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THE HISTORY OF WOOL *Fact Sheet*



Like human civilization, the story of wool begins in Asia Minor during the Stone Age about 10,000 years ago. Primitive man living in the Mesopotamian Plain used sheep for three basic human needs: food, clothing and shelter.

Later on man learned to spin and weave. As primitive as they must have been, woolens became part of the riches of Babylon.

The warmth of wool clothing and the mobility of sheep allowed mankind to spread civilization far beyond the warm climate of Mesopotamia.

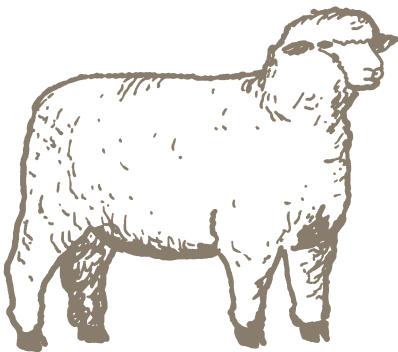
Between 3000 and 1000 BC the Persians, Greeks and Romans distributed sheep and wool throughout Europe as they continued to improve breeds. The Romans took sheep everywhere as they built their Empire in what is now Spain, North Africa, and on the British Isles. They established a wool plant in what is now Winchester, England as early as 50 AD.

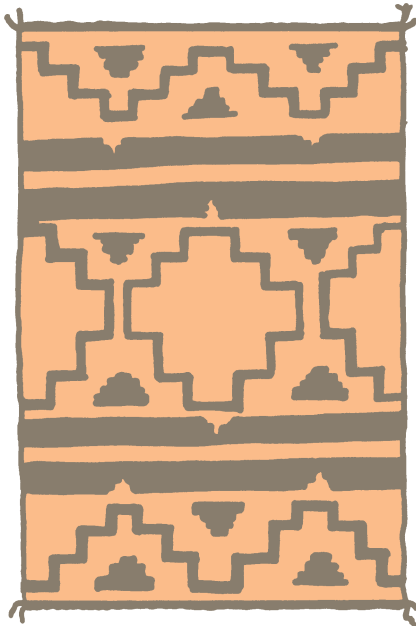
The Saracens, nomadic people of the Syrian-Arabian deserts, conquered Spain in the eighth century and established a widespread wool export trade with North Africa, Greece, Egypt and Constantinople.

During the twelfth century, weaving in Florence, Genoa and Venice was stimulated by the Norman conquest of Greece. The conquerors sent about a hundred Greek weavers to Palermo as slaves, and their extraordinary work was copied at once by Italian weavers.

Back in Spain a thriving wool trade helped finance the voyages of Columbus and the Conquistadores. Guarding its wealth closely, Spain levied the death penalty on anyone exporting sheep until 1786. That year King Louis XVI imported 386 Merino ewes to cross with sheep on his estate at Rambouillet in Northern France. The resulting Rambouillet breed is highly desirable today because of its fine and long-staple wool.

Just like Spain, England froze its borders to raw wool exports. In 1377 England's King Edward III, "the royal wool merchant," stopped woven-goods imports and the domestic weaving of foreign wools and invited Flemish weavers fleeing the Spanish invasion to settle in England where the industry thrived. By 1660 wool textile exports were two-thirds of England's foreign commerce.





Columbus brought sheep to Cuba and Santo Domingo on his second voyage in 1493, and Cortez took their descendants along when he explored what is now Mexico and the southwestern United States. Navajo and other Southwest Indian tribes are famous yet today for their magnificent woolen rugs and colorful wall hangings.

Although pelts may have been worn in Britain as early as the late Bronze Age (3000 BC) England's "empire of wool" peaked during the 1509-47 reign of King Henry VIII. He seized the flocks of the monasteries and redistributed them to court favorites. This caused unemployed shepherds to be sent to prison for non-payment of debts and was one of the unfair treatments which incited immigration to America.

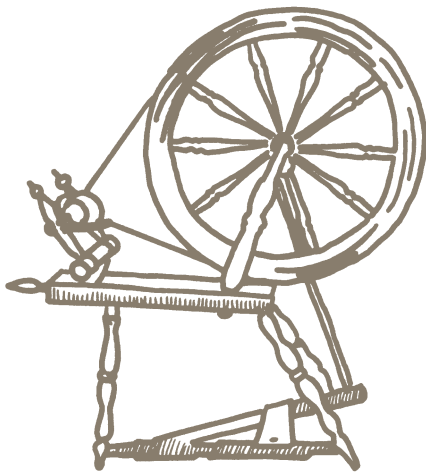
Despite the fact that England tried to discourage a wool industry in North America, a few smuggled sheep had multiplied to about 100,000 by 1665. Massachusetts even passed a law requiring young people to spin and weave. Traditions and folklore grew with the industry. Spinning duties fell to the eldest unmarried daughter in the family, hence the term "spinster." Spun yarn was wound on a reel (weasel) which made a popping sound when a given yardage was reached. Pop goes the weasel!

King George III of England made wool trading in the Colonies a punishable offense. Cutting off the offender's right hand was the chosen punishment. This policy, together with other oppressive actions including the Stamp Act of 1765, which required that revenue stamps be affixed to all printed matter and official documents in the Colonies, helped incite the Revolutionary War.

Despite the King's attempts to disrupt wool commerce, the wool industry flourished in America. Both Washington and Jefferson maintained flocks of sheep; both were inaugurated in woolen suits. New inventions like the spinning jenny, combing machines and water-powered looms, expanded the industry rapidly. Sheep moved West with civilization and beyond; at the turn of the 18th century small flocks in the hands of pioneers started the industry in Australia, New Zealand and South Africa.

