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AN INDUSTRY BRIEFING

WOOL, FASHION AND SUSTAINABILITY

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FOREWORD

Sheep wool is the most popular animal textile fibre. Its annual global production has hovered around or just above the one million mt mark for the past decade. But the historical trend in terms of wool production is downwards. Global wool output was almost two million mt as relatively recently as 1990; output has fallen steadily since, albeit plateauing in recent years.

This trend has seen wool lose market share to other textile fibres, particularly synthetic fibres such as polyester and nylon but also man-made cellulosic fibres, most pertinently viscose.

The increase in popularity of synthetic fibres has been dramatic. This growth has gone hand in hand with the advent of fast fashion. Virgin polyester is cheap and is rarely, if ever, constrained by supply issues. This makes it the perfect foil for the fast fashion industry which relies on an abundance of cheap, readily available raw materials.

Wool's reduced market share cannot just be put down to these pricing dynamics, however. In recent years, the wool industry globally has come under scrutiny from various directions. These include the animal rights lobby: Peta now argues that *all* animal-derived fibres are inherently cruel and should be phased out.

Wool has also been penalised by attempts to score textile fibres based on how sustainable they are. In 2009, an NGO called Made-By (which went into administration) began this trend. It gave wool a surprisingly poor environmental rating.

This trend continued with the launch of the Higg Index, which was created by the Sustainable Apparel Coalition. Again, this gives wool (and other natural fibres) a poor environmental rating vis-à-vis their man-made counterparts.

Wool, then, has suffered on animal rights issues as well as the environmental rating front. There is, to some degree, a case to answer in both these areas. No fibre should receive a free pass on sustainability and this paper will explore critiques of wool.

And yet, at a time when virtues such as biodegradability, durability and longevity are increasingly brought to the fore in sustainable fashion circles, it seems incongruous that wool – for some brands at least – has been falling out of fashion.

This paper attempts to ask why that is.

Discussions around textile fibres, the benefits of one fibre over another, LCAs and so on can be complex and nuanced. We look at these, hopefully in a way that is coherent and easy to follow.

This paper also presents up to date thinking around wool and where it ranks on some of the most important issues of our time. These include recyclability and circularity, biodegradability (and microfibre/microplastic release), regenerative farming and other issues in between.

For full disclosure, I am a wool fan and have made no secret of that in the magazine I edit.

But I am a journalist and researcher first and foremost, and with this paper I wanted to produce something balanced and informative, and which can hopefully help fashion sourcing teams make decisions which are better for the planet.

Finally, it's important to be transparent about how we put this briefing together. Sponsorship was kindly provided by BKB South Africa, Australian Wool Innovation, Schneider Group, American Sheep Industry Association and N. Schlumberger.

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Brett Mathews
Editor
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WOOL AND SUSTAINABILITY: AN OVERVIEW

While this paper was being produced, the European Union unveiled its Strategy for Sustainable and Circular Textiles. In the strategy, the EU was surprisingly critical of the fast fashion business model, especially when one considers that many of the world's largest fast fashion retailers reside at the heart of the EU.

The EU's publication of this strategy appears to mark a step-change in its approach to the fashion industry, with relevance for all textile fibres.

Previously, the EU authorities have taken a laissez faire approach to fashion, letting the industry largely self-regulate via voluntary initiatives.

The EU's strategy appears to indicate this will no longer be the case, and regulation will likely be introduced in several areas. These include unsubstantiated sustainability claims, an over-dependence on polyester (driving fast fashion), microplastic release from clothing, and the needless destruction of textiles.

Notably, these and other issues floated by the EU have become the battleground in the debate which has raged in recent years around the comparative merits of synthetic and natural textile fibres. This, of course, has implications for wool.

Critiques of wool

Wool's opponents have, historically, criticised the fibre on two fronts: the environment and animal welfare.

To begin with the latter, the most extreme critique has come from animal rights groups, and particularly Peta. Late last year, we had a lengthy conversation with Peta about its "all animal fibres are cruel," stance.

We asked Peta whether by encouraging people not to wear wool, they were not pushing them inadvertently towards synthetic fibres, which as well as having a large environmental footprint, also harm wildlife in, for instance, oil extraction.

Peta's spokesperson told us: "So many people believe the choice stands between wearing wool and wearing synthetics – which, luckily, is not the case. Natural, sustainable vegan options include organic cotton, linen, Tencel, bamboo, hemp and more."

All these fibres offer very solid options where the environment is concerned. But all are produced in relatively tiny quantities where polyester represents more than 60 per cent of global fibre production.

There are two more points to note around animal welfare. One is that growing swathes of the global wool industry are now adhering to standards which cover animal welfare issues, such as the Responsible Wool Standard, in line with the demands of fashion retailers. There will be no turning back on this issue, with textile supply chains (and not just wool) under heightened scrutiny.

The second is mulesing, which is the surgical removal of strips of wool-bearing skin from around the breech (buttocks) of a sheep to prevent the parasitic infection flystrike (myiasis). Australia is the last major wool producer where this practice is still occurs. That said, some producers are moving away from the practice; also, for context, Australia is the world's largest exporter of non-mulesed wool

Environmental Aspects

Peta also pointed us to the Pulse of Fashion Industry Report's analysis of the cradle-to-gate impact of several materials. They said: "We can see some of the most harmful synthetics, such as polyester, acrylic and nylon are included on the list – and in fact most people are aware of the damage caused by these materials. But wool ranks higher than all of them."

The Pulse report draws on data from the Higg Material Sustainability Index (MSI), and here we come to the crux of the issue. Higg covers cradle to factory gate only. The wool sector has consistently argued that this measuring tool only focuses on life-cycle stages where wool performs poorly compared to its synthetic fibres. This means it is only capturing stages of production where wool's impact weighs the most, ignoring the parts where it offers benefits.

