

Colour in Textiles: Colour and the Environment Since the 1990s

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During the three last decades of the 20th century in Europe and America, the use of colours reflected people's thinking and behaviour and was a clear expression of the social premises of the time. Throughout the 1990s colours used were in accord with widespread concerns about the environment: a deeper awareness of the environment in danger because of activities of mankind. Companies from Italy, France, Germany and the USA began to propose textiles and colours with a much reduced environmental impact in their manufacture and use. Colours related to the nature were much in evidence and products using naturally coloured cotton produced without any chemical treatment began to be commercially viable.

Background

This article examines how the use of colour in textiles has acted as a paradigm as regards attitudes and behaviour towards environmental matters over the past two decades. During the 1990s the use of colours by fashion designers reflected concerns about 'green' issues. A new trend of thought set forward a deeper awareness of the environment in danger. An emphasis on conservation was the most remarkable trend, and taking on board themes such as humanity's relationship with the environment, the protective home, native roots and traditions. The new commandments were avoiding pollution, the efficient use of resources, the importance of quality rather than quantity, and respect for nature. Several companies, at first in Europe and the USA, and later throughout the world, began to propose textiles and colours related to this way of thinking. Everyone celebrated nature in their own way, by the choice of material, subject or colour.

It is interesting to consider how the use of colour has reflected and accompanied attitudes and behaviour towards environmental concerns in Western countries. Complex applications of colour have provided a clear expression of the social priorities of the time, throughout the 1990s colours, reflecting concerns about the impact of human activities on the environment.

The euphoric creativity of the 1960s, and the accompanying sense of prosperity and expansion, was reflected in the widespread use of bright colours, to be followed in the more utilitarian 1970s where muted, faded colours became fashionable after the oil crisis of 1973. The 1980s was the decade of appearance: egocentricity together with hedonism and obsession for social status were more significant features. It was a decade of a remarkable awareness of colour. Blacks were popular, alone or associated with white and red, as well as with metallic colours, silver and gold, so as to emphasise the sought-after luxury effect [1,2].

As styling manager, dealing with design, colour and product planning for many years in a multinational textile group, I have had the opportunity to travel, visiting the main cities that matter in design. The commentary and images presented in this article are based on the experience gained during these travels and the material collected at textiles and decoration fairs and stores.

Environmental Trends

In the 1990s, the end of the Cold War brought about a hope for the end of the nuclear menace. A new trend of thought emphasised a deeper awareness of the environment in danger. The idea of conservation became important, with a focus on ecology, the protective home, the native roots and traditions. The new commandments were all about avoiding pollution, the efficient use of resources, the importance of quality instead of quantity and a respect for nature.

This was the beginning of a new way of thinking which would give birth to the desire for a simpler way of living that rejected unnecessary consumption. The search for true moral values was shown by the use of natural materials, exemplified in textiles with a growth in popularity for unbleached linen.

Companies from Italy, France, Germany and the USA began to develop coloured textiles related to this way of thinking. Everyone celebrated nature in their own way, through choices of material, subject and colour.

Facts Accompanying this Movement

Negative headlines were widespread at this time: chemicals used in textile manufacturing were indiscriminately branded in negative terms or were characterised as being dangerous to health. Against this background the Austrian Textile Research Institute in Vienna developed a test standard in 1989 for measuring harmful substances in textiles. In 1991 the German Textile Association was carrying a similar work, and cooperation between these two organisations gave birth to the Oeko-Tex standard.

The Oeko-Tex Standard 100 was introduced as a response to the needs of consumers for textiles that posed no risk to health. It was presented to the textile and clothing industry for the first time in 1992 at the Interstoff trade fair, for manufacturers of underwear, babywear and home textiles in Germany, Austria and Switzerland. But just one year after the launch of the product label, there were 214 companies adopting it [3].

At the Heimtextil Fair, in January 1993, in Frankfurt, 'natural' textile products for bed-wear and decoration were introduced; these were undyed, unbleached fabrics having undergone no chemical processing (Figures 1–3). Amongst the companies presenting such products were Zucchi, Bassetti, Madival (Italy); Descamps, Jalla, le Cotonier (France); and Fieldcrest (USA), typically using organic cotton, untreated with chemicals.