Sheep are as versatile as the fiber they produce. All parts are used; they provide tender, delicious meat... and wool is a renewable resource. Sheep thrive in all 50 states and most nations of the world, often in rough, barren ranges, or high altitudes where other animals cannot survive because of lack of vegetation. Sheep can survive and flourish on weeds and vegetation other animals will not eat, therefore they convert to protein a group of natural resources which would otherwise be wasted.

Sheep fill our food and fiber needs today just as they have for centuries.



AMERICAN WOOL

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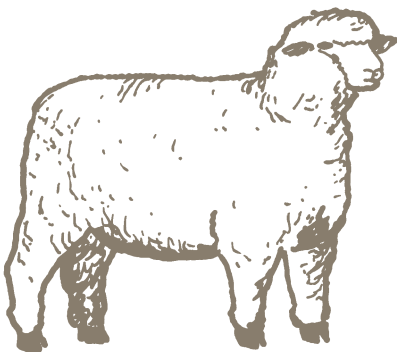
PROCESSING WOOL *Fact Sheet*

Shearing & grading
Washing & scouring
Blending & dyeing
Carding



PRODUCING WOOL For thousands of years sheep have been among the most efficient of all the domestic animals. Unlike cattle and swine, they thrive in the most extreme conditions of climate and habitat. Sheep graze easily on noxious weeds in the highest reaches of mountain vegetation where neither cattle nor elk nor deer choose to feed; thus they convert to protein for human use a whole variety of natural resources that would otherwise be wasted.

These conversions are, of course, wool—the perfect fiber for uncounted varieties of fabric, and lamb—the most tender and succulent of meats. Shear a sheep and spin its wool into yarn for a sweater or a skirt. Before you know it, the sheep has grown a new fleece and the cycle starts all over again. Wool is a renewable resource.



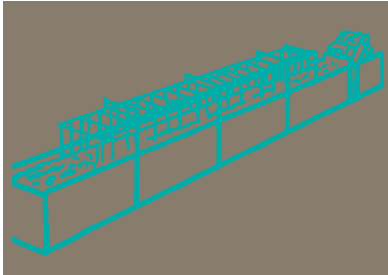
SHEARING AND GRADING The first step in processing wool takes place on the farm or ranch with shearing... usually in the springtime just before lambing. A skillful shearer, using fast electric hand clippers similar to enlarged barber's shears, can shear a sheep in about 5 minutes. He uses long, smooth strokes close to the skin in order to preserve the length of the fiber and hence the value of the fleece.

The shearer usually peels the fleece off in one piece. Then a worker rolls and ties it and stuffs it into a long bag with 19 or 39 other fleeces which together weigh from 200 to 400 pounds. He also marks the bag to identify its source (owner) before it goes to the warehouse.

Next come the buyers. They are the final judges of the value of the wool. Many times they take core samples of the bags of wool in order to measure fiber length, diameter, amounts of dirt, plastic, and vegetable matter. These factors can also be determined by experienced graders who make their judgments by visual inspection. The buyers bid on "the lot" based on the grade and/or the core samples of the wool.

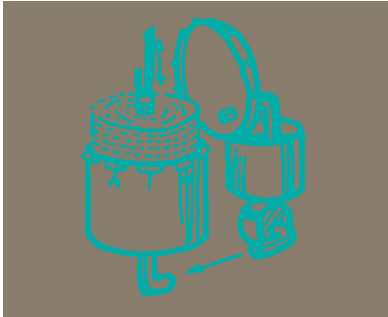
Fine and medium-fine wools of longer staple lengths (more than three inches) usually go to make light-weight worsted suit and dress fabrics. Coarser and shorter fibers, under three inches long, usually go into bulky sweater and carpet yarns.





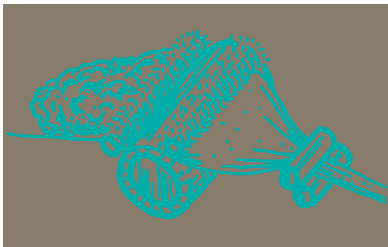
WASHING AND SCOURING The next step in the process is washing (scouring) the wool to remove grease (unrefined lanolin), vegetable matter and other impurities which gather in the wool from the range, feedlot, or shearing floor. A set of rakes moves the fleeces through a series of scouring tubs of soap and water. Impurities can weigh from 30 to 70 percent of a raw (unscoured) fleece. The first wash waters are warm—up to 140 degrees F—and the rinses are cold. Then squeeze rollers and a hot-air drying chamber bring the moisture content to the right level for the next step in processing.

The grease in wool is a wonder of its own... lanolin. It is separated from the wash water (oil and water don't mix), purified, and used in creams, soaps, cosmetics, and other products.



BLENDING AND DYEING Clean wools from several different batches or lots are often blended—mixed mechanically—at this stage. Blending unifies the slightly-different basic colors of raw wool, and also helps to standardize staple length and diameter for uniform quality.

Each wool fiber absorbs dyes so deeply that dyeing at any processing stage is equally effective and durable. Wool dyed immediately after it is scoured (washed) and blended is *stock-dyed*. Spin it into yarn first and then it's *yarn-dyed*. Weave it into a piece of fabric and then it is *piece-dyed*. To weave a patterned fabric, use either stock-dyed or yarn-dyed threads. Plain-colored fabrics are usually piece-dyed. And woolen fabrics can, of course, also be screen or roller printed in myriad colors and patterns.



