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Beyond cotton: Which alternative fabrics are eco-friendly?

Here's how plant-based fabrics flax, hemp, bamboo and Tencel rate in terms of sustainability.

By Susan Carpenter Los Angeles Times - June 19, 2011



Much as they're trumpeted by so-called eco-designers, plant-based alternatives to cotton are a minuscule piece of the fashion puzzle. Dwarfed by cotton and synthetics such as polyester, spandex and rayon, textiles made from flax, wood pulp, hemp and bamboo make up less than 2% of the market. But that percentage is growing due to consumer and corporate demand, as well as technological advancements that make natural fibers easier to transform into wearable fabrics.

One of the more promising developments in sustainable textiles is **flax**, a stalky and fibrous plant that can be grown with far less water and fewer pesticides than cotton and produced at a lower price. While cotton is cultivated on 12.6 million U.S. acres, flax is currently grown on just 2 million acres of U.S. and Canadian farmland. Most flax is produced for its grain, which is turned into food. But its fiber can also be transformed into materials that look and feel similar to cotton. As a textile, it's incorporated into 1.1% of U.S. garments and most commonly used in linen.

One version of a flax fabric, Crailar flax, was created by Vancouver-based Naturally Advanced Technologies in collaboration with the National Research Council of Canada. In the works for almost four years, it isn't yet commercially available, but Hanes, in North Carolina, has been working with NAT for more than three years and a spokesman said the company "might introduce some products that incorporate flax possibly late this year on a pretty small scale."

A NAT spokesman said that Crailar flax is produced with a naturally occurring proprietary enzyme that transforms the fibers from the flax plant stalk into a soft and strong textile ideally suited for knit garments, such as T-shirts and underwear, mostly in blends with cotton. The processing agents for Crailar flax meet the Global Organic Textile Standards, according to Chief Executive Kenneth Barker.

Bamboo, once the darling of eco-designers who prized its silky hand feel and drape, has largely been discredited as an alternative source. While bamboo is among the fastest-growing plants on the planet and grows without irrigation, processing its fiber into textiles requires heavy-duty chemical solvents such as sodium hydroxide and carbon disulfide that can harm human health and the environment. The use of bamboo has dropped dramatically. In 2008, 0.1% of U.S. garments incorporated bamboo, compared with 0.04% today.

On the other hand, **hemp**, an industrial, non-psychoactive plant that is part of the cannabis family, has been growing in popularity among clothing makers in recent years. Stella McCartney, Calvin Klein and a host of lesser-known labels now use the fiber, which, like bamboo and flax, requires far less water and fewer pesticides to grow than cotton. Hemp, however, is not legal to grow in the U.S., so most of the material used by American clothing designers is imported from China. As a result, just 0.003% of U.S. garments incorporate hemp.

Tencel, a textile made from the pulp of eucalyptus trees imported, for the most part, from South Africa, is rising in popularity due to its rayon-like feel and sustainable origins. Like bamboo and flax, eucalyptus requires fewer pesticides and far less acreage and water to grow than cotton. Most of the wood pulp is Forest Stewardship Council-certified, and Tencel's use has doubled in the last three years, from 0.2% in 2008 to 0.4% today.

A competitor to viscose, Tencel is made by combining wood pulp with the nontoxic solvent amine oxide, 99% of which is recovered and reused, in a process known as closed-loop manufacturing. Patagonia, Banana Republic and L.L. Bean are among the manufacturers that use Tencel in their garments.

[Click here to see Naturally Advanced Technologies in the LA Times.](#)