About the History of Coloured Cotton

Coloured cotton agriculture began around 2700 BC in India/Pakistan, Egypt and Peru. It was then common for cotton to grow in a variety of natural colours. The Mochica culture in Peru developed an extraordinary palette of natural cotton fibre colours, ranging from white, grey, cream, beige, brown, and reddish-brown to chocolate, green, yellow and mauve. Small villages



Figure 1



Figure 2



Figure 3

kept the coloured strains alive and growing through the past several hundred years. Today descendants of ancient Peruvian cultures still harvest, gin and spin by hand the naturally coloured cottons. In their original, natural state the fibres are not long enough for industrial spinners and therefore are unsuitable for use in mass-produced textiles [4–6].

Many scientists and explorers have been intrigued by the singular beauty and value of Peruvian cotton, including the naturalists Darwin and von Humbolt. Native cotton offers important advantages. It requires virtually no maintenance after sowing, no fertilisers, and no pesticides during its long growth cycle. Developing into large bushes that produce fibre all year round after the first year, native cotton can be harvested for up to six years, and will yield high-grade fibre often in excess of average yields of commercial hybrid varieties. It can be grown successfully in arid soils whose high level of salinity and boron toxicity will support virtually no other crop.

Coloured Cotton Development

While spending time in the Gambia, West Africa, the American Sally Fox observed the indiscriminate use of pesticides, which chimed with her concern for the environment and encouraged her to develop safer methods of pest management. She was introduced to coloured cotton while working for a cotton breeder, whose focus was developing pest-resistant strains of cotton. She rediscovered a small amount of brown cotton seeds in 1982. The peoples of Central and South America had spun these strains for centuries. Here was Sally Fox's opportunity to combine her concern for the environment, work in her field of entomology, and practice her

favourite pastime, spinning and weaving. She took on the challenge of improving an ancient agricultural art, spending several years crossbreeding coloured cotton plants to produce a commercially viable long-fibre coloured cotton. Sally Fox's motto was 'No dyes, no pesticides, just pure cotton' [7,8].

After only three years of plant breeding, she realised that the brown colour was actually hiding green, red, and pink. These unexpected cotton lints were given to hand spinner study groups who helped her to discover other qualities. The task was not only improving the fibre quality, but also increasing the colour spectrum. Experimental machine processing by John Price at the International Centre for Textile Research and Development first demonstrated the improvements that had been made. It takes seven to ten years of selective crossbreeding before a new variety develops, i.e. a line of plants whose seeds always produce plants identical to the parent but distinctly different from others of the same species.

Sally Fox has been successful in increasing the average length of coloured cotton fibres from about 1 cm to over 2.5 cm, more than adequate for commercial spinning. She registered the trade name Foxfibre in six distinct shades: Coyote and New Brown, both of which are reddish-browns, milk-chocolate-coloured Buffalo, sage-coloured Palo Verde, Green Fox Fibre, and a dark forest New Green (Figures 4 and 5).



Figure 4



Figure 5

The raw colours of the cotton yarns may display only a hint of the colours to come once 'developed' by washing and/or boiling. Some of the techniques to develop the colour before weaving take into account the pH of the water. The higher the pH used to wash or boil the cotton, the darker the colours will become. The more minerals in the water, the brighter the colours may be. The colours also darken in warm or hot water and when dried with as much heat as possible. It is the heat and the moisture that bring the colour out. These colours do not wash out, but they do fade in the sun.

Two of the numerous advantages of naturally coloured cottons are:

- Elimination of the need for the dyeing and finishing steps, so detrimental to the environment, and
- They are inherently more fire-resistant than white cotton.

Fox found that some cotton plants are naturally flame-resistant. When the brown cotton didn't burn easily, she recognised the possibility of producing a safe cotton for children's sleepwear. Coloured cotton plants also resist pests and drought better, so they are very adaptable to farming in arid conditions.

Kitan (Israel) launched Colorcot, a line of naturally grown coloured cotton products, at Heimtextil Frankfurt in 1994, in response to consumer demand for chemical-free products.

Colorcot signifies Kitan's commitment to improving the quality of the environment. The strategic partners were Fieldcrest-Cannon, Bassetti, Coats-Viyella (Dorma), Ichida and Dodwell (Figures 6–8). The products were first offered in North America and Europe, and then in Asia and Australia in 1995.



