

Decision making: the textile business cycle

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Introduction

Our aim in this chapter is to brush up on the processing sequence between wool production and the marketing of wool products to consumers – the textile pipeline.

We will identify the key decision-makers and understand their influence on wool usage. It is vital to understand who makes the decision to use wool in a product, as opposed to who actually buys the wool at auction.

We also need to understand the technical and commercial implications of this process to see how the decisions are translated from consumer product to raw material specifications and selection, and what buyers ultimately purchase at auction – and why. It is also important to realise that what is happening in the auction at present is not the start of the process. In fact, the fibre decision has generally been made many months before.

The wool textile industry

From a marketing point of view, there is no such thing as the wool textile industry. In fact, the only aspect of processing that can be described as unique to wool, is scouring.

Wool must compete against other fibres, many of which have been engineered for particular properties or performance and are, in the main, cheaper and easier to process than wool.

Our task is to offer consumers the range of products they desire and create profit opportunities for manufacturers and retailers, while achieving a price premium over other fibres. Achievement of these goals is essential for the survival of Australia's wool growers.

Influencing fibre choice

A typical commercial decision-making, manufacturing and distribution flow for textile products aimed at the autumn–winter retail season in Northern Hemisphere markets is illustrated in Figure 1. It is complex, and thus market signals to growers become increasingly clouded.

TEXTILE PIPELINE NORTHERN HEMISPHERE - AUTUMN/WINTER

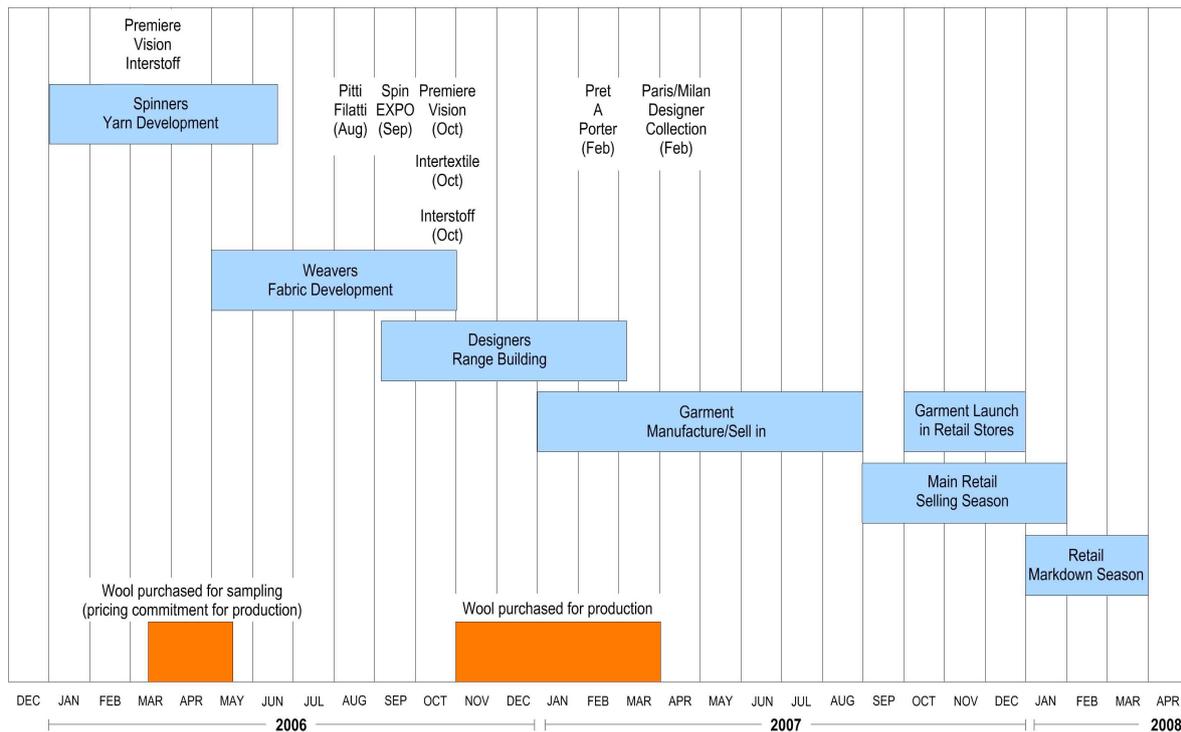


Figure 1: The textile pipeline.