CARDING The carding process passes the clean and dry wool through a system of wire rollers to straighten the fibers and remove any remaining vegetable matter. The rollers vary in diameter and turn at different speeds in order to form a thin web of aligned fibers. Smooth steel fingers then divide the web and roll the strands over onto one another to create narrow continuous ropes of fibers called "slivers."

If the batch of wool is of coarser fiber and shorter staple length (three inches or less), the machinery gently twists the slivers into ropelike strands called "roving," and winds the roving into balls ready for spinning into woolen yarns.

If the batch is of finer fiber and longer staple length (longer than three inches), the slivers usually go to the combing and drawing steps which prepare them for spinning into worsted yarn.



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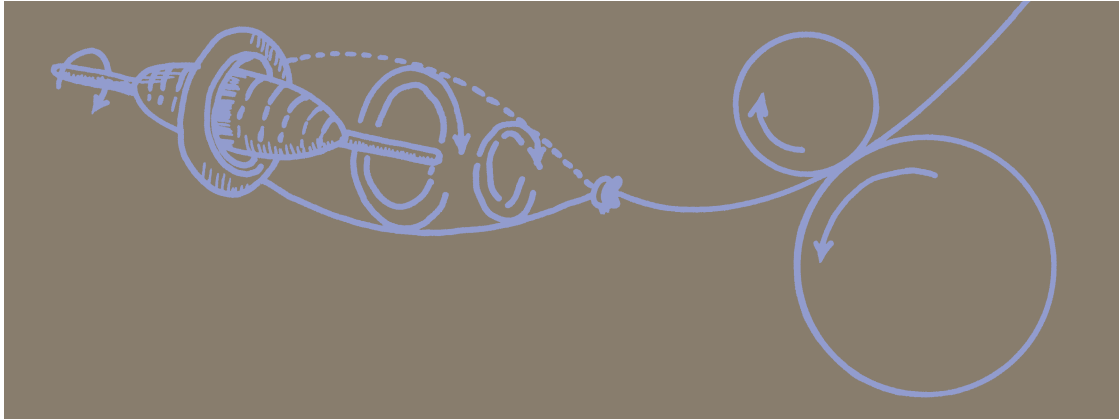
PROCESSING WOOL *Fact Sheet*

Spinning

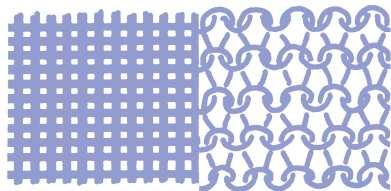
Weaving or knitting

Fulling & finishing

Chemical finishes

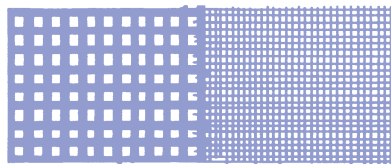


SPINNING Roving for both woolen and worsted yarns goes through the spinning process for yarn formation, making it suitable for weaving or knitting. After spools of roving are in place on the spinning frame, the ends of the roving are drawn through small rollers to extend the wool fibers still further. Then the spinning machines twist and retwist the roving into yarns of a wide variety of qualities including strength, firmness, size and ply.



WEAVING OR KNITTING Weaving produces cloth by interlacing two sets of yarn at right angles. Yarns running lengthwise in the loom are the “warp,” while yarns running crosswise form the filling or “weft.” As each warp yarn passes through the loom, it is raised and lowered by a wire eyelet through which it is threaded. As yarns are raised and lowered by cycles of the loom, a weft yarn is carried by a shuttle, (rapier or air jet) through the opening created by the warp yarns. This sequence, repeated endlessly, forms woven fabrics of almost infinite variety.

Knitting machines are just as versatile. Their mechanical needles are just as accurate and many times faster than hand knitting. Knitted fabrics are produced by interlocking rows of yarn and loops. As new loops are formed, they are drawn through those previously shaped. This inter-looping and the continued formation of new loops produces knit fabric. A circular knitting machine produces mainly jersey and a variety of double knits. Flat knitting machines produce yard goods such as tricot and raschel knits.



QUALITY CONTROL, FULLING AND FINISHING Quality control inspection is a part of the final step in fabric manufacturing. A thorough examination of the cloth identifies imperfections such as broken threads, variations in color and other undesired effects. These are removed and the area is rewoven by hand if necessary.

Fulling Once the fabric passes inspection it undergoes a controlled shrinkage process called *fulling* or *milling*. Moisture, heat and friction are applied causing the fabric to shrink a controlled amount in both length and width. This tightens the weave and improves the hand (texture) of the fabric.



Finishing Woolens are often brushed to raise the ends of the wool fibers above the surface of the cloth in a soft, fluffy nap. Naps range from the lightly brushed surfaces of a flannel to the deep-pile effect of fleecy coatings. Deep naps are produced by passing the fabric over cylinders covered with fine metal wires and small hooks. These hooks pull fiber ends to the surface and create the nap.

Worsted goes through less radical changes in finishing, although the characteristic crisp, firm appearance of worsted fabric is sometimes enhanced by special treatments. *Clear finishing* is a shearing or singeing process which gives the fabric a smooth surface and a crisp feel. *Unfinished* worsteds are lightly napped to give them a woolen-like surface producing a fabric with the softness of a woolen and the firmness of a worsted.

The *decating* finishing process is another shrinking process which gives the fabric stability. It is done by winding the fabric under tension on a perforated cylinder through which steam is passed.

Crabbing sets the cloth and yarn twist by rotating the fabric over cylinders through hot, then cold water baths. The cloth is held firmly and tightly to prevent wrinkling.

