



# Sustainable Material Guide // 01 Cotton

Created by supplyCompass



# Cotton

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## Material Properties

Natural Fibre – Seed Hair



Comfortable on the skin  
and breathable



Tends to shrink upon first  
wash and under high  
temperatures



Absorbs water



Inelastic and rigid fibre



20% stronger wet than  
dry and wrinkles easily



Easily absorbs dyes and  
prints and retains  
colour well

## Introducing cotton

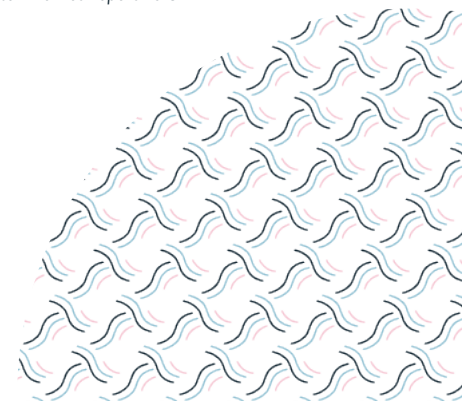


Cotton is ubiquitous: chances are that you are wearing it right now. It is a great natural material that has an abundance of uses, making it the second most used fibre in the textile industry after polyester.

Currently, less than 1% of global cotton production is organic, with an even smaller percentage being recycled<sup>1</sup>. The highest growth in organic cotton fibre production comes from India, China, Turkey, and Kyrgyzstan. Conventionally grown cotton faces environmental, social, and economic challenges, but has the potential to provide healthy livelihoods for 350 million people annually through organic and Fair Trade practices<sup>2</sup>.

<sup>1</sup>. Textile Exchange, Organic Cotton Market Report 2018

<sup>2</sup>. Fairtrade UK



## Key facts



### Organic farming in India

It takes farmers on average 3 years to convert to organic, as they have to clear the soil of chemicals and pesticides<sup>1</sup>. Madhya Pradesh, Odisha, and Gujarat are the 3 largest cotton-growing states in India.

1. Textile Exchange, Transitional Cotton



### Largest cotton producers

The largest producers of organic cotton are India, China, and Turkey. India is the largest producer with 51% of market share<sup>2</sup>. 18 countries produce organic cotton worldwide.

2. Textile Exchange, Organic Cotton Market Report 2018



### Contaminated waste water

It is estimated that 70% of the rivers and lakes in China are contaminated by wastewater due to the textile industry<sup>3</sup>. In 2018, China introduced an environmental protection tax as an incentive to cut the pollution of waterways.

3. EcoWatch

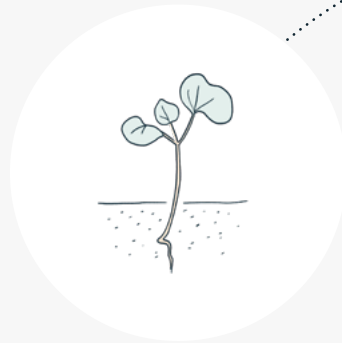
# The organic cotton process

*From seed to fabric*

## Cultivation

The organic farming process doesn't rely on genetically modified (GM) seeds, instead using organic cottonseed, organic fertilisers, and bio pesticides, which are less harmful to the environment. However, organic cottonseed is hard to come by in a market dominated by GM seeds. More than 90% of the cottonseed in India is GM, however organisations like Chetna Organic have set up seed banks to conserve quality of organic cottonseed<sup>2</sup>.

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## Growth

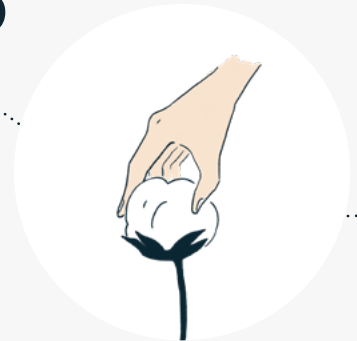
It takes approximately 10 weeks for the seed to grow into a cotton boll, and it is ready to be harvested after 25 weeks or when it reaches its full length of approximately 6cm. Cotton plants don't always mature within the same time frame and harvesting can occur in 2-3 waves throughout the season.



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## Picking

In the organic process, the cotton leaves are removed by hand rather than with chemicals. This helps retain the cotton quality and staple length of fibre. The average staple length with Indian cotton is 24-28mm.



*There are 192,060 organic cotton farmers in India<sup>1</sup>.*



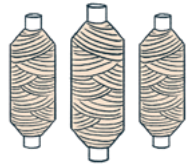
1. Textile Exchange, Organic Cotton Market Report 2018

2. EcoWatch

## Spinning

# 5

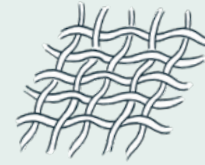
The bales are opened and blended through a range of machines. Next, the fibre is fed into a carding machine where the fibres are turned into a long, continuous loose rope called a sliver. The sliver then goes through the drawing, combing, and roving process to turn into a finer strand; it is then wound onto a bobbin, ready to be spun. There are 3 main types of spinning: ring, rotor, and air jet.



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## Fabric weaving & knitting

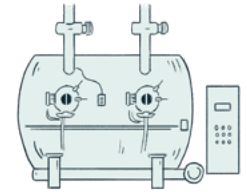
Yarn is now woven or knitted into fabric. This can either be turned into a piece of fabric through either weaving or knitting, or be dyed as a thread yarn for specific effects like gingham and plaid.



## Fabric dyeing & processing

This is the final step in the process. The raw and uncoloured "greige" cotton fabric is now ready to be finished through a series of chemical processing treatments to change the texture, colour, and add certain qualities. The core stages the fabric will go through is cleaning, preparing, dyeing, and then treating.