The following are some key points:

- Greasy wool is bought because retailers have placed orders for garments, not because processors hope to sell tops or yarn to one of their clients. Thus, apparel wool moves along the processing pipeline because of orders for garments placed by retailers with garment manufacturers.
- The period from development of new product ideas to retail product launch can be from 18 months to two years for woven garments. The cycle for knitwear can be a little shorter, given the relatively simpler and shorter processing route.
- The principal commercial activities are development of new yarns, fabrics and garment styles, presentation of garment ranges to retailers, garment manufacturing once orders are confirmed, and the retail launch and promotion of products.
- Major international product exhibitions are held to present new products and designs to prospective buyers.

Potential new products sampled in Europe during the Northern Hemisphere autumn period will ultimately find their way onto retail shelves almost one year later. They will have been made from wool purchases triggered by orders placed with manufacturers by retailers after the samplings, on the basis of their assessment of the products sampled. Very little raw wool is bought without an order for top having been placed.

Thus, wool is ‘pulled through’ the pipeline by the retail garment trade, not pushed through by woolgrowers offering wool for sale at the other end of the pipeline.

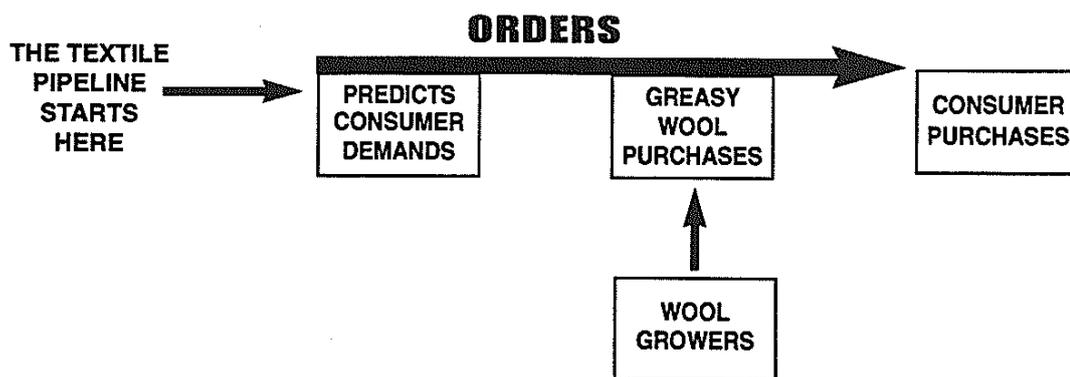


Figure 1: Wool is 'pulled through' the wool pipeline by the retail garment trade.

Retailers

Retailers determine what will be sold and the price points for the products, which suppliers must ultimately meet. They will be seeking product interest, which will provide the best stock turnover at the highest margins. In the main, there is little fibre loyalty.

Retailers also recognise that the customer is interested in styling, design, handle and, of course, price. Fibre content is usually a minor consideration.

It is the retailer who makes the first (and probably the last) decision that affects the products offered and ultimately, wool's share of these.

Garment manufacturers

Garment makers must attempt to meet the product and price criteria set by their customers, the retailers. Garment makers will seek to create product design and styling interest and will select fabrics that complement these ideas. Again, however, fibre content will not be the major consideration.

Fabric and yarn manufacturers

It is at the fabric and yarn manufacturing stages that fibre selection and the use of appropriate raw materials will be a major consideration.

Fashion determines the type of fabric and raw material and, for wool, whether it will be worsted or woollen, knitted or woven, which in turn influences weight, handle, design and colour. Importantly, these characteristics will also determine the specification of the yarn – the correct choice of wool at this stage is critical, as changes in fibre composition beyond this point are very limited.

Decisions at the yarn stage are also crucial in determining technical wool quality considerations.

Before considering this aspect in more detail – particularly as it impacts directly on what happens at auction – it is useful to take a brief look at the processing stages involved and explain their contribution to wool product manufacture.

Wool processing systems – a quick refresher

There are two main systems for processing wool from fibre to fabric:

- the worsted system
- the woollen system.

Worsted system

The worsted system is used for processing longer staple (>50 mm) wools, with generally lower levels of vegetable matter, to produce finer (thinner) yarns for lighter weight, smooth fabrics such as suiting and lightweight women's dress fabrics. The steps involved include:

- **Scouring**

scouring removes dirt and grease through washing in warm water and detergent (or in some cases, solvent chemicals)

- **Top making**

top making involves –

- carding – which disentangles scoured wool and removes vegetable matter, while forming the wool into a continuous rope or sliver
- gilling – through a sequence of rollers and bars with pins or combs, a number of card slivers are blended together and the fibres aligned (made parallel with one another)
- combing – which continues the fibre alignment using a finely pinned circular comb to remove the remaining vegetable matter and short fibre (noil), to produce a top, which is wound into a ball or 'bump'.

