOL

These clips need not be divided into fineness brackets, but this will depend upon the age of the sheep, the micron range and price differentials. It is important that off-type fleeces be removed from the main line.

GOOD AND BETTER	AVERAGE	POOR
Take out off-type fleeces which obviously do not match the bulk, or are: ▪ *Cotted* ▪ *Yellow or discoloured* ▪ *33 microns and finer* ▪ *Very hairy* ▪ *Very strong and lustrous* ▪ *Obviously short or very long* ▪ *Heavy VM*	Take out off-type fleeces which obviously do not match the bulk, or are: ▪ *Cotted* ▪ *Very discoloured* ▪ *Very short or long fleeces* ▪ *Very heavy VM*	▪ *All cotts*

CLASSING FULL FLEECE FINE WOOLS

These will be classed for fineness – usually fine, medium and strong. Secondary lines of off-type fleeces will cater for those of very different length, colour or with significant faults.
The following descriptions should be used as applicable *but in most clips only two or three main lines will be required for fineness.*

MERINO		HALFBRED/CORRIEDALE	
Extra Fine	*18 microns & finer*	Extra Fine	*25 microns & finer*
Fine	*19-20 microns*	Fine	*26-27 microns*
Medium	*21-22 microns*	Medium	*28-29 microns*
Strong	*23-24 microns*	Strong	*30-31 microns*
		Extra Strong	*32 microns & coarser*

The following wools must be separated from the main fineness lines.

GOOD COLOUR	AVERAGE COLOUR	POOR COLOUR
Take out fleeces from the main lines which obviously do not match the bulk, or are: ▪ *Cotted* ▪ *Yellow or discoloured* ▪ *Obviously short or very long* ▪ *Containing VM* ▪ *Tender*	Take out fleeces which obviously do not match the bulk, or are: ▪ *Cotted* ▪ *Short or very long* ▪ *Very discoloured* ▪ *Very tender*	No grading required except for Merino clips which must be graded for fineness.

3. Lambs and Second Shear Wools

This caters for body wools which do not hold together and are best handled on the board, then taken to a stack on the wool room floor for blending and checking before pressing. Shorter and/or discoloured wool, urine stains and dags, should be removed from the main body wool as it comes off the sheep.
Lambs and second shear can generally be divided into two lines:

- *The body wool.*
- *The shorter and discoloured wools from the belly, legs and crutch and is known as the Bellies and Pieces.*

SORTING LAMBS AND SECOND SHEAR WOOLS

GOOD COLOUR	AVERAGE COLOUR	INFERIOR COLOUR
Remove: ▪ *Permanently discoloured wool* ▪ *Very short wool* ▪ *Pen stain* ▪ *Hairy britch in fine crossbred lambs* ▪ *Seed or vegetable matter* ▪ *Dags*	Remove: ▪ *Heavily discoloured wool* ▪ *Very short wool* ▪ *Pen stain* ▪ *Hairy britch in fine crossbred lambs* ▪ *Seed or vegetable matter* ▪ *Dags*	Remove: ▪ *Heavily discoloured wool* ▪ *Dags* ▪ *Urine stain* ▪ *Any other wool that does not match the bulk*

GRADING LAMBS AND SECOND SHEAR WOOLS

The principle factors involved in the grading of lambs and second shear are length and colour. Usually there is no need to sort second shear and lambs wool for fineness, as they are bulk handled.

However, it is very important when handling lambs to keep the different breed types, the very coarse, hairy or lustrous fleeces and the shorter milk lamb body wool separate.

4. Crutchings

Crutchings fall into two main types:

RING OR FLY CRUTCHINGS

This wool is normally short and sometimes urine stained. Urine stains and dags should be separated from the good coloured wool.

FULL CRUTCHINGS

This wool is removed from around the back legs, the crutch and around and over the tail and should be sorted for length, colour and dags.

It is important that urine, shed stain and dags be kept separate from the main line. Eyeclips should also be kept separate. If the whole belly is removed at crutching time, it is preferable to keep it separate from the crutchings.

Code of Practice for Clip Preparation

This Code of Practice for the preparation of New Zealand wool was compiled with the assistance of the following organisations, and has their endorsement:

- *New Zealand Woolbrokers' Association*
- *New Zealand Council of Wool Exporters Inc.*
- *Federation of New Zealand Wool Merchants Inc.*
- *Massey University*
- *Lincoln University*
- *Wools of New Zealand*

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WOOL — THE NATURAL FIBRE

Wool is an extremely complex protein, evolved by Nature over millions of years for the protection of sheep throughout the world in a great variety of climates and conditions.

The qualities that make wool so useful are genetically built into every fibre on the sheep.

Wool fibre is so resilient and elastic that it can be bent 30,000 times without danger of breaking or damage. Every wool fibre has a natural elasticity and wave or crimp that allows it to be stretched as much as one-third and then spring back into place. Its complex mollecular structure also enables it to absorb moisture but yet repel liquid.

It is not surprising then that no man-made fibre has ever been able to copy everything in Nature's original design of wool.

Wool 'breathes'

In cross-section, each wool fibre consists of a two-part outer layer and an absorbent core. It is this outer layer that regulates wool's dual ability to repel liquid yet absorb moisture.

If you could look at a single wool fibre under a microscope you would see that it has a thin porous sheath covering overlapping scales that act like tiny roof tiles.

These 'scales' cause liquid to bead and roll off the surface of the wool fabric, repelling moderate rain and spills. But wool also absorbs moisture vapour (such as air humidity or perspiration) through the porous coating over the 'scales'.

Through this unique arrangement, wool can absorb up to 30 percent of its own weight in moisture — without feeling clammy. Damp wool fabric remains absorbent and comfortable inside because its outer surface releases this moisture through evaporation.

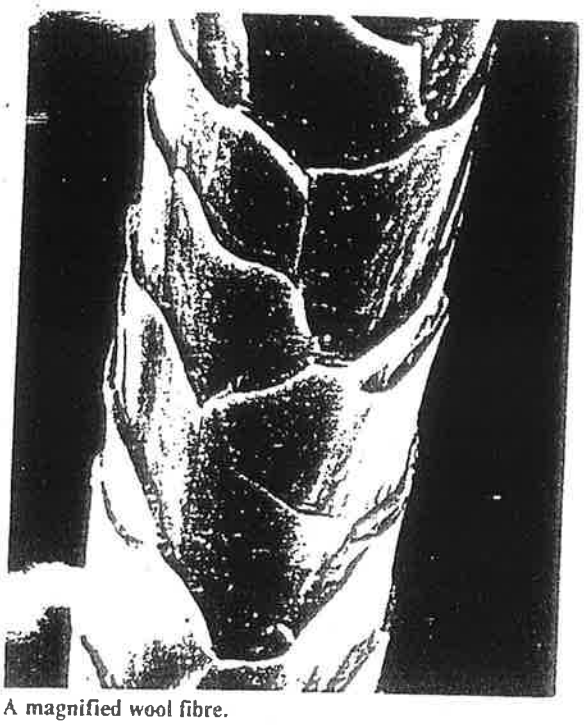
Although shorn wool is no longer 'alive' and growing, it does retain the unique lifelike action of its thirsty centre cells always striving to stay in balance with the surrounding moisture conditions. This is why wool is said to 'breathe' as it absorbs and evaporates moisture.

Bundles of fibres

If you marked off an area one centimetre square on the back of a Romney sheep and counted the wool fibres on it, you would find about 5,600. On a Merino sheep, which has fine wool, you would find about 24,000 fibres per square centimetre. In total, a sheep's fleece contains between 10 and 50 million fibres depending on the breed.

These fibres grow in tufts called 'staples'. A staple is a bundle of some thousands of fibres, each bundle separate from its neighbour.

The shape and size of the staple varies between sheep. In Merinos it is blunt ended, while coarser-wool sheep have a tapering staple. Within an individual fleece there is also a considerable variation amongst staples.



A magnified wool fibre.

All these staples are kinked from end to end in a regular wave pattern, commonly referred to as "crimp". Generally speaking, the finer the wool, the smaller and tighter the crimp. Because of this crimp, the true fibre length within a staple is greater than the actual staple length.

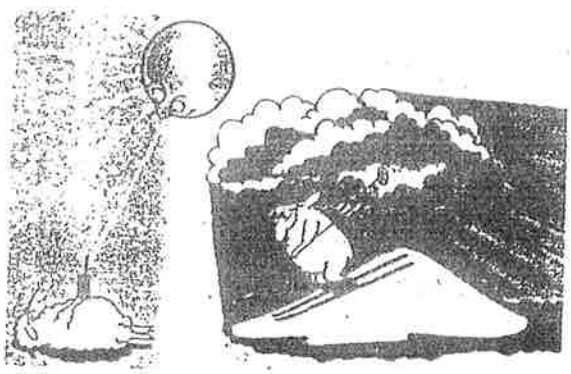
Insulation

In a wool garment, the crimp in the fibres makes them stand apart from each other, As a result little pockets of still air are trapped between the fibres. This lining of air trapped inside the fabric acts as an insulator — still air is one of the best insulators found in Nature.

Resilient

The wool fibre is very tough. It is resistant to abrasion and can be bent and twisted many times without damage, making it an ideal choice for heavy duty needs such as carpets in hotels and banks.

Inside every fibre is an inner core of long spindle shaped cells which are responsible for making the wool stretchy and strong. A wool fibre when dry can be extended by about 30 percent, and when wet will stretch by between 60 and 70 percent.



Wool acts as an air conditioner.

FIBRE PROPERTIES.

Whereas strong woolled sheep from many other parts of the world have mixed fleeces that are a combination of short, fine, crimpy wool and coarser, medullated fibres, New Zealand breeds have been developed in which fibre diameter and length are comparatively uniform throughout the whole fleece. For example, many New Zealand wools exhibit low coefficients of variation of diameter (35-45%), compared to measurements on wools of other origins (up to 50-80%).

Diameter

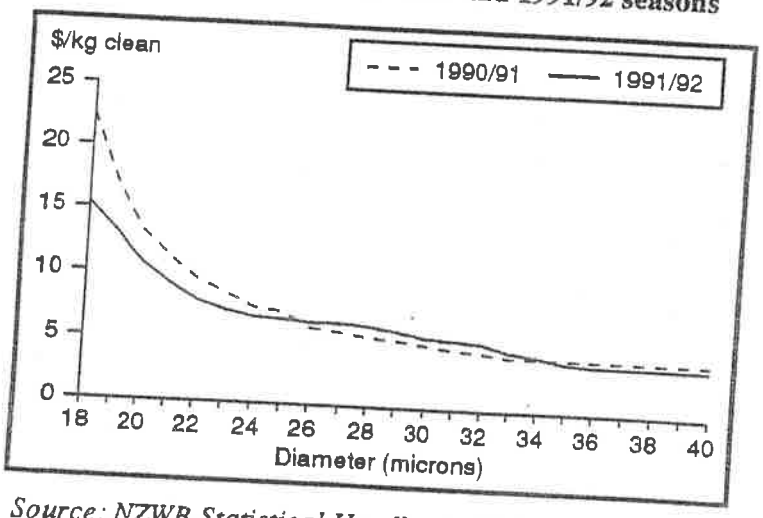
Fibre diameter is the main determinant of spinning limit and consequently spinning efficiency. While a degree of flexibility exists for coarse count yarns, finer counts require careful diameter selection to ensure correct spinning performance. Thus, in woollen processing the range of fibre diameters in a blend can be quite wide, while for the worsted system the range is usually much narrower. In addition, because finer fibres are usually a little bulkier and more flexible, processing yields and speeds will generally increase as the average diameter of a blend becomes finer.

Because of its importance to spinning performance, fibre diameter will have a major influence on yarn regularity and processing performance. Irregularity in yarn thickness not only causes blemishes and stripes in woven and knitted fabrics, it also affects yarn strength. The thinnest or weakest points in a yarn will establish its breaking load and extensibility, and therefore its ability to withstand the tensions placed on it during weaving, knitting or tufting.

For all end uses the selection of fibre diameter has a major effect on achieving the appropriate handle in the end product. Thus, finer count yarns spun from finer diameter fibres are used for apparel because they feel soft and smooth, whereas heavier yarns made from stronger fibres are selected for carpets because of their crisp handle and stiffer construction. While fine wools will produce high quality, light weight fabrics, other properties, such as fabric drape and crease resistance, may be improved by the introduction of stronger fibres into the blend (eg, tropical worsted fabrics.

Fibre diameter also influences dyeing performance. Because fine fibres have a higher surface area to weight ratio than stronger fibres, when dyed, they give a much deeper yield shade in

Figure 3.2 Price relativities based on variation in fibre diameter for the 1990/91 and 1991/92 seasons



Source: NZWB Statistical Handbook 1991/92 Season

both yarn and product form. Careful manipulation of fibre diameter in a blend can be used to achieve special effects, such as tweeds.

Therefore, because of its importance to processing, fibre diameter is a major determinant of the price of wool traded on the world market. However, as figure 3.2 shows, while in New Zealand there is a premium for fineness, it drops rapidly so that traditionally, wools stronger than 26 microns (which account for about 90% of total production) do not differ greatly in price.

This pattern has altered noticeably since 1988/89, with market interest from end users other than the carpet industry heightening the demand in some seasons for medium crossbred wools up to about 32-33 microns.

Because of the wide range of breeds farmed, New Zealand can supply wools ranging in diameter from 17 microns and finer for Merinos, to over 40 microns for very strong Drysdale carpet wool. The majority of production, however, falls within the 31-39 micron range.

Within a fleece, the individual fibres will vary in diameter depending on whether they have been produced by the primary (strongest) or secondary (finest) follicles. Similarly, because of the seasonal growth pattern, the fibres may also vary along their length by as much as 10-15 microns. However, this natural fibre diameter variation does not normally affect processing or product performance. What is important, is that uniformity of the mean fibre diameter, which takes these variations into account, is maintained.

Length and Strength

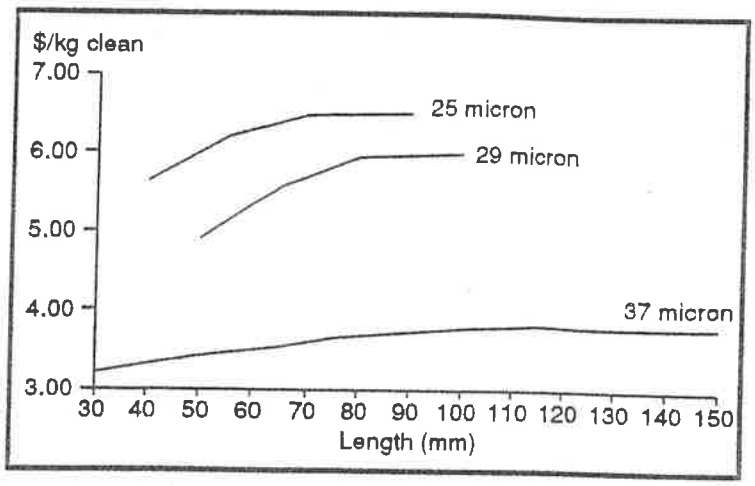
Fibre length largely determines the processing system on which the wool will be spun, and consequently the properties of the yarn (see section 7.2). This is because it affects the frequency of ends down (or breakages) during spinning and, as a consequence, influences yarn yields and maximum spinning speeds. As with fibre diameter, length also has an important effect on yarn regularity, strength and extensibility, which in turn influence subsequent manufacturing efficiencies and product qualities and performance.

Because of the amount of drafting required and the fibre control mechanisms used to produce fine, even yarns, worsted and semi-worsted processing systems require longer wools, whereas the woollen system, with its limited drafting requirements, can accommodate shorter fibres.

In domesticated sheep wool grows continuously, and left to its own devices it will attain a length several times its annual growth. A crossbred sheep would normally grow about 125 to 150 mm of wool a year, although ideal climatic and pasture conditions will result in better wool growth. With shearing taking place at different times of the year and at varying points in the growing cycle, New Zealand wools are available in a range of staple lengths between 25 and 175 mm throughout the season. However, as each sheep produces a fairly even growth over the whole body, each lot of wool will be relatively uniform for length.

Fibre length has a fairly consistent and predictable influence on price, which reduces as length decreases, being most marked for fine and medium halfbred and crossbred wools (fig. 3.3).

Figure 3.3 Price relativities based on variation in fibre length for the 1991/92 season



Source: NZWB Statistical Handbook 1991/92 Season

In terms of strength, wool is subjectively described as being either sound (strong) or tender (weak). Tenderness is caused by a reduction in fibre diameter at some point along the staple as a result of the seasonal growth pattern of wool (fig. 3.1) or physiological stress arising because of extreme environmental conditions, pregnancy or disease. Any unsoundness in the staple will be located within a short, well defined region: very seldom is New Zealand wool tender over its entire length. Farmers are able to time their shearing so as to locate the tender point (or break) as near to the staple ends as possible (see section 1.3.1).

During its initial processing most wool will be subjected to a carding procedure, which can significantly reduce fibre length depending on:

- the initial fibre length (longer fibres generally being more prone to breaking),
- staple and fibre strength,
- the position of any tender region in the staple (the nearer it is to the tip or the base, the less the reduction in mean fibre length in the carded sliver),
- the degree of entanglement of the staples as they are presented to the card, and
- the condition of the card and the vigour of the carding process itself.

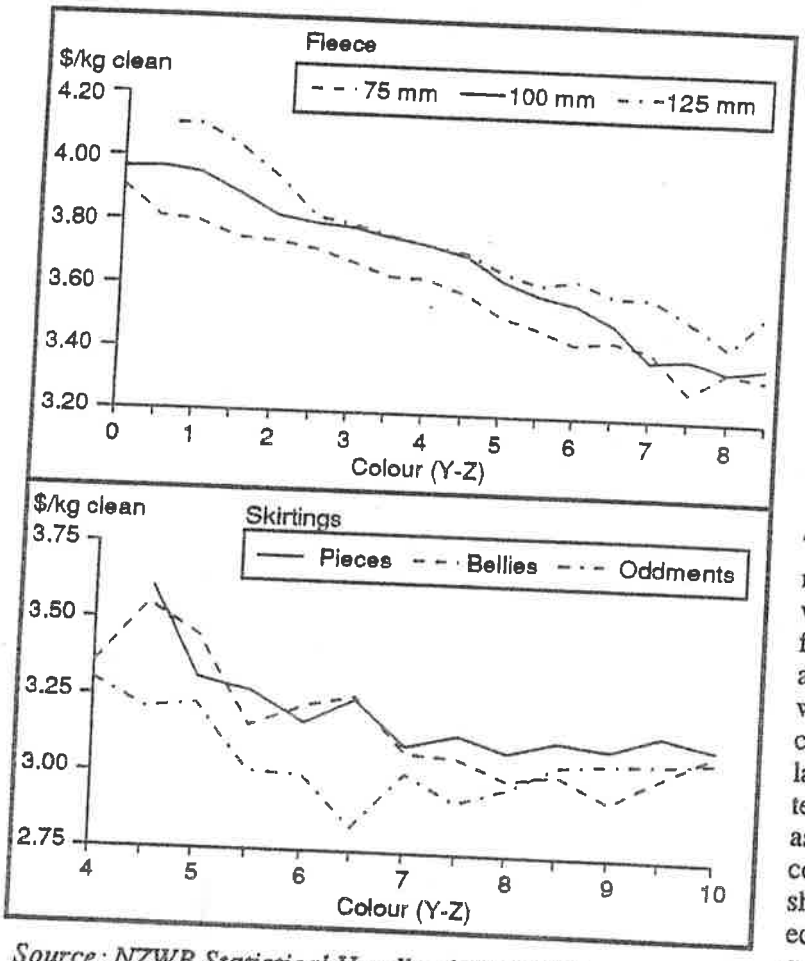
While the effects of differences in length can vary according to the spinning system used, increased fibre length after carding generally results in improved spinning performance, increased yarn strength, improved efficiencies in subsequent processing, improved product performance and a smoother appearance and handle. Excessive short fibre content can also contribute to fabric faults, such as pilling, or shedding in carpets.

