



# HEMP

## BEYOND SMOKE

*Most people don't know there was a time – dating back 12,000 years – when many had their own stash of hemp, carefully woven into soft, durable garments.*

San Luis, Colorado, is famous for being the state's oldest town, its Stations of the Cross shrine, and the decadent *sopapillas* at Emma's Hacienda.

And if the textile organization Fibershed has anything to do with it, San Luis will be notorious for something else: hemp fiber.

Though it derives from the same species as its more colorful cousin, marijuana (both go by the scientific classification *Cannabis sativa*), hemp fiber comes from varieties of the plant that have been specifically bred to be long on fiber, not on Delta 9 Tetrahydrocannabinol (THC), the psychoactive component that makes people high.

The federal government, however, doesn't make such fine distinctions. Though hemp is allowed only 0.3% of THC, both it and marijuana are considered Schedule 1 controlled substances, which makes the growing of

hemp illegal without a Drug Enforcement Agency permit.

But this is a brave new world, with cannabis prohibition facing challenges on all fronts. In 2012, Colorado and Washington became the first states in the nation to legalize recreational marijuana. Recognizing the potential economic benefits of both crops, Alaska and Oregon have since decriminalized pot, and a total of ten states, including Colorado and Washington, have opened the door to industrial hemp farming.

Even the 2014 Federal Farm Bill allows for hemp cultivation for research purposes in states where it's legal. But that doesn't mean farmers in those states can simply order hemp seed and put it in the ground. Colorado and Kentucky (where hemp was once a major agricultural crop), the two states on the leading edge of this movement, have faced



massive hurdles from the federal government in importing seed. But that didn't stop determined farmers and researchers from bringing in the country's first legal hemp harvest last fall.

One of those harvests occurred on a one-acre plot in Colorado's sweeping San Luis Valley, buttressed by the soaring spires of the Sangre de Cristo mountain range.

Fibershed's interest in the San Luis Valley is multi-fold. Arid and largely rural, the San Luis Valley is one of the poorest regions in Colorado. A low-water, cash crop like hemp that grows well without expensive agri-chemicals could be a boon to this impoverished but beautiful part of the state, especially if residents could find ways to develop value-added products like yarn, cloth or building materials—all possible with hemp fiber.

Equipped with funding from Patagonia, the Clif Bar Family Foundation and the Blackie Foundation, Fibershed worked with Costilla County leaders late last spring to plant an experimental acre of two hemp strains chosen for their hardiness at that latitude: Kompolti and Futura 75. Like other growers anxious for quality hemp seed, Fibershed's Colorado Hemp Research Project was stymied by challenges to import seed in a timely manner. Hung up by the DEA, they were barely able to get enough seed to cover their plot and couldn't plant until June 8, 2014. Despite the late planting date, the crop thrived, yielding 2,000 pounds of raw hemp.

But growing the hemp is only part of what's involved in resuscitating American hemp textile manufacturing. Rendering those tough stalks into textile-grade fiber is a tricky business in a country that long ago abandoned its hemp manufacturing infrastructure.

"There are no protocols for what we are doing," explains Rebecca Burgess, Fibershed's executive director. "There are major challenges involved in developing a hemp fiber supply chain." These challenges include decortication (removing the plant's outer layer to expose the fibers) and preparing the raw fiber so that it can be processed on equipment designed for wool or cotton. "The value addition is so complex, and there are so few of us who are promoting fiber," Burgess observes.

There is nothing easy about processing hemp. Hemp is a bast fiber, which means its fibers come from the stringy bast section of the plant located underneath the skin or bark of the stem. Traditionally, hemp's bast fibers are obtained by retting, a process that allows water to rot away the outer tissues and sticky pectins around the bast bundles. Harvested stalks are either left in the field to allow nature to take its

*From top: Fibershed believes that fiber systems are best that minimize detrimental impact on the planet. Hemp fiber strains can produce over 2,000 pounds per acre of useful textile and cordage fiber without need for pesticides or herbicides. Photo by Rio de la Vista.*

*Fibershed intern Erin Axelrod assists with the Growing Warriors hemp harvest in Kentucky. Photo courtesy of Erin Axelrod.*

*Page 1-2: Hemp drying shed. The stalks are dried for at least 5 weeks before processing. Photo by Meg Wilson Photography.*



*Kevin Lanzi of Growing Warriors (Kentucky) built a decorticator with plans that originated with Thomas Jefferson. A crank is used to hand-process dried hemp stocks and separate fiber from the woody hurd - the first step in processing for textiles. Photo by Meg Wilson Photography.*



*During Milan Fashion Week in 2013, the So Critical So Fashion alternative fashion exhibition focused on biological, vegan and recycled materials, including hemp blends. Photo: Eugenio Marongiu / Shutterstock.com*

course or submerged in ponds, streams or vats.