- **Spinning**

spinning involves –

- drawing – drawing or drafting of the fibres reduces the thickness of the sliver through a succession of stages until a 'roving' is produced for subsequent spinning into yarn
- spinning – the yarn manufacturing stage in which the roving is further reduced in thickness to the required yarn fineness (or count), to which twist is applied to bind the fibres together for strength.

- **Fabric making and knitting**

This part of the process involves –

- weaving – a loom interlaces yarns at right angles to one another to form a fabric
- knitting – fabric or garment is formed through interlocking loops created by needles
- dyeing – can be carried out at various stages in processing: in loose form after scouring or at the top, yarn, fabric or garment stage

- finishing – involves a number of processes designed to influence the required handle, drape, surface appearance and other aesthetic properties, using chemical and mechanical treatments, such as ‘shearing’ or ‘cropping’ to reduce the hairiness of a fabric.

Processing firms may be vertically integrated, with all processes carried out by the same company. Many mills in China, for example, are almost vertically integrated – typically, all operations are carried on in the one organisation except for scouring.

Vertical integration is not as common in most Western countries, where firms tend to specialise in individual activities, such as top making, spinning, weaving or knitting. It is for this reason that proposals to brand Australian wool and maintain its integrity to point of retail sale is generally difficult to achieve in other than vertically integrated mills, due to the fragmentation that occurs, particularly at the top and yarn manufacturing and distribution stages.

Woollen system

The main steps in the woollen system are scouring and carbonising, carding, spinning, weaving and knitting, dyeing and finishing. The woollen system is used for processing shorter greasy wool (less than 50mm in length), such as crutchings, pieces, lambs wool and noils from the top making process, which often have higher levels of vegetable matter, and produce heavier and more ‘hairy’ products, such as blankets, bulky knitwear, flannels, tweeds and upholstery.

The mechanical processes are essentially the same as those in the worsted system, with the exception that often the wool is carbonised before scouring. Carbonising uses mild acid solution to break down high levels of vegetable matter, after which the vegetable matter is crushed and beaten out during the carding operation. Furthermore, there is no combing stage, thus the yarn contains non-aligned fibres, which give it its characteristic bulk and hairiness.

The above is only a brief outline of the processing sequences. It should be noted that there can be more than 30 stages involved.

We will now return to the influence of the yarn manufacturing: stage on wool selection and specification.

Relationship between yarn specification, top specification and wool selection

The yarn specification will, in the first instance, be influenced by the type of product, that is, whether woven or knitted. For knitwear, fashion will determine whether a fine, soft, smooth appearance is required or, conversely, whether a crisper, bulkier and more hairy appearance is sought. This in turn influences whether a worsted (combed) yarn or a woollen (carded) yarn is to be used. For the former, generally finer micron, longer combing wools will be purchased, whereas for the latter, cardings, lambs or carbonised wools will usually be used.

To forecast demand for particular types of wool therefore requires an understanding of textile and fashion trends, but given the fickle nature of fashion, attempting to predict trends in micron and specific technical characteristics with a high degree of precision is difficult.

The yarn specification, in the case of worsted spun yarns, will determine the specification for the wool top in terms of micron, mean fibre length (Hauteur), coefficient of variation of mean fibre length (CV of Hauteur), short fibre content, dark fibre content, colour and other

parameters. Each of these particular parameters will become important determinants of the range of greasy wool types that subsequently make up the top.

Another important factor is the element of risk. This relates directly to the roles of the top maker and wool buyer. As discussed earlier, the time frame involved in developing a product to its retail launch can be up to two years. As a consequence, buying decisions at every stage (from garment to fabric, fabric to yarn, yarn to top and top to greasy wool) might involve forward price contracts or commitments for the supply of products of a given specification, volume and price, for delivery at a specific future date. The risks in this process should be evident. They are exacerbated in the case of wool, where supply conditions and auction prices can be unstable.

Wool buyers (exporters) are not the fibre decision-makers, but they play an important risk management role for the wool industry. They manage the risk associated with wool selection and product quality and need to accommodate foreign exchange risk, predict future market prices and meet shipping deadlines.