" We can see some of the most harmful synthetics, such as polyester, acrylic and nylon are included on the list – and in fact most people are aware of the damage caused by these materials. But wool ranks higher than all of them "

Wool's advocates claim it is the use phase where wool's environmental benefits begin to stack up, hence Higg does not do wool justice. Conversely, if Higg were to go beyond factory gate, the negative impacts of polyester would become more apparent.

One of the reasons the EU's new textile strategy is so eye-catching is that it puts the EU's authorities on a potential collision course with the SAC and its members. This detailed document is heavy

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on words such as 'durability' and 'longevity' which have become part of the wool industry lexicon over the years.

Likewise, the EU strategy is highly critical of fast fashion, and makes a direct link between the growing use of polyester and the burgeoning fast fashion sector.

It is an uncomfortable truth for the SAC that if one were to invent, from scratch, a tool to justify and legitimise fashion's heightened use of polyester, the Higg MSI would be that tool.

Our take on all of this is that, if the EU presses ahead with enforcing its strategy, the Higg MSI will need to be drastically revised to include full lifecycle, cradle to grave impacts. Wool and other natural fibres would surely be beneficiaries of such a revision.

The Case for Wool

But what of wool? We spoke to several industry stakeholders on wool's sustainability claims and the answers were clear and consistent.

Peter Ackroyd MBE has worked in the wool industry for just shy of 50 years. He serves on the IWTO executive committee and, in addition to his Australian and IWTO duties, he is currently the chief operating officer of the Campaign for Wool.

"Wool is natural, biodegradable, renewable and hypoallergenic," he told us. "When it's cool it keeps you warm, when it's warm it keeps you cool. Wool is as good as it gets, for all these fibre management properties."

Ackroyd is pragmatic on the issue of synthetic fibre use. Like many proponents of wool we have spoken to over the years, he sees a place polyester in the overall fibre mix. "We could not clothe the whole world in wool, we have to strike a balance," he says.

This balance, he suggests, comes in how we use textiles and our relationship with clothing generally. A big problem, he suggests, is the word "fashion" as this insinuates something you need to regularly change. "I think consumers that wear classic clothing are making a massively good contribution to the environment," he tells us. "Classic clothing is not 'fashion' where you wear something different every Saturday night."

Ackroyd is keen to discuss pricing. He offers the example of Intimissimi, the Italian brand which sells a Supima cotton T-shirt for 30 Euros while its merino wool equivalent is 59 Euros.

"The challenge is convincing the consumer to spend another 30 Euros," he says. "The answer is that if consumers do buy the merino, they say 'it's amazing, I didn't smell when I wore it and when I was hot it cooled me down.' It is a difficult thing to get a consumer to pay nearly double the price but we have to get that message across."

We also spoke to the Woolmark Company's program manager, fibre advocacy & eco credentials, Angus Ireland.

We wanted to know how he viewed critiques of wool, and particularly the fact that wool receives such a poor rating on fibre scoring tools such as Higg MSI.

" Most importantly, the Higg MSI is clearly intended to be used by members and stakeholders as an additive tool, not to prevent the consideration of other sourcing criteria for material manufacturing "

He told us: "The Higg MSI has many limitations preventing equitable assessment of clothing made from wool and other natural fibres. I'll discuss two examples of these limitations.

"Firstly, the MSI's focus on only the front-end of the life cycle of clothing, up to the formation of fabric, means it ignores assessment of the use phase of clothing, so it is 'blind' to factors such as the reduced laundering frequency of clothing made from animal fibres, and hence their reduced consumption of water, energy and chemicals during the use phase. It's also 'blind' to the release of microplastics during the use phase.

"Similarly, the impact of this reduced laundering on garment lifetime is ignored, with these garments retaining their 'as new' appearance for longer, which extends their functional lifetime and delays the need for new raw materials and manufacturing processes to replace them."

He continues: "Magnifying the weaknesses of this front-end focus, the MSI assesses the environmental impacts of a larger system boundary for clothing made from renewable fibres than it does for fossil fuel-based fibres.

"Forming fibres like wool, cashmere, cotton, flax etc. on the farm is often the most impactful life stage of clothing made from renewable fibres. By contrast, the oil used to make synthetic fibres bubbles out of the ground entirely free of any environmental footprint - accounting for the raw material for synthetics starts at the extraction process, while the oil itself is deemed to have no footprint. Having an environmentally 'free' raw material typically results in synthetic clothing having a significantly smaller impacts at this stage, meaning the Higg MSI cannot provide equitable comparison of clothing using renewable and non-renewable fibres."

Our last conversation with the SAC specifically on the Higg MSI was with executive director, Amina Razvi, in October 2020.

She told us: "… the Higg MSI measures several environmental impacts that can be quantified using conventional lifecycle impact assessment methodology, which represent average manufacturing impacts. Cradle-to-gate is a common LCA scope – and is only misleading if it is represented as something it is not.

"Most importantly, the Higg MSI is clearly intended to be used by members and stakeholders as an additive tool, not to prevent the consideration of other sourcing criteria for material manufacturing."

Readers can draw their own conclusions here. Our only comment would be this: if Higg was not developed to influence sourcing decisions, why was it developed?

Product Environmental Footprint

Another area of contention for wool, and one which loops back to European Union regulations, is the PEF.

The PEF methodology first proposed by the European Commission in 2013. The EU wanted to develop foot-printing methodologies to provide a standardised system for measuring and validating environmental claims.

" It is in the consumers' interest that any method used to assess a product's environmental foot-print is holistic and includes all sustainability impacts of consequence. Being LCA-based, PEF suffers from limitations by focusing only on harmful impacts and failing to account for positive environmental impacts. Social impacts should also be considered for a holistic assessment of a product's sustainability "

KEY TAKE-OUTS

- **Wool should be viewed as a small but important part of the over-all fibre mix, alongside cotton and synthetic fibres.**
- **Wool and other natural fibres appear to align with current thinking in the EU, particularly its Strategy for Sustainable and Circular Textiles**
- **Fibre scoring tools such as Higg MSI, which rank wool poorly, are incomplete because they only cover cradle to factory gate and omit key indicators.**
- **Higg MSI is in urgent need of reform to ensure it: (a) Aligns with the EU's textile strategy and (b) Provides more complete, openly accessible data. Complete transparency and openness is now being demanded by stakeholders in the fashion industry, and tools such as Higg must reflect this step-change.**
- **Like Higg, PEF does not account for wool's environmental benefits. However, PEF could be superseded by the development of the EU's new textile strategy. This space is moving fast.**

In late 2021, Make the Label Count campaign, a coalition of natural fibres sectors, was formed. It warned that, "the impacts of the formation of crude oil - a base material for producing synthetic fibres - are not accounted for in the PEF methodology."

