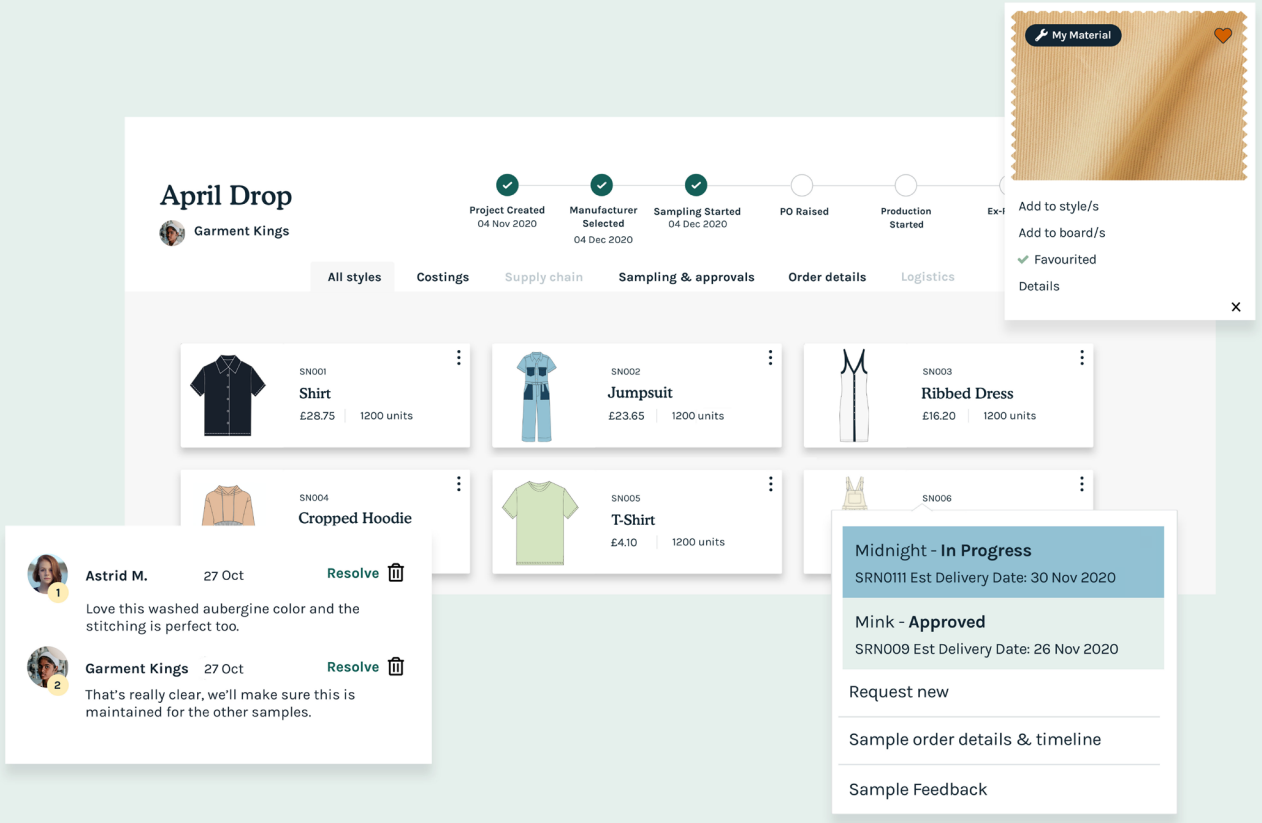
2021 //

Sustainable Material Guide // 07 Hemp

Created by supplyCompass

About SupplyCompass

SupplyCompass is the Production Platform reimagining Collaborative Production for the fashion industry. Our cloud-based software enables both brands and manufacturers to track and manage the entire product development and production process from design right through to delivery, all in one place.



Fashion production tends to be messy and error-prone. Brands and manufacturers spread across the globe all have their own methods of working. Then there's the unequal risk-sharing, inefficient communication and frequent delays all leading to a huge waste of time, money and resources and unsustainable methods of working. It's a painful, disorganised system that hurts brands wanting to scale quickly and profitably and manufacturers who are pressured to cut corners and work overtime.