Colour

Good wool colour is extremely important for yarn or fabrics which are to be dyed in pale pastel shades. As dyeing is an additive process, it is not possible, without using temporary optical bleaching effects, to produce a shade that is lighter than the original substrate colour. Additionally, as the natural yellow component of wool is not light stable, pale colours dyed on yellow wools may fade quickly, because the strength of the yellow component has been lessened. Poor wool colour may also be an indicator of the presence of other processing faults, such as tender regions.

New Zealand wools are well known for their uniformly good colour, with the majority of production also being free of black and pigmented fibre. Because of the wide range of wool types produced, a proportion of the clip, however, shows some degree of discolouration. This is reflected in prices (fig. 3.4). However, in terms of price relativities colour is not as important

Figure 3.4 Price relativities based on variation in fibre colour for the 1991/92 season



Source: NZWB Statistical Handbook 1991/92 Season

for New Zealand wool as it is for wool from many other trading nations, because the range of colour is significantly lower, being concentrated in the good to average range.

Colour in wool varies in terms of both yellowness and brightness (see section 4.2.4), which in turn are influenced by breed, as well as climatic and bacterial effects on the wool itself. In general terms, finer wools (Merino, halfbred and Corriedale) are brighter and whiter than stronger crossbred wools.

There are several types of, and reasons for, discolouration in wool. The most general is diffuse yellowness which is most apparent in late shorn crossbred wools grown in warm, moist conditions. Although it is largely scourable, its presence tends to obscure the subjective assessment of the clean wool colour. Where longer woolled sheep are subjected to prolonged periods of warm, moist conditions after their fleece has become thoroughly wetted, an unscourable yellowness, called canary stain, may develop. This condition, which can appear as either discrete bands in the fleece or in extreme cases spread throughout the fleece, is particularly prevalent under cotts.

Prolonged periods of wetness may also promote fleece rot, which appears as confined bands of brittle discolouration in the fleece. This condition is generally confined to the wool on the back of the sheep and is more prevalent among fine woolled breeds, where the tight staple formation prevents adequate ventilation and drying. Providing the fleece is opened sufficiently before scouring, both the discolouration and the brittle material within it will be removed. Hence, the term fleece rot is misleading, since the fibre itself is not damaged.

Some forms of discolouration are caused by bacterial action within the fleece. As with yellowing, most scour out, although others are permanent, while rare cases may also damage the fibre.

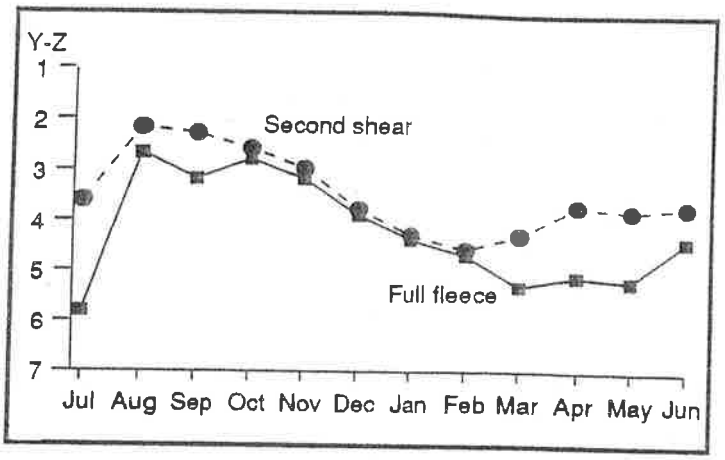
Yellowing of the fleece can be minimised by shearing in late winter/early spring, before the moist warm conditions which cause it develop (fig. 3.5). Where this is not practicable, research has shown that susceptibility to yellowing can be detected by testing and since it is inherited, breeding programmes can be adopted accordingly.

Wool colour can also be affected by natural staining. Although faecal stains are usually scourable, unscourable breakdown products of pigments in grass may affect the colour-fastness of

some dyes to strong sunlight. Urine stains are unscourable and wool also tends to be permanently discoloured if it becomes very muddy.

Greasy wool will also eventually discolour in storage, the yellower the original colour, the sooner and more marked will be the change.

Figure 3.5 Average colour measurements of full fleece and second shear crossbred wool



Source: NZWB Statistical Handbook 1991/92 Season

3.2.4 Medullation

In addition to the cuticle and cortex, some stronger wool fibres contain a third major component, the medulla. This is an inner core formed from a network of porous, air-filled cells. In fibres less than 35 microns, the medulla is usually absent or extremely fragmented, while in very strong fibres the cell walls may collapse completely to give a hollow tube. Whereas the former is not obvious to the eye, heavy medullation increases the reflection of light, giving the fibre a chalky, opaque appearance. However, unless the medulla forms a large percentage of the fibre cross-section, the processing properties of the fibre will not be greatly affected.

While most medullated fibres follow the same growth pattern as normal fibres, some only grow for a short period before being shed into the fleece in the form of kemps. These short, coarse, ribbon-like fibres are usually brittle and of low strength and extensibility. Kemps, which lie loose in the fleece, are easily distinguished from longer, coarse medullated fibres, which are not normally shed. Because kemp production is a strongly inherited characteristic, it can be controlled by careful selection of breeding stock.

Medullation levels vary according to breed, being virtually non-existent in Merino wool and generally increasing as fibre diameter becomes stronger. However, lambswool and Perendale wools contain slightly higher percentages of medullation than their diameter would suggest, while Lincoln and Leicester wools contain only a small proportion. The proportion of medullation also varies between different parts of an individual fleece, with crutchings and eyeclips being more heavily medullated than the main fleece. In Drysdale wool, which has been specially bred for its higher than normal medullation content, the percentage of fibre diameter occupied by medulla increases with increased fibre diameter.

While high levels of medullation increase the bulk of a yarn, they generally also reduce the processing yield and spinning efficiency of a blend. Because the coarseness and stiffness of these wools produce yarn with a harsh handle and hairy rough appearance, medullation is generally undesirable in wools for apparel use. Conversely, because the rigidity of medullated wools imparts a crispness which is considered desirable in some styles of carpet, many carpet yarn manufacturers often specify a percentage blend composition by breed (eg, Drysdale) or category (eg, crutchings). The stiffness of medullated fibres imparts enhanced resilience to wool carpets by increasing the force required to compress the pile and also assisting the recovery of the pile after compression. However, excessive levels will reduce abrasion resistance.

When dyed, medullated fibres appear lighter coloured than other fibres, because there is less cortex to take up the dye and the interior surfaces increase the amount of light reflected. They can, therefore, be used to create special effects in products such as tweeds and Shetland styles.

Apart from the speciality types, such as Drysdale and crutchings, the majority of the New Zealand clip is not highly medullated, unlike many other strong wools.

3.2.5 Bulk

Bulk is an indicator of a wool's ability to resist compression or more simply, its springiness. It defines a wool's space filling ability, and is therefore measured as the volume occupied by a given weight of clean, scoured wool at constant pressure, expressed in cubic centimetres per gram (cm^3/g).

Research has shown that wool bulk is closely correlated with the bulk of the yarn made from it. In spinning, the process of applying twist can reduce the bulk of the yarn by as much as 60-70%. High bulk wools, being naturally more resilient, are better able to resist the compaction which occurs during the twisting process, and thus at low twist levels will produce a bulkier yarn. In turn, bulky yarns give improved fullness or cover for fabrics and carpets made from them. A 10-15% increase in yarn bulk is sufficient to produce a discernible difference in the appearance of a carpet, because of the increased apparent pile density. Similar results have been found in knitted fabric, giving increased resistance to air permeability, providing greater insulation and warmth, without increasing the weight. High bulk wools also provide greater resistance to abrasion and enhanced appearance retention properties.

The more pronounced crimp structure of high bulk wools traps more air which enhances wool's natural insulating properties, making them ideal for use in wool-filled bedding. Their suitability for this end use is also enhanced by the fact that they are more able to resist felting and fibre migration, and therefore retain their original loft and comfort for longer.

Table 3.1 Bulk values for New Zealand wool

Wool type	Breed	Bulk (cm^3/g)
Lustre	Leicester/Lincoln	16-19 (low)
Strong-medium crossbred	Romney/Coopworth	19-24
Medullated	Drysdale	21-25
Medium wool	Corriedale/halfbred	20-28
Medium-fine crossbred	Perendale	22-32
Fine wool	Merino	23-32
Crimpy	Downs/Cheviot	30-36 (high)

Bulk varies considerably among breeds (table 3.1), and is closely related to the shape and frequency of fibre crimp. Wool crimp can be described as either planar (flat), such as Leicester wool, or helical (spiral), such as Down wool. High bulk levels are generally associated with helical crimp which gives the fibre a three-dimensional character. This means that it will take up more space than the uniplanar crimped fibres, and also contain more spaces in which to trap air, adding to its insulation properties.

The corkscrew nature of the helical crimped fibre gives it the ability to withstand pressure more readily and it also means that it will spring back once the pressure has been released. These enhanced compression resistance and resilience characteristics are particularly important in wool-filled bedding, knitwear and carpets.

Bulk is also a function of crimp frequency, which generally becomes more pronounced as diameter decreases. The nature and frequency of fibre crimp in high bulk wools also makes them more cohesive, so that they give higher carding yields and better fibre control in drafting and spinning.

Crossbred wools are predominantly low bulk wools, but they can now be artificially crimped to improve their resilience, particularly for use in wool-filled products (see section 8.2.2).

Lustre

High lustre wools are associated with strong fibre diameter and because they exhibit very little crimp, very low bulk levels (eg, Lincoln, English Leicester, Border Leicester and Coopworth). Lustre wools reflect higher than normal levels of light, and therefore appear shiny. This is the result of the outer scales on the wool fibre being larger, flatter and smoother than non-lustrous wools, and the scale edges are also lower. This also means that during processing, inter-fibre friction is low, and slivers may lack cohesion.

New Zealand can supply lustrous wools which tend to have a larger diameter than other cross-bred wools. They are used mainly in the handknotted carpet industry, but because they are often soft handling for their diameter, they are also used in mohair-like knitwear and woven fabrics to give a shiny finish and silky handle. Lustre is also an advantage where bright, clear colours are required.

Other Wool Components

The fleece as it comes off the sheep also contains variable quantities of yolk (wax and suint), dirt, vegetable matter, moisture and other contaminants, most of which are removed during scouring. It is the weight of clean wool (yield) that is of interest to the processor, but this can be extremely variable, both among breeds and within the fleece itself.

In general, yield increases as fibre diameter increases. For example, the average yield for New Zealand Merino wool is 65-70%, while for halfbreds it increases to 70-74% and crossbreds achieve 75-80%. The yield from oddments can be as much as 10% less than the fleece from which they have been taken, with necks generally yielding the most and second pieces and locks the least.

Wool Wax

Wool is coated with a yellowish, waxy substance produced in the sebaceous glands just below the skin, at the base of the fibre. Produced to lubricate the fibre, so preventing damage during growth, the wax gradually works its way to the outside of the fleece, where it accumulates on the staple tip, attracting dirt and dust. Because this wax component imparts a greasy feel to the wool, it is often referred to as wool grease.

Wool wax melts at 40 °C and is readily removed during scouring, where it is recovered and sold for conversion into lanolin, which is widely used in cosmetics and pharmaceuticals.

The amount of wool wax present in the fleece varies, but generally increases as fibre diameter decreases. For example, wool wax will average about 25% of the weight of a Merino fleece, while in crossbred it is around 10%.

Suint

Suint is formed when perspiration dries on to the fibre. It is easily dissolved in water, and therefore can be washed from the fleece by rain and so is also readily removed by scouring. Suint can form up to 10% of the fleece weight, with strong crossbreds carrying more than finer woolled sheep.

Vegetable Matter

Vegetable matter, such as seeds, small pieces of foliage, chaff or hay, is picked up by the sheep in the paddocks and becomes embedded in the wool. Because it is not readily washed from the

wool during scouring, vegetable matter content is an important factor to consider in wool purchasing, as increased levels of vegetable matter will affect both processing and product performance.

Because fibres adhere to the vegetable matter when it is removed during initial processing, carding yields will be reduced. Vegetable matter which survives the initial processing will also reduce processing efficiency as it can cause yarn breakage and irregularity. Finally, vegetable matter in the yarn is generally undesirable as it will spoil both the handle and appearance of fabric made from it.

New Zealand wools are widely recognised as being virtually free of vegetable matter, usually significantly less than 1% (average 0.3%). The most common contaminants are grass or hay, bidi-bidi and shive, with more isolated instances of bathurst burr, storksbill, subterranean clover, spiral burr, horehound, thistle and starr burr. Where sheep graze amongst scrub, they pick up leaves, twigs and pieces of bark which contaminate their backs. These wools are termed moity. Most vegetable matter picked up by sheep in New Zealand pasture is easily removed during the initial stages of yarn manufacture.

Where vegetable matter contamination is particularly heavy, it can be removed by carbonising. This involves treating the wool (or fabric) with acid and baking it in an oven to convert the cellulose into carbon which can then be crushed and removed. As well as adding to costs, it may also weaken fibres and affect yarn softness, dyeing potential and fabric handle. Carbonising is rarely required with New Zealand wools, and in fact, there are no carbonising plants in New Zealand.

Soil

Particles of dust, dirt and sand picked up by sheep adhere to the greasy fibre in varying quantities, depending on grazing conditions, climate and wool type. Most New Zealand fleeces will average less than 5%, which will usually be removed during the scouring process. Wools that are particularly dirty are termed 'dingy' or 'sandy'. In extreme cases belly wool and skirtings may warrant the description 'muddy'.

AgFact

The objective measurement of wool

Wool buyers now use a range of measured characteristics to help decide the suitability of wool for their processor clients. Wool measurements have an increasing influence on the price paid for your wool, while the appearance of the clip is becoming less important. Measured characteristics can also help you make decisions about future breeding and clip preparation.

How do I find out about my wool?

When you sell a main line at auction, you receive a copy of the test certificate, which shows the major test results, measured by a registered wool testing laboratory.

If you sell wool privately, you usually have to arrange your own testing. You can sample the wool yourself, preferably using a core tube, and send the sample to a testing laboratory. The laboratory can give you guidelines on sampling.

What is measured?

A typical test certificate shows the four main characteristics that buyers look for:

Yield

Yield is the proportion of clean wool present after the grease (wax), suint (sweat) and dirt are washed out and vegetable matter is removed. Yield is expressed as the percentage of clean wool derived from the greasy sample.

A test certificate shows several yields that are calculated by slightly different methods. They allow for different moisture contents in the dried wool. The yield most buyers use to calculate greasy prices is the "Schlumberger dry" yield.

Yield is important in deciding the price per kg of greasy wool, since the processor wants only wool, not dirt and grease. Suppose the buyer decides two similar lots are both worth $4.00 per clean kg of wool. Line 1 yields 78%, and Line 2 yields 83%. The buyer can therefore pay a greasy price of $3.32 per kg (i.e., $4.00 multiplied by 83%) for Line 2, but only $3.12 for Line 1. The price per kg of *clean* wool is the same for both.

Breed influences yield. Fine-woolled sheep like the Merino have lower yields than strong-woolled breeds like the Romney. Management and climate, especially rainfall, also affect yield.

Vegetable matter

Vegetable matter (VM) can reduce wool processing performance. Hay and twigs drop out easily but seeds and burrs with strong hooks are hard to remove.

VM is measured by dissolving away the wool with a strong alkaline solution. The percentage by weight of VM that remains, and type, are shown on your test certificate.

Most New Zealand wools have less than 0.4% VM, which is low relative to wools from other countries. VM is not usually a problem until it is more than 0.5%. Some Australian wools have VM levels of more than 5%.

Fibre diameter

Fibre diameter (measured in microns – millionths of a metre, or µm) is very important for spinning performance and consequently the end use. For example, fine Merino wool (17 to 22 µm) is made into apparel – the finer the wool, the lighter and softer the garment. Medium wool (25 to 30 µm) is used largely in knitwear. Strong crossbred wool (over 36 µm) is used mainly in carpets. Buyers pay premiums for fine wools.

Until recently the "airflow" method was the most common test. Air is drawn through a plug of an exact weight of clean wool. The finer the wool, the greater the resistance to air passage.

The airflow method can give misleading results for coarse, medullated wools (fibres with a hollow core) and some lambs wool.

New methods are gradually replacing airflow. Image analysis instruments measure the fibre at various place along its length, and are reliable for all wools. Two important instruments are OFDA (Optical Fibre Diameter Analyser) and Sirolan-Laserscan. These instruments can now also measure fibre curvature, which is related to bulk.

Colour

Wool colour determines the shade to which wool can be dyed. Only very white wool can be dyed to fashionable light or pastel shades.

Eye assessment of greasy wool can be misleading because some apparent colour may only be grease that will wash out. Colour measurement avoids the need to estimate whether the visible yellow is permanent.

The colorimeter measures light reflected from scoured wool. Results appear on your test certificate as values in

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the X (red), Y (green) and Z (blue) parts of the visible spectrum.

The measurements of most use to the farmer are:

Y – a measure of brightness: the higher, the better.
Y minus Z – a measure of yellowness: the lower, the better.

Ideally, you want bright, white wool.

Typical values are:

	Y	Y minus Z
Good Merino	62	0 to 2
Good crossbred	58	2 to 4
Poor crossbred	50	7 to 10

If your wool is very yellow for the breed, you may need to change your shearing dates and shear earlier or more frequently, if you have a long-woolled breed.

What other measurements are done?

Other optional measurements usually depend on the type of wool being measured.

Length and strength

The length and strength of the wool affects the types of yarns that can be spun and the strength of the resulting yarn. For example, late-shorn 150 mm full fleece may end up only 75 mm after carding if it is tender in the middle.

Length and strength testing is usually done only for Merino wools in New Zealand. Some crossbred wools are "tippy" and hard to measure because the staples have tapered tips.

The test instrument stretches the staple with increasing force until it breaks. The certificate reports the force needed to break the wool in "Newtons per kilotex" – a measure of force per unit thickness of wool. The test also measures the position of the break and the resulting average length of wool.

Bulk

Bulk or "filling power" refers to the volume a weight of wool occupies.

Bulk is important in wool garments for warmth without weight. High bulk wools give better cover in carpet with less wool per unit area. They also have a higher appearance retention.

Loose wool bulk testing applies a known force to a wool sample and measures the space the sample occupies. Bulk is expressed in cm^3/g (cubic centimetres occupied per gram of wool). The higher the result, the bulkier the wool.

The bulk test has recently been accepted as a standard test available for display on wool samples at auction. The test is of most use to breeders already producing bulky wool to emphasise the high bulk of their clip.

