

LCA

Cottonized hemp

The first data on the environmental footprint of French industrial hemp production, available in an international reference database.



Photo A. Goulard
InterChanvre

HEMP

2026

The context OF THIS LCA



Photo N. Fichaux
InterChanvre

Hemp straw

Life Cycle Assessment (LCA) is the benchmark method for assessing the potential environmental impact of goods and services.

Framed by the ISO 14044 and ISO 14040 standards, the method consists, once the objectives have been defined, of making an inventory of the incoming flows (energy, water, materials, etc.) and outgoing flows (waste, emissions to air, water and soil) of the system under study in order to assess its impact (on the climate, air, water, soil, resources, etc.).

However, one of the main obstacles to carrying out LCAs is the availability of data. To overcome this, practitioners use so-called "generic" databases that represent average production systems.

Until November 2025, no generic data on hemp production in France was available in any of the recognised databases. The only data available concerned hemp harvests in India.

This is now history: InterChanvre has sent Ecoinvent data on the industrial hemp sector, representing several key players in the French value chain. These contributions have led to the creation of several hemp data sets, including one on cottonised hemp used for textiles.

With the boom in the use of hemp in textiles, it has become essential to be able to support the environmental allegations at the industry level

and provide access to this data for as many professionals as possible.

Ecoinvent: one of the benchmark LCA databases, THE benchmark for transparency

Ecoinvent is the world's benchmark Life Cycle Assessment (LCA) database, recognised for its scientific rigour and exhaustiveness. Used by thousands of experts, industry professionals and decision-makers, it provides reliable, transparent and constantly updated environmental data.

By publishing its production data in Ecoinvent, InterChanvre is part of a trusted ecosystem and benefits from international visibility. This approach strengthens the credibility of its environmental commitments, while giving industry players and users access to robust analysis tools to optimise their environmental impact. In this way, InterChanvre is positioning itself as a key player in the ecological transition.

Hemp data

IN ECOINVENT 3.12

1 Hemp cultivation

Sowing operations, fertilisation, mechanical operations from sowing to rolling, packaging of rolled straw for transport.

No phytosanitary products or irrigation

- Beginning of the perimeter: soil preparation before sowing
- End: after harvesting and retting (including direct emissions from the fields).

Outside the scope of Ecoinvent data considered

Carbon footprint
(based on economic allocation)

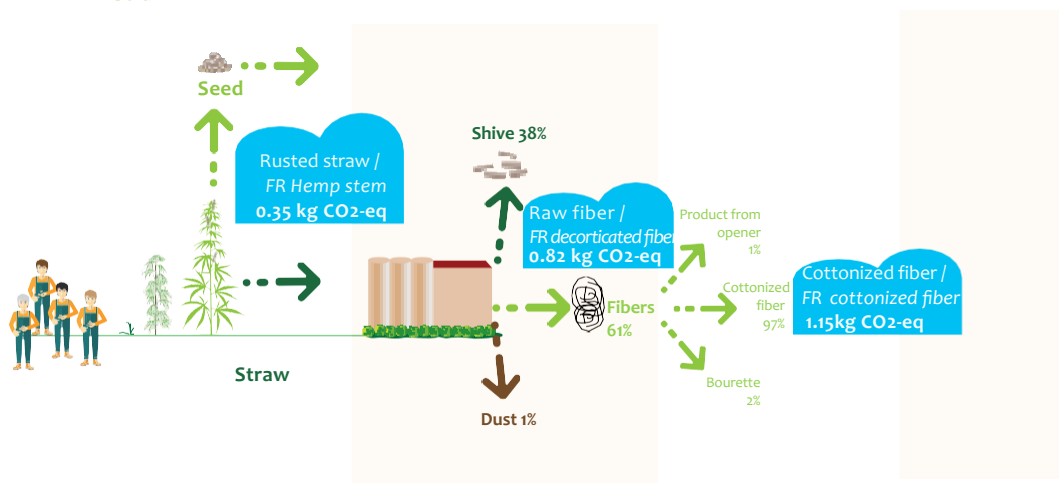


Growing and harvesting straw

Defibrage

Cottonisation

Spinning mill



3 Transformation

3.1 Defiberizing: separation of the fibre, short fibers and dust.

- Start: reception of dew-rotted hemp stalks at the defibration plant.
- End: after separation of the hemp stalks into defibrated fibres (reference product) and two co-products (hemp hurd and dust).

