SUSTAINABILITY: NATURAL FIBRES

With public awareness increasing of the problem of pollution from synthetic microfibres, there may never be a better opportunity for wool, cotton, linen and other natural fibres to win the hearts of a new generation of consumers.

Chance of a lifetime for natural fibres

The share of natural fibres in the greater apparel supply chain has shrunk in recent decades and synthetics, for reasons of performance and price, have dominated. Cotton is still the king of natural fibres, but even cotton has seen its share diminish in recent years, with polyester pushing further and further ahead. At the start of the 1960s, cotton's share of the global total was around 66%. By the start of this century, this figure had fallen to 40%. In 2007, according to Invista's executive vice-president for marketing and technology, Dr Bob Kirkwood, the picture had changed to give cotton a share of just 38% compared to polyester's 46%. Five years later, cotton's share had fallen again to a figure quoted by the International Cotton Advisory Committee of 32%. At the end of 2016, executive vice-president at agricultural merchant and processor Louis Dreyfus Company, Joe Nicosia, gave cotton's current share as 24%.

Mr Nicosia gave that figure in a talk he delivered at the International Cotton Association's 2016 industry event in Liverpool. That event took place towards the end of that year, mid-October, and at no point did any speaker raise the question of pollution caused by plastic. The subject did not come up. In 2018, it comes up practically every day and consumers are paying close attention to it.

Articles we have run already this year on the problem of plastic pollution have made it clear that the plastics industry is working hard to make itself more sustainable. Manufacturers of plastics, at least in Europe, also have the consolation of being offered hundreds of millions of euros in assistance from the European Commission to help them tackle sustainability.



Baselayer thermal wear suit from merino wool.

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Out in the wash

Nevertheless, consumers all over the world have reacted with horror to this year's reports, images and statistics that have made it clear how serious the problem of plastic pollution has become, on land and at sea. "One of the main sources is our clothing," the United Nations Environment Programme (UNEP) stated in April this year. "Minuscule fibres of acrylic, nylon, spandex, and polyester are shed each time we wash our clothes and are carried off to wastewater treatment plants or discharged to the open environment." UNEP quoted the conclusion from a recent study that more than 700,000 microscopic plastic fibres can be released into the environment during each cycle of a washing machine. It also mentioned a 2016 study commissioned by outdoor brand Patagonia that found that washing a single synthetic jacket just once released an average of 1.7 grammes of microfibres.

California-based blogger, accountant, TED Talks presenter and campaigner Beth Terry set up 'My Plastic-Free Life' about 10 years ago and by 2012, according to her own calculations, had reduced the amount of plastic waste she was generating each year to 2% of the US average. Ms Terry decided that she would go through the whole of 2016 without buying any new clothes or shoes, but her top ways to reduce her use of plastic include a number of references to clothing and her main piece of advice is: "Choose natural fibres."

Opportunity of a lifetime

This should be good news, then, for people who grow and process cotton (especially more sustainable cotton), wool, linen and other natural materials that can be made into fabric for apparel companies and others to use. This should be the opportunity of a lifetime for them; brands must be thinking carefully about launching plastics-free, ocean-friendly clothing collections.

A well known trends consultant to the wider textile industry, Ornella Bignami, runs the Linen Dream Lab at the Milan headquarters of her company, Elementi Moda, with the aim of helping to promote the work of The European Confederation of Flax and Hemp (CELC). The Dream Lab hosts a showroom for linen fabrics and an innovation centre to demonstrate to the designer communities of Milan and Florence the benefits of this ancient fibre that comes from the flax plant. "I have already noticed a counter-reaction to the plastics problem," Ms Bignami says, "especially among people from the younger generation. I must say I'm pleased that these young consumers are at least asking about and finding out more about natural fibres."

She is less encouraged by the lack of common standards for materials that have a lighter impact on the environment and agrees with those who argue that having hundreds of different standards (more than 430 at the last count) is, in the consumer's eyes, the same as having none. She talks about listening to a panel discussion at the start of Milano Unica in July, with speaker after speaker highlighting the sustainability credentials of the fabrics on display at the event. "They were all sustainable for a different reason," Ornella Bignami observes, "making it clear that we need a common standard for measuring what all of this means." No matter what the criteria of that common standard might be in the end, she is confident few fibres or fabrics would match linen. She explains: "The flax plant requires no irrigation, there is no issue over genetically modified crops, the process for producing the plant is completely natural and the process for producing linen fibre from the plant is mechanical, so it uses no chemicals." Ms Bignami says the Linen Dream Lab's work is bearing fruit because a number of Italian mills, at the mid-to-high level, are beginning to use it in their collections. She adds that big-name brands are also becoming more interested in linen; in some cases, at least, she thinks this is because they are trying to "save face" owing to the impact on the environment of their other products.