Figure 6 (left)



Figure 7 (right)

Kitan is the exclusive European licensee for Esprit Bath & Bed. Available in shop-in-shop retail locations in better department stores and specialty stores, Esprit bedlinen is made of 100% cotton saicems. The towels and robes are all of combed cotton. The Esprit line of contemporary styling captures the spirit of the times. The distinctly eclectic designs appeal to the bold yet unassuming lifestyle of the nineties. The colours, the fabrics, the styling and the impeccable quality - all reflect the demand for greater individuality. The newest addition to Esprit Bath & Bed is Esprit Naturals - bedding, towels and robes made of chemical-free Colorcot®. Kitan's naturally grown coloured cotton. The use of unbleached and undyed natural fibers is part of Esprit's long-standing commitment to greater environmental awareness.

Esprit - A lesson in lifestyle

A long-standing commitment to greater environmental awareness

Figure 8

The Earth Summit

The Earth Summit, more properly known as the United Nations Conference on Environment and Development (UNCED) was held in Rio de Janeiro, in June 1992. The two-week Earth Summit was the climax of a process, begun in December 1989, of planning, education and negotiations among all member states of the United Nations, leading to the adoption of Agenda 21, a wide-ranging blueprint for action to achieve sustainable development worldwide. The programme of action recommended ways to strengthen the part played by major groups, such as women, trade unions, farmers, children and young people, indigenous peoples, the scientific community, local authorities, business, industry and non-governmental organisations (NGOs), in achieving sustainable development. The Earth Summit, with 172 governments participating, had the environment and sustainable development as its principal themes. It was attended by almost 10 000 journalists.

Businesses are often the most capable actors to make product changes, since many adverse environmental outputs can be prevented at the product design stage. By using their position of power and through communication strategies, businesses can affect the behaviour of many people and optimise products' lifecycles beyond the manufacturing stages. Retailers too are

important in helping to exert pressure on suppliers and create greener market offerings. Most importantly, they can provide easily accessible product information to consumers. Consumers in turn can take a more responsible attitude towards their purchasing decisions and lifestyles. The media itself and celebrity trendsetters can also exert strong influences.

1994: The Year of Ecology

The trend forum at the 1994 Heimtextil in Frankfurt was devoted to raising awareness about



Figure 9

the preservation of nature: protecting, selecting and recycling, rather than polluting. Traditional unbleached linen fabrics, cotton fabrics from the environmentally friendly cotton, jute and linen blends, lambs wool, Indian silk and cotton and fine Chinese cashmere were used in the different textile products for the home. The colours were neutral, obtained from coloured cotton: pale greens, combinations of white with blue or beige, and light, slightly dull, colours (Figures 9 and 10). Colour charts reflected natural phenomena: the world of rain (blue, brown), the world of snow (whites and light pastels), the world of the sun (colours of the sun from midday to sunset) (Figures 11–14). Colours were named after the elements of nature: straw, olive and linen; browns from lianas and dark wood; sand, ivory, saffron, honey, ocean blue, lake green, slate, indigo. Sandy and greyish beiges were predominant, in some cases highlighted with vivid colours: yellow, orange and turquoise.