There have been concerns in natural fibres sectors such as wool that the SAC, which developed the Higg Index, would lobby at EU level to ensure the PEF category rules for clothing and footwear would be aligned with the Higg MSI.

Are these concerns justified? A few things to note. Firstly, in 2019, the SAC, Global Fashion Agenda (GFA), and Federation of the European Sporting Goods Industry (FESI) founded the Policy Hub which has put out a series of position papers in relation to fashion sustainability issues. Was Policy Hub established to lobby at EU level? This appears a reasonable assumption, especially given that in December 2021, Policy Hub was advertising for a public affairs manager whose role would be to "support the diffusion of the Policy Hub's positions and messages in Brussels." The role is based in Brussels.

We put these issues to Paola Migliorini from the European Commission in early 2022. She told us that while the SAC was the secretariat for PEF for the clothing and footwear product category, its role is purely an administrative/coordination one. "The SAC is not influencing the content of it," she told us.

So what, specifically, are the wool sector's concerns about PEF? We asked South African wool and mohair broker BKB about this, and a spokesperson told us: "[PEF] is admirable in its intent to dispel consumer confusion and encourage alignment in a common sustainability language for apparel and textiles. However, for the wool industry as well as other natural fibre industries, there is concern the EU will use an incomplete methodology to calculate the impact of clothing and footwear. This will result in oversimplified and inaccurate claims on product labels for consumers.

"It is in the consumers' interest that any method used to assess a product's environmental footprint is holistic and includes all sustainability impacts of consequence. Being LCA-based, PEF suffers from limitations by focusing only on harmful impacts and failing to account for positive environmental impacts. Social impacts should also be considered for a holistic assessment of a product's sustainability."

There has always been an assumption that PEF would ultimately underpin eco-labels on clothing in the EU. However, when asked about this, Migliorini said: "The PEFCRs for apparel are not setting up any eco-label for clothing. We have the EU Ecolabel currently that is a voluntary label, and we are working to have a harmonised method to measure environmental impacts, to use it for the substantiation of voluntarily made green claims and to compare products of the same category – this needs to be clear."

We also asked Angus Ireland about PEF. He made the important point that discussions have moved on around sustainability since PEF was first conceived. He said: "EU strategies such as the Green Deal and Circular Economy Action Plan (CEAP) are well-written and have laudable intent, however PEF methodology pre-dated these strategies and was never designed to deliver the EU's laudable goals.

"With PEF's focus on assessing only the harmful impacts of textiles, it is unable to recognise and reward positive attributes of natural fibres, including renewability at start-of-life and biodegradability at end-of-life. Notwithstanding the perfect fit between these inherently circular attributes and the EU's CEAP strategy, natural fibres will score poorly because they're not considered in PEF. The transition to a circular economy is a foundational cornerstone of EU strategy, yet none of the 16 PEF indicators directly measures circularity. Without addressing these omissions, application of PEF to the textiles sector has the potential to undermine the Commission's own policy objectives".

WOOL, CIRCULARITY AND FASHION

IN THIS Q AND A, WOOLMARK COMPANY MANAGING DIRECTOR, JOHN ROBERTS, OFFERS AN INSIGHT INTO WOOL'S CIRCULAR CREDENTIALS

What are the properties which make wool an inherently circular textile fibre?
Wool, by nature, is an inherently circular fibre, offering a natural solution for brands, designers and manufacturers looking to shift into a circular business model and create circular products. Wool is a 100 per cent renewable raw material grown by sheep, with high levels of reuse. Wool's durability and quality means products have an active first life of up to 20-30 years, with high levels of recycling.
In contrast to almost all other fibre types, a commercially profitable wool recycling industry has existed for more than 200 years.

Circularity is a relatively modern phrase in the fashion industry but recycling and closed loop projects have been a mainstay of the wool industry for decades haven't they?
The wool industry has had a long, successful and commercially profitable recycling system for the past 200 years. These well-established pathways champion evidence that wool is a highly sought-after fibre in both open- and closed-loop recycling pathways because of the fibre's high value, durability and longer fibre strength. Mechanical wool recycling is a long-established industry that enables both closed-loop and open-loop recycling at scale, based on existing manufacturing infrastructure, with a major hub being Prato, Italy.
Wool already is one of the most re-used of all fibres, accounting for up to 5 per cent by weight of total clothing donated by consumers for recycling and re-use. This is substantially higher than wool's share of the virgin fibre supply, which is about 1.2 per cent.

Why is recycled wool such a sustainable option for fashion?
By recycling wool items through a closed-loop system, and putting the same wool fibres to further use, the environmental impact from these fibres is lessened, as found by a recently published LCA study of a recycled wool sweater. The research shows that impacts of a recycled wool product can be significantly reduced by 66-90 per cent with best practice use and care, relative to that of a virgin pure wool sweater. However, we must note that recycling is not the only answer to circularity, it is merely one piece of the puzzle. Repair and reuse of the virgin garment comes before recycling, extending the active lifetime of a garment means it has to be replaced less often, reducing impacts on the environment.

How are you working with fashion to get recycled wool into collections by brands?
The Woolmark Company is currently undertaking an Extended Producer Responsibility project, so that the EPR benefits of wool can help brands position themselves in line with the circular economy, with a high recycling rate and low end-of-life clothing costs. The evidence being gathered will arm brands seeking to reduce these costs and capitalise on the long-established mechanical wool recycling industry. Our research will consider the economic viability and end-of-life pathways for wool relative to other fibre types, including price trends for used and recycled synthetic clothing and used wool clothing.