Wool fabrics from Lanificio Angelico.

Lanificio Angelico

Cotton keeps moving

These other products, of course, completely dominate the world of textiles. CELC puts linen's share of the global total at around 0.9% and even wool, which grows in many more geographies than flax, only commands a share of around 3%. Perhaps pinning hopes on cotton reducing synthetic fibres' domination is the best bet for supporters of natural fibres. The executive director of the Sustainable Furnishings Council (SFC), Susan Inglis, makes the point that no material is entirely free of environmental or social baggage and this certainly includes cotton.

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Apart from the well documented concerns surrounding conventional cotton's use of water and chemicals, she says the SFC has listed 19 cotton-producing countries around the world in which there are documented cases of slave labour, child labour or forced labour. And it is worth remembering, she points out, that the history of the US south also includes using enslaved people for cotton production. Mills in Europe, especially in England, benefitted hugely from that supply, as did their rivals in New England and New Jersey later.

Ms Inglis says: "We should use organic cotton if we can, or cotton from growers affiliated to the Better Cotton Initiative (BCI)." BCI is the Geneva-based non-profit organisation that works to promote greater sustainability in cotton production around the world. It is making a difference. It has calculated that in cotton growing season 2016-2017 a figure of just over 14% of the global total was what it classes as 'better', which includes fair-trade and organic cotton. It said this figure represents a 2% increase compared with the previous season and that 1.3 million licensed BCI farmers in 21 countries had produced 3.3 million tonnes of better cotton lint, enabling a record-level of more sustainably produced cotton to enter the global supply chain.

Chief executive of sustainability consultancy Forum for the Future, Dr Sally Uren, and the head of sustainable raw materials at the C&A Foundation, Anita Chester, teamed up at the 2018 BCI conference in Brussels at the end of June to launch CottonUp, a guide to help brands and retailers move to more sustainable cotton. It is a guide that will equip buyers with the information they need to increase the volumes of more sustainable cotton that they procure. They said that sourcing more sustainable cotton is essential to reducing the fibre's negative impacts and ensuring future supply. However, they acknowledged that researching the best available sourcing options is often "resource-intensive". The CottonUP guide shares direct experiences and learning from companies that have already navigated "the complex challenges".

Wool is cool

Outdoor brands appear increasingly keen on wool these days, at least in combination with other fibres. Recent *WSA* articles, including 'A buzz around merino blends' in April-May 2018 and 'Home grown wool' in July-August 2018, make this clear. A long-sleeve T-shirt that adidas made for the top 20 finishers in each age group in the 2018 Boston Marathon was made from 75% Australian merino wool and 25% polyamide, for example.

Developments taking wool beyond traditional cut-and-sew construction have helped. Seamless and flat-knitting technologies are now in use in the manufacture of next-to-skin baselayers made from wool, as well as garments for every layer from there up. Brands have proved, not least to themselves, that wool works well in all types of garments and is popular among consumers. Merino wool, in particular, with its fine fibres feels soft next to the skin. It has natural elasticity, breathability and odour resistance, and it reacts to changes in body temperature, helping the wearer stay warm when it is cold and cool when it is warm. Of particular interest to consumers who are concerned about ocean pollution and are looking for alternatives, wool is renewable (you just need sunshine, sheep and grass, often grass on land that cannot be used for human food crops). It is also biodegradable both on land and at sea. The relatively high price of wool helps make its use in blends more accessible and, therefore, more attractive, but the broad appeal of wool seems beyond dispute.



Unlike most field crops, the flax plant is pulled without it being cut as the fibre runs the full length of the stem, from tip to root. All parts of the plant, including the seeds and straw, have other uses.