RISK MANAGEMENT

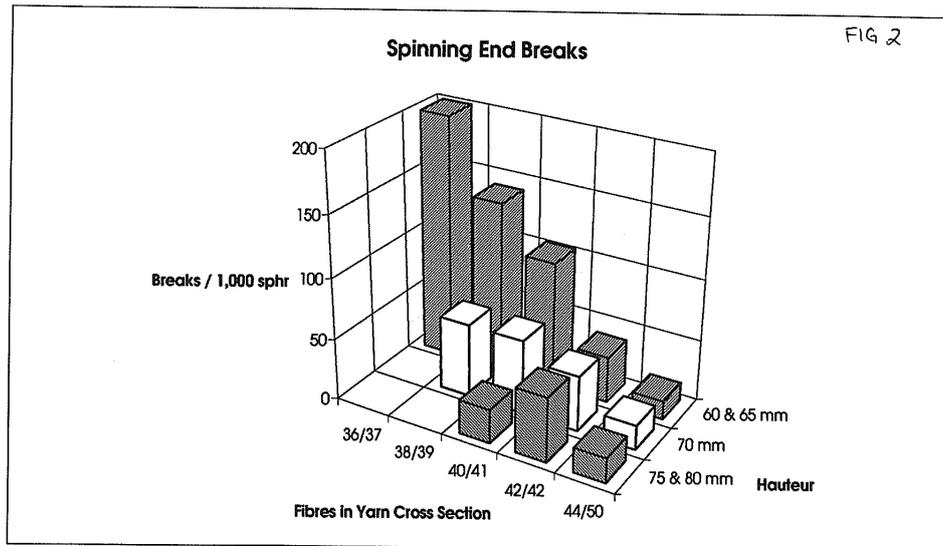
- QUALITY OF DELIVERY
- PRICE RISK
- FOREIGN EXCHANGE RISK
- DELIVERY DEADLINES

The top maker and the wool merchant

Once the raw material decision has been reached, the risks associated with delivering to the correct specification at the contracted price, are taken, in the case of worsted yarn manufacture, by the top maker and, subsequently, the greasy wool merchant.

The range allowed for each characteristic of the top determines the degree of flexibility that the top maker and/or greasy wool merchant has in selecting a range of wool inputs to meet the required specification and price.

It will be necessary to have an accurate knowledge of the processing capabilities of the scouring and combing mill, together with the processing characteristics of various wool types that can be blended together to meet the top specification at the lowest input cost. When it comes to spinning performance, fibre diameter is supremely important.



AWRAP

Figure 2: Relationship between fibre diameter, number of fibres in the yarn cross section and breaks in spinning.

Product specification along the textile pipeline

The following example shows the sequence by which specifications are developed for each major processing stage. It starts with a yarn specification, which leads to further specifications for top, combined (average) greasy wool in a consignment and finally to the individual greasy wool lots bought to make up the mill consignment. We show three examples of many possible mill consignments that a wool buyer could assemble to meet the same yarn and top specification.

Yarn specification

2/48 nm (metric yarn count) weaving yarn.

What does the yarn specification 2/48 mean?

The 2 is the number of single yarns twisted together. It is normal to take two single yarns and twist them together to form two-fold yarn, which has the required strength and abrasion resistance for weaving.

The 48 is a metric measure of the weight of the yarn. There are 48 kilometres per kilogram in each of the constituent yarns. Usually, the higher the count, the finer the yarn and the finer the fibre required. There is a minimum number of fibres needed in the cross section of a worsted yarn (usually around 40 to 45); hence, the finer the diameter, the finer the yarn that can be spun.

Top specification

Micron: 22.0 μm

Average fibre length: 70 mm Ha (Hauteur)

CV of Hauteur: Max 48%

Fibres <30 mm: Max 12%

Dark Fibres: 10/100g

Greasy wool specification

Average Micron: 21.7 µm

Average VM (Vegetable matter): 1.5%

Average Staple Length: 85 mm

Average Staple Strength: 40 N/ktex (Newtons/kilotex)

The top specification reflects the top characteristics to spin the above yarn. Other top specifications could meet the same yarn specification.

Note: these values are not recipes for top making, but are examples only.

Mill consignment

Example 1 Type	Example 2 Types	Example 3 Types				
79	63B	W ¹ 123P	W ¹ 85C	79C	80B	85B
	79	120PS	94	W ¹ 94B	79B	89B
	W ¹ 73	W ² 79	H ¹ W ¹ 79	86	79C	
	85	W ¹ 80	W ¹ 79C	73C	W ¹ 63	
	159AB	W ² 85	99B	79	63C	

The wool in Example 1 (fleece wools only), would be easy to process but expensive to buy. Example 2 is more typical, consisting largely of conventional fleece wools and shorter, weaker wools (such as pieces and skirtings), which should be assembled with the aid of objective measurement.

Example 3 may surprise you. It shows how a sophisticated buyer, with the aid of objective measurement and a computerised prediction program, could achieve the top specifications at minimal cost by using a wider range of wool types (fleeces, pieces, weaker wools)¹.

