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WHAT DOES 'ORGANIC FABRIC' REALLY MEAN?

by Leigh Anne Van Dusen

DO YOU KNOW THE DIFFERENCE BETWEEN AN organic cotton T-shirt and a conventional T-shirt? If you care about the health of the environment, and of your own family, you need to know, and to put that knowledge into action. We humans produce and use many millions of metres of fabric every year – fabric for clothes, for sofas, curtains, and so on and so on.

Your organic cotton T-shirt is a much better choice for the environment than your icky conventional cotton T-shirt. But if the only thing organic about your fabric is the way its fibre was raised, you are very far from being a steward of either the earth or of your own health. Textile production involves many more steps and many more affronts to the environment than just those concerning the production of the fibre itself.

Textile production – weaving, dyeing and finishing – uses a lot of two substances: chemicals and water. The chemicals used and the way the water is treated (or not) have devastating impacts on our planet and on ourselves.

Chemicals needed in fabric production weigh between 10-100% of the weight of the fabric. The 2005 American Association of Textile Chemists and Colorists Buyers Guide lists over 2,000 chemicals used in textile production, some known to cause ailments which run the gamut from headaches to some of the most dreaded diseases known. But 'the dose makes the poison', so the industry makes the case that these chemicals are used in such tiny amounts that they have no effect. But many are accumulative – and that same dose below which it is said to be safe for adult exposure might very well be toxic for an infant; or for fish or frogs or deer. The classic case is lead: in 1971 the US Surgeon General declared that lead levels of 40 micrograms per decilitre of blood were safe. It's now established that any detectable lead level can cause neurological damage in children, shaving off IQ points. Lead is a component in fabric dyes, and the chemical residue remains in the fabric... as the colour!

How does the lead get from the fabric into our bodies? Some chemicals 'out-gas', and we breathe them in. Some are absorbed through our skin. Other chemicals leach into the dust and dirt that settles onto the fabrics; microscopic dust and fabric pieces are often abraded and blown into the air, where we again have a chance to breathe them in.



Water is used at every stage in manufacturing: to dissolve chemicals to be used in one step, then to wash and rinse out those same chemicals to be ready for the next step. This chemically infused effluent is often released into the local river, where it enters the groundwater, the food chain, drinking water, and the habitat of flora and fauna and we're all downstream. Textile mills in India alone discharge over 600 million cubic metres – enough to fill 240,000 Olympic size swimming pools – of water that is saturated with dyes, de-foamers, detergents, bleach, optical brighteners, equalisers and many other chemicals. The situation is better in the developed world than in the developing world, where the majority of textile production has migrated. But even the developed world has much room for improvement.

If the product has the new Global Organic Textile Standard certification (GOTS) or any one of the myriad other third party certifications that apply to textiles – Oeko-Tex, BlueSign, or the EU Flower – it's the better choice than just buying a product made from fibres that were raised organically. Make sure you ask – the term organic is used liberally and may only refer to how the fibres were grown – but that means little when the fibres are treated with a deluge of chemicals in the processing. Many eco textile producers are also emphasising fair trade and social justice standards.

So how does the new GOTS (Global Organic Textile) standard help to improve this dire situation? What makes an eco textile better for me, and for the environment? Eco textiles address the detrimental health and environmental issues (and frequently social too) that are the by-products of conventional methods at each stage of textile production. (There are two major categories of fibre from which textiles are made: man-made, like polyester; and natural, such as linen, hemp, or cotton. We are only addressing here some of the steps and issues involved in natural fibres. Environmental issues in the production and use of man-made fibres are no less alarming – only different.)

First, on a very personal level: most of the chemicals which empirical research has shown to be hazardous to the health of frogs, dogs or humans are not allowed. That doesn't mean that chemicals are not used. But it does mean that the chemicals used are not known to be capable of altering your genetic makeup, affecting your reproductive ability, or inducing a myriad of other health issues, such as asthma, cancer or neurological problems.

Fibre production: Conventional methods for growing natural fibres include spraying of insecticides, herbicides, and fertilisers on crops. These chemicals destroy not only the targeted pests, but beneficial insects and birds as well. They seep into the soil where they kill soil microbes which keep the soil healthy enough to support a diversity of crops. The chemicals enter the water table where the polluted water feeds plants and animals which feed humans. The chemicals persist to ultimately enter our own fatty tissues – and apparently never leave. When the microbes in the soil are killed using conventional agricultural methods, they also decompose, creating harmful methane which pollutes the air and is a greenhouse gas twenty times more potent than carbon dioxide.

Eco textiles support organic agriculture by requiring that all natural fibres be grown organically or sustainably – that is, without the millions of tons of chemical inputs used by conventional methods each and every year that degrade soil, pollute groundwater, kill aquatic and other wildlife; and bio-accumulate in human and animal fatty tissue to impact human health. Not to mention helping the health of the farmers who are spraying the fibres as well as the communities downwind of the spray!