How does wool compare to the dominant textile fibres – polyester and cotton – on circularity?
Wool is the most circular of the three, because of its more highly valued attributes, higher price and higher recycling rate. As natural renewable and biodegradable fibres, wool and cotton are inherently circular through the return of their nutrients to the soil for use again.
Circular design can play a role in reducing the impact of the fashion and textile industry and the inherent circularity of wool makes it an ideal fibre choice for the transitions to a circular textile economy. The wool textile industry is working to address issues relating to substances of concern throughout the wool lifecycle, particularly in relation to wool production, scouring, dyeing and textile and garment finishing.
As a natural, biodegradable fibre, wool does not contribute to microplastic pollution. Both virgin and recycled synthetic fibres on the other hand are known to shed microplastic fibres, particularly when laundered and are responsible for as much as 35 per cent of all primary source microplastics in the marine environment.

TRACEABILITY OPTIONS FOR WOOL SOURCING

Traceability is huge for fashion right now, for commercial as well as regulatory and due diligence reasons. We are seeing major growth in traceability work in the cotton space and, to some extent, for viscose and recycled polyester fibres.

But what about wool? Is it possible for fashion retailers to trace the wool in their apparel back to the farm level? Are technology solutions being used in this area? And what are wool suppliers doing to embrace growing demand for traceable fibres?

As a highly regulated industry, processes are already in place to trace and identify wool along supply chains.

In fact, many IWTO's members have developed traceability systems, and a full list of these can be viewed at the link here: IWTO Traceability Systems.

The Current Situation

The IWTO notes that roughly 80 per cent of fine Merino wool used for clothing is sourced from Australia and sold via the Australian Wool Exchange.

Most wool is sold with an IWTO Test Certificate and, in Australia, this certificate reports how that wool has been declared through Australia's National Wool Declaration (NWD) programme. South Africa has a similar system in place. Worth noting in this context is that the NWD has a 76 per cent uptake, a significant level of commitment for a voluntary system.

The NWD includes information provided by the woolgrower on various issues, including the mulesing status of the sheep the wool came from. This information flows through the supply chain via the NWD and test certificates.

If a buyer wishes to stipulate wool's origin, the IWTO notes this must be confirmed with the comber and spinner in advance, to track the many lots of wool in the particular blend. "It can be done, most efficiently and cost-effectively when stipulated from the start of the process," the IWTO states.

This last point is key. Detailed information on wool's origins is possible but this requires long-term planning and a willingness for fashion brands to build deep relationships with wool supply chains. Many brands are already doing this, particularly in the luxury space.

German brand HUGO BOSS is one such example. In 2019, the company's brand BOSS has launched a traceable wool capsule collection, consisting of four styles which could be traced back to ZQ-certified farms in New Zealand. To obtain the ZQ certification, the highest standards of animal welfare, environmental sustainability, fibre quality and social responsibility must be met. This was the start for further traceable wool collections in the following seasons.

We spoke to Andreas Streubig, Senior Vice President Global Corporate Responsibility & Public Affairs at HUGO BOSS. Streubig made a number of points about HUGO BOSS' work on traceable wool, which is an important pillar in the company's work on supply chain transparency.

He told us:

- Wool is an intimate, close-knit industry where personal relationships are all-important. It takes time to build and maintain these relationships eg. with wool suppliers
- Sheep farmers are proud of their progress on sustainability/environmental issues and appreciative when this is recognised by fashion brands
- Besides doing the right things, traceable wool offers good opportunities to make our sustainable efforts visible to the customers.

"Our BOSS traceable wool collection made with ZQ showed how a great design combined with transparency leads to market success," Streubig said."

Eileen Fisher, the US brand, is another which has made a commitment to getting a better understanding of its wool supply chains. The company notes on its website that its commitment to transparency and traceability in its supply chains entailed three years of research, visiting farms in South America, New Zealand and Australia.

We spoke to Dalena White, IWTO secretary general on the issue of wool traceability. She suggested wool

" Taking care of farm animals is a 24 hour/7 day a week occupation and in the case of wool sheep farmers, the paycheque comes but once a year. They relish opening the farm gate and love telling their stories, as they are truly proud of producing high quality wool, despite all the obstacles and potential pit-falls along the way. It remains an achievement to be proud of when the wool bales leave the shearing shed for the market "

suppliers see traceability as a huge opportunity to showcase their work. She said: "Taking care of farm animals is a 24 hour/7 day a week occupation and in the case of wool sheep farmers, the paycheque comes but once a year. They relish opening the farm gate and love telling their stories, as they are truly proud of producing high quality wool, despite all the obstacles and potential pitfalls along the way. It remains an achievement to be proud of when the wool bales leave the shearing shed for the market."

"As with most laudable endeavours, the devil remains in the detail and what we need to establish, is the best possible way to trace wool through all the different processes it follows, travelling from the farm gate to the retail floor. Various certification schemes have been developed to answer the call from the market and in some cases, farmers need to work through annual audits six times per year, as each certification scheme ask similar questions, but answers must be submitted on different platforms." She adds: "Measuring and capturing the data relating to sustainability, animal welfare, supporting biodiversity, and practicing regenerative process need to be streamlined in the near future, so farmers can report on their best practices in the most effective and productive way possible. "Traceable wool is the future, and we are excited to make it happen. We just need to find the most effective and practical way to enable the process going forward."

Technology Solutions

Cotton supply chains are using technology to improve traceability. Are such solutions, which might include blockchain and/or the use of DNA 'markers', applicable to wool supply chains?

Traceable textile technology specialists are already looking at the wool sector. Recently, it was announced that the wool of British sheep farmers would be forensically traced along supply chains through a partnership between British Wool and textile traceability specialists, Oritain.

Oritain's isotope technology will be used to test and authenticate wool fibres from the British Isles to ensure proof of origin, creating a 'fingerprint' to enable the identification of authentic British Wool.