Sponging is a preshrinking process achieved by dampening the fabric with a sponge, then rolling it in moist muslin. It is applied to wool fabric before cutting to prevent possible contractions of the fabric in the finished garment caused by stresses created in manufacturing. "London Shrinking" is a popular sponging treatment which prevents shrinkage during manufacturing.



CHEMICAL FINISHES Several chemical finishes may be applied to wool, depending on their end use. Products labeled SUPERWASH®, a trademark owned by The Wool Bureau, Inc. are 100% wool that can be machine-washed (using ordinary laundry detergent) and machine-dried. The process that qualifies SUPERWASH® certification is a mild chemical treatment applied to the fiber to form a permanent microscopic film of resin which spreads evenly over the fiber surface, coating the scales of the wool fiber. The finish reduces friction and fiber entanglement and eliminates felting shrinkage that usually occurs if wool garments are machine-washed and dried. Wool can also be treated chemically to make it highly resistant to moths, stains, moisture and fire.

The finishing process is the final step in wool processing which takes the wool from the sheep's back to woven or knitted fabric.



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The Canadian Co-operative Wool Growers

The Co-operative was established in 1918 by the sheep industry as a national system of collecting and marketing its members' wool on a co-operative basis. This meant that regardless of the size of the wool clip, the time of year received or distance from the market, each member was paid the same price for the same grade of wool. Being merely an instrument of the growers, the company is non-profitable and thus operates quite simply. It collects, grades, measures and markets the wool and after deducting the cost of operations returns the entire difference to the growers.

The Co-operative grades and markets approximately 2.5 million pounds of raw wool each year; the majority of this coming from Alberta and Ontario. Each of the three general classes of wool (fine, medium and coarse) are sold wherever the best price is available.

Wool is received directly from the producer by way of truck or rail. The wool arrives in large sacks, raw from the sheep. At the warehouse it is graded according to type classification, quality (diameter and length of the fibres, amount of grease, amount of foreign matter present) and method of preparation. Wool of similar types and quality are hydraulically packed in bales weighing 600lbs. or more. They are stored until sold. Ninety percent of all the wool is exported out of Canada.

In addition to handling wool, the Co-operative operates Stockman Supply outlets across the country and a Real Wool Shop at Carleton Place. The Co-operative also publishes an annual magazine entitled The Canadian Co-operative Wool Growers Magazine, which is designed to assist the wool producer with information and a mail order catalogue for sheep supplies.

The company's mandate is to be a producer co-operative endeavouring to market wool at the top price it deserves while operating the business efficiently to maximize returns to the wool producer.

Canadian Co-operative Wool Growers Limited occupies what was once the round house and machine shops for the Canadian Pacific Railway. The Company is situated just off Moore Street in Carleton Place and is a totally Canadian Company.

HANDSPINNING FLEECE

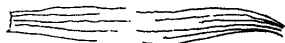
By Joanne M. Hiersch © 1988

A HANDSPINNING FLEECE is one that: 1) is healthy; 2) is clean and well skirted; 3) has the desired fineness (fiber diameter); 4) and has the desired color.

The time to start preparing to raise a healthy, clean handspinning fleece is at least 12 months before it is shorn.

Wool is the "thermometer" of a sheep's general health and condition. Healthy wool comes from healthy sheep.

RANDOM BREAKING (TENDERNESS)



HEALTH PROBLEMS:

TENDERNESS:

Symptoms: When the wool fibers are subjected to a 7 lb. pull test, there will be random breaking/weakening along the wool shafts. Tenderness is the most common problem spinners find in our local fleeces.

How to test for tenderness: Take a staple about the size of a pencil and hold it firmly at each end. Next give a steady, firm pull of 7 lbs. (think of how much 5 lbs. of flour weighs and add another 2 lbs., that's a substantial pull!). Do not twist the staple or snap it. If the fibers are "tender" you will feel "random" breaking. Hold it up to your ear and you can hear the crackling and snapping of the fibers as they weaken and break apart. A tender fleece is useless to the handspinner because as the wool is carded, the wool shafts continue to break into tiny neps or noils and the more the wool fibers are carded, the worse it gets. Yarn spun from tender wool will be lumpy and weak. Tender fleeces may be used for felting.

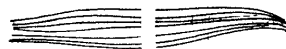
Causes: The causes of tenderness in wool are usually subtle and ongoing. Internal parasites are a frequent cause. If sheep are not wormed regularly to keep parasites at a low level, the wool production is affected. How much is enough? A rule of thumb is: the more sheep you have and the closer together they are pastured and the less pastures are rotated, the more frequent the need for worming.

Poor nutrition is another frequent cause of tenderness. Feed a high quality hay (with a minimum of 12% protein) plus energy grain for the gestating ewes. I use a Vitamin 40 stockblock (for ruminants) plus a salt block and don't forget lots of fresh water. I have found that the Vitamin 40 stockblocks give my sheep sounder fleeces, harder hooves and they are more resistant to disease.

Chronic hoof rot is another ongoing health

problem that can affect wool quality and cause tenderness.

BREAK ALL AT THE SAME SPOT



BREAKS:

Symptoms: A "break" is when the fibers weaken/break at the same point in all the wool shafts. The test for breaks is the same pull test as for tenderness.

Causes: A "break" usually results after some type of trauma occurred to the animal (e.g., a grain overload; an elevated temperature as occurs in lambing; an abrupt change in diet including water; a sudden illness; or even a dog attack).

Solutions: Shear fleeces shortly after lambing. I have found that the ewes will seek shelter more readily with their lambs. By shearing soon after lambing, you will eliminate the "break spot" and if you have lambs that like to crawl around or sleep on the ewes' backs, the less fleece, the better.