Retting: When the plant fibre used for weaving comes from the stalk of the plant, such as with hemp and linen, instead of from the flower, as with cotton, the plants must be 'retted'. Retting separates the fibres which are spun into yarn from the glues and pectins within the stalk. Retting can be accomplished using either chemicals, water, or the sun and elements. Chemical retting is obviously not optimal. Even water retting can leave the water pH, if untreated, too alkaline or acidic for the surrounding eco-system – a situation which could wreak havoc with aquatic life, frogs, and eventually the entire eco-system. 'Dew' or 'field' retting, the environmentally optimal retting method, is labour and time-intensive, highly skilled – and an endangered activity. Conventional textile production allows chemical retting or water retting without requiring water treatment. GOTS producers are required to use either dew retting or to treat the water from water retting.

Weaving: To prevent the warp yarns from breaking during weaving, they are coated with a 'size' or glue before weaving to increase their tensile strength and smoothness. This 'size' prevents the shuttle from catching an errant thread and breaking the yarn, creating a defect and stopping production. While in conventional production, sizes such as metal containing polyurethane and other potentially toxic chemicals are not infrequently used, GOTS requires the use of a biodegradable and non-toxic substance such as potato starch. The sizing compound dries and remains a part of the cloth until it is removed in de-sizing or scouring. In conventional scouring de-sizing is most frequently accomplished with sodium hydroxide under high pressure and temperature (above 100°C). Best practice in eco textiles production dispenses with this step, using no water and introducing no additional polluted water to be treated – or not treated.

Bleaching: To get the woven fabrics ready for dyeing in conventional textile processing, they are most often bleached. Chlorine based chemicals are most frequently used for this process, a practice much to the detriment of environmental and human health. Dioxin, one of the most potent carcinogens known, is a by-product of chlorine bleaching. Eco textile bleaching requires oxygen based bleaches.



Dyeing: This is considered one of the most environmentally damaging stages because of the toxicity of the dyes used. Conventional dyes not infrequently contain phthalates (which are linked to a myriad of human health concerns including damage to the liver, kidney, and lungs) or polyvinyl chlorides (PVC), one of the most damaging persistent chemicals in use. Conventionally used dyes often contain heavy metals such as lead, cadmium, mercury and chromium, or benzene, toluene or AZO colourants, all potent toxins to both humans' health and the environment. These toxins permeate the water which is often then disposed of untreated, directly into our groundwater. Eco textile production, though not yet benign, prohibits the use of a very long list of the known most toxic ingredients and requires water treatment.

Finishing: We humans demand that our fabrics perform feats of strength: that they be stain resistant, perspiration impermeable, wrinkle free, colourfast to every known insult from sweat, sun, heat or whatever we throw at it. To accomplish these feats of strength the fabric is doused with chemicals, many of which can produce a catalogue of human health and environmental horrors. Among these delightful introductions to our environment are the PBDEs. These are bio-accumulative, with the levels in our bodies doubling every 2 to 5 years. They are potent thyroid disrupters. Formaldehyde is a frequently used fabric finish. That new linen smell? Formaldehyde.

The treatment of mill effluent (wastewater) required by eco textile production will help prevent toxic and/or bio-accumulative chemicals (such as PBDEs which are now found everywhere on the planet and in practically every tested animal, from fish to polar bears) from entering our ecosystem. These pervasive chemicals circulate in the groundwater around the world. In addition to wreaking havoc with human health they also impact aquatic life, from plankton to fish to seals. So there is a not terribly indirect link between eco-textile purchase and preserving species diversity on the planet. There are implications for global warming. Being lethal to aquatic organisms, mill effluent kills the small, usually plankton size animals en masse and they decompose into methane.

Treatment of mill effluent will also help conserve one of our most precious resources: water. The amount of water we have on the planet is finite but as population grows water consumption grows with it. A third of the world's population today lives in water stressed areas; by 2025 that is expected to grow to two thirds. Polluting our waters is simply a way of reducing the amount of fresh water available for us. It's a sure path to disaster.

Yes, it's complicated and irritating – and eco textiles are really hard to find. But let's transition from the distressing to the positive.

The trend to eco consciousness in textiles is major progress in reclaiming our stewardship of the earth, and in preventing preventable human misery. The new textile standards are not, by any means, yet environmentally benign. But, if people demand or support the efforts, more progress can be made – and rapidly. Many new techniques are possible, such as using ultrasound for dyeing, thereby eliminating the use of water entirely; and drying fabrics using radio frequencies rather than ovens, saving energy.

You have the power to stem the toxic stream caused by the production of fabric. If you search for and buy an eco textile, you are encouraging a shift to production methods that have the currently achievable minimum detrimental effects for either the planet or for your health. You, as a consumer, are very powerful. You have the power to change harmful production practices. Eco textiles exist and they give you a greener, healthier, fairtrade alternative. What will an eco textile do for you? You and the frogs and the world's flora and fauna could live longer, and be healthier – and in a more just, sufficiently diversified, more beautiful world.

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Information:
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Soil Association www.soilassociation.org
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