How can I use my test results?

Most test results are used to decide the price of wool. You can compare prices for similar wools, published by Wools of New Zealand. Use the yield to convert clean prices to a greasy price as quoted by potential buyers (refer to section on "Yield").

You can also assess the standard of your clip preparation. If "yellow" wool (fleece or oddments) does not have a Y minus Z result at least 2 units greater than the main line, then it was not different enough to justify removal. Fine wool clips classed for fibre diameter should show at least 1 µm difference between fleece lines in the 19 to 20 µm range and 1 to 2 µm difference for medium and strong Merino clips.

You can also use objective measurement to make culling decisions, such as selecting Merino hoggets for fine fibre diameter. Some crossbred stud breeders use yield to convert greasy hogget fleece weights to clean weights for selection.

Where can I get more help?

Your Wools of New Zealand production officer of wool broker's representative can assist with the utilisation of objective measurements for breeding and clip preparation.

For further information, contact:
Roland Sumner[1] or Tim Harrison[2]
AgResearch
[1]Ruakura Research Centre
Private Bag 3123, Hamilton
Phone (07) 856 2836 Fax (07) 838 5012
[2]PO Box 60, Lincoln
Phone (03) 325 6900 Fax (03) 325 2946

ISSN 1172-2088

AgFact

Pattern and control of wool growth

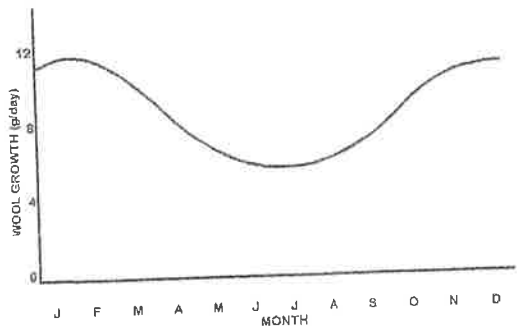
Wool does not grow evenly at all times. Its growth rate changes according to time of year, nutrition and physiological status of the animal. These effects interact, limiting the extent to which farmers can control wool growth.

Seasonality of wool growth

Time of year greatly affects wool growth of crossbred sheep. Growth in summer is about double that in winter, assuming nutrition is equal over these periods. Some breeds, such as the Wiltshire, actually cease wool growth in winter and shed their fleece annually. Seasonality is controlled principally by day length.

Wool grows both thicker and more length per day in summer; winter-grown wool is finer and grows more slowly. Typical figures for Romneys (under constant feeding throughout the year) are 42 microns (μm) and 0.65 mm of growth per day in summer and 34 μm and 0.45 mm/day in winter (Figure 1).

Figure 1: Wool growth for crossbred sheep, under constant feeding throughout the year.



Season does not greatly affect Merino sheep. Farmers may notice that winter-grown Merino wool is finer but this is mainly due to nutrition, not day length. Day length affects the wool growth of Merino–crossbred crosses (e.g., the halfbred) but to a lesser extent than for Romneys and Coopworths. In trials at Whatawhata, Corriedale wethers fed at the same level as Coopworth wethers grew more wool in winter but less in spring and summer than the Coopworth.

Nutrition

Trials show a direct increase in wool growth as feed intake increases. In theory the rate of increase may decline at extremely high feeding levels, as the follicles cannot use all the nutrients available, but this does not occur within realistic feeding regimes. Wool growth is obligatory and continues at very low intakes despite liveweight loss.

The extent of the response to extra feeding changes depending on time of year. The best responses occur at times of year when sheep grow more wool due to the seasonal effect. Farmers wanting to feed sheep for more wool should therefore increase feeding levels in summer, when wool growth is more responsive. This will increase average fibre diameter as well.

Extra feeding in winter has little effect on total annual wool production. It may, however, improve wool quality by increasing winter fibre diameter slightly and reducing tenderness and cotting. The best method to minimise effects of tenderness and cotting is to shear early in spring, so that the weak part of the fibre is near the bottom of the staple.

Effects of body size

Larger sheep grow more wool than smaller sheep with a similar genetic potential for wool growth. Thus on *average*, on a within-flock basis, a ewe 1 kg heavier than its flock contemporaries will grow about 0.1 kg more greasy wool.

Pregnancy and lactation

The effects of seasonality and nutrition ar complicated by pregnancy and lactation. Ewes rearing more lambs grow less wool, but the effects are small. The trial results below (averages from a large number of experimental flocks) show how wool growth depends on the number of lambs reared.

Dry ewe	+0.40 kg	(+10%)
Ewe with single lamb	0.00	(base level)
Ewe with twins	-0.12 kg	(-3%)
Ewe with triplets	-0.25 kg	(-5%)

Dry ewes grow more wool in winter, with less tenderness and cotting. Increasing lamb drop, through better management or improving genetics through selection, does not greatly decrease wool returns. The extra weight of lambs weaned by ewes with twins and triplets more than balances the

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economic effect of slightly reduced wool growth and quality.

Practical management implications

Knowing the effects of seasonality, nutrition and reproduction, we can evaluate management strategies for wool growth.

The first priority is liveweight gain in ewe hoggets. Hogget fleece-weighing trials on farms show an increase of 0.075 kg greasy fleece weight for every 1 kg increase in off-shears fasted liveweight. Larger body size increases lifetime lamb drop and wool growth.

Wool growth is quite responsive to autumn nutrition, so having heavy ewes before mating and flushing (of two-tooths and mixed-age ewes) increases wool growth as well as reproductive rate.

The seasonal winter decrease in wool growth and fibre diameter coincides with pregnancy. If ewes are poorly fed in winter, wool becomes tender and may break.

Feeding during lactation is important for milk production (and hence lamb growth), ewe liveweight and wool growth. Rapid spring pasture growth means higher feeding levels should be easily achieved. Plan feed supplies carefully if lambing early or out of season.

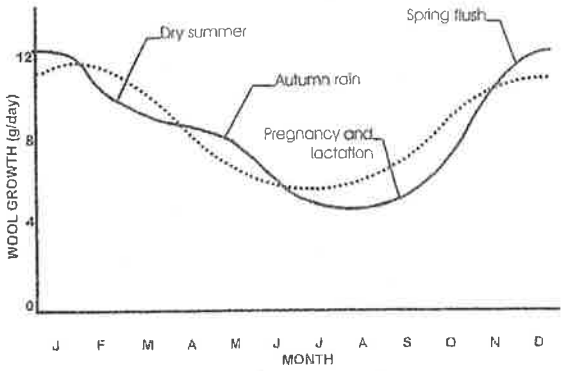
From weaning, good feeding of ewes over summer will result in more wool. This also helps get ewes up to a good mating weight, to achieve high conception rates.

Maintaining weight or gradually increasing it over summer makes more efficient use of feed than having ewes lose weight after weaning and regain it for mating. A 60 kg ewe losing 5 kg from December to February, then regaining 5 kg from February to April, eats slightly more feed over that period than a ewe maintained at 60 kg. She also grows about 0.24 kg less clean wool from December to April than her stable counterpart.

A trade-off may therefore be needed between using ewes to maintain feed quality for young growing stock and feeding ewes well to optimise their productivity. Where possible, control summer pasture with topping or breeding cows.

Figure 2 shows the typical wool growth curve for crossbred ewes on North Island hill country. Making ewes high priority in summer reduces the "dry summer" drop, but there is little that can be done about the effects of pregnancy and lactation, when fibre diameter may fall below 30 µm and wool growth may slow to less than 40 mm/day.

Figure 2: Typical crossbred ewe wool growth curve.



Where can I get more help?

Your Wools of New Zealand production officer or wool broker's representative can help you set preparation standards for your clip.

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Roland Sumner
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Phone (07) 856 2836 Fax (07) 838 5012

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Measuring traits invaluable for stock improvement

It is important that stud breeders use measurement information for stock improvement themselves, as opposed to just window dressing for their clients, says corriedale breeder Charlie Ensor.

"If a stud breeder can demonstrate he or she is making good use of the information collected, it is not so important for a ram buyer to go overboard about the records."

Objective measurement is the measurement of wool characteristics, such as fibre diameter, by scientific tests, as opposed to visual estimates.

Charlie farms 9,000 hectares in the picture postcard part of Mid Canterbury, where the Wilberforce and Rakaia rivers join. He runs 3,000 corriedales, 3,000 merinos and 100 cattle and started wool testing in 1978 with his stud flock of corriedales.

"I'd like to test all my ram hoggets, but because of the cost I carry the top 75% through until they are shorn".

He is also the president of the Corriedale Breeders Society, and says a lot of its members are using objective measurement not just because their buyers are demanding it. "Breeders also want to improve the breed's performance on economic factors such as wool production."

To educate the corriedale breeders in production recording, the society runs a class of ewe hoggets from January for 10 months in one environment. They are then side sampled and finally judged at the Canterbury A&P show on visual appraisal and wool production using objective measurement ie: measured diameter and clean fleece weight.

By having a midside wool sample tested for yield a stud breeder can determine an animal's individual clean fleece weight. There are much greater variations in yield between individual sheep in a flock than most people think. Clean fleece weight is very important in high value rams.

Charlie says the measurements help determine the value of each individual sheep. "For example a breeder will use the clean fleece weight and family wool production history of a ram to determine the potential of its off-spring. Clients buying rams shouldn't be too influenced by individual characteristics unless they have a special requirement: ie some clients require lower yielding wools to withstand dusty conditions."

He says fleece weight is an important selection characteristic because it has a high heritability factor and strongly influences wool income. Effective selection can result in sheep that more efficiently convert food into wool. Also selection for fleece weight improves staple length and strength.

Resistance to yellowing is another important selection objective. As discolouration is very dependant on weather conditions and time of shearing, some measurement houses provide a test that determines the resistance or susceptibility to fleece discolouration. ■

To sum up

- Shear when your wool is at its optimum processing length (100-125 mm), minimising the effects of break, cotting and discolouration.
- With annual shearing, try to shear as early as possible, before yellow discolouration and cotting occur.
- With Crossbreds, look at an eight-months regime and the idea of splitting the flock into two shearing groups. (But remember, this takes careful planning and is best suited to a larger flock.)
- Always handle sheep quietly at shearing to reduce stress, particularly when they are in lamb.

Postscript

When you are shearing, don't forget:

- Keep belly wool out of fleece.
- Put cotts and cotted pieces aside.
- Take out necks and backs with vegetable matter.
- Skirt lightly, only the permanently discoloured wool.
- Avoid penstain and take out any that does occur.
- Use only good quality packs; if recycled, only from registered operators.
- Use two strands gold label twine, tightly sewn.
- Keep string, caps and rubbish out of bales.
- Don't press over 200 kg.

For further information, write to: The Production Manager
New Zealand Wool Board
PO Box 3225, Wellington
or ring one of the production staff below.

Lance Wiggins, Wellington	(04) 726-888 (work)	784-412 (home)
John Hutchinson, Cambridge	(071) 273-893	276-147
Murray McEwan, Cambridge	(071) 273-893	273-524
Lew Willoughby, Napier	(070) 67-986	433-569
Owen Petrie, Palmerston North	(063) 68-611	83-518
Bryan Bradley, Christchurch	(03) 488-726	584-871
Stuart Bishell, Timaru	(056) 84-791	24-829
Robert Pattison, Dunedin	(024) 777-353	45-947
Mark Williamson, Invercargill	(021) 82-869	58-061

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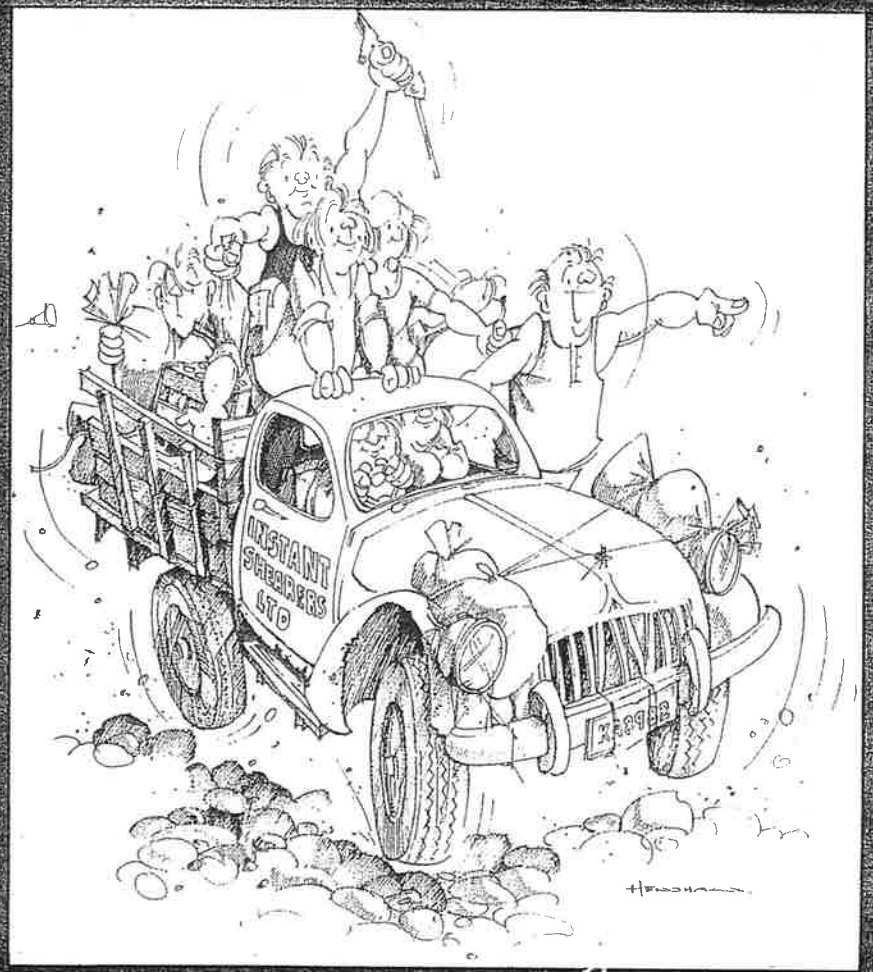
SHEARING WHEN YOUR WOOL IS AT ITS BEST



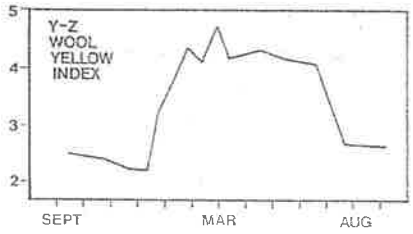
Shear to suit the Manufacturer

The quickest way to improve the value of your woolclip is to pick the right shearing date.
Wool is an industrial material. The manufacturer wants it white, strong and a suitable length for his machines.
More and more growers are seeing this. By feeding and managing their sheep well, they are able to shear when the wool is at its best.
There is no fixed pattern. When and how often you shear depends on the breed of sheep, the climate in your district, the current weather, pasture growth, the labour supply and so on. There are also the financial considerations: The cost of each shearing, cash flow and tax.
But generally, the new approach shows up two ways:

- More growers are shearing in spring and early summer. In the South Island there is more pre-lamb shearing.
- More growers are shearing every eight or nine months.

This is what you Look for

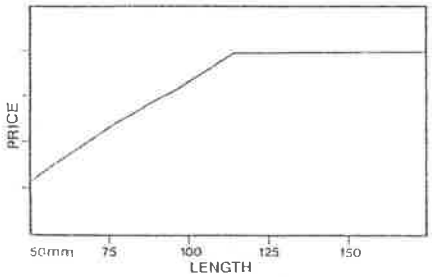
1. **Better colour**
   In Crossbred wools, colour equates with the old style grade. Measurement shows permanent yellow increases rapidly from November to March, particularly in long wool. The diagram is the typical pattern — it would be worse for wet and humid conditions in the summer months.



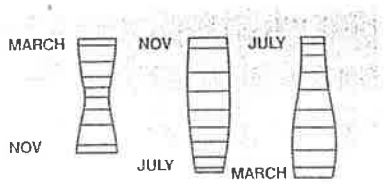
From November to March, wool colour deteriorates rapidly. Yellow increases and the brightness declines in parallel.

2. **Less cotting**
   The fibre naturally thins in July/August and if the winter is hard there will be a lot of breakage. By early summer, the free ends are growing out of the skin and cotting begins. It starts on the points and shoulders and spreads rapidly. Under the blanket of cott, the wool is slow to dry and yellowing can be severe.
   You should shear before cotting is established. If you also look for measured wool weight in rams and select your hoggets on the same basis, you will get better length and greater resistance to break and cotting.

3. **Better length**
   Buyers look for the break in wool to decide what the length will be after carding. You are more likely to meet their requirements with early shorn wool where the break is closer to the butt of the staple. By December/January it is at the mid-point, which limits the use of the wool.
   Except for lambs, you should not shear at less than 75 mm. For Crossbreds, the optimum length is 100 — 125 mm.
   The diagram shows how the price is discounted below 75 mm and how the premium disappears above 120 mm.



For Crossbred wools, 110 mm is the optimum.



The diagram shows in an exaggerated way, the growth and thickness of the fibre month by month. This is an eight-month shearing regime.

The eight month Regime

This is an option for those shearing annually in the summer or those second shearing. It has benefits over both systems.

- You can vary shearing date to suit stock management and feed supply.
- You dispense with a crutching and some shearing costs compared with twice-yearly shearing.
- You produce a whiter wool and should eliminate cotting.
- The wool is around the optimum length. With twice-yearly shearing, there is a risk it will be too short and with annual shearing it can get too long and discoloured.
- The winter break will affect only one clip in three — and you can reduce or eliminate this by shearing early.
- Spreading the shearing will be an advantage to shearers and contractors, provided you can give them adequate notice.
- You may receive a better price for a good wool 'out of season'.