At SupplyCompass we believe technology is a great unifier for ensuring brands and manufacturers that are spread across the globe *really* trust and understand each other, and work in a more efficient, productive and stress-free way. Our Platform ensures that all the information brands need from manufacturers and vice-versa is easily tracked, managed and visualised in one single place—from moodboards, tech packs, lab dips, styles, collections, fit logs, samples, kanban boards, libraries, and RFQs to approvals, POs, invoices and more. Easy-to-use and designed for people working *in fashion* to enjoy, SupplyCompass is empowering fashion brands and manufacturers across the globe to produce and work better, *together*.

Credit: Avery Meeker, Unsplash

Hemp

Cover Image: CanvaLoop

Material Properties

Natural Fibre • Cellulosic Fibre

Durable

Machine washable

Insulative

Absorbent with good colour retention

Softer with use

Resistant to bacteria, mold and mildew

Introducing Hemp

Hemp is one of the most historically celebrated textile fibres in human history, used in textile, paper, oil, canvas and rope production; the oldest paper in the world is supposed to be made from hemp in China. It is a bast fibre produced from the *Cannabis Sativa* plant and is unique in that every part of the plant can be utilised to make items ranging from fuel and resins to bricks, paper and textiles. Once one of the most important fibres and widely grown in Europe and Asia, it was used to create canvas for ship sails, ropes and nets amongst other important commodities. Cultivation of hemp continued until the 1940s; however, it began to decline in production due to the controversies surrounding the plant as both hemp fibre and marijuana are derived as distinct cultivars but from the same plant species. Hemp is now being increasingly recognized once more globally for its numerous useful and sustainable properties, particularly essential for the fashion industry of the 21st Century.

The hemp production process

1 Cultivation

Hemp can grow in a variety of soil types and climates but is best suited to loamy, well-aerated soil, and warm, tropical or moderate cool climates.

2 Harvesting

After 70-90 days, the crop is ready to be harvested for textile fibre. This takes place after flowering before the seed sets in and the fibres become coarse.

3 Retting

This process breaks down pectin, that binds the hemp fibres together, with the help of bacteria, fungi or chemicals. The crop is soaked and moistened to soften and separate the fibers. In water retting, the fibres are soaked in water streams or ponds with natural bacteria while in dew retting, the crops are laid out in the open fields for several weeks.

4 Breaking

This process breaks the stems or hurd by passing them through a breaker or fluted rolls, or through a machine called a decorticator.

5

Scutching or Cottonizing

For wet spinning long hemp fibre, the broken stem is beaten to separate the impurities from the raw material and the fibres from the woody core.

An alternate and a more commercial alternative process is cottonisation where hemp becomes softer and blendable with other fibres such as cotton, Tencel, rPET etc. and spinnable on cotton spinning systems. Additionally, cottonisation can be performed on both long and short fibre and also on hemp grown for non-fibre purposes, making it more scalable and economical. Once cottonised, it does not go through the following processes.

6

Hackling

After scutching, the fibres are combed to straighten them and further separate them from the woody core or shives, into a continuous sliver.