RAIN ROT:

Another health problem that seems to plague the sheep producer in wet climates.

Symptoms: A pinkish or grey-green color found in the wool usually down the back and top of the shoulders. The wool is dry and brittle as the bacteria actually rots the wool shafts.

Causes: When sheep do not have or will not seek shelter, the continual wet and dry conditions strip the wool of its protective water soluble greases and the bacteria can then grow.

Solutions: Provide shelter in the form of a lean-to from the prevailing rain. Because sheep are "flight" animals, most will resist going into an enclosed barn. However, they will go under a "roof" if they feel they can "escape." A one- or two-sided shelter closed to the prevailing weather usually does the job. You may wish to try shearing the heads and neck of uncooperative animals as sheep dislike rain directly on their skin. If a few sheep go willingly under the shelter, the rest of the flock will usually follow. Another way to help avoid rain rot or tippiness (weathering) is to trim the lamb curls off in the fall. These finer tips tend to weather easier and because the curls stick together, they form tiny pockets when vegetation and moisture collects and will work down into the fleece. Trimming off the tips gives a smoother and more uniform surface that stays cleaner with less weathering.

WOOL SCALES



MATTING/COTTING:

Symptoms: Staples are firmly meshed/felted together, usually close to the skin. Matting is actually a form of felting as the wool scales are tangled together and cannot be separated without breaking. A felted fleece is totally useless to a handspinner.

Causes: Usually caused by abrupt changes in humidity and weather conditions. Sometimes heredity plays a major role in matting. Some sheep have kemp fibers in their fleece and the kemp does shed out. This shedding, if substantial, can actually mat into the still growing wool. In the same way as a fleece that "lifts" due to illness or trauma, the wool that lifts is free to mesh and mat into the still growing fibers. Lambs that climb up on the ewes back with their wet feet and into wet wool are another cause of matting/cotting. Matting/cotting/felting conditions are heat, moisture, and agitation.

Solutions: Shear.

CLEAN WOOL:

A fleece that is free of vegetation: hay, straw, grains, shavings, sawdust, second cuts, keds, etc.

Vegetation clings tenaciously to the wool shafts. No amount of carding or hand picking can remove it all. Yarn spun from this type of wool will never be fine and smooth.

Second Cuts: They act like broken wool fibers, the more you card the cut pieces, the more they noil up in the batt or rolag. Yarn spun from this wool will have noils (tangled bits of short fibers). Be sure that your shearer knows how to shear a handspinning fleece.

Keds: An external parasite, they are very difficult to remove from the fleece as they do not come out during the carding processes, and thus must be picked out by hand. Dusting the sheep with livestock dusting powder will control these parasites.

Solutions: Keeping sheep clean has its challenges, but also its rewards. I do believe that sheep are really little "pigs" with wool on and attempt to thwart all but the most persistent efforts to keep them clean. I feed Eastern Washington timothy hay because there is very little break up of the stalks as there is with alfalfa. The added benefit is that the hay is not "stalky" and my sheep eat every blade. My feeder has a solid slanted front with an opening at the bottom where the sheep pull out the hay. I fill the feeder, which is attached to the north side of our barn, from the inside of the barn thus eliminating the hay being dripped or dragged over the backs of the sheep.

About January, when the wool is getting long on the face and neck, I shear it all off to the shoulders because all those wooly heads and necks pull a lot

of hay out of the feeder that can then be draped over the neighbor's back.

On a small spinners flock, sheep coats may be another helper. Having experimented with netting, Gortex (breathable waterproof material), scotchguarded raincoat material, waterproof rucksack cloth, ripstop nylon and fiberglass screen door material, I have yet to discover the perfect material. Gortex comes close, but is very expensive. In our climate, we cannot use waterproof materials if they are not breathable. I believe that a netting with a small enough grid to keep out the seeds and vegetation, yet strong enough to withstand the "sheep torture tests" would be the real solution.

Bedding: DO NOT USE WOOD CHIPS OR SAWDUST. Straw is still the best bet in the handspinners flock.

Keds are easily controlled with livestock dust. It is best done after shearing, but don't forget to dust the bedding material as well as the tender lambs. I have found that the Mectin wormers also help control external parasites.

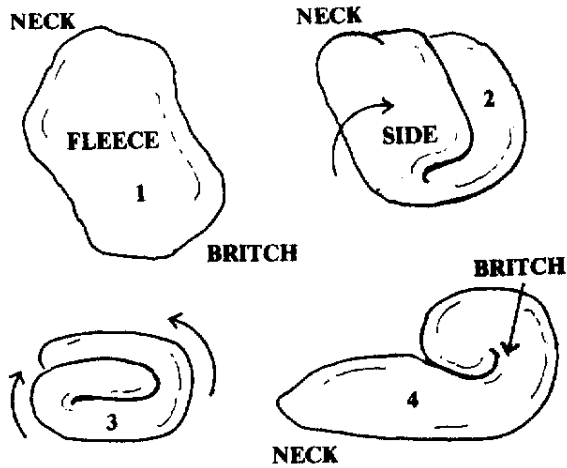
Second Cuts are all in the hands of your shearer. Some shearers are more concerned with how well the sheep looks after shearing than how the fleece is shorn off. If the shearer does not take the time to brush away the cuts from the second pass with the shears, those short fibers mix into the fleece. Have a talk with your shearer in advance and explain that you are raising handspinning fleeces for a handspinning market. If he cannot brush away the second cuts, suggest that he go back and touch up the sheep after the fleece is off. Consider paying extra for his time and efforts. After painstakingly raising a handspinning fleece for 12 months, the shearers role is crucial. Imagine for a moment that you've hired someone to pick your beautiful crop of peaches. You wouldn't want that person to fill the box from the top of the ladder, would you?