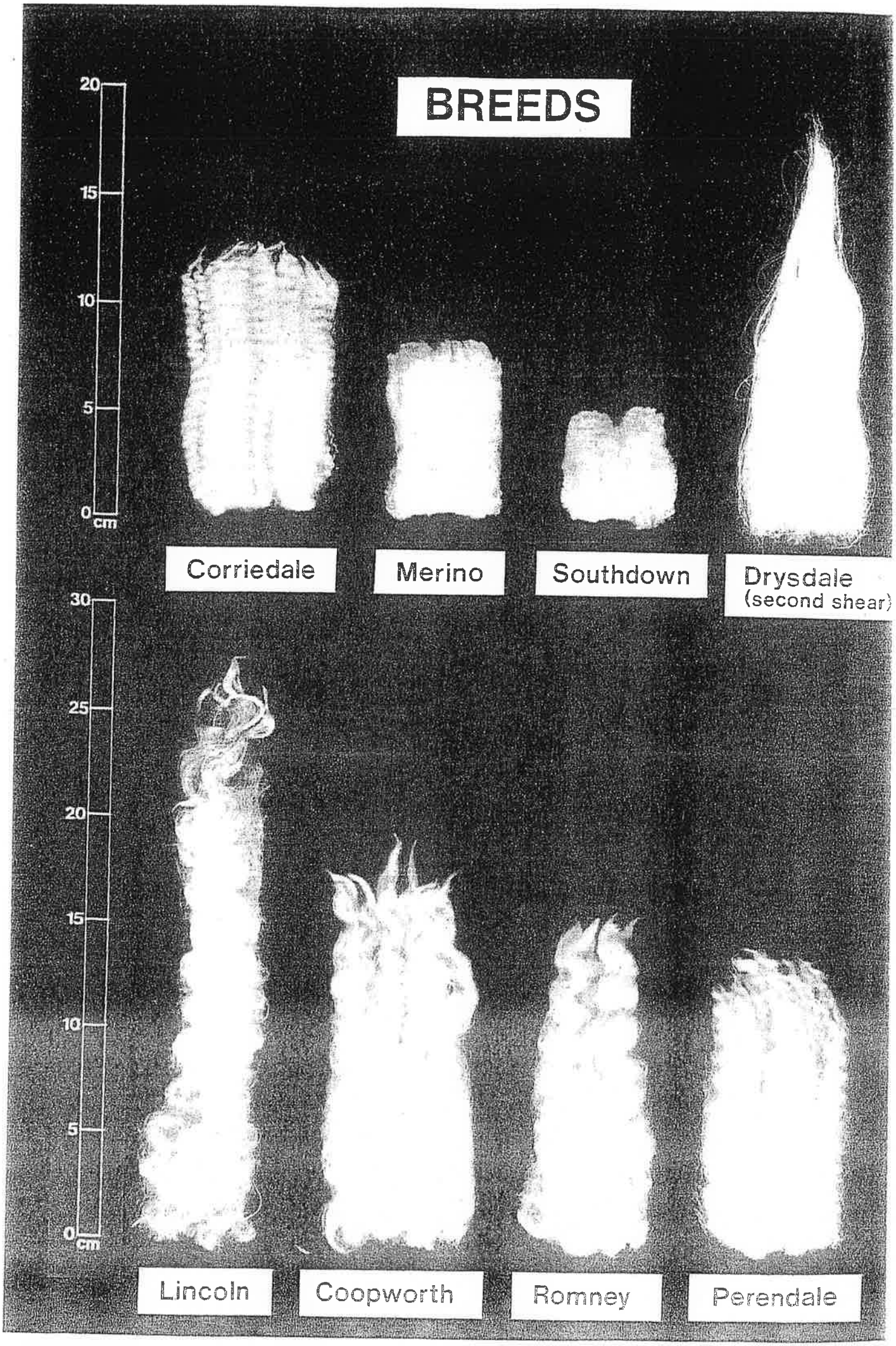
Winter shearing Needs care

It may be preferable to shear in early spring with lambs at foot than in winter. Newly shorn sheep suffer from cold and will eat valuable feed for up to six weeks, merely to maintain condition. If the feed is not available, they will rapidly decline, particularly young sheep with small fat reserves and ewes close to lambing. This sets the scene for sleepy sickness and parasite problems.
If sheep are to be shorn in winter, they should be in good condition and there should be adequate feed and sheltered paddocks to follow. (Apart from everything else, poor conditioned sheep are terrible shearing.)
In severe climates, the cover comb or blades should be used. Only 20 mm of wool provides almost as much protection as full fleece.

YEAR ONE	MARCH	JULY	NOVEMBER*
YEAR TWO	MARCH	JULY	NOVEMBER

A variant on the eight-month regime is to split the flock as illustrated, giving you a small shearing every four months. It can be easier to manage, the sheep may all go under cover, your cash flow is improved and you avoid the tax hassle of two wool cheques in one year and only one in the next.

* Lambs shorn December/January


BREEDS
20
15
10
5
0
cm
Corriedale
Merino
Southdown
Drysdale
(second shear)
30
25
20
15
10
5
0
cm
Lincoln
Coopworth
Romney
Perendale

Objectives

There are two objectives in good wool handling:

- To provide both the buyer and the manufacturer with parcels of wool they can handle confidently, knowing they are uniform and meet the standards required for efficient processing into quality yarns and textiles.
- To maximise the net return to the woolgrower.

To meet these objectives, careful attention must be paid to the following:

- Grouping of wools into the fewest uniform lines that will meet the requirements of valuing and manufacture.
- Wool's reputation is undermined if it is poorly packed, contaminated with string, pack fibre and branding ink, or if bales have incorrect or illegible marking.
- Removing the cotts, stains, permanent discolouration and vegetable matter or any odd fleeces which prevent the majority of the wool from realising its full manufacturing potential.
- Handling the lines according to the wool type and degree of fault in the clip. Too little attention may be costly, too much will almost certainly be costly - and both are poor woolhandling. So too is inconsistency.

From dagging to the despatch of specifications, each step is a part of preparing the clip well.

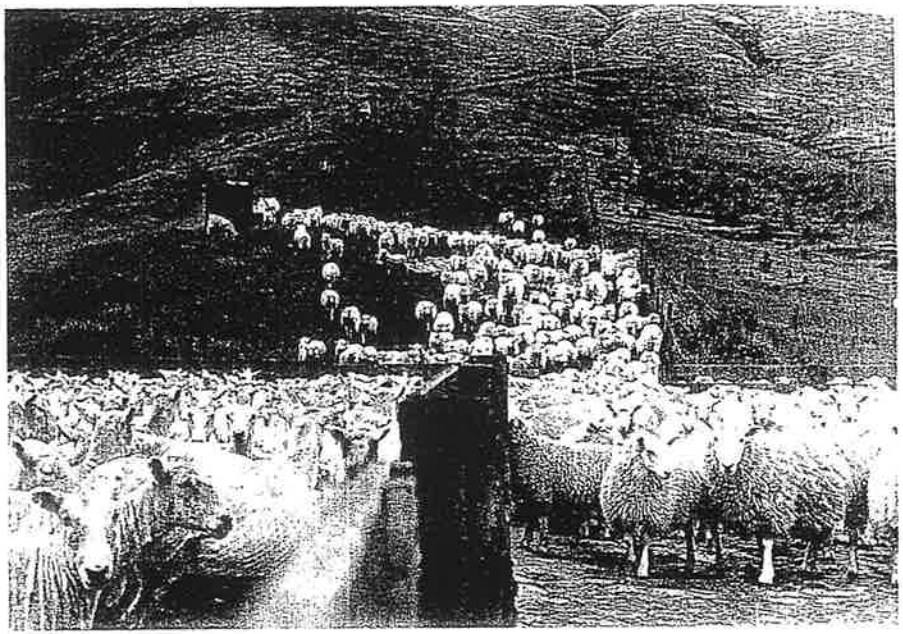
Getting Ready For Shearing

First, there should be a contract with the shearing contractor and a clear understanding with the classer or leading woolhandler. The contract or understanding should cover, among other things, the number of sheep to be shorn each day and the number of shearers and woolhandlers who will be working - their standard and experience.

In this way, both sides know their obligations; the grower to present the sheep and the shed staff to handle them.

There is no simple formula for determining the number of woolhandlers required. It depends on the work to be done, the design of the shed, the speed and experience of shearers and woolhandlers; whether it is full wool, lambs or shears that is being handled. The important thing is to have sufficient hands to do the job required, based on the flow of wool. There should be an experienced person in charge, either a qualified classer, a senior woolhandler or the grower.

The grower should see that the facilities are adequate. These start outside the woolshed. There should be well grazed paddocks nearby for holding



sheep so that they empty out before yarding. The yards should be well drained and clean.

At shearing, the woolshed should function as efficiently as a factory. That means it should be well designed, well lit and well equipped. A list of essential equipment is included in a later section. The shed should be swept or washed down in preparation and everything checked. Bins should be cleared of accumulated wools. White paint on the walls does much to improve the lighting and encourage careful work.

The grower can greatly assist the shed staff by the way the sheep are handled before shearing.

- They should be dagged at least two weeks beforehand so that they are clean (hopefully) and any penstain has had time to fade out.
- If they are of different breeds, bought-in stock and/or shorn at different dates, they should be drafted back into their original mobs. The grower should keep the shed staff informed about how the mobs are coming.
- All steps should be taken to avoid penstain, which seriously devalues the wool.
- Ask the shearers only to remove socks if necessary. Short kemp fibres from the leg area of sheep are undesirable to many processors, even in the 2ND PCS or BLS/PCS.
- The sheep should be kept out of undeveloped and seedy blocks for some time before shearing.

Finally the grower can prepare for shearing with homework on woolroom policy. From last season's sale and test results, the grading of the main lines can be seen - the proportion of oddments, the level of colour and vegetable matter ...

Taking account of the new season's conditions, the grower can then establish with the classer or the senior woolhandler the preparation policy or classing plan for the clip. From time to time, he or she should be around to discuss developments.

For the woolhandler, with a busy repetitive task, the day can go much better if the boss is well informed, takes a lively interest and has a word of praise for a good job.

EQUIPMENT

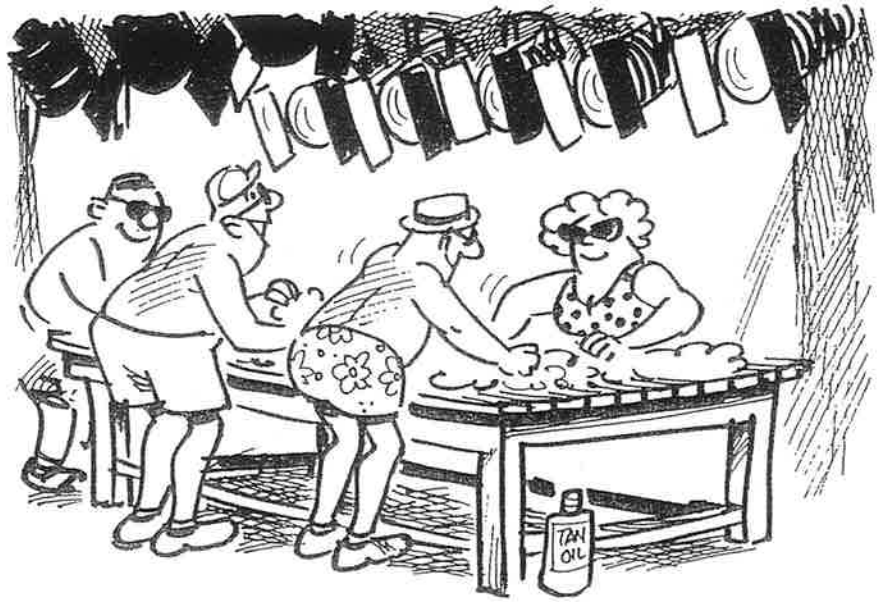
Lighting

Shed lighting greatly affects the appearance of the wool and the performance of the shed staff.

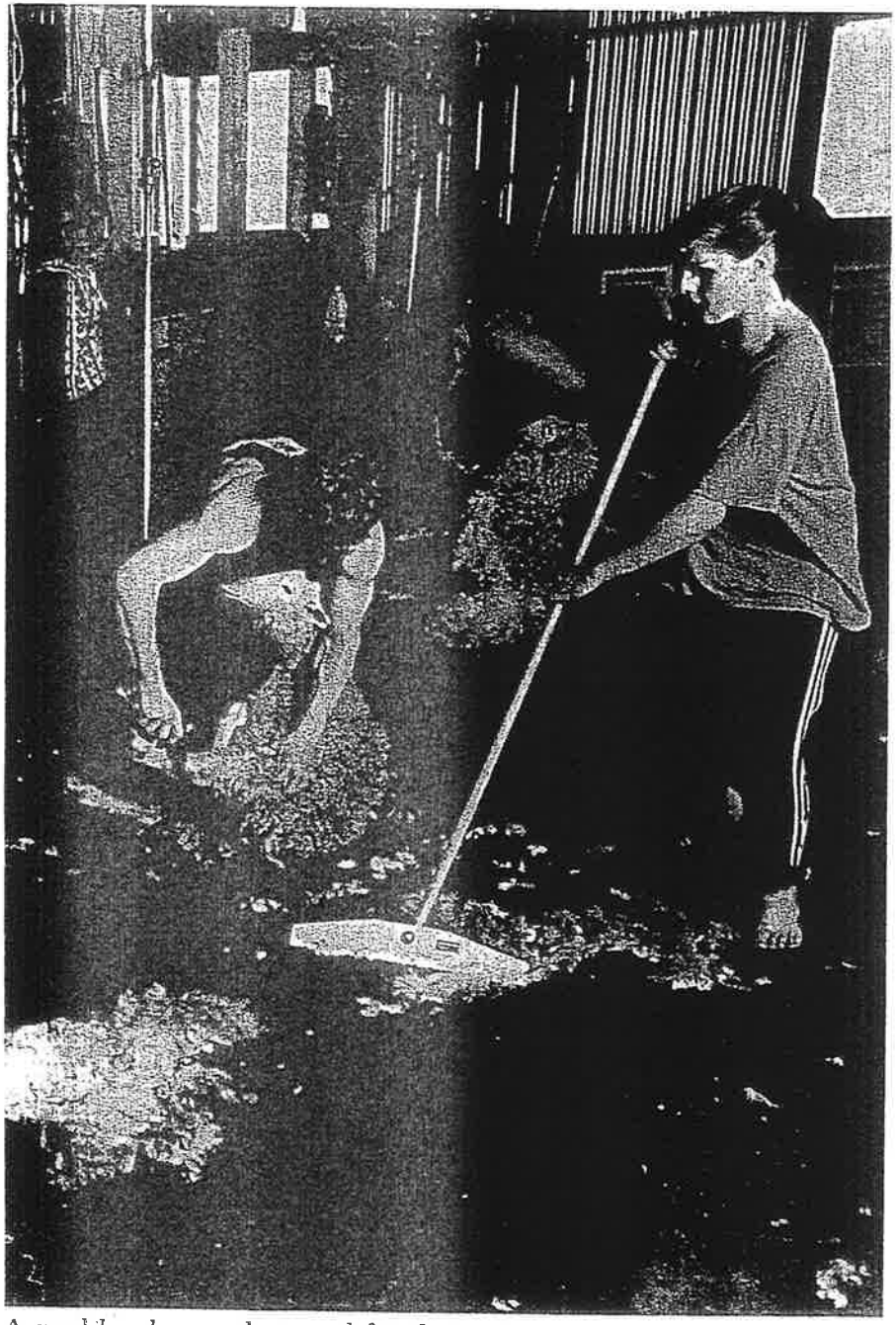
For skylights and panels, avoid tinted sheeting or products which discolour with age. Duralite F with Tedlar (woolstore grade) gives a diffused, correct light. It is made in Christchurch. Natural light can be improved by careful placement of skylights, but it is not always sufficient. For consistent work all day, the woolshed should be lit with fluorescent tubes of the correct colour temperature for handling the wool. Two 5ft tubes should be hung 1.5m above each table. Suitable types are Philips TDL 86, Thorn "Northlight" and GEC Colour 11.

Tables

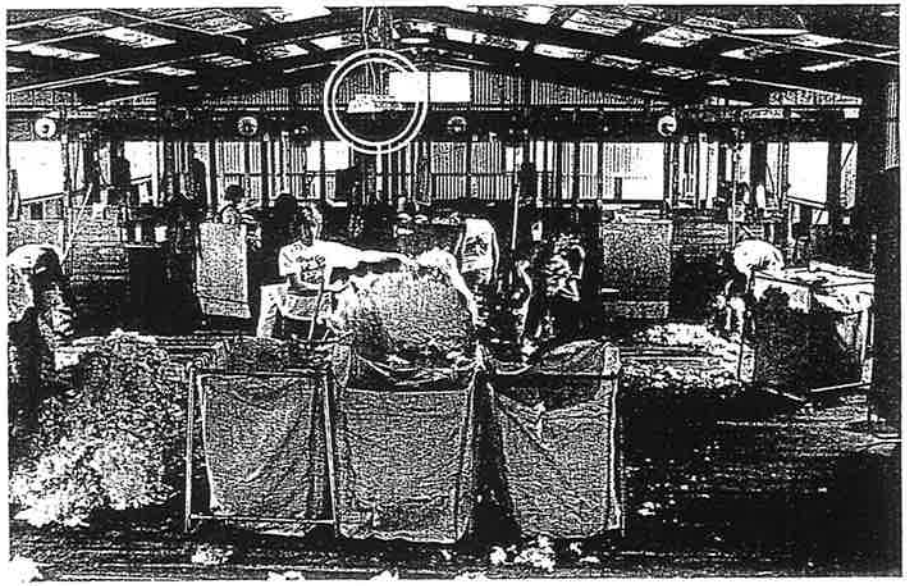
The most common type of wool table is rectangular, 2.7m long, 1.5m wide and .8m high. If the height can be adjusted, so much the better.



"Great eh — I borrowed them from the drama club!"



A good hand, a good eye and fast footwork.



Fluorescent tubes improve even a well-lit shed.

Spaces between the slats should be no more than 25-30mm or good fleece will drop through. Round tables are about 2.1m in diameter.

A single table will suffice for two or three stands and possibly four - say 800 fleeces per day. Sheds with four to six stands should have two tables either standing apart or linked in a V shape. (This makes a saving in that one shedhand can stand in the V and work both tables).

Fadge holders

About five are needed in a two or three-stand shed, seven to ten for sheds with four to six stands. There are several types; an efficient one fits inside the pack and is 69cm square and 99cm tall.

Bins

There should be at least two or three in a crossbred shed and eight to twelve in a fine wool shed. A convenient size is 1.5m wide and deep and about 1.8m high, enough to hold a heavy bale. The movable and backless variety is the most convenient. Then the wool can be stacked into the bin while the presser is clipping the bale. Bins should be clearly labelled.

"Will two bottle tops and a bandaid be any help?"

Scrapers

Scrapers are efficient and avoid the risk of fibre contamination. Some are available with telescopic handles, which could be an advantage. Staff should be instructed on using these carefully to ensure too many pieces are not swept in with the body wool.

For the presser

A sufficient number of new or approved recycled packs is needed, clips and branding materials.

Rubbish bin

There should be a sack or box to hold rubbish. A tidy, well equipped shed encourages a positive attitude in those who work in it.

First aid

Every shed should have a properly equipped first aid cabinet and preferably a bottle of ready-mixed disinfectant. Hot water, plugs for the washbasins, towels and clean lavatories all help morale and efficiency.

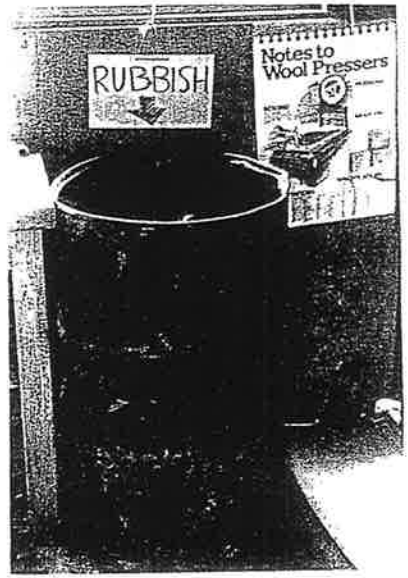
Before The Start

For the senior woolhandler, the shearing should start with a thorough inspection of the shed and its facilities, and a talk with the grower or the contractor and the presser.

Increasingly in crossbred sheds, farmers and the senior woolhandler complete a "specification" sheet which clearly sets out the way in which the farmer wants the wool prepared for market. This sheet is then displayed in the shed so all staff can refer to it if in any doubt about the farmer's requirements.

The fadges should be placed at the natural points where the woolhandlers can drop the wool into them. So far as possible, no one should have to throw pieces or turn around to reach a fadge. The "flow" of the work deserves careful consideration.