# 7



# 4

## Ginning

Once harvested, the fluffy raw cotton bolls go through a mechanical process called ginning, which separates the fibre from the seed and cleans the fibre of all lint and dirt. After the ginning process, a sample is sent off to be classified into grades based on colour, character, staple length, and strength. The raw fibre is then compressed into bales and carefully wrapped and stored to retain optimal moisture content and is then ready to be transported for use.



*To be certified by GOTS, the organic cotton must be tracked and certified at every stage throughout entire process.*





*“Going organic  
has allowed us to be  
self-reliant, providing better  
food security and allowing  
us to live healthier lives.  
All whilst maintaining  
the same income.”*

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Chetna Organic Cotton Farmer  
Adilabad, Telangana, India



# What's the difference?

## Conventional & organic

The cotton plant itself is not a thirsty plant; it is the process of turning the cotton fibre into fabric which requires a lot of water. It is believed that organic cotton needs less water to grow, in part due to the improved soil quality and water retention capacity brought about by organic farming methods.

One of the main benefits of organic cotton is the positive impact on the livelihoods of farmers, both in terms of their health and stability of income. Conventional cotton production requires GM seeds and use of agrochemicals – three of the ten most hazardous insecticides are used to cultivate cotton. The use of these hazardous chemicals degrades soil, affects the health of farmers, contaminates water, decreases biodiversity, and has had numerous cases of affecting major ecosystems.

There are lots of alternatives to this cherished material that can provide safer livelihoods for farmers and have a lesser environmental impact, whilst also increasing long-term yields. Although organic cotton is more time consuming to cultivate and requires more resources and skill for crop rotation, there are a multitude of other benefits from not using chemicals and managing water correctly. These include healthier systems, less water loss, and a safer environment for workers. This, ultimately, allows the crop to remain renewable and prosperous.



Credit: SupplyCompass visit to a Chetna organic cotton ginning facility (Telangana, India)



# Conventional

Soil degradation and potential loss of biodiversity through monoculture (planting only one crop) and use of GM cotton can result in loss of native species of cotton.

Highly inefficient water consumption with polluted run-off. Growing cotton on irrigated land consumes large amounts of water and can cause water shortages. Agro chemicals damage water retention of soil.

GM seeds are dependant on artificial fertilisers and hazardous chemicals, which pollute the environment, workers, and nearby populations. Nitrogen synthetic fertilisers are 300 times more potent than carbon dioxide as greenhouse gases.

There are high rates of farmer suicides recorded, many from large debts due to purchasing GM seeds and exposure to toxic chemicals. Farmers can easily become trapped in poverty and debt cycles that are difficult to break out of.



# Organic

GM seeds are not permitted, which increases biodiversity in the farms. Organic cotton instead uses natural, local materials for composting and soil maintenance, and there is no depletion of soil quality through the use of pesticides.

Irrigation is used but it is more likely to be rain-fed. There is a reduction in water consumption as organic cotton tends to be less thirsty, in part due to the soil's water retention capacity.

GM seeds are not used, which results in a lack of toxic chemicals. This also allows for no chemical spray drift and no contamination of groundwater or surface water. Organic crops avoid the use of energy-intensive mineral fertilisers and are also more resilient in extreme climatic conditions.

Crop rotation, which is integral to organic farming, allows farmers to rely on more than one crop. Seed saving facilitates farmer independence from GM seed companies. Organic farmers work under fairer more autonomous working conditions and have an increased income due to the premium price of the fibre they produce.

# Working with organic cotton?

*Here are 5 things to consider.*



Credit: SupplyCompass visit to a Chetna organic cotton ginning facility (Telangana, India)



## 1 / Recycling

Both pre and post-consumer cotton waste can be recycled, although post-consumer waste is more difficult to sort and recycle. Recycled cotton is a rougher yarn as the fibres are put under a great deal of strain when re-processed. After recycling the length, strength, and quality of the fibre is not the same as the original fibre. Most recycled cotton is mechanically recycled. SupplyCompass works closely with recycled cotton yarn suppliers who collect pre-consumer cotton waste directly from factories.



## 2 / Fibre

Opt for 100% unblended organic cotton as this makes recycling easier. Because recycled organic cotton is a weaker fibre, it is often blended with recycled polyester to increase its strength and resistance.



## 3 / Colour

As cotton is a natural crop, it is fully biodegradable if organic and untreated. Dye, chemicals, and material blends

can impede its degradability. The most favourable environmental option is naturally coloured or untreated cotton – this is because it is less processed, requiring much less water, energy, and chemicals to clean, bleach, soften, and dye the fibres. Look for GOTS and OEKO-TEX certifications from dyeing and printing units to ensure the right dyes and inks are used.



## 4 / Origin

Consider the origin of your yarn and material, and try to produce as close to the source as possible. This will reduce the carbon footprint in your supply chain.



## 5 / Care

Ensure clear labelling on your care label to advise consumers on the correct washing conditions. Cotton can be machine washed at 30 degrees celsius and there is usually no need to dry clean it.



# Key Certifications



GLOBAL ORGANIC TEXTILE  
STANDARD GOTS



ORGANIC SOIL  
ASSOCIATION



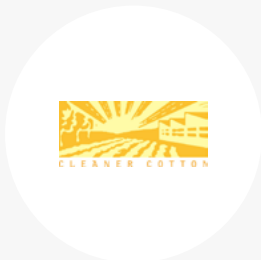
GLOBAL RECYCLED  
STANDARD



FAIR TRADE



BETTER COTTON INITIATIVE



CLEANER COTTON



COTTON MADE IN AFRICA



OEKO-TEX



E3 COTTON



COTTONCONNECT

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