7

Roving

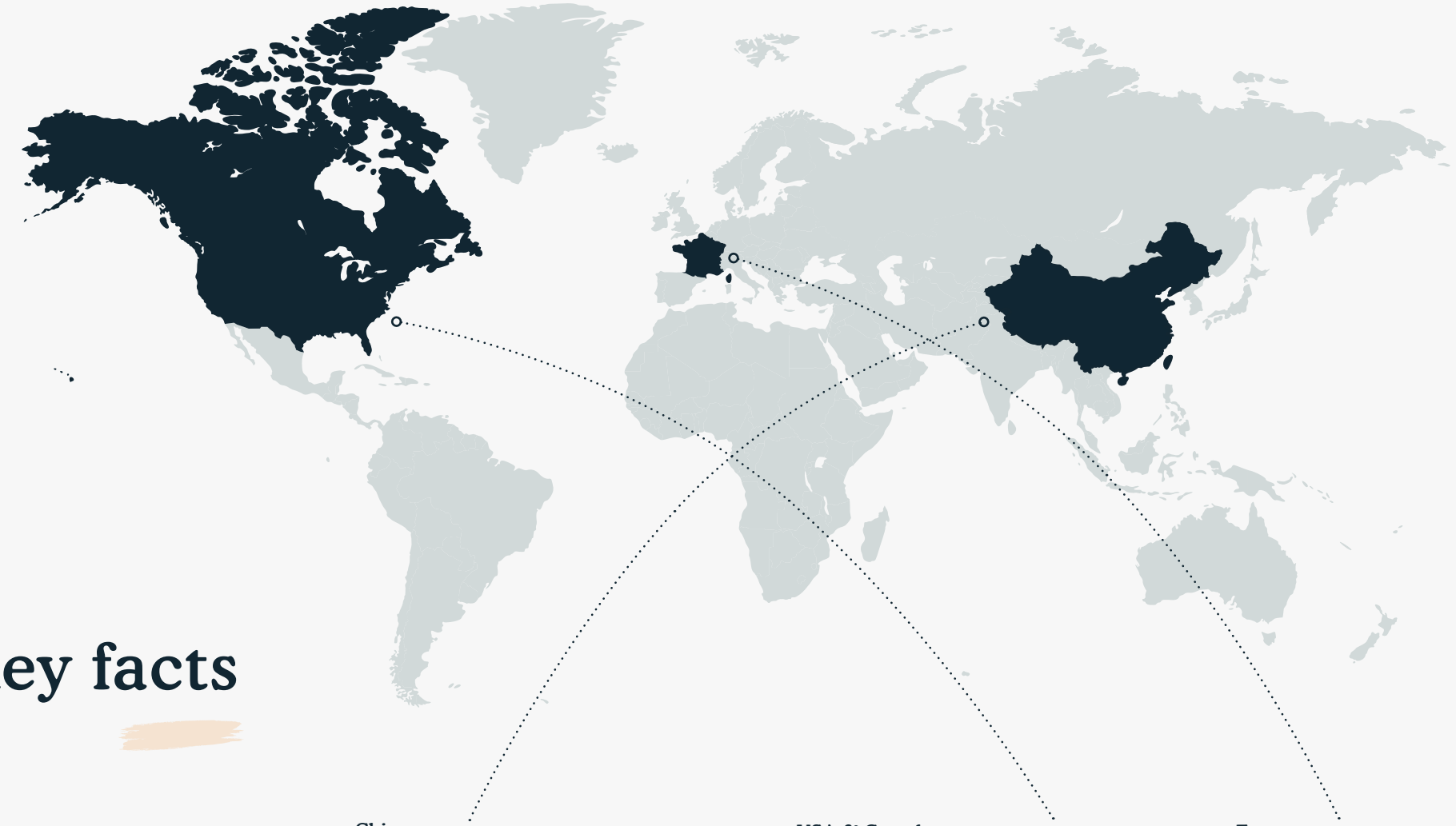
A sliver is drawn out and twisted to be spun into yarn.

8

Spinning

To produce fine yarn, the slivers are wetted in troughs of water; otherwise, the yarns are dry spun, resulting in coarser yarn.

1. Recreator
2. Hemp Gazette



Key facts

China

China is the largest producer, accounting for 30-40% of global hemp production in 2019.

USA & Canada

Once the most widely grown in the USA, hemp production was banned until the last decade, due to political lobbying against the production and legalization of marijuana. Now the USA is one of the largest hemp growers growing 146,000 hectares in 2019 [1] , along with Canada, that saw an 80% increase between 2016-2017.[2]

France

France is Europe's leading hemp-grower, growing 44000 acres in 2017 [2] and the largest producer of hemp seeds in the world.

1. *J.Avins, D.Kopf, Quartz*
2. *Ministry of Hemp*

The social and environmental impact of hemp

Hemp is naturally one of the most sustainable fibres that can be grown. It is fast-growing, has a high yield with upto 250% more fibre than cotton[1] and requires less land to grow, requires no harmful pesticides or chemicals, and requires 1/3rd-1/4th of the water used by conventional cotton. Growing hemp is also beneficial for the soil by limiting topsoil erosion, increasing fertility by supplying nutrients, absorbing heavy metals from the soil and helping to revive degraded land. It can be used as both a rotational as well as a monoculture crop. Every part of the plant can be utilised to make products from paint, fuel and oil to construction material, making this a zero-waste crop. In addition to this, hemp is a carbon negative crop with the ability to capture 15 tonnes of CO2 per hectare of industrial hemp.[2] Hemp is also labour-intensive and largely mechanically processed, thereby generating more employment and livelihoods.