The senior woolhandler should take care all the bins, fadges and skips are clearly marked. It is a good habit to include pieces of cardboard, a large felt pen, drawing pins and chalk in a kit that goes from shed to shed. That way everything can be labelled.



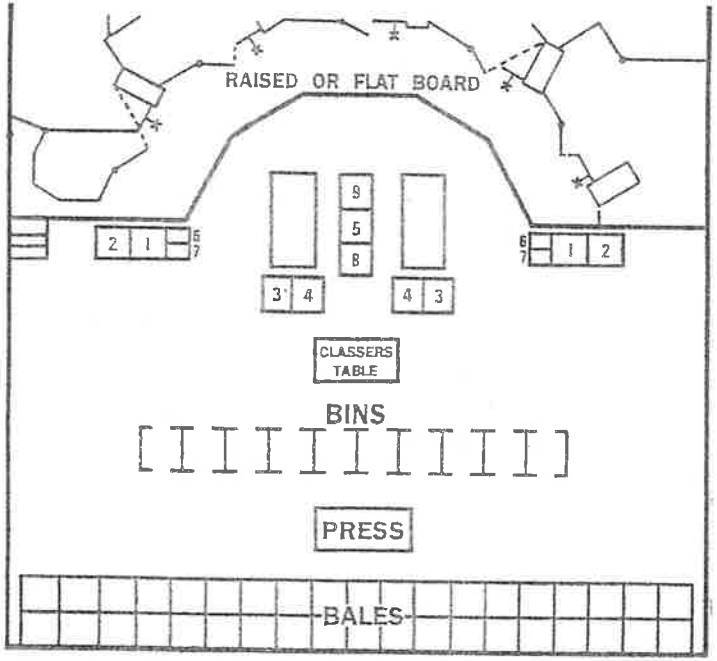
A few rough labels will prevent mistakes.

Most important is the layout. Just as a well-designed kitchen can save the legs, so a careful arrangement of wool table, bins and press can save everyone in the shed miles of running in a day. It should be as compact as possible while allowing a clear passage on the main routes from board to table and table to press or bin.

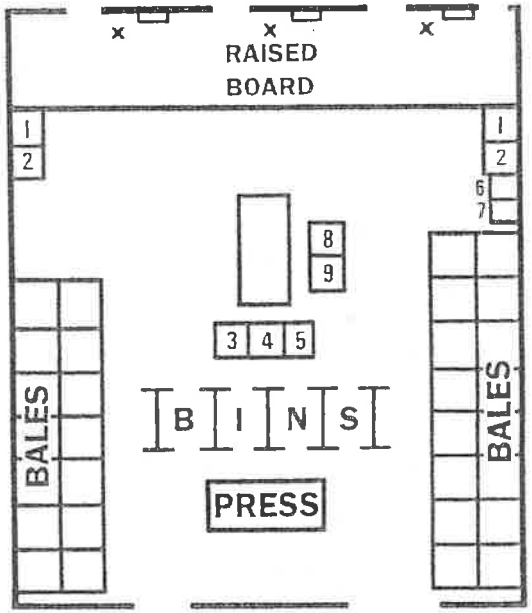
In many sheds, there may seem little flexibility but an experienced woolhandler will see opportunities to save steps and help the work flow smoothly. The presser has a part in the deliberations because he (or she) needs access to the wool and room to stack the bales.

For full fleece (all fleeces which are holding together).

- The table as close as convenient to the board.
- Press as close as convenient to the table.
- A fadge for bellies close to the board.
- A fadge for locks and 2nd pieces close to the board.
- Fadges for necks and for pieces at the far end of the table.
- Adequate bins for lines if classing the clip.
- Bins for cotts and offsort fleeces handy.
- Separate containers for urine stains, dags and black wool.

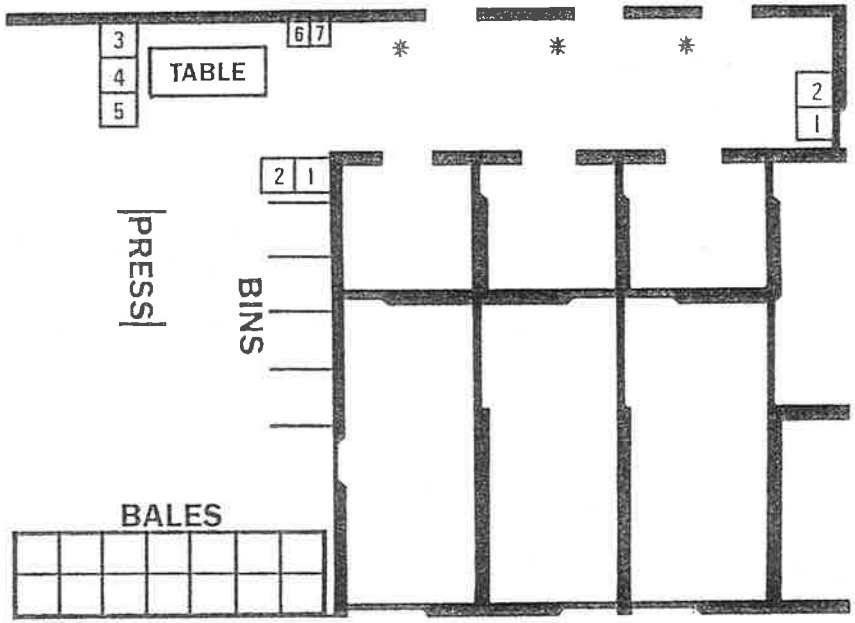


Curved board. With one table, can be turned side on with fadges either end.

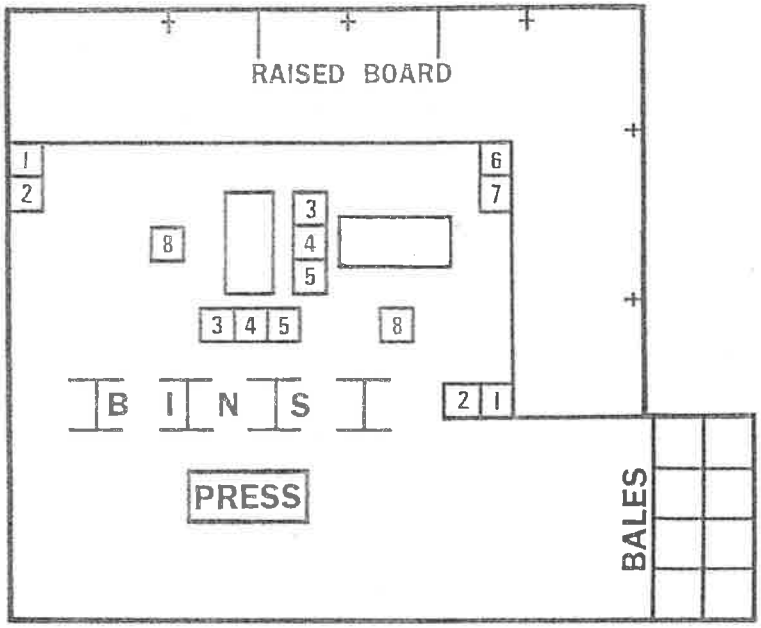


Straight board. Table can be turned side on with fadges either end.

KEY: *1 - Lox/2nd PCS; 2 - Bellies; 3 - 1st PCS; 4 - Neck collars; 5 - Moity backs; 6 - Dags; 7 - Urine stains; 8 - Shed stain; 9 - Tupping crayon.*

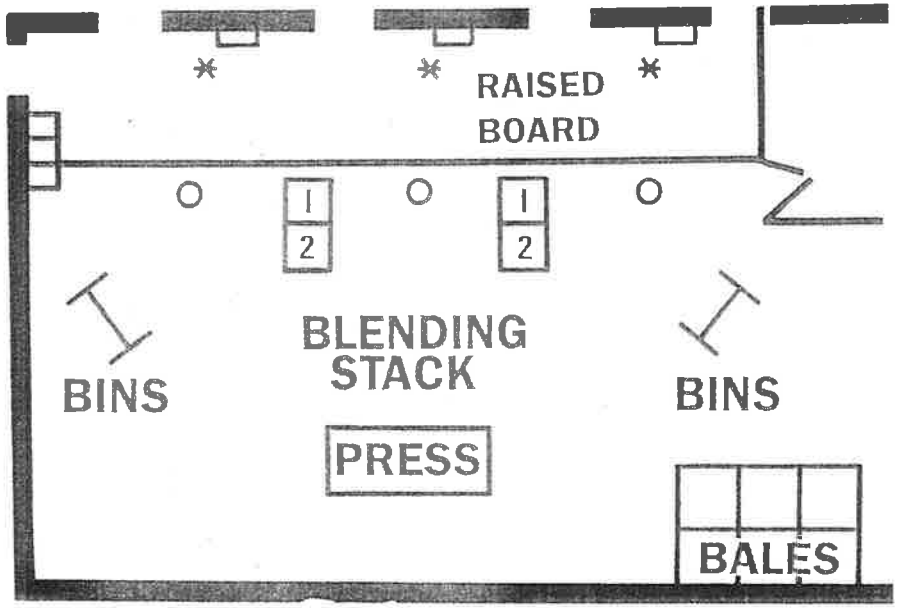


Running board.



Raised L-shaped board.

KEY: *1 - Lox/2nd PCS; 2 - Bellies; 3 - 1st PCS; 4 - Neck collars; 5 - Moity backs; 6 - Dags; 7 - Urine stains; 8 - Shed stain; 9 - Tupping crayon.*



Lambs or second shears. O - woolhandler; one for each shearer. 1 - 2nd LBS or 2/s B and P; 2 - Belly fribs.

For short wools (second shear, lambs, crutching wools which don't hold together).

- Table removed and a large stack made on the woolroom floor.
- Fadge for bellies/pieces close to the board.
- Press and fadges as above.
- Bin for off-type fleeces
- Separate containers for urine stain, dags and black wool.

A talk with the owner is important. The classer or senior woolhandler will want to know the requirements in handling the wool and should offer suggestions. A look at the sheep in the yards will be helpful in deciding what needs to be done.

Then it is time for the senior woolhandler to talk to the troops, and to make sure they understand the general requirements; the particular ones can be best picked up on the job.

The main message will be speed, care and a light touch.

- Speed is necessary when the shed is in full swing. With four stands, a fleece is arriving at the table every 20 - 30 seconds.
- Care is needed. The wool through a four-stand shed in a day may be worth $25,000 to $30,000 and it is costing the grower maybe $1,500 - $2,000 to have it harvested, quite apart from his standing charges on the shed and equipment. Careless habits on the board and at the wool table can pull down the value of the clip by hundreds of dollars in a day. It pays handsomely to employ trained staff.
- A light touch is wanted. When fleece wool is thrown in with the pieces, its value drops. The woolhandler wants to be very sure that the improvement to the majority of the fleece is going to cover this loss.

A main responsibility of the senior woolhandler is to see the clip is consistently handled. That means watching the other woolhandlers as the jobs are rotated, and keeping standards up to the mark through the heat of the day. The pieces and necks should be regularly checked to make sure that good fleece wool is not being removed. The fleece should also be checked to ensure that there are no pieces in good fleece wool. All bins should be checked.

A delicate hand taking just the permanent colour.

But a good tug to tear out cotted areas.

Full Fleece

On the board	Where they go
The bellies are dealt with separately and go into a fadge placed near the board.	BELLIES
Remove the stained brisket frib if the belly wool is of good colour.	FRIBS
Bellies shorn from rams or wethers should always be separated from ewe bellies and must have pizzle stain completely removed. They can be put up as a separate line if there are enough of them or otherwise they can go to the broker's bins.	WETHER BELLIES
Crutch wool, second cuts (and socks if they were removed) should all be swept from the board.	LOCKS & 2ND PIECES
Eyeclips (topknots) must be kept separate. Dags and stains must be kept separate from fleece wool, other oddments and each other. Stains should be dried before baling.	EYECLIPS DAGS STAINS
Black spots	BLACK

At the wool table

Now is the moment of truth! What the woolhandlers do with the fleece in the few seconds it is on the table can mean hundreds of dollars to the woolgrower in the course of the day.

The general purpose is to secure the highest return for wool on the table. That means improving those fleeces which can be improved. It also means that the maximum amount of wool should go into the fleece, which will fetch the best price.

"Polly prefers to rip the fleece off the pieces."

All fleeces should be thrown across the table carefully for the removal of second cuts and inspection for faults.

Specifically, the task at the wool table is:

- To remove cotted portions. These would otherwise have to be sorted at the scour and put through a decotter. This is an extra expense for those who buy the wool, and it limits the competition. Some countries may not have the decotting equipment.
- To remove heavy penstain which can cause manufacturing problems.
- To remove heavy brands and tupping crayon, which cause buyers uneasiness if they are unsure of their scourability.
- To take out any permanently discoloured wool from an otherwise white clip. An indication as to whether colour is permanent is to wash a few samples thoroughly under a tap with a little soap.
- To offer the buyers a well-presented, uniform line. Mixed lines may be heavily discounted.

These are the wools to remove on the table:	Where they go
Permanently discoloured wool skirted from the fleece.	1ST PIECES
Cotted shoulders and other portions should be torn out taking care not to include free-opening fleece.	COTTS
Back wool carrying heavy vegetable matter or seed should come out if the fleece is otherwise free. These wools should not be mixed with necks. Pay particular attention to pre-lamb shorn crossbred clips, and where sheep have been fed hay.	BACKS
Neck collars should be removed only if the wool is shorter than the fleece, is cotted or contains vegetable matter.	NECKS
Heavy penstains.	PENSTAIN
Locks and second cuts that will have fallen through the wool table.	LOCKS & 2ND PIECES

DANGER IN THE SHED

Have the wiring and sockets checked every five years.
Install an overhead socket for the press (or at least check the press is not on the cable.)
Insist the presser sets the lid down into the box.
Install a brake for lowering the box.
Keep the floor clear; put up hooks and shelves.
Look for protruding nails and splinters.
Mount the grinder in good light and clear of traffic.
Fix loose or broken steps.
Know something about first aid.

Grading crossbred wools

It is generally not necessary to class into more than one line unless there is an obvious difference in micron or the clip is a large one. The aim should be to create one main line removing only the fleeces that do not match the bulk. More care should be taken with hogget wools, falling into the fine end of the crossbreds.

There are price differences for colour and length. If mobs are bought in, shorn at different times or grazed under different conditions and have clear distinctions, the wool should be put up in mob lots.

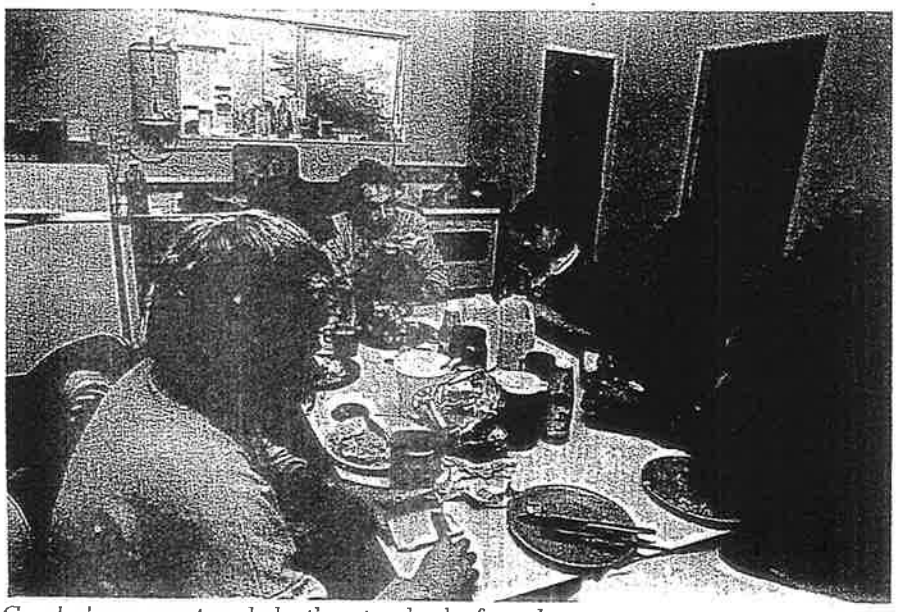
With clips of even colour, the following wools should be kept separate from the main lines:

- All cotts.
- Discoloured fleeces.
- Very short or very tender wools in an otherwise sound clip.
- Very high vegetable matter.

In other words, separate those that do not match the main line.

When the clip is of poorer colour, remove:

- All cotts.
- Fleeces that do not match for colour, length, VM etc.



Good clean quarters help the standard of work.

Grading finer wools

Wools finer than 33 microns (corriedales, halfbred and merinos) should be handled by a registered classer. They will be classed for fineness; usually fine, medium and strong. Secondary lines of off-type fleeces will cater for those of very different length, colour or with significant faults.

The following descriptions should be used as applicable, but in most clips only two or three main lines will be required for fineness.

Merino

Extra fine	18 microns and finer
Fine	19-20 microns
Medium	21-22 microns
Strong	23-24 microns

Halfbred and Corriedale

Extra fine	25 microns and finer
Fine	26-27 microns
Medium	28-29 microns
Strong	30-31 microns
Extra Strong	32 microns and coarser

With clips of average colour and better, the following fleeces should be kept separate:

- All cotts.
- Discoloured fleeces.
- Fleeces with heavy vegetable matter.
- Very short or tender fleeces in an otherwise sound clip.

The important thing is to avoid over-classing. It is a common mistake to make lines with only slight differences. The classer should make the fewest lines possible, with very clear distinctions for mean fibre diameter at least 1 micron in merino and 1-2 microns in halfbred clips and corriedales.

The classing should be structured to avoid small lines as they will usually be combined with other clips prior to sale. Similarly, the number of reclass fleeces to be binned should be kept to a minimum.

Small lines are justified for wools 19 microns or finer, which can bring substantial price premiums.

Second Shears And Lambs

These are short wools which do not hold together and are more easily handled on the board.

These are the wools you remove:

On the board	Where they go
These wools are best sorted on the board, with the woolhandler working alongside the shearer.	
Remove all dags and urine stains and put each in separate fadges. Particular attention should be paid to dag chip in lambs wool.	DAGS STAINS
Bellies and the short discoloured wools from the legs and crutch can all go into a fadge located nearby. Bellies may need fribbing.	BELLIES PIECES FRIBS
(But if the pieces are distinctly better colour than the bellies, keep them separate).	
Eyeclips (topknots) from woolly-faced sheep should be put aside, particularly if they have seed or vegetable matter.	EYECLIPS
At the blending stack	
From the board, the body wool should be taken to a blending stack, the wool table having been put away. Any discoloured wools missed on the board can be readily spotted in the stack and they should be picked out and placed with the bellies and pieces.	BELLIES PIECES

For adequate blending and a good chance to pick discoloured wools, the stack must be allowed to build so that at least a bale is permanently on the floor. The presser should be encouraged to help in picking the stack over.

A good shake blends the wools well.

Grading second shear

The sheep should be drafted if they have been bought in or shorn at different times and the difference in fleece length exceeds 50mm. Second shear wools are generally uniform in colour. Make one line, removing fleeces that are very poor colour or much shorter than the bulk.

Grading lambs

Lamb's bodywool will go into one line except very short wools, milk lambs or very coarse or lustrous wools that do not match the bulk. Do not put short lambs into bellies and pieces, even very short ones. They are worth more and should be kept separate for binning.