SKIRTING:

Place the fleece, cut side down, on a large table. Pull off ALL dung tags and urine/manure stained wool. Next, remove all the leg, head, neck and belly wool. Remove any britchy or hairy leg/haunch wool. If there is any rain rot, be sure to remove it all. Pick out any surface vegetation. Check the health of the wool by using the 7 lb. pull test in various places of the fleece. Grade your fleece. Check for any dampness, if it is damp, allow it to dry thoroughly before rolling.

ROLLING:

Determine where the neck and britch areas are. Fold 1/3 of one side over and across the back (right to left). Next fold the other side over and across the back (left to right). Starting at the britch end, roll the folded fleece up to the neck end. The prime shoulder wool is now on the top and is easy for the buyer to inspect. If you are selling to a handspinner, DO NOT TIE THE FLEECE.



STORAGE:

Store your fleece in large unwaxed cardboard cartons (boxes) elevated up off the floor so that air can circulate under them as well as around the wool. Every 5 or 6 days, rotate the wool in the box so that it will continue to dry evenly. NEVER STORE THE FLEECE IN PLASTIC BAGS and don't stuff a freshly shorn fleece into a feed sack. Wool needs room to "breathe" and dry. An oversized burlap bag

suspended off the floor would be an alternative way to store wool. Weigh the fleece after it has had time to dry. Spinners get upset when they pay \$5 to \$8 a pound for water. A fleece can hold 30% of its weight in water and not feel wet. For example: a 10 lb. fleece could have 3 lbs. of water, at \$5 per pound, that would be paying \$15 for water! If you weigh the fleece after it's shorn and the spinner weighs it later after it's dry, there could be a 3 to 5 lb. difference. Remember, you want the spinner to come back and buy again next year as well as tell friends about your fleeces.

After determining the health and cleanliness of a fleece, a handspinner needs to know how to determine the grade/fineness(fiber diameter) of the wool.

Most wool grades are determined by one of three methods: the blood count (the percentage of Merino blood in a particular breed of sheep) or by the Bradford count (how many hanks of yarn, each 560 yards long, can be spun from one pound of wool top) or by the Micron measure (the precise measurement of the fiber diameter using a micrometer). All of these methods of measuring require a great deal of training and skill or the use of expensive equipment.

An easier though less accurate method better suited to the needs of Handspinners for determining wool grade is the amount of crimp per inch. Take the time to count the crimp per inch and make a note on the grading/evaluation sheet. The more knowledgeable you are regarding your wool and the more information you can supply the buyer, the better.

Fine Wool (Silver Luster)	Blood Grade	Bradford	Micron	C.P.I.*
Merino	Fine	64's Finer	22.04 Under	12-23
Cormo	3/4	64's Finer	22.04 Under	12-19
Rambouillet	Fine	64's Finer	22.14 Under	12-15
Medium Wools (Silky Luster)	Blood Grade	Bradford	Micron	C.P.I.*
Targhee (Ramb/Lin/Corr/Col)	1/2 - 3/8	58's - 64's	26.5 - 21.5	9-12
Corriedale (Merino/Lin)	1/4 - 1/2	50's - 60's	31.5 - 24.5	7-11
Columbia (Ramb/Lin)	1/4 - 1/2	50's - 60's	31.0 - 24.0	7-11
Most Meat Breeds	1/4 - 3/8	50's - 60's	31.0 - 24.0	7-11
Coarse Wools (Glassy Luster)	Blood Grade	Bradford	Micron	C.P.I.*
Romney	Low 1/4 - Braid	44's - 50's	38.0 - 31.0	2-6
Border Leicester	Braid - Low 1/4	36's - 48's	38.5 - 30.0	1-6
Lincoln	Braid - Low 1/4	36's - 46's	40.2 - 33.5	1-4
Cotswold	Common Braid	36's - 40's	40.2 - 36.2	1-4

*Crimp per inch

Ontario Wool Collection Deposit

(Note: These locations and contacts may not be current. Check with the Wool Growers for current listings at <http://www.seregonmap.com/SCM/> or phone at (613) 257-2714 or 1-800-488-2714)