Then the hemp is submitted to more abuse. It must be broken, scutched and hackled (scraped and separated) to remove the woody core (hurd) and other non-useful bits and separate the shorter fibers (tow) from the more desirable long ones (line fiber), which are ultimately combed—all prior to spinning. The lack of processing infrastructure puts Fibershed in the position of having to create its own supply chain from scratch, starting with extracting the fiber. “If we can turn fossil fuels into clothing,” Burgess says, “we can turn plants that have been used thousands of years into clothing. We can figure this out.”

American wool and cotton mills can’t accommodate the leggy staple length of hemp fiber. “We would love to see full-length hemp fiber in textile manufacturing,” Burgess says. “But if we are going to reignite a fiber industry using existing equipment for wool and cotton, we need to shorten the staple length.”

To do that, Fibershed is working with entrepreneur John Lupien, the founder and

president of a company called BastCore. Together, they are using an in-field, automated decorticator developed by BastCore to process Fibershed’s Colorado hemp. (Fibershed is also working with Growing Warriors to process its experimental hemp fiber in Kentucky.) The decorticator not only obviates the need for the water- and time-intensive retting process; it also separates the bast from the rest of the stalk, spewing out long ribbons of undamaged fiber.

The next step is degumming, to rid the fiber of its sticky resins and shorten the staple so that it can be carded and spun.

To degum the fiber, Fibershed is exploring a couple of options, including a waterless textile cleaning system that uses recycled liquid carbon dioxide as well as a water-based process. If all goes well with the degumming, fiber will be sent to Gaston College in North Carolina for carding with low-micron-count Churro wool from the San Luis Valley and spinning into yarn. The final goal: to weave it into cloth.

To the best of Burgess’s knowledge, this

could be the first hemp-blend cloth grown and woven on American soil in decades. But she is reluctant to call her proto-supply chain a success until she holds the supple, degummed fiber and sees how it behaves when milled with wool.

“We are working up the supply chain, answering questions along the way,” she says. “Could we decorticate? Yes. Can we degum? Can we make cloth? I think so, but don’t know yet.”

Next year there will be more research plots outside San Luis, including experiments in no-till farming, a technique that improves soil and sequesters carbon. The idea is to determine the best hemp strain for the region and foster Burgess’s vision for an ideal future in which local wool and hemp will be spun at a community mill that will provide jobs and support the work of artisans.

“We are hoping to help create bioregional textiles that speak to the landscape in which they are grown,” she says, “to create textiles the community can rely on.” ■

# SUPER HEMP

Hemp is the strongest natural fiber in the world, which is beneficial when it comes to durability of fabrics: it retains its shape, it resists mold and UV light, and the more it's used, the softer it gets. Here are some more reasons why it's being called a "super fiber."

55,700  
METRIC TONS

The estimated amount of industrial hemp produced globally

12,000  
YEARS AGO

when hemp began to be grown for textiles and food (approx.)

50% LESS

Land and water needed compared to cotton

0 Pesticides or herbicides needed to grow hemp.

(Cotton, on the other hand, accounts for 25% of the world's pesticide use.)

30 Nations grow hemp as an agricultural commodity

## GOT HEMP?

Ever spin or knit with hemp?  
Get your *Cannabis sativa* on!

Hemp top: [www.woolery.com](http://www.woolery.com)

Hemp and hemp-blend yarns and knitting patterns: [www.hempforknitting.com](http://www.hempforknitting.com)

Elsebeth Lavold Hemptathy:  
at yarn shops and online retailers

Martha Stewart Crafts:  
[www.lionbrand.com](http://www.lionbrand.com)