3.2 Cottonisation of fibres

Cottonized hemp fibres are short fibres that can be mixed with other fibres such as cotton for spinning.

- Start: reception of defibrated hemp fibre at the cotton mill.
- End: transformation of challenged hemp fibre into reference cotton fibre) and two by-products.

Upstream farming



Demonstration platform

This set of data concerns the cultivation and retting of hemp on the farm, in order to produce retted stalks which are then transported to defibration facilities. The hemp stalks are retted for about 6 weeks at, after which they are ready to be processed by the hemp growers. For this type of industrial hemp cultivation, only the stalks are harvested, not the seeds. This data set includes sowing, fertilising and mechanical operations, from sowing to retting. This type of production uses neither plant protection nor irrigation.

The data was collected from four French hemp growers representing around 80% of French hemp farmers: La Chanvrière, Cavac, Interval/Eurochanvre and Planète Chanvre.

Together, these manufacturers account for 98% of the French hemp textile market.

The data refer to 1 to 3 crop cycles (depending on how long the farm has been producing hemp) between the 2021 harvest and the 2023 harvest inclusive.

2° transformation process

Annual production volumes and prices for the reference product and production by-products correspond to the reference year 2024 and have been collected over 3 production years (2018-2020).

"Cottonized hemp fiber" refers to short hemp fibres between 40 and 50 mm long. These staple fibres can be spun using a ring or open-end rotor after undergoing the appropriate preparation steps (e.g. carding, combing, drawing). They can be mixed with other types of staple fibre such as cotton, cellulosic or others...

Analysis and interpretation

The following analyses compare Ecoinvent data in its v3.12 version, *Allocation, cut-off by classification*.

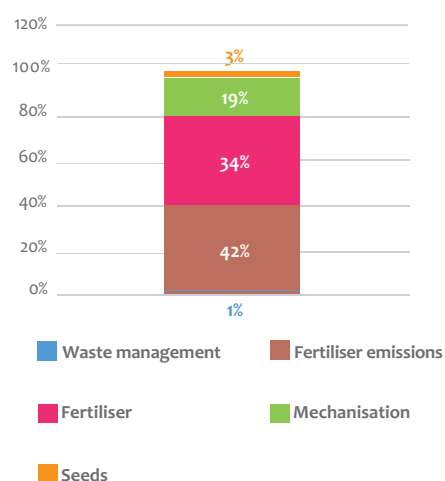
The data compared here have been reviewed by the Ecoinvent authors to ensure consistency.

They are said to be generic: they represent average practices. If they are to be relevant for LCA purposes, the analysis needs to be complemented by a comprehensive product approach incorporating the factors that differentiate systems (product durability, etc.) and the specific practices of the production systems under consideration.

In addition, the values communicated here are uncertainty ranging from

- by around 10% on robust indicators such as climate change
- several orders of magnitude on the indicator less robust indicators such as eco-toxicity.

Impact of cultivation on the climate change indicator



Retted Fiber AFTER DEFIBRATION



Photo A. Goulard
InterChanvre

Retted fiber

The comparisons presented are only valid within the framework of the assumptions made in the Ecoinvent 3.12 database.

On the graph, the ideal impact is closest to of 0%.

Hemp fibre retted after decortication is compared here with jute and kenaf fibres (comparable mill gate perimeter).

At the fibre stage, **hemp has a lower impact on almost all indicators** compared with kenaf and jute.

The only exception (in terms of indicators that are robust enough to draw conclusions) concerns ionising radiation, due to France's heavily nuclear-based electricity mix.