However, the cultivation and processing of hemp can have severe environmental impacts on both people and planet, if not responsibly produced. Since hemp production has been restricted due to global governmental policies, technological innovation in processing has not taken place at the same pace as other fibres. Thus, old and ecologically inefficient methods may be used to process hemp, that may negate any of the sustainable benefits that it provides.

The key sustainability issues with hemp production lie in retting and processing.

1 / Retting

To soften the harvested stems and remove the natural binding agent called pectin, water, bacteria or chemicals are used. These chemicals may be harmful and contaminate groundwater, during improper disposal of wastewater and both chemical and biological pollution (due to natural impurities) can occur. Water retting may also consume large amounts of water and energy, used to heat water. This contamination can then affect the health of farmers, workers and local communities. [3] However, sustainable retting without the use of chemicals and heat is also possible through dew, field and snow retting.

2 / Processing

Though most processes involved are largely mechanical and non-polluting, certain areas can have a large impact on the environmental footprint of hemp. Wet-spinning, where the yarn slivers are wetted in troughs of water to produce finer yarn, as well a range of chemical dyes and finishes such as wrinkle-resistants, and softeners may be applied to change the feel of the end-fabric, that use large amounts of water, energy and harmful chemicals. If wastewater is not treated and is not recycled along with chemicals, this can be leaked into surrounding ecosystems, acutely affecting local communities.

1. *Design for Longevity-Global Fashion Agenda*
2. *The Future of Hemp by EIHA and BHA*
3. *CFDA Materials Index*

Designing a collection with hemp?

Here are 4 aspects to consider.

Credit: B Label by BOHECO

1 / Fibre-Blending

If necessary, hemp is blendable with other fibres to obtain the right properties for the fabric to be produced. Blending with organic cotton can make the fabric more elastic while blending with wool or silk helps to create a softer feel and better drape; however if blending is required, aim to blend with other cellulosic fibres to aid recyclability.

2 / Transparency

Hemp is labour-intensive and can provide livelihoods and generate wide-spread employment but needs to be appropriately monitored for labour transgressions. Look for Fairtrade certified sources that can ensure the people involved have been treated and paid fairly.

3 / Processing

Hemp does not need fertilizers or pesticides to grow; however, it can be processed with harmful chemicals. Though sometimes difficult, aim for responsible sourcing of hemp through GOTS or Oeko-Tex certified sources that can verify the organic processing of hemp.

4 / Disposal

Hemp is naturally biodegradable but the processing largely determines how it can be disposed of as toxic chemical finishes and dyes can inhibit the ability of hemp to biodegrade. Avoid blending hemp with other synthetic fibres as this inhibits both recycling and biodegradability of the fabric. Look for certified organic hemp, toxic-free or natural dyes or hemp in its natural colour (ranging from greys and greens to creams and blacks) instead.

An interview *with* CanvaLoop

CanvaLoop, an Indian company has developed a proprietary technology to convert the hard stem of bast crops (like hemp) to soft cotton like structure. These fibres can be used from multiple applications ranging from carpets, bed-sheets to clothes, shoes, bags to sanitary pads and dams.
They have also partnered with BOHECO for making hemp blended yarns. CanvaLoop has also launched SLOW Jeans—the world's first Himalayan Hemp Jeans, which saves 3500 litres of water per jeans. Here we sit down for an interview to talk all things hemp.

How did you start CanvaLoop and what have been your biggest achievements?

After getting 3 degrees in Finance and relevant work experience, I went to the US for my Masters in Entrepreneurship, with a clear plan of starting a Fintech venture or working for one. The idea of sustainability stuck with me in the US and I wanted to do something about it. We clearly see air pollution by burning of fuel and the enormous impact of plastic pollution daily, but what almost everyone has missed is the invisible textile pollution. Textile is the 2nd largest polluting industry on the planet and Surat, my hometown, is the hub of synthetic textiles. Thus, in 2016, I started on a journey to make the most sustainable textile/fashion material. We got 2 Ph.D scientists and did a lot of hands on research ourselves for 2 years to come up with a commercially viable sustainable textile material, hemp.

We virtually created the supply, technology and a bit of market for the industry. We have not raised VC money, carried out all the research ourselves and put up a great product for the industry to adopt. In the process, we have genuinely cared about sustainability—nothing we do is green-washed or done for a certification. We genuinely care!

What makes hemp special and why should brands look to include hemp in their fibre basket?