CELC

Prepared to pay

The commercial director of Lanificio Angelico, Luca Monti, suggests that there is more to this argument than price. Angelico is one of the many firms in the northern Italian city of Biella to produce high-end wool fabric and Mr Monti acknowledges that most of the consumers whose clothes the company's products go into can afford to pay a premium for wool's qualities. "They will spend more," he says, "but only if we can offer something different, while at lower levels of the market, it seems to me that money has for a long time been the only thing that most consumers and most brands think about. But millennials are arriving onto the market now and they are very sensitive to issues such as ocean pollution. They are interested in natural fibres and I am sure that in future there will be more demand, even if I don't know how long that might take."

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Intensive testing

Linen, with an even lower share of the global fibre market, may have to wait even longer, but Marie Demaegdt, who is in charge of textiles and sustainability at CELC, believes the flax and linen community has been working hard for many years to present the fibre's credentials with confidence and pride. And it has science, research and analysis to back this up. CELC carried out a lifecycle analysis (LCA) of linen's carbon footprint as long ago as 2008. In 2014, it worked with academics at the University of Lorraine in north-eastern France to test the properties of linen in comparison to those of cotton, polyester and viscose, plus a cotton-linen (50-50) mix and has all the results on display on its website. "All the results are there, even those in which linen doesn't come first," Ms Demaegdt says. "I like it best when linen does come first, of course."

Linen comes top in permeability to air and in water vapour resistance, for example, making it the most breathable fibre designers and brands can choose. It also ranks second (to polyester) in thermal resistance and this, coupled with its top ranking in breathability, led the Lorraine academics to conclude that linen scored the highest for comfort of all the fibres and combinations in the tests.

Marie Demaegdt is highly hopeful of an increase in demand and she explains that, while cultivation of the flax plant in Europe is restricted to a strip of coast stretching from Caen in France, through Belgium, as far as Amsterdam in the Netherlands, farmers have succeeded in increasing the surface area for growing flax by between 10% and 15% in each of the last three years.

Ancient and honourable

Europe accounts for around 80% of global production and this shows little sign of changing, which is fine in Ms Demaegdt's book because linen's history is intertwined with Europe's. For example, it is well known that linen gave us the word 'lingerie', and that textiles of any origin for use in the dining-room and bedroom are often called table linen and bed linen, respectively. Less obvious, perhaps, is that the word 'line' also has its roots in linen: 'Linum' is the Latin word for the flax plant. From the same source we have words such as 'lint' and 'Linoleum' (first made from linseed oil, another fruit of the flax plant) and even the name for a songbird, the linnet, so-named because of its liking for eating flax seeds. "Our connections to linen are very strong," Ms Demaegdt says, "and include the land, the weather and all the know-how that goes with producing a product for centuries. We have villages in which, non-stop, communities have been making a living from growing flax and producing linen since, at least, the sixteenth century. I talk to them all the time and they say that they have learned less than 1% of what they know about linen from books or college courses. Most of their knowledge is from their own experience or passed on to them by their families and neighbours. This makes linen attractive for social and ethical, as well as environmental, reasons. It's difficult to see which factor is attracting people more."



CELC ran an event called '1 Love Linen' in London in April 2018 to raise consumer awareness of the fibre's many attractions. UK fashion retail group Jigsaw embraced the event enthusiastically.

Jigsaw

Applications beyond fashion

As with wool, developments that allow the fibre to be used not just in woven applications but in knitted fabrics, too, as jersey, piqué or spacer fabrics. The active sports market is particularly interested in this, according to Marie Demaegdt, and she says a new plaited jersey fabric from Portuguese mill João António Lima is a good example because it is a fabric that will appeal to brands in the athleisure market but also one that will work in hiking apparel.

There is no ambition to grow linen's share of the fibre market to 10% of the total or anything approaching it, she insists. Instead, CELC and its partners want to concentrate on innovation and on finding new areas in which to make linen one of the materials of choice.

Sports equipment is one of the areas of interest here because it turns out that it is not only in clothes that fibres from the flax plant can replace plastic, but in composite materials too. Tennis rackets made with 15% flax offer a reduction in vibration of 22%, and helmets, bicycles and surfboards have all been made from flax composites too. A Scottish company, Lonely Mountain Skis, is already using combinations of carbon and flax fibre for its skis and its Sneachda product was a gold category winner in the ski segment at the 2016-2017 ISPO Awards. Sneachda is from the Gaelic word for snow.

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