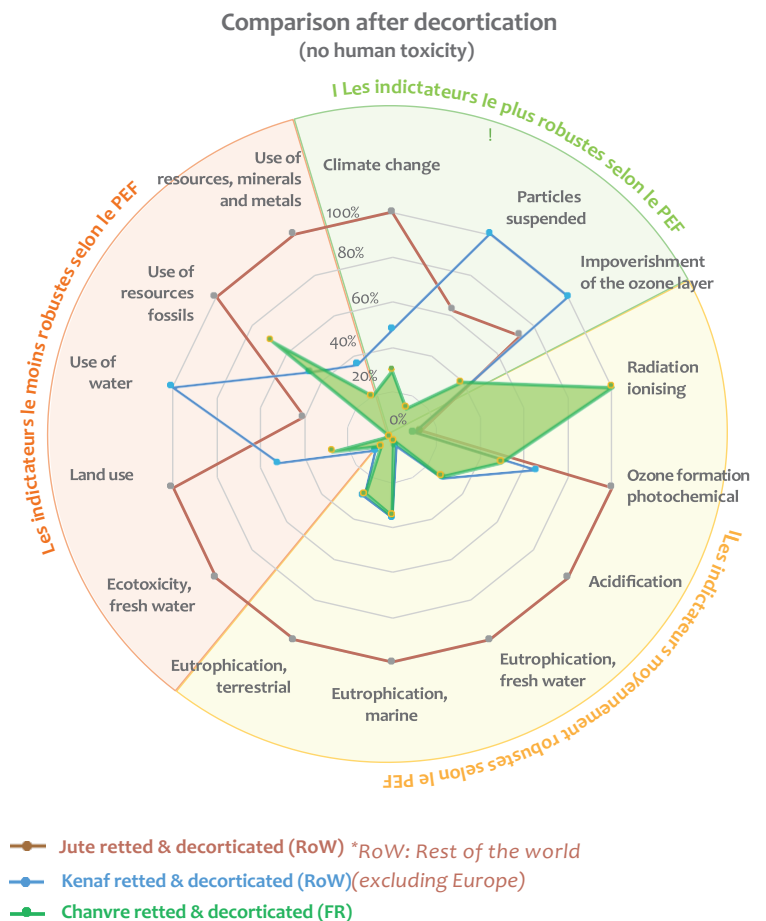
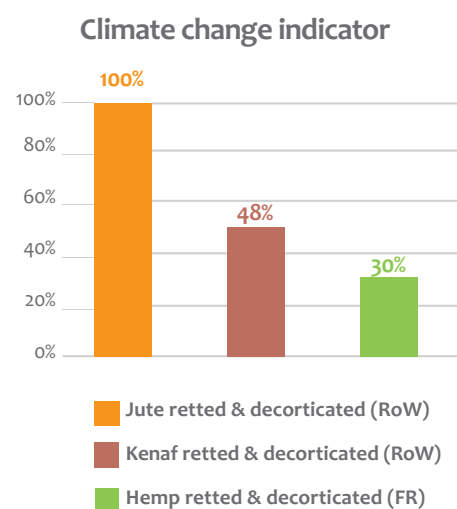
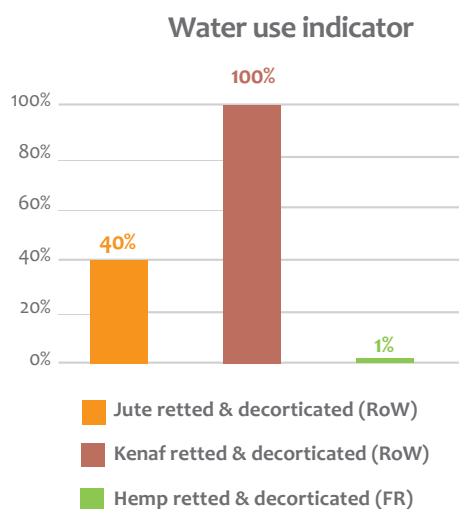


Figure 1: Comparison of hemp fibre produced in France, and kenaf and jute produced outside Europe after retting and decortication on 14 EFP indicators (human toxicity indicators were excluded because of their high uncertainty).