We understand the Peruvian alpaca wool sector will also announce a partnership with a textile traceability specialist during 2022.

As well as Oritain, other key players in the traceable textiles space include Applied DNA Sciences, Haelixa and Fibertrace.

It is very likely more partnerships will follow in the wool sector although quite how these new solutions will dovetail with wool's existing processes – the NWD, for example – is not yet known.

Australian Wool Innovation has been progressive in this area. Last year, it announced it would use a transparency platform called Everledger to capture and make visible secure information about wool provenance and its supply chain to, "create new sources of value for wool growers, manufacturers and retailers."

Everledger, a digital transparency company, will build and host an Electronic Chain of Custody Tool (ECCT) on its platform. This tool will be used to track and validate the exchange of ownership of selected wools as they move up the supply chain from farm to overseas processing and through to finished products. According to AWI, in this initial stage, ECCT will act as a proof of concept.

KEY TAKE-OUTS

- **The wool industry is embracing the opportunity to provide more transparent, traceable supply chains**
- **The 'story-telling' opportunities of tracing wool back to farm level offer a compelling marketing proposition for fashion**
- **Suppliers see traceability as an opportunity to showcase their progress on sustainability issues**
- **For fashion, gaining a better understanding of wool supply chains requires a new approach to sourcing based on strong supplier relationships and mutual trust**
- **Traceable textile technology solutions are proven and likely to play an important role in wool's traceability journey**

AWI notes: "It will trace the journey of wool from farm to the end consumer, by identifying and capturing the necessary documentation at each stage of the value chain. The ECCT will demonstrate sustainability and compliance best practices and provide more confidence on the authenticity and provenance of the wool product. It means a retailer or end consumer could verify where and when in Australia the original wool was sourced."

AWI's work with Everledger gives us an idea of what is possible where traceable wool is concerned. The technology is an interesting glimpse into a future where fashion will gain better information about their wool supply chains and be better placed to tell the story of the wool in their products.

BKB TAKES REGENERATIVE ROUTE TO FARMING

HERE, WE SPOTLIGHT SOUTH AFRICAN WOOL AND MOHAIR BROKER BKB, THE LARGEST SUPPLIER OF RESPONSIBLE WOOL STANDARD (RWS) WOOL GLOBALLY

It is long believed that the first Merino sheep to leave the European continent first came to South Africa in the late 1700s. While some might disagree, what is not debatable is that since then the Merino industry in South Africa has contributed substantially to the economic prosperity of the country on the southern tip of Africa. Perhaps not the best known or the largest producer of Merino sheep globally, nonetheless, South African farmers are dedicated to the sustainable production of high-quality wool for global markets.

BKB Limited is a wool and mohair broker with over 100 years of experience in the South African wool and mohair industries and is currently the largest wool and mohair broker by volume in the country. BKB represents approximately 62,000 clients which deliver over 48 million kilograms of wool and 2.5 million kilograms of mohair per year.

BKB introduced the global Responsible Wool Standard (RWS) to South African wool growers in 2016. Prior, South African wool growers had already experimented with certification schemes. However RWS provided an opportunity for growers to demonstrate and reliably prove their animal welfare enhancing on-farm practices to the end market. The RWS helps ensure a strong chain of custody for certified materials as these fibres move through the supply chain. BKB is proud to be the single largest supplier of RWS wool in the world, with over 1,400 producers group-wide, farming with approximately three million sheep on an area of over seven million hectares of land. In complying with these standards, South African producers are well-positioned to continue supplying quality responsible wool to meet the growing market demand.

In addition to South African wool growers' high animal welfare standards, these wool growers are also just as passionate about environmental stewardship and the well-being of the communities in which they live and operate in. This ensures the vitality of their farming operations for future generations. Regenerative farming practices are fundamental to the long-term health and viability of farming businesses globally. Research shows that establishing regenerative farming practices builds soil carbon which leads to many additional positive farming outcomes including water holding capacity, system biodiversity, soil nutrient availability, disease resistance, resilience to extreme weather and enhanced livelihoods within local communities. Many South African farmers have faced years of extended droughts, relentless swarms of locusts and other adverse conditions. In managing their farming operations with a holistic approach, wool growers recognised that they can establish more resilient systems during such unfavourable conditions and bring about immense environmental and social benefits.

" In addition to South African wool growers' high animal welfare standards, these wool growers are also just as passionate about environmental stewardship and the well-being of the communities in which they live and operate in "

While the co-benefits of regenerative agriculture are well documented and understood there is a need for a clearer and more holistic shared understanding of what it means to measure and model these outcomes in the context of each individual farming operation. Immensely varied ecosystems across South Africa and the rest of the world makes measuring such outcomes extremely complex. With pilot projects underway, BKB is collaborating with local experts as well as global counterparts within the apparel and textile supply chain. This ensures that a holistic, place-based, outcome-focused approach is taken and not a "one-size-fits-all" checklist of practices is implemented.

In addition, positive environmental and social outcomes are measured efficiently and accurately.

BKB strives for continual improvement in its effort to offer complete traceability and transparency from sheep to shop, building trust within global supply chains. BKB also ensures that optimal animal, environmental and social welfare standards are upheld. Collaboration with like-minded individuals and organisations is also a fundamental part for a sustainable future for all.

Sheep at the US Sheep Experiment Station

WOOL: FOCUS ON THE UNITED STATES

The American sheep and wool industry is diverse, with sheep in all 50 states, ranging from large range operations in the west to smaller farm flocks in the east. Most wool produced in the United States comes from the west where there is more room to graze in states like Colorado, Wyoming, Utah, and South Dakota. Shorn US wool production for 2021 was 22.5 million pounds greasy weight or 11.2 million pounds clean.

To get an overview of the US sheep and wool industry and challenges it is facing, we spoke to the American Sheep Industry Association, which represents more than 100,000 ranch families across the United States.

We interviewed Christa Rochford, Wool Marketing Program Manager.