Figure 10

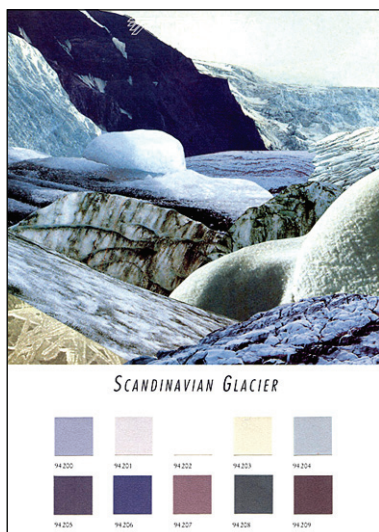


Figure 11

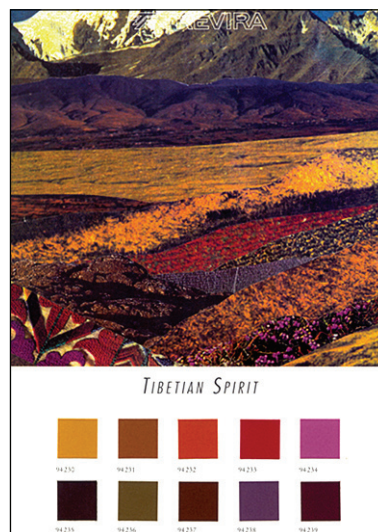


Figure 12

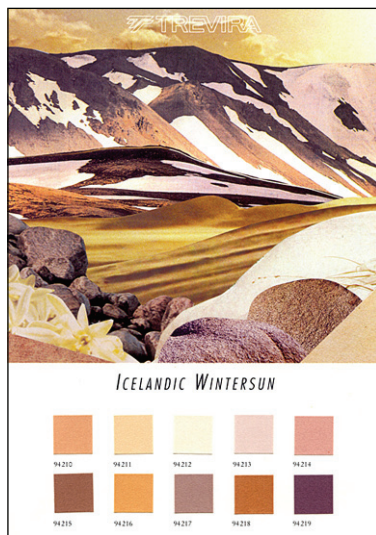


Figure 13

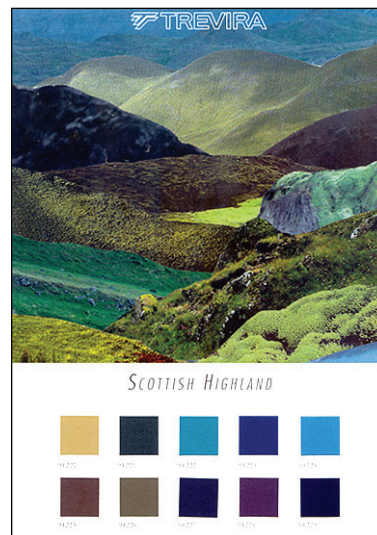


Figure 14

Following the Trend

In 1995 the Cotton Incorporated trends for womenswear and menswear were named as Land (inspired by colours of the Arizona desert), Reflections (from moon twilight, thunder, shadow and dusk), Atmosphere, Liquids, and Typhoon. Neutrals were more colourful than in past seasons. The cool tones, inspired by raindrops and cool filtered light, mix with the warmer darks, the colours of autumn foliage, berries and harvest time. Neutrals were more colourful than in past seasons (Figures 15 and 16). Trends for 1996/97 pointed toward influences from people from geographically remote areas, with emphasis on rural life, frontier spirit and communal living, where function and simplicity are key. Shaker and Zen ideas were major influences of this way of living. Intense, brilliant colours, combined with black, blue or white, white and black, greys with browns and red brick were nevertheless present, in others styles, to a lesser extent.

Looking towards the 1998/99 season, Cotton Incorporated's direction was 'A Sense of Home', following the so-called house of the five senses displayed at the Salon du Meuble in Paris in January 1996. It was intended to show that the habitat is a domestic space for well-being, and



Figure 15



Figure 16

the free reflection of a personality, marking a clear distinction with the quite rigid designs of the 1980s. Natural motifs such as water-coloured botanicals, clouds, waves and spirals signified the return to the ephemeral, and gave rise to feelings that allowed the viewer to imagine new products, patterns and textures, with fabrics inspired by natural structures and soft organic textures, complemented by calming colours.

Towards the end of the 20th century a new questioning approach became apparent, focusing on the fundamental needs that would help achieve a new approach to design. The quest was to produce goods that were lasting, of high quality, simple and environmentally friendly. There was a preference for simple and refined products, made with attention to detail and a high standard of finish. High quality, simplicity, lightness put forward the importance of avoiding the superfluous. Every object had an essential identity concerning its form, its material, its colour and its function. Home was seen as a cosy shelter in a world that lacked stability.