Fibres retted

COTTONIZED

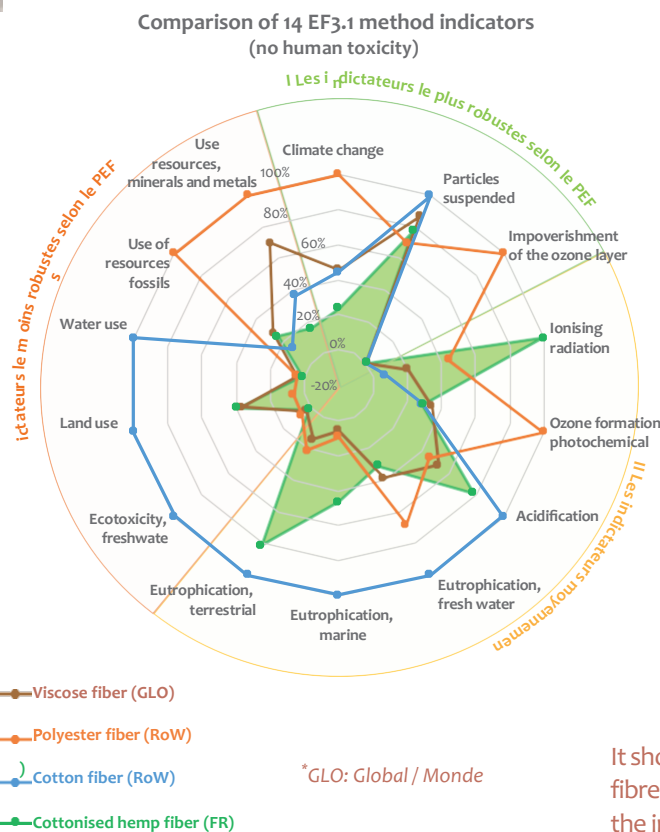


Photo A. Goulard
InterChanvre

Cottonized fibre

The comparisons presented are only valid within the framework of the assumptions made in the Ecoinvent 3.12 database.

On the graph, the ideal impact is closest to of 0%.



Cottonized hemp offers a significant advantage in terms of climate change, namely:

- 3 compared with polyester (excluding end of life)
- 2 compared to other plant fibres (cotton, viscose).

Figure 2: Comparison of cottonized hemp fiber produced in France and polyester, cotton and viscose produced outside Europe on 14 PEF indicators (human toxicity indicators have been excluded because of their high level of uncertainty).

It should be noted that, like other plant fibres, hemp fibre without seed production potentially increases the impact on environmental issues.

related to agricultural activities (eutrophication, land use, terrestrial acidification, etc.), excluding water consumption in the absence of irrigation.

In the context of a transformation process carried out in France, the use of an electricity mix that is heavily based on nuclear power leads to a greater impact for hemp in terms of ionising radiation.

Finally, hemp (like cotton and viscose) has an advantage over polyester in terms of the use of fossil resources.

The right use FROM DATA

Reminder

The comparisons presented here are provided for information only, as the data "at the factory gate" is taken in its raw form as supplied by Ecoinvent v3.12 and analysed using the EF3.1 method.

To make informed decisions about the choice between the different fibres in a product, the systems studied need to be completed and fine-tuned specifically.

As it stands, the data provided by Ecoinvent are :

- available to licensed LCA practitioners, Bilan Carbone®, etc.
- could potentially be integrated into Agribalyse, the French LCA database (which already contains other Ecoinvent data).
- potentially mobilisable by Ecobalyse for the French textile environmental labelling which uses Ecoinvent and Agribalyse.
- that can be used in eco-design to help make design decisions and then in communicating the environmental footprint of products, once the methodology has been validated.

About EVEA

Consulting, Software, Training

Our mission since 2005: to support organisations in improving their social and environmental performance, from product to global strategy.

Our activities: from objective assessment to the integration of operational solutions, via R&D, training, tools and software, applied to the specificities of sectors and realities on the ground.

Our values: Utility - Objectivity - Cooperation - Transmission



Photo Evea



Going further ON HEMP

InterChanvre

The Hemp Interprofession has been organising and working to develop the French industrial hemp sector since 2003. It is made up of two bodies, one representing the producers (FNPC) and the other all French hemp manufacturers (UTC). Its aim is to promote the ecological, eco-nomic and local qualities of hemp, while initiating scientific and technical research activities.



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