Contact the CCWG for bags for packing raw wool

Number & Name	Location/Details	Contact & Number
No. 1 WINGHAM WOOL DEPOT	R.R. #2, Wingham, Ontario NOG 2W0 (Formerly located at Ripley, Ont.)	John L. Farrell (519) 357-1058
No.2 GLEN HURON WOOL DEPOT	R.R. #1, Glen Huron, Ontario LOM 1S0	Richard Metheral (705) 466-3295
No. 3 LITTLE BRITAIN WOOL DEPOT	R.R. #1, Little Britain, Ontario KOM 2C0	Gord Mark (705) 786-2679
No.4 YORK WOOL DEPOT	R.R. #1, York, Ontario NOA 1R0	Jerry Kelleher (905) 772-3298
No. 5 GLEN MEYER WOOL DEPOT	R.R. #5, Langton, Ontario NOE iGO	Garnet Russell (519) 875-4007
No.6 THAMESFORD WOOL DEPOT	R.R. #4, Thamesford, Ontario NOM 2M0	Doug Kennedy (519) 285-2845
No.7 SUTTON WEST WOOL DEPOT	Sutton West	Brad Smokum (905) 836-3077
No.8 MILLBROOK WOOL DEPOT	R.R. #2, Millbrook, Ontario L0A 1G0	Ruco Braat (705) 939-2366
No.9 INDIAN RIVER WOOL DEPOT	R.R. #1, Indian River, Ontario KOL 2B0	Bill McMaster (705) 295-4231
No. 10 COOKSTOWN - BRANCH OF CCWG	Located at the Ontario Stockyards Inc. R.R. #1, Hwy. #89, Cookstown, Ontario LOL 1L0 Weekdays: 9 am- 4 pm	John Cuthbert or Al DeGasparro (705) 458-4800
No. 11 CARLETON PLACE	HEAD OFFICE & WOOL GRADING WAREHOUSE - C.C.W.G. LTD. 142 Franktown Road, Carleton Place, Ont. K7C 3P3 Hours of Operation: Weekdays 9 am - 4 pm Closed- noon to 1pm Saturday - please call ahead	1-800-488-2714 (613) 257-2714 Fax: (613) 257-8896
No. 12 MADOC WOOL DEPOT	Madoc	Terry Spicer (613) 473-1278
No. 14 HANOVER WOOL DEPOT	R.R. #3, Hanover, Ontario N4N 3B9	Judy Miller-Shelley (519) 364-6193
No. 15 BLENHEIM WOOL DEPOT	Blenheim	Calvin and Jeff Russell (905) 676-2560
No. 15 BELLE VALLEE WOOL DEPOT	Belle Vallee	Dave Wight (705) 647-8686

Wool Handling and Grading

By: Bob Shopland, Alberta Sheep and Wool Commission
(Modified by OSMA)

Shearing and Care of the Fleece

The following practices will improve the quality and increase the value of the wool clip. The manufacturer (purchaser) makes use of the wool only and not the foreign material that may be present in the fleece. Therefore, the quality of fleece is based on its clean wool content. With the exception of lanolin, everything else is waste material. Consequently, it is in the interest of the wool producer to keep debris to a minimum by all practical means, as careful preparation of the fleece will result in higher returns.

1. Consider culling ewes with black fibres and Kemp in fleeces and use good-fleeced rams (not at the expense of strong growth and reproductive traits)
2. Use feed racks and feed roughages carefully to prevent seeds, straw and chaff getting into fleeces. Keep sheep away from burrs, if possible.
3. **Do not** use tar, paint, linseed oil, oil crankcase oil, etc. for marking or branding sheep. Use only water-soluble branding fluids, approved for use with livestock.
4. Shear sheep on a clean floor.
5. Avoid “second cuts” in the wool (first cut isn’t close enough to the skin, so a second pass with the clippers is required).
6. Keep fleece all in one piece if possible.
7. Do not shear when fleeces are wet or damp.
8. Spread the fleece skin-side down on a slatted or wire-topped table.
9. Face and leg pieces should be separated from the fleece. For the black-faced breeds in particular, these areas usually contain black or grey fibres that are particularly objectionable to the manufacturer, as they cannot be used in white or pastel-coloured goods.
10. All parts of the fleece that have burrs, chaff or straw, should be removed and packed separately.
11. All dirt and manure encrusted fleece (tag) should be separated and packed separately. Damp tag rolled up in a fleece discolours and damages the surrounding wool.
12. When the low-grade wool has been removed, the most valuable portion is now ready to be tied. One side of the fleece should be folded into the centre one-third of the way and then the other side should be folded in to cover the first fold. The fleece should then be rolled tightly from the britch (hind-end) to shoulder to expose the best portion for inspection when graded (see diagram on previous page). Tie fleece with paper twine or with a strand of wool, if paper twine is not available. **Never use binder twine for tying wool. Strands of twine are a major source of wool contamination.**
13. Black and brown fleeces should be kept separate from the white fleeces. The tags and skirting should be packed separately.
14. Pack wool in clean sacks or bags immediately after shearing in large wool-bags. The upper portion of these bags should be soaked to prevent slippage while being filled, and also should have a handful of tags tied in each bottom corner to facilitate handling of the bags when they are filled. The bag should be mounted on sacking stand with the upper end supported by a ring that holds it open. The fleeces should then be placed in the bag and tramped in firmly. Tight packing permits maximum loading of shipping cars and facilitates handling. When filled, the bag should be released from the ring and sewn with a bag needle and cotton twine. One bag will hold approximately 25 fleeces or over 200 pounds.

15. Storing the packed wool is an important consideration if it is not to be shipped to market immediately. Wool can be held in storage for relatively long periods of time if kept dry and protected from insects. Market wool annually if you can't ensure that the wool will be kept clear of insects and moisture. Holding wool over may result in loss from shrinkage in weight, discolouration and moth damage

Wool Fibres:

Wool growth is a continuous process and, except for the 'hair' breeds, sheep must be shorn periodically. The wool fibre is divided into three sections: the root, the shaft and the tip. The tip of a fibre on a lamb's fleece is pointed, while the tip from a mature fleece is flat, because of previous shearing.

Sheep breed has a significant bearing on the characteristics of the wool fibre. Representative breeds of various wool grades are shown below. Individual sheep of the same breed may have wool that varies either one grade finer or one grade coarser than the breed average

Fine	- Rambouillet, Merino
Fine-medium	- Columbia, Romnelet, Targhee
Medium	- Southdown, Corriedale
Low-medium	- Hampshire, Suffolk, Shropshire, Dorset
Low-quarter	- Leicester, Lincoln
Carpet Wool	- Scottish Blackface
Specialty information)	- Icelandic, Shetland (often highly valued-contact breeders for marketing)
'Hair' sheep	- Katahdin, Dorper (these breeds do not require shearing, as the fibres are shed)



Merino Sheep

Within different breeds, the rate and uniformity of wool growth is very dependent on the sheep's nutritional status. A sheep on a high plane of nutrition grows wool with a thicker fibre than a sheep on a poor ration. Increasing protein in a ration, for example, can increase the weight of the fleece from 3 lbs to 9 lbs or more. Animals on a sub-maintenance ration will produce a weak fibred and light fleece clip. The diameter within a given fibre can vary as much as 5 microns due to changes in nutrition and the environment. A break or tender spot in the fibre may occur due to a drop in feed quality or an increase in production demands (e.g. ewes in early lactation). Fibre dimension may also be compromised when the animal is stressed (e.g. illness). Studies have also indicated that exposure to short day length results in smaller fibre diameter.