The lesson to be learned from this is that widening the range of specification (with knowledge and skill) will result in the required yarn at lower wool input costs.

The benefits from using objective measurements, staple measurements and the Trials Evaluating Additional Measurements (TEAM) formulae to improving the precision of blend selection to meet top parameters and predict processing results, cannot be over emphasised. These aids are an important source of value-adding to Australian wool.

Wool growers and top making

There is an increasing desire by wool growers to become more involved with downstream activities in the wool industry, in the belief that this allows them to better meet the needs of their customers. However, wool growers should not assume that becoming involved in processing is automatically more profitable.

¹ The wool type descriptions used in this example are based on the type list of the Australian Wool Corporation (1994)

The importance and benefits of full objective measurement apply equally to a wool grower who is considering processing, as they do to established wool processing mills and exporters. Wool growers with an interest in top making need to understand the importance of blending parcels of greasy wool (each of which might have different quality and technical characteristics), and the methods used by manufacturers to select raw material to meet end-product requirements. Objective measurement also provides the means to assess the performance of the commission comb. Since the adoption of objective measurement, top makers increasingly seek blends on the basis of finely tuned, precisely monitored objective measurement specifications.

Woolgrowers considering top making must be able to determine from the greasy wool input the predicted processing results using the TEAM prediction formulae. Wool growers should advise commission combers what top length they expect from the combing parcel, and this can only be done with the use of complete objective measurements.

The objective of buying and selecting greasy wool is to make a wool top. **Selecting the best lines of various wool clips because they are the longest, strongest and brightest and then making a wool top, does not necessarily produce a wool top that will be easy to sell or achieve a premium price.** A top that is too long for the micron and too good for the market might have to be sold at a discount, which can defeat the objective of growers processing their own wool in order to obtain a better return.

Industry risk versus profit margins

There is a dangerous assumption in some sectors of the wool industry that because profit margins become much greater as you proceed along the processing chain, the further growers take their wool along the chain, the higher the guaranteed returns will be. However, as well as adding value to the product, each manufacturing stage involves an increased degree of risk.

Top makers face risk because their wool top must meet the spinner's technical and price requirements. It should also be noted that top makers do not select a single grower clip, nor a particular line to process. They will generally blend a number of individual growers' lines representing different technical characteristics, which, in combination, give them the required technical and commercial result. Because of this process, some people have advocated that there is no need to separate lines, and crutchings can be 'thrown in' with fleeces, because this is 'what top makers do'. This is not the case. Top makers need to know with precision that each of the individual lots meets specific technical parameters and they can accordingly combine individual components to achieve a required specification. Otherwise, they face the prospect of rejection of the consignment or a quality claim by their customers.

Another development taking place that has the capacity to alter relative risk and margins is the advent of 'just in time' or 'quick response' practices – particularly at retail level. This had the objective of shortening delivery times by the manufacturer, with the retailer placing orders as late as possible. As a consequence, more pressure is placed on the top maker as delivery times shorten, and this extra risk may result in an increase in top maker's margins to maintain profitability.

Spinners and weavers are placed in a similar position where they have to be ready to meet orders that may not be placed until the last possible moment. They may also be required to hold onto finished stock for longer periods, increasing stockholding risks and financing costs.

Garment manufacturers carry more of the risk associated with fashion than those earlier in the pipeline. They have to design their ranges and ensure they can manufacture and sell these to the retailers. Their margins must take this risk into account. Garment

manufacturers may not aim to make a profit from every garment but, rather, sell a particular range of clothing over which they hope to profit.

Retailers ultimately carry the highest risk, which is associated with the fashion element of garment manufacturing. If the garments do not sell, retailers are forced to keep reducing margins until the stock is cleared.

Who is the customer?

The task of establishing just who is the customer for Australian wool is a long and complex process. It is important to recognise the interdependence of the various participants in the fibre decision-making process. Clearly, our customers at auction are not the final users and consumers of the wool they purchase. There are many decision-makers involved in the manufacturing and distribution pipeline who can influence whether wool, and in particular Australian wool, is used.

Therefore, it is crucial that promotion and marketing efforts are directed towards influencing the fibre choice decision in favour of Australian wool as early as possible in the pipeline. By maintaining Australian wool's quality image, developing fashionable and innovative products, establishing price competitive sources of manufacture and, importantly, ensuring that it is profitable for processors, manufacturers and retailers, Australian wool will be incorporated in their ranges.

Above all, we must ensure that the final customers are satisfied that products made from Australian wool are worth the extra price premium – because they are the ultimate decision-makers.