Crutchings

The first rule is that sheep should not be over-crutched.

Good crutchings are valuable wool, keenly sort by the trade. They deserve careful handling.

They are two types:

- Ring or fly crutchings - the wool is normally short and sometimes stained.
- 1st crutchings which may be full length or second shear - the wool comes from the back legs, the crutch and around and over the tail. Sometimes the belly wool is also removed.

Full length, second shear and ring crutchings should be kept separate.

Crutchings are bulk handled into one main line and the following removed:

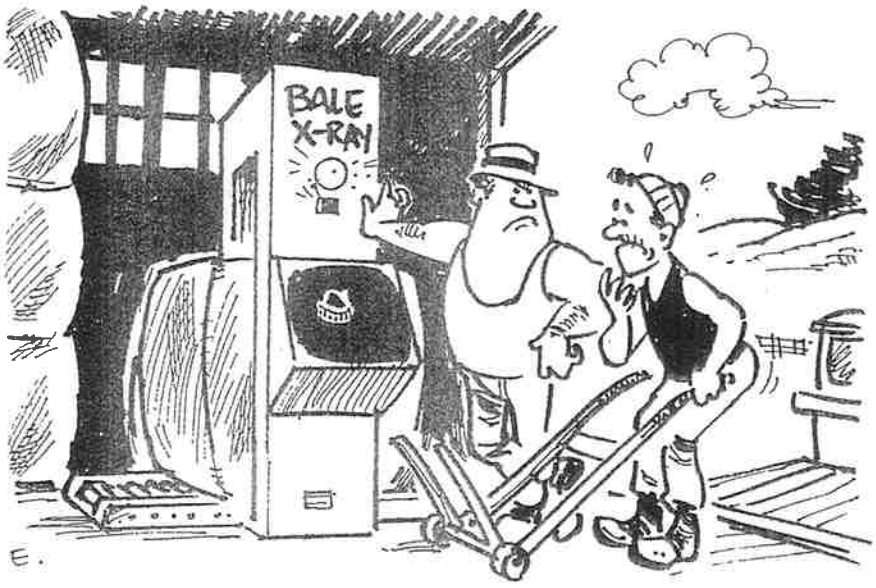
On the board	Where they go
The stains and dags. Particular attention should be paid to urine stain.	DAGS STAIN
When full length belly wool is removed, it should be kept separate from the crutchings.	BELLIES
Care should be taken that the stained brisket frib is removed.	FRIBS
Eyeclips and topknots should be kept separate, particularly if they are carrying vegetable matter.	EYECLIPS

Pressing, Branding And Despatch

The well prepared clip should also be well packed and accurately branded. The industry has agreed on codes of practice for packaging and the recommendations that follow are in accordance with these.

Wools of New Zealand has published the *Wool Presser Handbook*. This should be studied by the presser and any problems discussed. The handbook, available free, covers:

- The safe operation of the press.
- Getting the bale weights right.
- Branding and clipping.
- Taking the tally and penning up.
- The cut-out, with and without a change of wool.
- Safety measures.



Bale weights

There are substantial savings to be made in pressing to good weights - but care should be taken not to go over the 200 kg limit. While that may be difficult with fine and bulky wools, it is too easy with some heavy conditioned wools and oddments. Wools of New Zealand suggest a target weight of around 180 kg.

Where there are weighing mechanisms attached to the press, take care to see that the presser understands how to operate them. Scales that have been used with a cattle platform may need adjustment, and the farmer should be consulted.

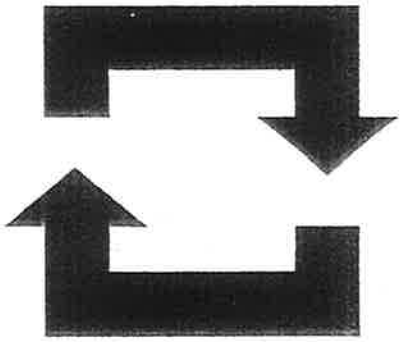
When the cut-out is approaching, the classer or senior woolhandler and the presser should work together to see that the line finishes with a full bale. Half bales are a nuisance and the farmer has to meet the cost of binning.

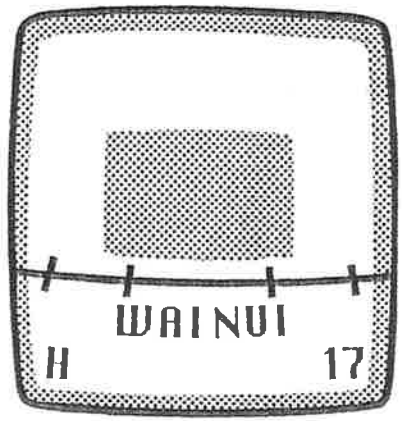
Woolpacks

If unsatisfactory recycled packs are provided, this should be brought to the attention of the farmer or contractor. It is false economy to pack wool into substandard packs. If they cannot be branded clearly, the wool may be wrongly identified or lost. If they tear or burst at the seams, the wool may be contaminated. Problems for the customers either way hurt the reputation of the New Zealand clip. Only new packs or those sold by an approved recycler should be used.

A code of practice has been agreed between Wools of New Zealand, the trade and a number of recyclers. The main conditions are:

- No more than two grab-holes; ie. one previous usage.
- No visible brands from previous use including brands that have bled through the fabric.
- All rips or tears must be repaired by sewing - not with patches.
- No packs shall have tears in the base or seams, or within 10 cm of the seams, and no repair shall be more than 20 cm long.
- Recycled packs should carry the recycler's brand showing they meet the approved standards or repair.





Place brands as shown, keeping clear of the middle of the bale-top and the edges. Don't forget to fill in the wool book.

Branding and labelling

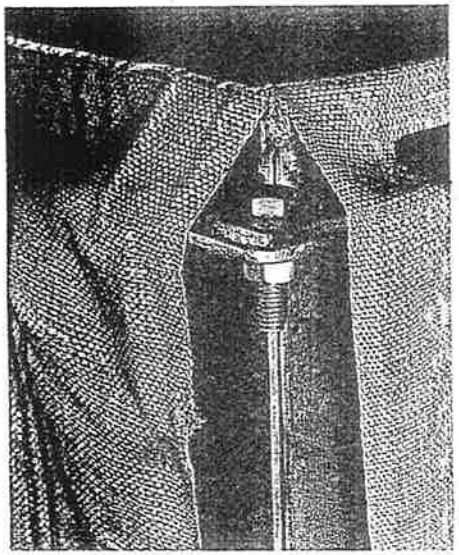
The presser should have a well-oiled routine for branding or marking bale labels. It can be done before taking the bale from the press or straight out of the press. No unmarked bales should be lying about.

It is very easy to get the numbers out of sequence. Two ways to avoid this are (a) before shearing starts to number the flaps in sequence, (b) to pin a list of numbers on the wall and cross one off as each bale is numbered.

It is also easy to enter the wool incorrectly in the wool book. For this reason, the presser should make the entry before the bale is pressed. Stencils 5cm high should be used; felt pens for writing on packs are not a satisfactory substitute.

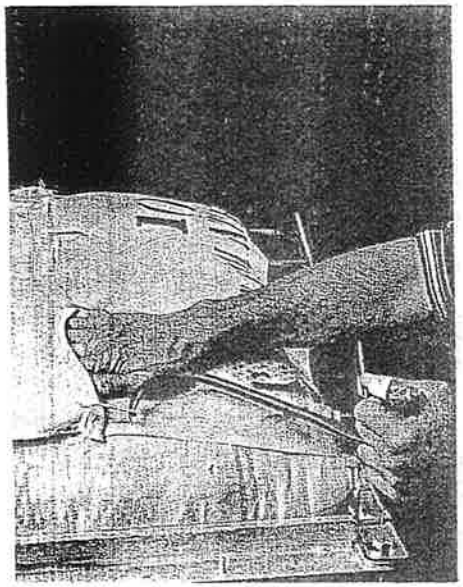
Use only approved branding inks, and only according to the makers' instructions.

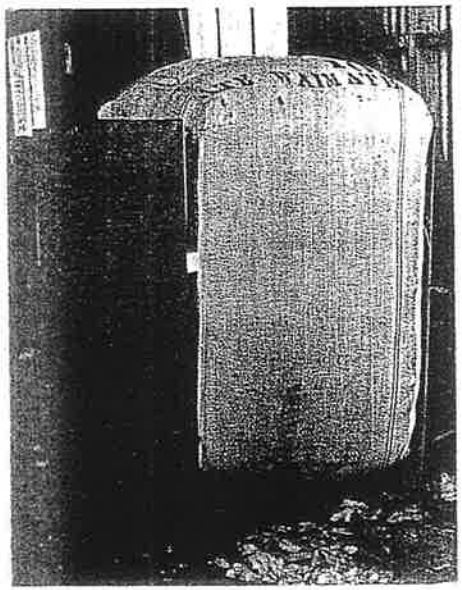
In branding, avoid the centre of the bale-top, which is most likely to be rubbed. Place the farm brand below this and the bale number towards the corner. In the North Island, the description will go there too but don't let them get over the edge, or again they will be hard to read. (See diagram)



The seam should come to top of the box. Tear off bulges in the wool to make a flatter top.

Clip should hook round seam and be pushed well down.





Overlap the flaps just a hand-width. A well-pressed bale.

Bale labels

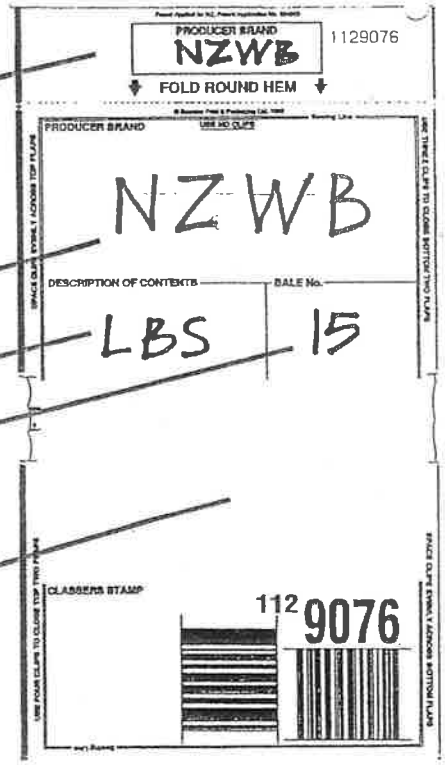
When capping off your bales, make sure the labelled flap is on the top. This saves the additional work of stencilling.

A. Use a bold spirit based permanent black felt pen to:

1. Write your farm brand in the producer brand section.
2. Write in your bale description, ie: LBS.
3. Write in your own bale number, ie: 15.

B. Record the bale description and information.

Please note: Leave the blank panel clear for woolbroker information.



It is critical that the number of the bale and the correct description of its contents goes into the wool book. With bin bales, the different wools should be separated by sheets of newspaper (never use plastic, bags etc) and all the contents listed in the book.

Mistakes should be very few if the presser is encouraged to check before branding and there is good communication between presser and woolhandlers. This is particularly important when there is a cut-out with change of wool. The presser will be busy filling the catching pens and taking the tally, and at the same time there will be part fadges from the old mob to be disposed of. Everyone should co-operate at this time.

Producing uniform bales

Capless packs should fit snugly into the box with the side seams coming to the top corner; otherwise tufts of wool will show. It may be necessary to construct a solid edge-to-edge false floor and some boxes may need a wooden lining.

To avoid rounded bales, the fleeces should be well tramped into the corners. The top layer of fleeces under the lid should be placed around

the sides. Before the first flaps are folded over, any bulges in the wool should be torn off.

To ensure bales are of uniform length, the flaps should be overlapped just 100mm, or the width of a closed hand, and clipped. The inner flaps should be secured with three clips, pushed well home, and the outer flaps with four clips. The outside clips should point well down the sides of the bale. If long skewers are used, take care in withdrawing them to avoid tearing the pack. A quick jerk should help. Removal is easier if the middle pins are withdrawn first.

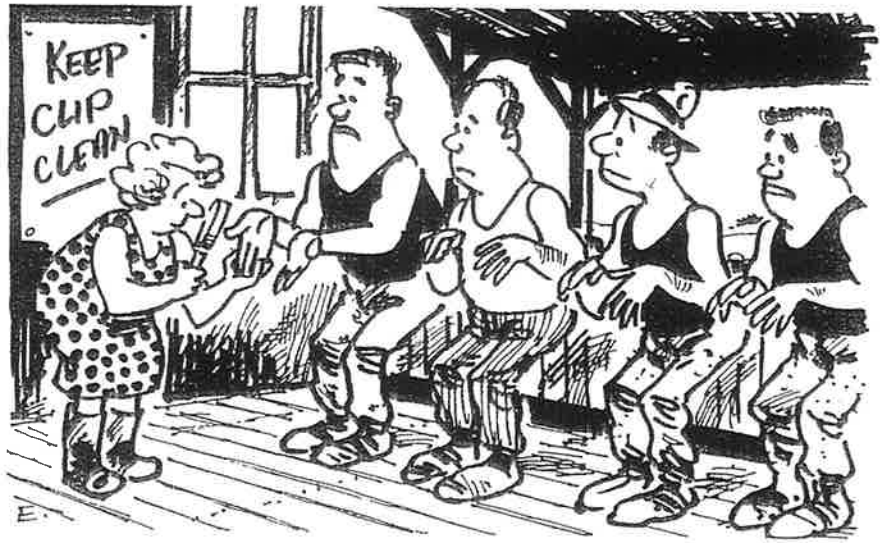
Specifications

The lines should be described and every bale accounted for in the specifications. They should then be checked bale by bale as the wool is loaded out of the shed.

The farm brand with the farmer's name and address should be included, together with instructions on the sale of the wool and a note as to whether the lines are complete and shearing finished. The specifications should reach the broker with the wool or if possible ahead of it.

Security

All bales should be branded on leaving the press and the wool shipped out as soon as possible. While it is in the shed, it is advisable to lock securely all exits large enough to take a bale.



WOOLS OF NEW ZEALAND™

Market information for wool growers

Wools of New Zealand has a variety of market information services for wool growers. Here's what's available, and how to get it.

WOOLS OF NEW ZEALAND MARKET INFORMATION SERVICES

1. Pre-sale Prices
2. Answerphone Price Report
3. Wool Sale Report
4. Verified Quotes Report
5. Fine Wool Prices Report
6. Wool Market Review
7. Fine Wool Review
8. Faxback

OTHER INFORMATION IN THIS LEAFLET:

- Auction sale roster for 1997/98
- How to operate Faxback
- Contact phone numbers:
  - For obtaining market reports
  - Wools of New Zealand staff (wool appraisers, wool production officers, market information staff).
- Order form — for ordering free market reports
- Wool Market Price Table (used for recording wool prices)

Market information is a vital management tool for when you're selling your wool, doing your shearing and making day-to-day management decisions. Longer-term information is also useful when you're making breeding decisions.

Wools of New Zealand provides market information services to wool growers for no direct charge, other than the cost of a telephone call, or a standard charge of $2+GST for Faxback calls. (Note: the Faxback charge has been reduced from last season's $4-99+GST.)

Our market reports express wool prices in cents per kilogram ***clean***. To convert to a greasy price for your wool, multiply the clean price by the average yield for your wool. Wools of New Zealand publishes clean prices, because they are a consistent basis for comparing the value of different lines of wool which may have a variety of yields.

Wools of New Zealand market information services

1. Pre-sale Prices

If you want to know the latest auction prices for your type of wool, as a guide to setting reserves, ring our appraisers in Napier or Christchurch during business hours on the day before the auction. If you have wool in that sale, please quote your broker and lot number. If you don't have wool in that sale, describe your wool to us, in terms of fibre diameter, length and colour. ***Phone numbers:*** Napier 06-835-1888; Christchurch 03-343 7912 or 03-343 7914; Dunedin 03-474 1168 (Dunedin sales only).

2. Answerphone Price Report

Whether you sell wool privately or at auction, you need to know what it is worth, to get a fair price or set a realistic reserve. For a quick update on the latest auction prices, call the Answerphone Price Service and listen to the recorded message. This includes the latest market indicators, exchange rates and prices for the list of types on the Wool Market Prices Tables. Copies of each table are included in this leaflet, so that you can write in the prices for your type of wool. Table 1 applies from July to December and Table 2 from January to June.

If none of the types closely describe your wool, you can still get an indication of what it is worth by comparing the prices of similar types of wool. For further assistance, contact your local wool production officer or appraiser. (See the list elsewhere in this leaflet.)

The table of wool types used on the Answerphone Price Service is the same as the list of types used in the *National Sale Report* (see 3 below), *Teletext* (page 226) and *Wool Market Review* (see 6 below).

Phone numbers: For South Island prices, ring Christchurch 03-348 8699, for North Island prices ring Napier 06-835 8140 and, for combined national prices, ring Wellington 04-472 9876. The service is available by 5pm on sale days.

A brief commentary on each sale is available from 04-473 8649, with an early report by midday on sale day, and a final report by 5pm.

3. Wool Sale Report

Wool Sale Reports are available by fax after each sale. These contain market indicators, composition of the offering, price comparisons and a list of prices for selected wool types. Separate reports are given for North and South Islands, plus a combined *National Sale Report*. The National Sale Report contains the Wool Market Prices Table, which is also used on the *Answerphone Price Report*, *Teletext* and *Wool Market Review*. As with other reports listed below, the Wool Sale Report is available on free 'subscription' to wool growers on request. Others can get these reports on a paid subscription basis. If you haven't subscribed to the regular reports, you can still get them on a one-off basis through our Faxback service.

4. Verified Quotes Report

If you want a list of all the prices (quotes) verified by our appraisers at a sale, you can receive the *Verified Quotes Report* following each sale, or request the North or South Island Report via Faxback.

5. Fine Wool Prices Report

If you want to follow fine wool prices, you can subscribe to our *Fine Wool Prices Report*. This is prepared after each Australian wool sale and contains a brief report on the Australian market

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and a comparison of the latest New Zealand and Australian prices. It is sent by fax to people who have subscribed through our order form, and is also available via Faxback.

6. Wool Market Review

Wool Market Review is a fortnightly newsletter which gives up-to-date market information, and prices from the latest sales. It contains the same list of wool prices as the *Answerphone Price Service*, the *National Sale Report* and *Teletext*. Special editions every two months give more information on major markets, and long-term trends, including market outlooks. It is available by 5pm every second Friday. *Wool Market Review* is free on request to woolgrowers either by fax or by post. It is available on subscription to others. It is also available via Faxback.

7. Fine Wool Review

Fine Wool Review contains the same sort of information as *Wool Market Review*, but concentrates on corriedale, halfbred and merino wools. Its price table is an expanded version of the *Fine Wool Prices Report*. Quarterly reviews contain more analysis of price relationships and market outlooks. *Fine Wool Review* is free on request to woolgrowers either by fax or by post. It is available on subscription for others. *Fine Wool Review* is also available via Faxback. It is published fortnightly from August to December and monthly from January to June. It is available by 5pm on a Friday.

8. Faxback

Faxback is not a separate report, but a way of receiving a range of market information reports by requesting a report be sent to your fax machine. Instructions for using this service are included on a separate insert in this leaflet. If you are interested in using this service, pin the insert by your fax machine.