Wool Grading and Classification

To facilitate its sale, wool is classified and graded to determining its value and use. In Canada, wool is sorted based on its origin (Western or Eastern), and then graded for texture, length, and fibre strength.

Wool Grades

Texture, length and strength of fibre determine the grade of the fleece. The size of crimp or wave in the fibre varies with grade, e.g. crimp is barely discernible in fine fleeces while easily seen in coarse fleeces. Different grades of wool have different uses, e.g. fine and 1/2 staple used to make worsted cloth, 3/8 and 1/4 staple used to make blankets, coarse staple used to make carpets and rugs. The term staple denotes fleeces of fibre length of more than two inches. Clothing fleeces are those having a fibre length of less than two inches.

Range Wool is from range flocks predominantly in Western Canada. The breeds of sheep producing the finer grades of wool predominate. Wool is heavier with natural grease or oil. The following grades are found:

Fine - 22/23 Micron Wool, 2.5" to 3" Staple Length
Half - 22/24 Micron Wool, 2.5" to 3.5" Staple Length
Range 3/8 - 26/27 Micron Wool, 3" to 3.5" Staple Length
Range 1/4 - 30/31 Micron Wool, 3" to 4" Staple Length

Western Domestic from small flocks in Western Canada. The medium grades of wool predominate and there is less grease. The following grades are found:

Domestic 3/8 - 31/32 Micron Wool, 3" to 3.5" Staple Length
Domestic 1/4 - 33/34 Micron Wool, 3" to 4" Staple Length

Eastern Domestic is from sheep flocks in Eastern Canada. Medium grades predominate.

Domestic 3/8 - 32/33 Micron, 3" to 4" Staple Length
Domestic 1/4 - 33/34 Micron, 3" to 4" Staple Length

Misc. Grades

Lot A - Black or Brown fleeces
Lot B - White Fleeces Containing Black Fibres
Lot C - Grey Fleeces
Low 1/4 - Coarse - 34/40 Micron Wool Staple Length 4.5" to 10"

Separating Offsorts

S.B.O. - Sorted by owner, S.A.G. - Sorted at grading, Micron - Microscopic measurement of fibre diameter, One micron = Thousandth part of a millimetre.

Wool Classification

Manufacturers buy wool on a clean or soured basis after all dirt, grease, etc. has been removed. The amount of clean wool is estimated, or determined on actual core test or scouring results. Classification of wool is estimating the amount of clean wool in any given fleece by means of subjective measurement i.e. Bright, Semi-Bright, Dark. The amount of clean wool in a fleece depends on the breed of sheep, geographic and climatic conditions and general care of sheep and fleece.

Rejects In Fleeces

Chaff: This probably makes up the greater percentage of Canadian wool rejects. This is due to the long feeding period in Canada, and where hay is thrown out on the ground or into feeders with a percentage landing on the backs on the sheep. The top half of a sloping hay feeder should be closed in with plywood to avoid a sifting of chaff on the necks and shoulders of sheep while feeding. It is advantageous to place

the feed in the feed bunks and then allow the sheep to enter the feed area. Fence feeders prevent excess amounts of chaff getting into the wool.

Tags: Heavy manure tags and sweat locks should be removed. Soft manure can cause heavy manure tags and sheep out on lush grass or wormy sheep tend to be the worst offenders.

Kempy: Some sheep have hair growth well up the leg to give a mixture of hair and wool which degrades the fleece as it lacks strength and will not take dyes the same as wool.

Burly Wool: The wool contains burrs, which are difficult to remove from the wool.

Black Grey or Brown: Coloured fibres or patches of coloured wool in the fleece. These degrade the wool as the fleece cannot be dyed uniform and can only be dyed a dark colour.

Cotted Fleeces: These are fleeces in which the fibres have become matted or felted together while on the sheep. The condition is usually caused by sickness and lack of yoke to protect the fleece. **Soft cotts:** only a small length of the fibre affected. **Hard cotts:** most of the fibre length matted tightly.

Second Cuts: Short pieces of wool produced by cutting the staple twice in shearing.

Stained Wool: Wool that has been stained mainly by urine which cannot be scoured completely white.

Rebates and Deductions

Wool handling Rebate: is a refund based on a pre-determined rate for wool slips that are well packaged and prepared by the producer. Criteria as follows:

1. Minimum shipment 200 pounds.
2. All offsorts, dark fleeces etc., separated from main grades.
3. High percentage of bright wools.
4. Well packed sacks to reduce freight costs.

Scrutiny Fee: is a charge based on a pre-determined rate for extremely poorly prepared wool clips that require additional time and effort to grade and process, i.e. fleeces tied with baler twine or containing other contaminations.

Freight Rebate: an additional rebate for exceptionally well packed woolsacks

Supplies, Sacks and Twine: refers to purchases made of these items and charged on account. At the time of wool settlement any outstanding amount is transferred to the wool account.