With so many materials claiming to be sustainable, hemp stands out. Hemp requires significantly less water to grow, no insecticides, no pesticides or fertilisers of any kind, rejuvenates the soil it grows in and probably has the lowest carbon footprint among textile fibre crops. It solves many problems that the fashion industry is infamous for.

Hemp is naturally antibacterial due to the high lignin and pectin content in the fibres. It means less odour, reduced chances of skin infection and multiple wears without washing. Hemp also acts as a natural shield for your skin against the harmful UV rays. Hemp's porous structure makes the hemp fabric extremely breathable. Breathability keeps sweat away and makes hemp more comfortable to wear for longer periods of time. Hemp fabric also adapts to weather, keeping you warm in winters and cool in summers.

Why has hemp not been as widely grown and used as other fibres globally?

There are a lot of challenges in working with hemp as a modern fashion material.

1. The non-compatibility of hemp fibre with modern textile machinery and the 'harsh' feel of hemp : Hemp needs to be cottonised before it can be used in modern textiles. Until now, the process was very expensive and controlled by few Chinese companies.
2. The pricing of hemp: Due to the miniscule scale of production and the lack of consistency, hemp is almost 4x more expensive than cotton.
3. The legal issues associated with unclear regulations in some countries: The regulations in major countries is a major hindrance. The minimum THC limit set in most countries is ad-hoc and not consistent with native varieties of hemp that grow there. Moreover, hemp specific companies are treated with suspicion in countries like the USA — it took us more than 3 months to register a company and bank account in the US because we use hemp. The process usually takes 10 days.

What are some of the challenges with growing, cultivating and processing hemp?

The major challenge in growing and cultivation of hemp is the lack of seed genetics or seed bank. There is no research into the various strains of the hemp plant either by the public or private organisations. Another factor limiting the cultivation of hemp in India is the set THC limit of 0.3%. For most varieties of hemp that grow indigenously in the country, the regulation of less than 0.3% THC cannot be met. The number of 0.3% is borrowed from countries like France which have completely different climatic conditions and hemp plant genetics as compared to the Indian subcontinent. In fact, most countries across the globe have made their regulations based on the 0.3% THC limit set by France without conducting research of the varieties that grow in their countries.

The processing of hemp to textile fit fibre is a challenge in itself. There are no SOP's for harvesting and extraction of hemp for fibre purposes. Even after extraction, the fibre needs to be 'cottonised' for using in the modern textile ecosystem.

What are your aspirations for the future of hemp and CanvaLoop?

Our vision is to make hemp the mainstream fashion material by 2030. We are building a vertically integrated hemp fashion company and aspire to be present in every wardrobe sustainably by 2030. We believe that the consumption of hemp made goods is going to increase exponentially in the coming years because:

1. Consumers will gradually realise the difference between greenwashed materials and true sustainable materials such as hemp.
2. The rising awareness among the consumers and textile manufacturers regarding the power of hemp.
3. Deregulation of hemp cultivation and increase in acreage of hemp cultivated for fibre.
4. Significant advancements in the processing of hemp and gradual decrease in the cost of hemp made fashion products.

Credit: CanvaLoop

Key Certifications

FAIRTRADE

Certifies better prices, decent working conditions, and fair terms of trade for farmers and workers in developing countries around the world.

GOTS

The leading textile processing standard for organic fibres, defining worldwide requirements that ensure organic status of textiles – from harvesting through responsible manufacturing, and labelling.

OEKO-TEX STANDARD 100

A certification system for raw to finished textile products at all processing levels and focuses on testing for toxic chemicals.

Key Organizations

EUROPEAN INDUSTRIAL HEMP ASSOCIATION

Represents over 250 hemp farmers producers and traders in Europe and their interests.

INDIAN INDUSTRIAL HEMP ASSOCIATION

Non-profit representing India's hemp industry and advocates responsible hemp farming and products.

EUROPEAN CONFEDERATION OF FLAX AND HEMP

The only European agro-industrial organization federating all the stages of production and transformation for linen & hemp.

BRITISH HEMP ASSOCIATION

Representing the UK hemp industry and comprises of NGO's, farmers, and businesses who want to support progressive changes in hemp legislation

CANADIAN HEMP TRADE ALLIANCE

Represents Canada's hemp industry and advocates responsible hemp farming and products.

HEMP INDUSTRIES ASSOCIATION

A non-profit trade association representing more than 1,300 farming and business members, in the USA

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