What are the main sustainability challenges for US wool growers and how are these being addressed?

Firstly, there is communication and understanding. As a growing number of consumers are distanced from understanding agricultural production practices, the industry must deal with narratives that are being driven by outside forces and sometimes competing interests. For generations, ranchers have relied on taking care of the land not only because it's the right thing to do, but to sustain the environment and their business for future generations. The sheep and wool industry are now learning to share their own story with consumers in a more transparent way with the help of organisations like the American Wool Council.

Greenwashing is also an issue. As consumers want a more transparent and sustainable product, brands find creative ways to make misleading sustainability claims with little or no science backed data. This crowds the sustainability space and makes it difficult for consumers to distinguish what is sustainable and what is misleading marketing.

What about data around agricultural practices? Are you doing any work here?

Yes, but more research is needed. While American sheep ranchers regularly practice sustainable exercises in their daily lives, additional research is needed. A study is currently underway to evaluate the environmental footprint of the US sheep industry in order to have accurate and robust data to contribute to this very important issue. The initial focus of this work has been to define a comprehensive model of GHG emissions for the diverse array of US sheep production systems, such as range, farm flock pasture and intensive. The study will conduct a partial life cycle analysis (LCA) of sheep production in these types of operations to quantify GHG emissions. As work progresses, data will be assembled on various GHG mitigation strategies, primarily via land and crop management practices. During the final phase, it will define environmental improvement strategies that are the most feasible and impactful for sheep producers to employ according to their particular production system. A blueprint for producer education strategies to address these priorities will wrap up the project.

The USDA Sheep Experiment Station also leads continual new research in sheep productivity and efficiency to improve the sustainability of sheep production.

What other sustainability programmes is the US wool industry working on?

There are several. There is the American Wool Assurance Program and Sheep Safety Quality Assurance – both developed by the American Sheep Industry Association. These programs are certified programs showing best animal care and handling practices. Organizations such as Fibershed have also developed the the Climate Beneficial Wool program.

In addition, the ASA Let's Grow program provided resources for producers to deliver on consumer demands and increase flock productivity in the following areas: animal handling, animal health, environmental stewardship, genetics and selection, survivability, nutrition, meat quality, reproduction management, birth management, forages, and grazing.

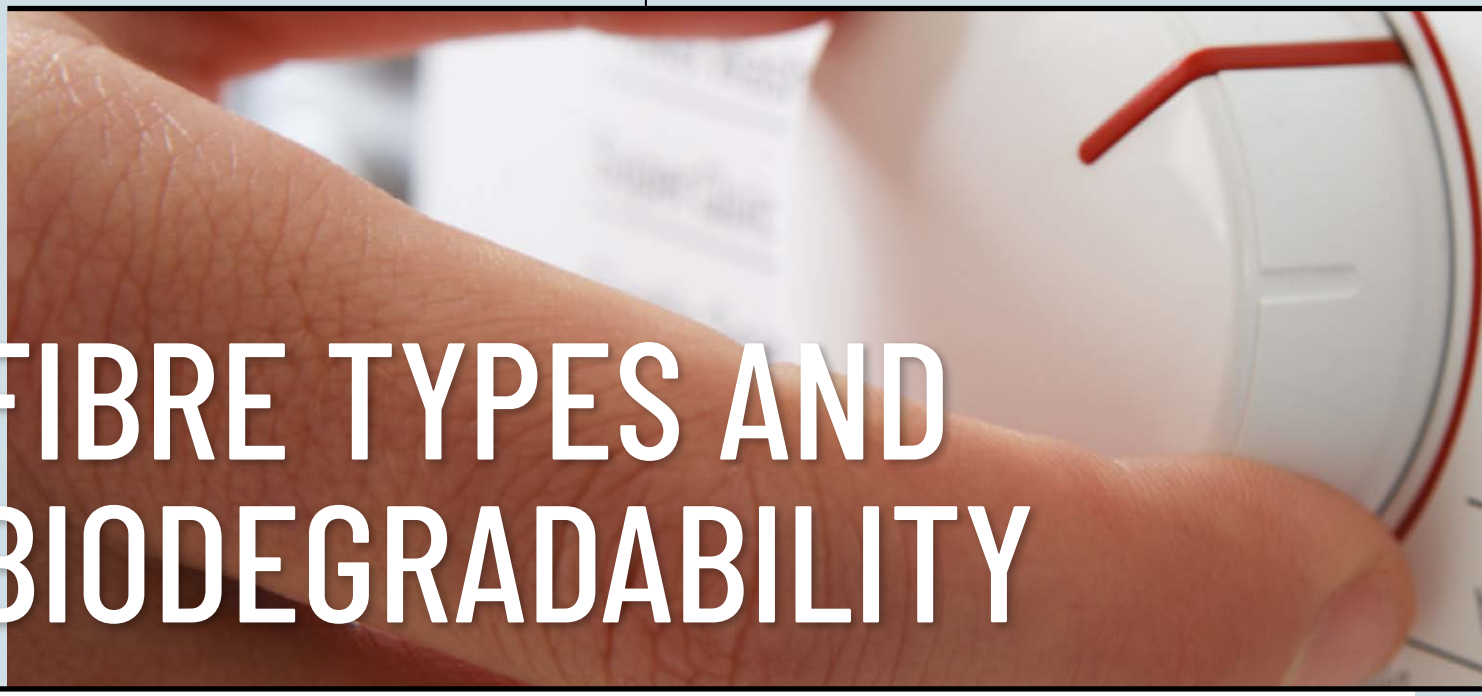
What are your thoughts on how wool has historically been assessed by tools such as, for instance, Higg MSI?

While we encourage methods of transparency for sustainability, there must be accurate and reliable measurement standards to create any meaningful results.

The impact of fashion and apparel in the environment does not stop at the end of manufacturing. The Higg MSI does not take into account the full life cycle of a garment, ignoring two important phases – use, and end-of-life. The use phase is important as fibres such as wool are more durable, last longer, are washed less often, and do not shed microplastics into the environment during laundering.