Reports available on Faxback are: *Sale Reports (North Island, South Island or National), Verified Quotes (North Island or South Island), Fine Wool Price Report, Wool Market Review* and *Fine Wool Review.*

The cost of Faxback is $2+GST per call. This covers the cost of your phone call and the cost of transmitting the fax back to your machine.

Auction sales roster 1997/98

July 1997 31 Thursday– Nap, Chch	**August 1997** 14 Thursday – Chch 21 Thursday – Nap, Chch 28 Thursday– Chch	**September 1997** 4 Thursday – Chch 11 Thursday – Dun 18 Friday – Nap, Chch 25 Thursday – Dun
October 1997 2 Thursday – Nap, Chch 9 Thursday – Dun 16 Thursday – Nap, Chch 23 Thursday – Dun 30 Thursday – Nap, Chch	**November 1997** 6 Thursday – Chch 13 Thursday – Nap 20 Thursday – Nap, Dun 27 Thursday – Nap, Chch	**December 1997** 4 Thursday – Nap, Chch 11 Thursday – Nap, Chch 18 Thursday – Nap, Chch
January 1998 8 Thursday – Nap, Chch 15 Thursday – Nap, Chch 22 Thursday – Nap, Chch 29 Thursday – Chch	**February 1998** 5 Thursday – Nap, Chch 12 Thursday – Chch 19 Thursday – Nap, Chch 26 Thursday – Chch	**March 1998** 5 Thursday – Nap, Chch 19 Thursday – Nap, Chch 26 Thursday – Chch
April 1998 2 Thursday – Nap, Chch 16 Thursday – Nap 23 Thursday – Chch 30 Thursday – Nap	**May 1998** 7 Thursday – Chch 14 Thursday – Nap 28 Thursday – Nap, Chch	**June 1998** 11 Thursday – Nap 18 Thursday – Chch 25 Thursday – Nap, Chch

To reflect the evolving group nature of its operations the Board is forming a holding company, *New Zealand Wool Group Limited*, to hold its interests in the various business units. From 1 July the Board will conduct its limited remaining functions as the New Zealand Wool Group. These functions will include fulfilment of the Board's statutory accountability obligations, levy collection, economic analysis linked to resource allocation, Group finance and information system support, market access and communication co-ordination.

Wools of New Zealand Limited will conduct a range of programmes in conjunction with its Fernmark brand partners that build demand for New Zealand wool.

The Wool Production Technology (WoolPro) business unit will accelerate the development and transfer of production technologies and maintain a quality programme along the supply chain. WoolPro will also be contracted to manage a discreet business unit called *Wool-Net*. Wool-Net will provide price and market information to wool growers and others within the industry and will maintain the industry database.

While the business units will be empowered to operate along commercial lines, it does not mean they will be trading in wool, nor will they compete with existing businesses. They will, however, be incentivised to market the unique services they provide in order to deliver quantifiable benefits to growers.

Fernmark
Since forming Wools of New Zealand in 1994, the Board has made strenuous efforts to establish a new image for New Zealand wool internationally. The Fernmark brand is widely recognised and is a powerful marketing asset for New Zealand wool growers. It has built on the increasing identity linkage of New Zealand, New Zealanders and New Zealand businesses to the fern.

The Fernmark brand will in future be managed by Wools of New Zealand Limited but the established association between New Zealand wool and the fern will be leveraged across all the businesses of the New Zealand Wool Group.

Strategies for Improving Returns
On the basis of its analysis, aided by the GVA model, the Board will continue to build on the Fernmark Value system. This involves:

- Improving the efficiency of the supply chain, and building a quality culture along it
- Improving marketability of the national clip by better matching supply to the needs of the changing market
- Creating a flow of new production, processing and product technologies that accelerate production efficiency gains and drive innovation in the use of new Zealand wool
- Building customer demand, supported by a constant stream of innovative products.

Grower Value Added (GVA) Analysis
In the 12 months since the GVA project began, it has delivered a substantial quantity of detailed data from the industry value chain. For the first time we have been able to understand precisely where all the costs lie in the chain.

The project has also highlighted the importance of identifying not only where we can create value in the chain but also the need to establish mechanisms to capture that value. With the current state of the industry and the market we cannot assume high consumer demand and improved processing efficiencies will automatically be reflected in higher fibre prices.

We will therefore use GVA as both a guide to our own programme selection and as a means of demonstrating to our partners the value that can be created for them.

B Collins

Bruce Munro
Chairman
New Zealand Wool Board

New Zealand Wool Board
PO Box 3225, Wellington, New Zealand
Phone 64-4-472 6888, Fax 64-4-473 7872
Email info@woolsnz.co.nz
Freephone 0800 104 666

April 1998

Transforming the New Zealand Wool Board

Dear Wool Grower,

This is to bring you up-to-date with decisions taken by your Board on 1 April to approve a new structure for the New Zealand Wool Board. We know that some of this information will already have reached you through the media and directly from grower directors and other industry contacts.

Most of you will also be familiar with the activities of your Board over the past 18 months in conducting an extensive analysis of the dynamics of the industry, how value is created between farm and retail and how our levy resources can be directed to capture that value for growers.

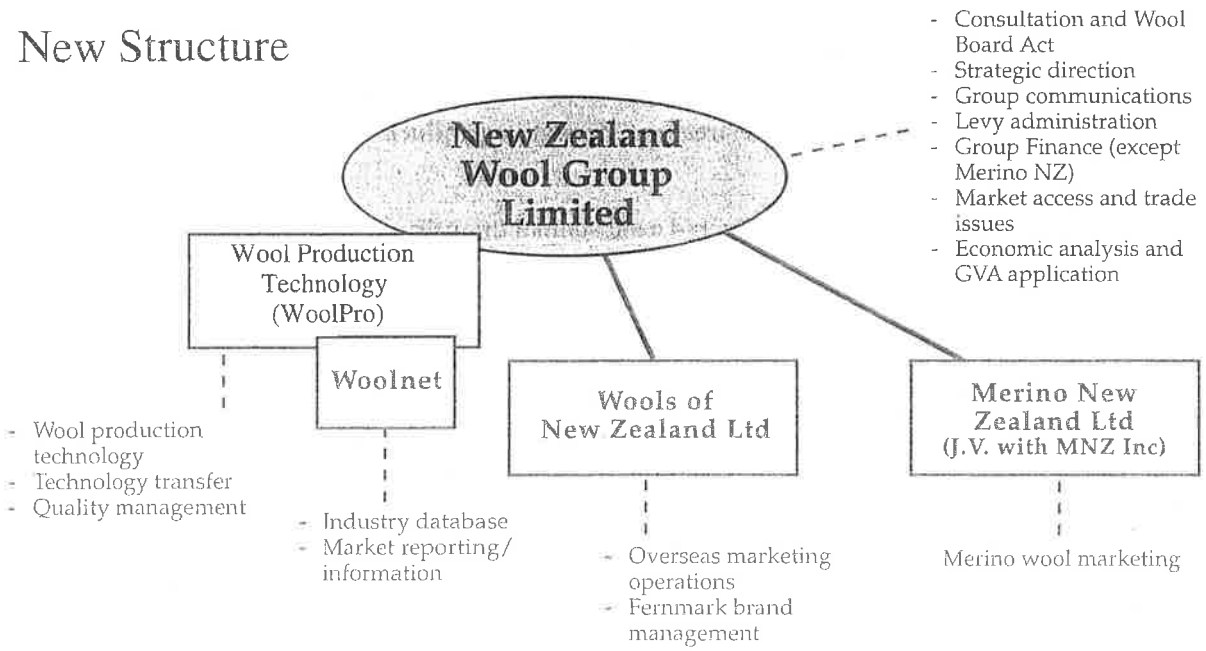
The new structure approved by the Board on 1 April, and illustrated in the chart below, allows the Board to deliver on that analysis and achieve its fundamental goal of maximising returns to growers using a more commercial structure to run the Board's activities.

As signalled by the Board in February the primary reason for establishing a new business model has been the need to separate statutory functions and operational activities, that is funding from service provision.

In doing so, and using a 'Grower Value Added' (GVA) model to identify the appropriate programme groupings, we have established business units which will focus on the key drivers in their sector. The business unit approach will provide an incentive for each to reduce dependence on levy funding as they build alternative revenue streams that reflect their creation of value.

There is a strong financial imperative for change. The Board is determined to progressively reduce its recourse to reserves in funding its programmes. The new structure enables the Board to live within a defined income and to capitalise the very considerable value and power which has already been created in the Fernmark brand since its launch three years ago.

New Structure



The chart shows the establishment of two new business units, additional to the joint venture establishing Merino New Zealand Limited announced earlier. These businesses will be established by 1 July.

Contacts

1 Pre-sale prices (wool appraisal service)

Napier 06-835 1888
Christchurch 03-343 7912
Dunedin 03-474 1168

2 Answerphone price report

Napier 06-835 8140
Wellington 04-472 9876
Christchurch 03-348 8699

Market commentary
Wellington 04-473 8649

3 Faxback

0900 SHEEP (74337) $2+GST per call

4 Wool appraisal staff

Napier	Graham Roddick
06-835 1888	Graham Foote
Christchurch	John Povey
03-348 4029	Struan Hulme
	Kerri Mann

5 Wool production officers

Cambridge	07-827 3893	John Hutchinson
Napier	06-835 1888	Lew Willoughby
Palmerston North	06-356 8611	Ken Geenty
Masterton	06-378 8106	Richard Gavigan
Christchurch	03-348 4029	Alan Marshall
Timaru	03-615 9842	Stuart Bishell
Dunedin	03-477 7353	Robert Pattison
Gore	03-208 7140	Sharon McIntyre

6 Market information staff

Wellington	David Long (market reports)
04-472-6888	Patrick Conway (market analysis)
	Steve Britland (market analysis)
	Rebecca Munson (subscription enquiries)

WOOLS OF NEW ZEALAND

Faxback

Pin this page up on your noticeboard close to your fax machine.

The Faxback service allows anyone in New Zealand with a fax machine to request a market report by phoning 0900 S-H-E-E-P (74337). There is a charge of $2 (+ GST) for each market report, to cover the cost of your call and transmitting the faxed report back to you. This charge will appear on your Telecom account. The phone call may be made either from the fax machine itself — as long as it has a phone attached — or from a telephone, in which case you give the number for your fax machine.

WOOLS
OF
NEW ZEALAND™

How it works

1. Dial **0900 SHEEP** (74337) either from your fax machine or a telephone.
2. You will hear the pre-recorded Telecom message advising what the call will cost. You will then be switched through to Wools of New Zealand's **Faxback** service.
3. You will then be given the option to request the market report of your choice. (See 'Market reports available' below.)
4. You will be asked to enter **1** if you are calling from a **fax machine**, or **2** if you are calling from a **telephone**.
5. If you are calling from a **fax machine**, enter **1**, and then you will be asked to press the **START** key on your fax machine. Following this, the report will be faxed directly to your machine. Once the fax has been sent, your call will be terminated.
6. If you are calling from a **telephone**, enter **2**, and then you will be asked to enter the number of your fax machine, and to confirm the number by pressing **#** on your telephone key pad. The call will then be terminated and the market report will be automatically faxed to the number you entered. Remember to include your area code, if you live outside the Wellington (04) area.

If you have any problems with the Faxback service, phone Wools of New Zealand, Wellington, on 04-472 6888.

Market reports available on Faxback

No.	Report Title	Contents	When available
1.	North Island Market Summary	• Brief report on auction sale • Wool market prices	Early report-12:30 pm Final report-5:30 pm
2.	South Island Market Summary	• Brief report on auction sale • Wool market prices	Early report-12:30 pm Final report-5:30 pm
3.	National Sale Report (Combined North and South Island market summaries)	• Commentary on sale • Wool Market Prices Table	6:00 pm on sale day
4.	North Island Verified Quotes	• List of verified prices • Market Indicators	10:00 am on day after sale
5.	South Island Verified Quotes	• List of verified prices • Market Indicators	10:00 am on day after sale
6.	Fine Wool Prices Report	• Latest Australian wool prices; • Comparison of Australian and New Zealand fine wool prices	10:00 am on day following each Australian sale
7.	Wool Market Review	• Market commentary • Price trends and relationships • Wool Market Prices Table	5 pm on Friday Fortnightly
8.	Fine Wool Review	• Market commentary • Price trends and relationships • Fine wool prices table	5 pm on Friday Fortnightly from August to December; monthly from January to July.

CUT THIS PAGE OFF AND PIN IT NEXT TO YOUR FAX MACHINE

Wool market prices

Table 1

Table No. 1 (July to December)

Average auction prices in NZ cents/kg clean

WOOLS OF NEW ZEALAND™

Date										
Centre										
Segment Indicators										
Fine (24 micron and finer)										
Medium (25-31 micron)										
Strong (32 micron and stronger)										
Lambs										
Market Indicator										
Exchange Rates										
$NZ/$US										
$NZ/$A										
Wool T.W.I.										
TYPE DESCRIPTION										
No.	**Category**	**Diameter Micron**	**Colour (Y-Z)**	**Length (mm)**						
Merino										
1	Fleece	18	1.0	80						
2	Fleece	19	1.0	80						
3	Fleece	21	1.0	85						
4	Fleece	23	1.0	90						
5	Pieces	21	2.5	75						
6	Bellies	21	2.5	75						
Halfbred and Corriedale										
7	Fleece	25	2.0	90						
8	Fleece	27	2.0	95						
9	Fleece	29	2.0	100						
10	Fleece	31	2.0	105						
11	Pieces	28	4.5	85						
12	Bellies	28	4.5	85						
13	Lox	28	4.0	50						
14	Crutchings	28	3.5	50						
Crossbred Full Fleece										
15	Fleece	32	3.5	115						
16	Fleece	33	3.5	115						
17	Fleece	34	3.5	115						
18	Fleece	35	3.5	125						
19	Fleece	35	5.5	125						
20	Fleece	36	3.5	125						
21	Fleece	36	5.5	125						
22	Fleece	37	3.5	125						
23	Fleece	37	5.5	125						
24	Fleece	39	2.5	125						
25	Pieces	35	8.5	100						
26	Bellies	35	9.5	100						
27	Lox	35	9.5	50						
28	Crutchings	37	5.0	65						
Crossbred Second Shear										
29	Shear	37	3.5	100						
30	Shear	37	5.5	100						
31	Shear	37	3.5	85						
32	Shear	37	5.5	85						
33	Shear	37	5.5	75						
34	Shear	37	3.5	65						
35	Shear	39	2.5	100						
36	Bellies/Pces	35	8.0	65						
Lambswool										
37	Lambs	28	2.0	50						

Wool market prices

Table 2

WOOLS OF NEW ZEALAND™

Table No. 2 (January to June)

Average auction prices in NZ cents/kg clean

Date										
Centre										
Segment Indicators										
Fine (24 micron and finer)										
Medium (25-31 micron)										
Strong (32 micron and stronger)										
Lambs										
Market Indicator										
Exchange Rates										
$NZ/$US										
$NZ/$A										
Wool T.W.I.										
TYPE DESCRIPTION										
No.	Category	Micron	Diameter (Y-Z)	Colour (mm)	Length					
Halfbred and Corriedale										
1	Fleece	25	2.5	90						
2	Fleece	27	2.5	95						
3	Fleece	29	2.5	100						
4	Fleece	31	2.5	105						
5	Pieces	28	4.5	85						
6	Bellies	28	4.5	85						
7	Lox	28	4.0	50						
8	Lambs	26	1.5	50						
9	Crutchings	28	3.0	50						
Crossbred Full Fleece										
10	Fleece	33	3.5	115						
11	Fleece	35	3.5	125						
12	Fleece	35	5.5	125						
13	Fleece	37	3.5	125						
14	Fleece	37	5.5	125						
15	Fleece	39	3.5	125						
16	Cott	37	6.5	125						
17	Pieces	35	8.5	100						
18	Bellies	35	9.5	100						
19	Lox	35	9.5	50						
Crossbred Second Shear										
20	Shear	33	3.5	65						
21	Shear	33	3.5	50						
22	Shear	35	3.5	75						
23	Shear	35	3.5	65						
24	Shear	37	2.5	100						
25	Shear	37	5.5	100						
26	Shear	37	2.5	85						
27	Shear	37	5.5	85						
28	Shear	37	2.5	75						
29	Shear	37	2.5	65						
30	Shear	37	5.5	65						
31	Shear	39	3.5	100						
32	Bellies/Pieces	35	9.5	65						
Lambswool										
33	Lambs	28	2.0	65						
34	Lambs	29	2.0	65						
35	Lambs	29	2.5	65						
36	Lambs	30	2.5	65						
37	Lambs	31	2.5	65						

Market Information order form

In order to receive market information reports on a regular basis, please complete this form and return it to Wools of New Zealand, Wellington, by one of the means listed over the page. Be sure to include your name, address and mailing number from the label on your *Wool Report*, *Wool Market Review* or *Fine Wool Review*. Please note any corrections clearly, or include the label. Don't forget to include your fax number, if you want to receive the reports by fax.

WOOLS OF NEW ZEALAND™

Name: ..... Mailing no.: .....

Address: .....

.....

.....

Fax no: (.....) .....

Please send me the following market information reports on a regular basis.

Note that all these reports are available at no direct charge to wool growers.

Report	Content	Format	NZ price*	O'seas price	My order**
Market Summaries N.I and S.I.	Brief report on each auction sale	2 page fax after each sale	$65 + GST	NZ$200	
National Sale Report	Commentary and Wool Market Prices Table	2 page fax after each sale	$50 + GST	NZ$150	
Verified Quotes Report	List of prices and Indicators	2-3 page fax after each sale	$80 + GST	NZ$240	
Fine Wool Prices Report	Latest Aus. and NZ prices	2 page fax after each Aus. sale	$100 + GST	N/A	
Wool Market Review (by mail)	Commentary and prices	2 pages; fortnightly	$50 + GST	NZ$75	
Wool Market Review (by fax)	Commentary and prices	2 pages; fortnightly	$65 + GST	NZ$200	
Fine Wool Review (by mail)	Commentary and prices	2 pages; ftntly/mnthly	$30 + GST	NZ$50	
Fine Wool Review (by fax)	Commentary and prices	2 pages; ftntly/mnthly	$40 + GST	NZ$120	
TOTAL:					$

* No charge if you are a New Zealand wool grower

** Indicate with a tick or by writing in the cost of the report(s) you wish to order.

PLEASE TICK ONE

☐ I am a woolgrower

☐ Please invoice me for the amount shown above.

Signed: ..... Date: .....

Return this order form by one of the means listed below:

- **POST IT** TO WOOLS OF NEW ZEALAND, P O BOX 3225, WELLINGTON, NZ, **FREEPOST 3325.**
  Fold the form over and seal it with tape or a staple, folding this part inside.
  No need to attach a stamp if posted within New Zealand.
- **FAX IT** TO WOOLS OF NEW ZEALAND, **04-473 7872.**
- **PHONE 0800-104-666** AND QUOTE YOUR NAME AND MAILING NUMBER FROM YOUR LABEL.
  This freephone number is available only from within New Zealand.

The personal information collected on this form will be used to distribute wool industry information. The information is collected and held by Wools of New Zealand, PO Box 3225, Wellington. You have rights of access to and correction of this information under the Privacy Act 1993.