Into the 21st Century

At the beginning of the new millennium there were other priorities in mind. Evidence of our lack of engagement with the environment and the sustainability of our human lifestyles was becoming increasingly apparent. Without doubt there is now an enhanced appreciation of the environment and mankind's impact on it. Recently released scientific reports are raising the consumer's consciousness to new heights of awareness about global warming and environmental issues affecting our planet and our lives. The Global Lifestyle Monitor, a biennial consumer research study, conducted by Cotton Council International in 2006, pointed to increasing consumer concerns about environmental issues [9]. The survey included nine countries: Brazil, Colombia, Italy, Germany, the United Kingdom, India, China, Japan and Thailand. On average, 42% of consumers were either extremely or very concerned about global issues on the environment. So far, concern is one thing and actions are another. Surprisingly, according to the study, taking into account the environmental friendliness of a product was the least important factor influencing consumers' purchase decisions. In spite of that, more manufacturers and retailers are taking the eco-movement seriously.

In textiles, before the introduction of the Oeko-Tex standard, there was neither a reliable product label for consumers to assess the human ecological quality of textiles nor a uniform safety standard to guide companies on how they could assess potential harmful substances in textile products. There are currently over 7000 textile and clothing manufacturers throughout the textile processing chain in around 80 countries certified according to this standard (Figure 17). The country with the most certificates is Germany, followed by China and Italy.

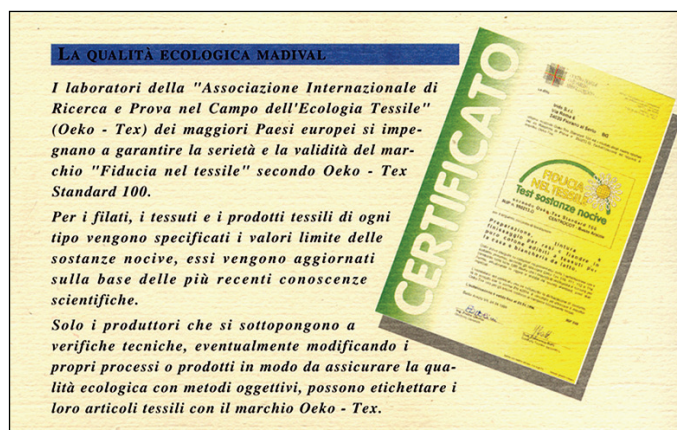


Figure 17

Looking for Naturally Coloured Cotton

The University of Agricultural Sciences (UAS), Dharwad, India, has been working with the Khadi and Village Industries Board to promote the cultivation of naturally coloured cotton in parts of northern Karnataka. Agricultural scientists at UAS developed two varieties of coloured cotton since 2003 by crossing the wild cotton varieties with the cultivated white ones under a five-year project sponsored by the Cotton Corporation of India. Naturally coloured cotton was developed in two colours, green and almond brown. Cultivation of coloured cotton varieties needs to be done in protected environment as there are chances of the normal white cotton becoming contaminated due to cross-pollination.

Scientists in Syria in 2004 produced naturally coloured cotton by introducing random changes in the genetic material of cotton seeds. Two brown varieties were produced giving greater yields and higher quality fibres than other naturally coloured varieties, giving them potential for commercial textile production.

China produces about 30 000 tonnes of naturally coloured cotton each year, accounting for nearly 60% of the world's total. Ninety-five percent of China's coloured cotton is produced in Xinjiang, in a total area of 20 000 hectares.

Peru Naturtex Partners is one organisation involved in this trade: a contract manufacturing organisation, vertically integrating organic fibre production, including both carded and combed natural coloured cotton. Embrapa of Brazil is another, having over the past three decades become well known in the field of tropical agriculture. A pioneer in the development of coloured cotton in that country, Embrapa launched its first cultivar, BRS 200 Brown, in 2000. The BRS Green was placed on the market in 2003, and BRS Safira and BRS Rubi in 2005. All were obtained through conventional methods of genetic improvement to meet the growing demand in the market.

Conclusion

Organic products such as naturally coloured cotton must have accurate labelling and meet the minimum standards set for processing. The need for a general global standard to protect the environment from chemical pollution is now recognised. For example, at Heimtextil 2008 there was a significant increase in the number of companies promoting products and services claiming environmental benefits. Amongst the items presented were organic cotton, water treatment plants to limit toxic waste and low-water dyeing processes.

Material processing and treatment must not release chemicals into the environment that can be traced in the products consumed and in turn adversely impact on the environment. These goals can only be accomplished if producers establish long-term environmental objectives and fix targets to achieve them.

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