The end-of-life phase is critical considering around 85 per cent of all textiles thrown away in the US – roughly 13 million tons in 2017 – are either dumped into landfill or burned. Wool biodegrades naturally, returning valuable nutrients back to the earth, while other fibres like synthetics can take centuries to biodegrade into smaller plastic particles.

We encourage those creating tools like the Higg MSI to consider the full life-cycle of a garment to truly measure the full environmental impact of different fibres, broaden data sources for more in-depth analysis, and to allow improved transparency in its methods. These changes are critical to ensure consumers are not misled, and to help the textile industry move forward towards a more sustainable future.



FIBRE TYPES AND BIODEGRADABILITY

In common with other natural and cellulosic-based fibres, wool biodegrades. The wool fibre can decompose in soil in as little as three to four months, depending on environmental conditions. It also releases essential elements back into the earth, such as nitrogen, sulphur and magnesium.

Various studies have been done on all textile fibres over the years, measuring how well and quickly they biodegrade in soil. Results consistently show that wool, as well as natural cellulosic-based fibres such as cotton, and wood-derived viscose, all biodegrade. Synthetic fibres such as polyester and nylon do not.

None of this is disputed.

The issue of biodegradability is important to fashion, increasingly so as more regulatory pressure is placed in brands to consider end of life issues around textiles.

We hear lots about microplastic pollution. In the context of clothing, a better term is microfibres as all textiles shed tiny fibres, although only synthetic fibres can shed microplastics.

"In addition to product design, measures will target manufacturing processes, pre-washing at industrial manufacturing plants, labelling and the promotion of innovative materials"

The question is, how much do these fibres biodegrade and are some more harmful than others?

The EU's recently launched textile strategy also touches on this issue. The EU has promised, "action to address the unintentional release of microplastics from textiles." Note the EU uses the term microplastics which suggests it is polyester and nylon textiles which are in its sights here. It added: "In addition to product design, measures will target manufacturing processes, pre-washing at industrial manufacturing plants, labelling and the promotion of innovative materials."

So far, the health implications of microfibre/microplastic ingestion or inhalation by marine fauna and humans have not been extensively studied. However, in some studies, microplastic exposure has been linked to several negative outcomes in aquatic species, including endocrine disruption, toxicity, gut blockages, reduced reproduction and death. In humans, atmospheric microplastic exposure has been linked to respiratory complications including lung disease.

Aquatic environment

Where we are seeing major debate is in the area of biodegradability in aquatic settings. Are tiny fragments of clothing finding their way into rivers and oceans and – via marine life – potentially into the food chain? And what is the scale of the problem?

While synthetic fibres are the culprit where microplastic shedding is concerned, wool and other natural fibres are also under the spotlight on this issue of microfibre shedding from clothing.

There is a school of thought which suggests the finishing processes all fibres go through, which includes the addition of dyes and chemicals, means they all represent a threat to marine life and the subsequent food chain.

Richard Blackburn is professor of sustainable materials at University of Leeds. He recently announced the launch of a PhD Scholarship at Leeds Institute of Textiles & Colour on 'Biodegradation of Cellulosic Microfibres'.

His post on LinkedIn summed up well the counterargument to the claim that natural fibres are 'safe' as they biodegrade. He said: "If cotton is biodegradable why are thousands of cellulosic microfibres found in our oceans and aquatic wildlife? If these fibres are not readily broken down, does nature recognise cellulosic microfibres resultant from textile processing?"

He also made the following claim: "However, recent research [2018] into the composition and abundance of microfibres in seafloor sediments from southern European seas found that nearly 80 per cent of these microfibres were cellulosic, comprising dyed natural and regenerated cellulosic fibres."

A link to the study referred to is here: The imprint of microfibres in southern European deep seas (plos.org)

We've followed the research on this closely. What is striking is that most of the controlled studies suggest natural fibres, including wood-derived viscose, biodegrade in aquatic environments, at various speeds. And yet, there will always be claims like the above of natural fibres being discovered intact deep in the oceans. Why is this?

We spoke to Dr Stewart Collie on this issue. Dr Collie is science team leader, bioproduct and fibre technology, at AgResearch in New Zealand.

Dr Collie points out that tests carried out on biodegradability of different fibre types need to be done in controlled conditions for consistency, reliability and so on. The studies he and his team have conducted show wool and other natural fibres do biodegrade. Viscose biodegrades fastest, followed by

cotton, then wool. Synthetic fibres remain almost wholly intact.

Notably, these studies also show that wool which has been through various industrial finishing processes also biodegrades, including machine washable wool. In fact, machine washable biodegraded faster than untreated wool.

This would appear to dispel the idea that finishing processes somehow inhibit the ability of wool to biodegrade.

So why are natural microfibres still being found in oceans? Dr Collie suggests the answer is likely that the conditions for biodegradation can vary. "In extremely deep waters, you might have low oxygen, low temperature and low levels of microbial activity, and these are all important for biodegradability," he says.

What about textile treatments?

Dr Collie acknowledges that there has so far been lots of research on understanding the problem but not so much done on evaluating the harm associated with microplastic pollution. "Textile treatments and their impacts have not been closely investigated yet," he says.

The focus on treatments for different fibres would seemingly bring all microfibres under the microscope where this issue is concerned.

However, a few other issues need to the factored in. The first is that wool makes up just one per cent of the global fibre mix so its contribution to this issue must be weighted accordingly.

Secondly, there has been a significant reduction in the use of potentially toxic chemicals in clothing production in recent years, thanks to stricter manufacturers restricted substance lists (MRSLs). The Zero Discharge of Hazardous Chemicals (ZDHC) group has been very influential in this area.

Finally, the industry generally has moved towards safer, less toxic dyes and chemicals, with industry leaders such as Achroma launching more and more biosynthetic dyes derived from natural waste products.

All of which suggests finishing processes will have less relevance in this space moving forward and that biodegradability remains the fundamental issue.