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Market Information
Wools of New Zealand
P O Box 3225
Wellington
New Zealand

FREEPOST 3325

FOLD 2

Farm Production & Practice

Ministry of Agriculture and Fisheries

Sheep Shearing
The Wool Board Way.
Techniques

Each year 10 000 New Zealand shearers harvest 370 million kg of wool from 100 million sheep and lambs. This produces, on average, about 20 percent of the nation's overseas income.

Quality work and efficiency on the shearing board are the first important steps in processing wool.

The role of the shearer was recognised in 1953, when the New Zealand Wool Board responded to the urgent need for a national shearer training scheme. They engaged record-setting shearer Godfrey Bowen as the first permanent instructor. He developed a network of instruction courses throughout the country run by 32 selected part-time provincial instructors.

Under Bowen's supervision the training scheme has developed to the stage where the Board now employs six permanent instructors and 20 part-time provincial instructors. Between them they provide instruction for 2500 shearers annually, in courses catering for novice, intermediate and advanced trainees.

Bowen's success was founded on the development of an efficient shearing pattern. The basic principles of this style remain unchanged but the style has been adapted by the field service to take advantage of changes and developments in shearing technique, technology, and equipment.

The pattern shearing illustrated here incorporates the combined knowledge of the Board's most experienced instructors and the country's most efficient shearers.

Key Points in Eliminating Second Cuts

1. Keep bottom tooth on the skin.
2. Start and finish each blow on the skin.
3. Shear in position.
4. Shear to a pattern.

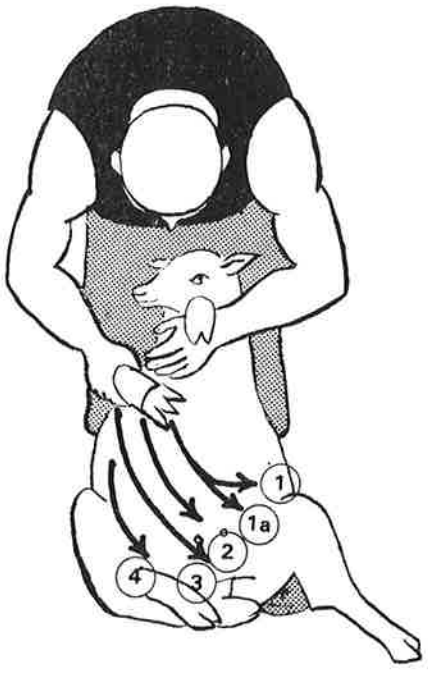

Fig. 1a: All discoloured brisket fribs must be removed with belly.

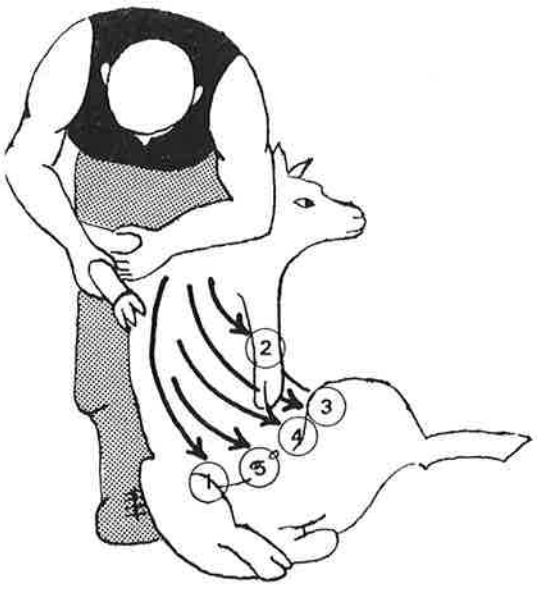

Fig. 1b: Bowen belly recommended with large sheep or Merinos.

aglink 1/3000/9/83: FPP 726

Information Services, MAF, Private Bag, Wellington, N.Z.

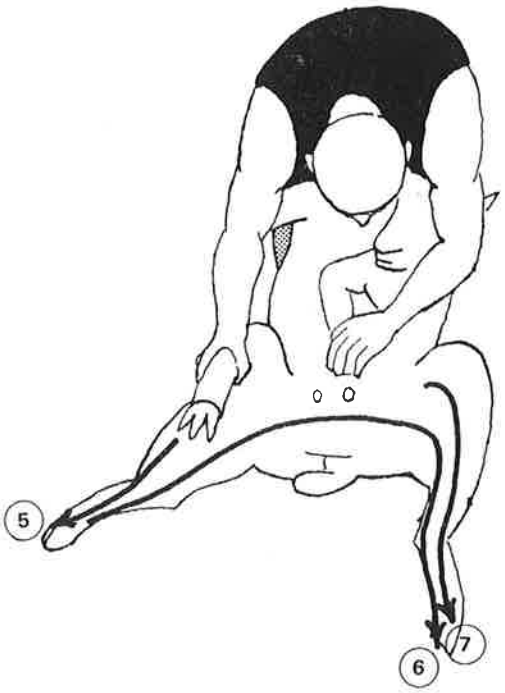

Fig. 2: Blow 6 may have to be repeated to ensure clean crutch. Cover teats on this blow.

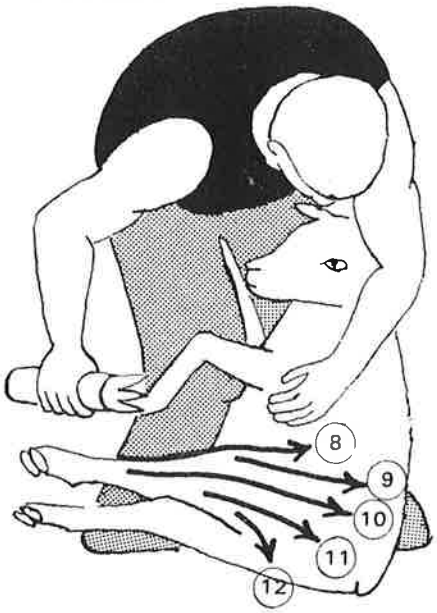

Fig. 3: Blow 9 starts at toe on top of leg. Blow 11 starts at toe on back of leg.

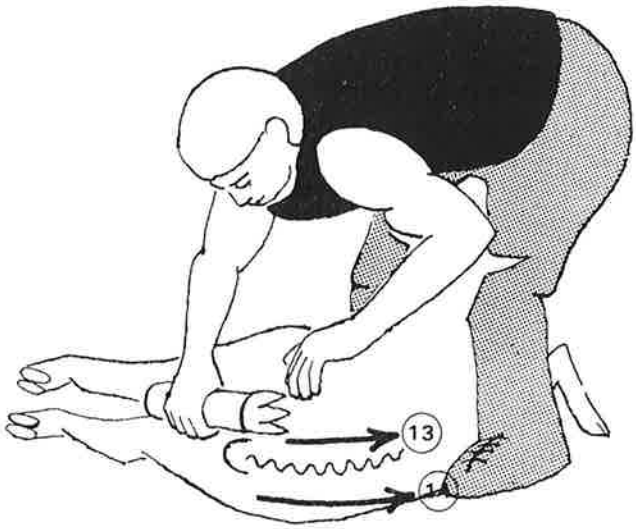

Fig. 4: ~~~~~ = Backbone. Second blow on tail must be full con under backbone.

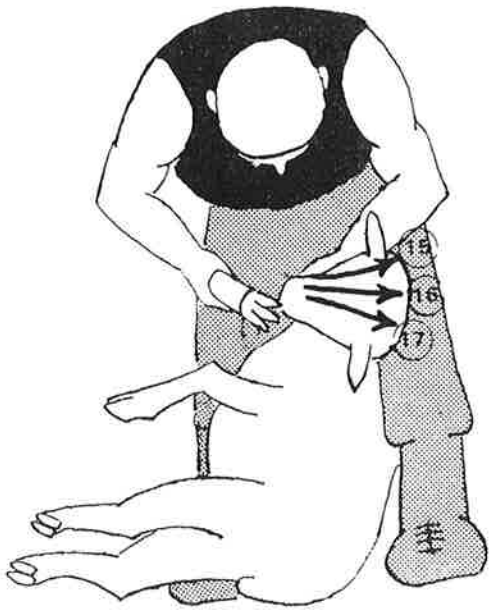

Fig. 5: Topknot.

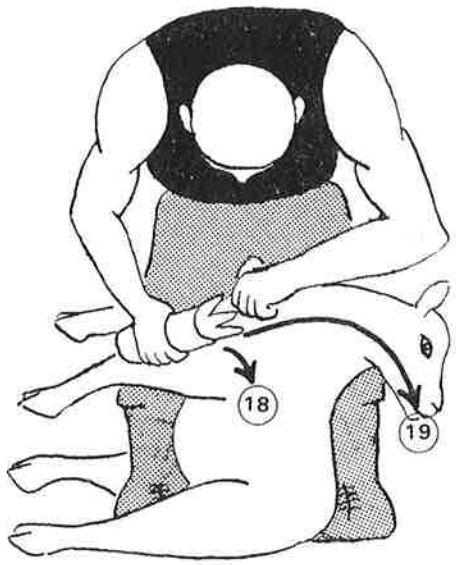

Fig. 6: Left hand stretches head back to complete Blow 19 square under jaw.

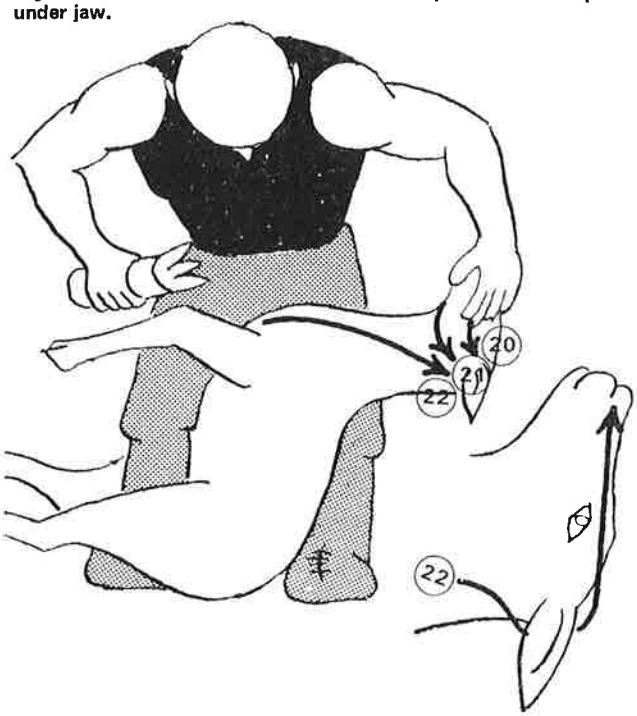

Fig. 7: On very woolly sheep, Blow 22 continues round ear as in insert.

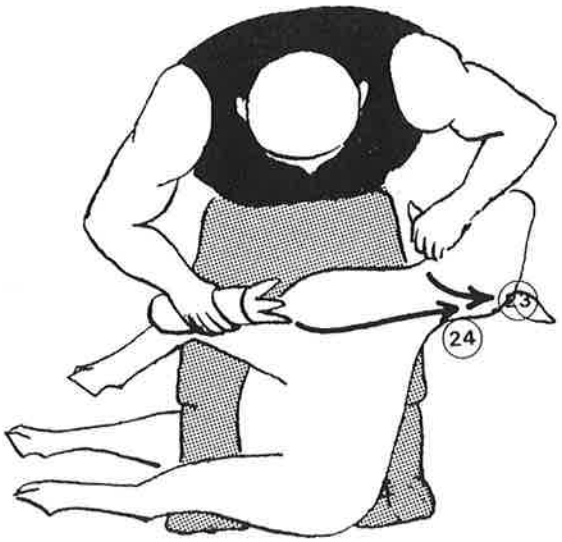

Fig. 8: Neck.

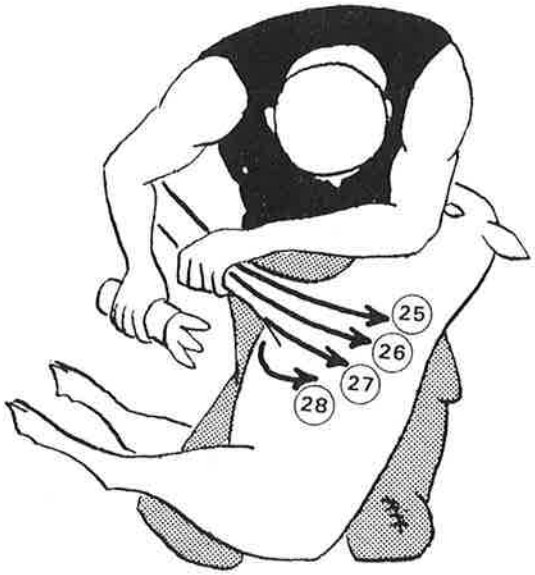

Fig. 9: Blow 26 clears tassles under leg before 27 completes shoulder. Blow 28 must not be used to remove yellow brisket fribs.

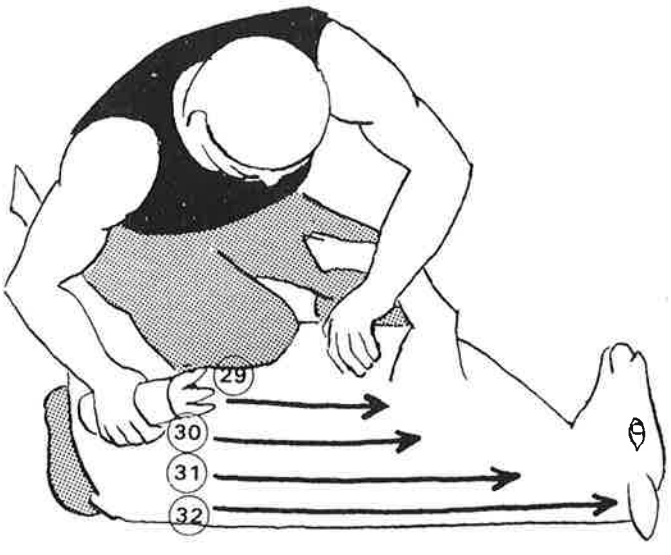

Fig. 10: Keep right shoulder low.

Fig. 11: ~~~~ = Backbone. On large sheep two full combs over backbone.

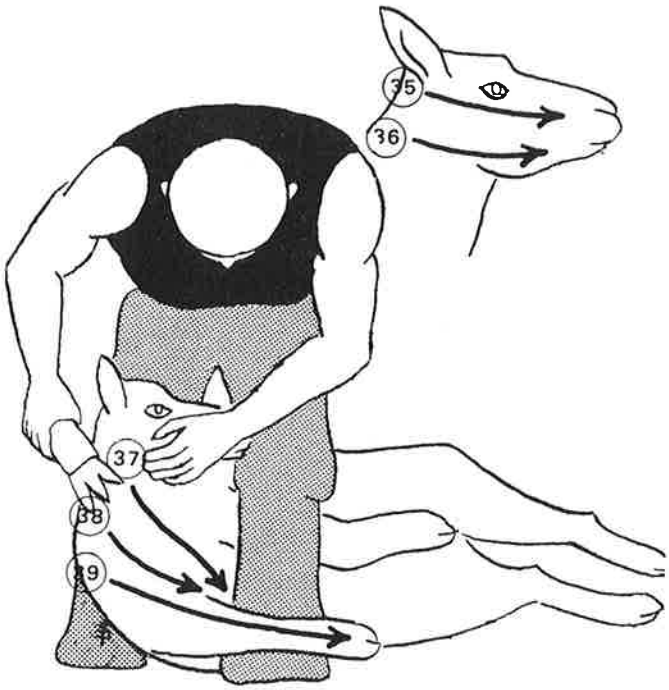

Fig. 12: Shearers knees to control head and hold fingers under jaw to lift sheep.

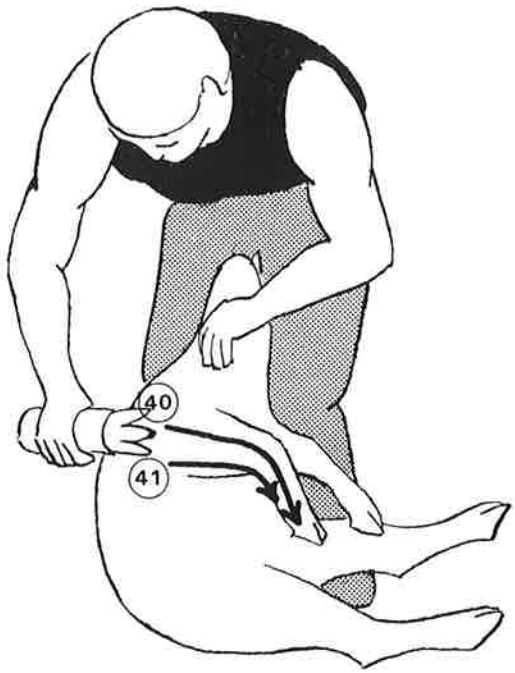

Fig. 13: Blow 41 clears tassles under leg.

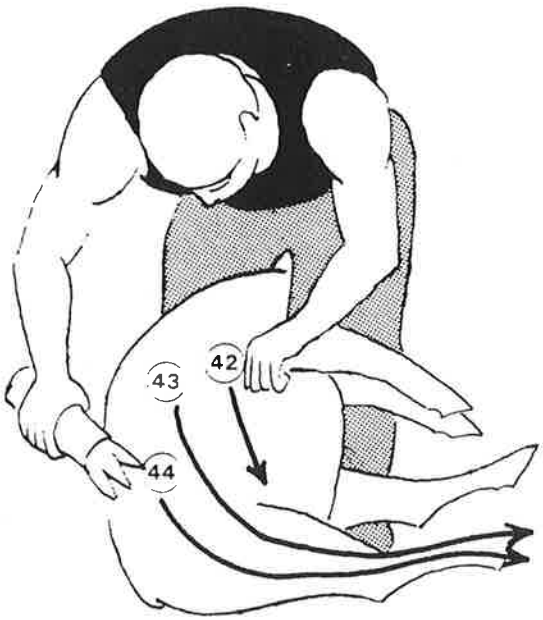

Fig. 14: Knees must stay straight on last side. NB: Two blows to the flank may be necessary on larger sheep.

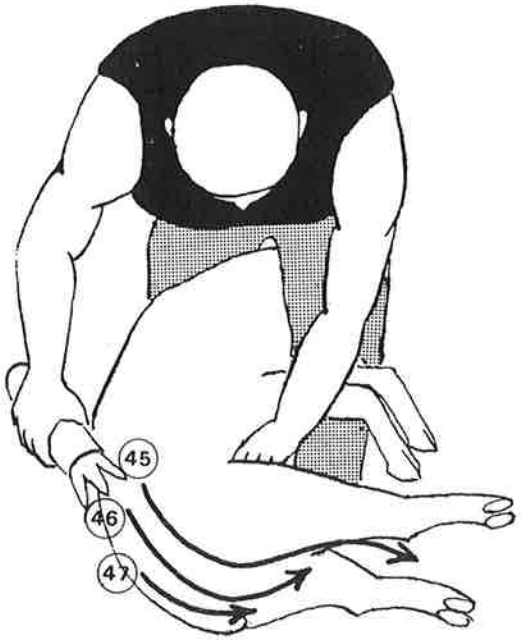

Fig. 15: Blow 46 rolls under hamstring. Fingers of left hand close on loose skin of flank, rolling fist onto firm part of leg.

New Zealand Wool Board
Information Service