KEY TAKE-AWAYS

- **Controlled tests have repeatedly shown that wool fully biodegrades in the earth as well as aquatic environments**
- **Global concerns about microplastics in the environment have placed all textiles under the microscope as all shed microfibres**
- **It is claimed by some that textile finishes, dyes and chemicals – found on all textile fibres – could also represent a threat to marine life and the natural environment**
- **There is no evidence that these finishing processes impact the inherent biodegradability of wool and other natural fibres**

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Regulations

What are regulators and textile standards doing to tackle microfibre release? There is no universally agreed way to measure this. The fashion industry currently funds The Microfibre Consortium (TMC) which, according to its website, is "understanding" and "mitigating" microfibre fragmentation.

TMC mentions a '2030 commitment'. Laudable intentions or not, this seems a remarkably far-off timeline for an issue which has been around for more than a decade already.

The Higg MSI does not recognise microfibre release from textiles. Asked why, the SAC has repeatedly suggested that it is because there is no universally-agreed upon testing method for this issue.

Likewise, the Product Environmental Footprint (PEF) methodology of the European Union does not recognise microfibre release. That this is the case does seem at odds with the new EU textile strategy, which makes clear microplastic pollution is high on the agenda.

So far, only one textile label recognises the microfibre release issue and includes it in its criteria. Nordic Swan, the official sustainability eco-label for the Nordic countries, recently became the first eco-label to include details of microplastics release for garments containing synthetic fibres, such as polyester, among its environmental requirements.

Nordic Swan does not yet set any threshold for the amount of microplastics shed during home laundry. Instead, it requires brands to measure and report fibre fragmenting.

Note, Nordic Swan puts the emphasis on synthetic fibres and microplastics, so clearly does not see natural fibres as the issue here.

It could be that other textile labels look to introduce their own criteria on this issue, although Nordic Swan is one of the more stringent textile standards and is no surprise it is the first to address this issue.

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SCHNEIDER MARKS 100 YEARS WITH SUSTAINABILITY DRIVE

The Schneider Group, which celebrates its 100th anniversary this year, embodies all that is good within the wool industry. Proactive on sustainability issues and committed to driving positive change, this Italian business has become a highly influential thought-leader within the sustainability conversations which are taking place in the wool space right now.

For nearly a century, Schneider Group has been a leading name in the processing and trading of fine wools and speciality fibres.

Established in Australia by Giovanni Schneider, the business sources, processes and supplies wool and natural fibres along its own supply chain to assist customers in producing sustainable, fully traceable, high-quality products.

These products include wool tops and open tops which are washed and combed in Argentina, Italy, Egypt and China. Schneider also sources cashmere and silk as well as speciality fibres such as Alpaca, Camel, Guanaco, Llama, Mohair, Yak and Vicuna fibres.

" Gallia tells us that 980 growers from Australia and New Zealand have now registered with the programme and it is expected to grow exponentially within 2022 with the inclusion of new countries "

We spoke to Willy Gallia, chief sustainability officer at Schneider, to find out about the company's sustainability strategy. Schneider will be making further announcements about its strategy later this year to mark its 100th anniversary, but Gallia was able to give us an overview of its work on sustainability issues.

Schneider's work on sustainability has four prongs, all of which form part of Schneider's Together 2030 sustainability strategy. The first of these is focused on the industrial impact of transforming wool, with a focus on Scope 1 and 2 emissions. Schneider is using the Science Based Targets Initiative as a base for its work here, the business having committed to SBTI and is currently on the process of setting targets.

The second prong of the strategy is the Authentico wool integrity scheme. Authentico is about driving continuous improvement across wool supply chains, with a focus on environmental and animal welfare issues. Argentina, Australia, New Zealand and South Africa are the focus markets currently. To avoid duplication, this ambitious programme builds on the use of existing wool industry standards, best practices and legislations honoured by wool growers already.

Transparent supply chains are now high on the agenda at all major fashion brands and retailers. To this end, Authentico's focus is on ensuring a transparent supply chain from the farm gate to the delivery of wool tops, rewarding woolgrowers that grow their product in a sustainable, environmentally friendly manner, with high attention to animal welfare. Since its launch, wool growers have been quick to get on board with Authentico. Gallia tells us that 980 growers from Australia and New Zealand have now registered with the programme and it is expected to grow exponentially within 2022 with the inclusion of new countries.

The third pillar of the strategy is communications. To this end, the creation of Wool Connect, an annual conference which brings together key stakeholders from the wool industry, has been a welcome development in the wool industry. The conference has a focus on robust, transparent debate and the first two events, which took place in 2020 and 2021, proved hugely popular.

The third conference will take place from 7 to 9 of September 2022. Unlike previous conferences, this Wool Connect will include input from other natural fibres sectors as well as wool, including cashmere and alpaca and mohair. Wool Connect will be hosted in hybrid mode on the new platform which will be called NATURAL FIBRES CONNECT. Giving these fibres a 'voice' where they might not ordinarily have one is a welcome move by Schneider.

The fourth and final pillar of Schneider's sustainability strategy is a focus on cultural aspects. Acknowledging that sustainability challenges require collaboration, The Schneider Group has set as a clear value to do so in every initiative that relates to the Together 2030 Sustainability Strategy to the point that the strategy itself can openly be adopted by anyone on the industry. It also emphasizes the fact that natural fibres have got more to gain if they work together than if competing. This is as opposed to wool producing countries seeking economic benefit by competing against one another without considering that the bigger gains, both economic and in general, can be achieved via collaboration, thereby ensuring wool the status of a truly sustainable fibre.


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At BKB, our supply chain originates with growers of natural fibres who exercise a great duty of care to their land, the people, and the animals it supports. Our growers are the first link in a holistic system that ensures that our wool and mohair is traceable to ethical sources and regenerative farming practices which champion sustainable production of high quality fibre while impacting positively on the community, the environment and the end market.
South Africa is renowned for producing superior quality wool and mohair, and the integral part that nature plays in our industry's future is central to our sustainability programmes.
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