

Why hemp should be a crop of the future

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Present hemp industry

Total Hemp cultivation area in the EU around 15.000 ha in 2007

The European Industrial Hemp Association (EIHA) has 8 regular members (hemp processors) and 56 associate members from 21 countries (2008).

Hemp processors



EIHA members



Non-EIHA members



Hemp agronomy

Key benefits for cultivation (1)

- **Robust, adaptable plant**, well suited to the central European climate.
- **Fast growth** (up to 4 m in 100 days), large biomass yields (up to 9-10 t dry matter per hectare in commercial cultivation), with modest fertilisation.
- **Strong suppression** of weeds thanks to its fast and dense growth, no herbicides are required. In fact no agrochemicals are needed whatsoever, a fact rare in agriculture today.



Hemp agronomy

Key benefits for cultivation (2)

- **Soil-improving and conditioning**, leaves the cultivated soil free of weeds and aerated; yield and quality benefits with successive crops.
- **Good for the rotation**, a complete change from Peas, Beans and Oilseed Rape. Spreads the farm workload.
- **Excellent lead** into a first Cereal, contributes to the preservation of biodiversity.



Regional added value and jobs (1)

- **Compared to other crops**, hemp yields a relatively high regional added value. Storage, processing (fibre and shive separation) and in most cases further steps of the process chain usually take place right next to the field.
- **Regional processing reduces** costs and increases its environmental credibility.
- **According to the Ernst and Young report**, for the EU commission, Hemp as well as Flax leads to more regional employment per Hectare than wheat: Actual figure are 800 jobs on 10,000 farms (4 times as much as wheat per Hectare). 2,000 jobs at 1st processing stage (5 times as much as wheat per Hectare) in around 100 companies.



Regional added value and jobs (2)

- **According to Ernst and Young** the following working hours are required per Hectare: Wheat 4 hours, Hemp 8 hours. This difference is explained by the greater harvesting effort required for Hemp.
- **Also included** in the Ernst and Young report was that Hemp requires 2-3 times more workforce in the primary processing stage than wheat.
- **In summary** the growing of Hemp has a very positive effect on employment, particularly in regional employment in rural districts.
- **Hemp production** takes place in rural districts where it plays an important role in the economic and social environment.



Decortication and fibre separation: From straw to fibre and shives



Applications and markets for hemp fibres and shives



EU 2007: Production of 24.000 t hemp fibres – main applications



Non-automotive



Insulation

Automotive



Pulp & Paper

Agrotextiles

Valuable and innovative biomaterials

- Along with a high yield, Hemp produces **natural fibres of the highest quality**. Their mechanical properties are equal to the best natural fibres available.
- Along with biopolymers and wood, Hemp and other natural fibres constitute the “**new material generation – biomaterials**”. Hemp can be used in many ways with new and innovative material concepts. In particular when natural fibres are mixed with plastics they add and extend the properties of the material.
- Hemp, along with wood and polymers and other natural fibres can play an important part in **reducing plastic components and metallic materials** – and improve the profile of **bioplastics** for durable applications.

Natural fibre composites (1) – innovative technology for the automobile industry



BMW 5 Series



Fibre



Non-woven Fleece



Naked Door



Finished Door

Natural fibre composites (2) – wide range of application possibilities



Scale



Grinding Disk



Toy Cars
Made by Injection Moulding

Insulation – CO₂ emission and cost reducing application for construction



Application



Pulp and paper – special utilization of hemp



Pulp

Agrotextiles (1), garden – easy to handle base for agricultural use



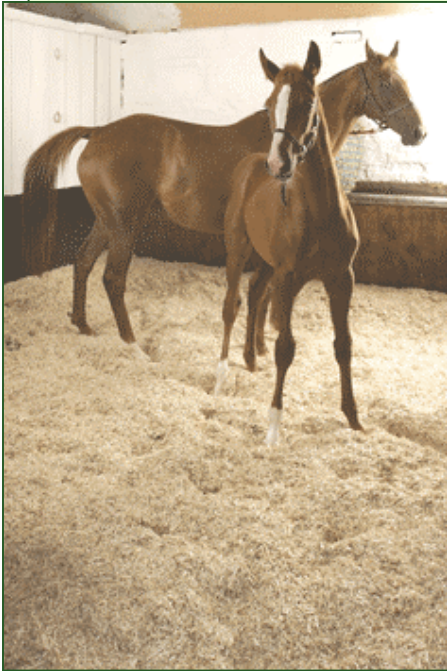
Tree planting

Agrotextiles (2), cress – easy to use base layer for plant industry



Cress production

EU 2007: 48.000 t production of Hemp Shives – main applications



Animal Bedding

Particle Boards



Construction



Garden

Animal bedding – implementation for the comfort of your animal



Horse stable ground



Chicken farming

Garden – alternative to barkmulch



Particle boards – alternative to wood-based particle boards with half the weight



Construction (1) – easy to handle construction material with great qualities



Spraying



Finished Wall

Construction (2) – applicable for large constructions as well



Beer Distribution Centre



Ecology



CO₂ Emissions & Sequestration

Hemcrete® sprayed wall mix

1m³ of wall mix contains: Sequestration/emission

110 kg hemp shiv

- 202 kg CO₂/m³

220 kg Tradical® HB

+ 94 kg CO₂/m³

Water

0 kg CO₂/m³

Nett carbon capture

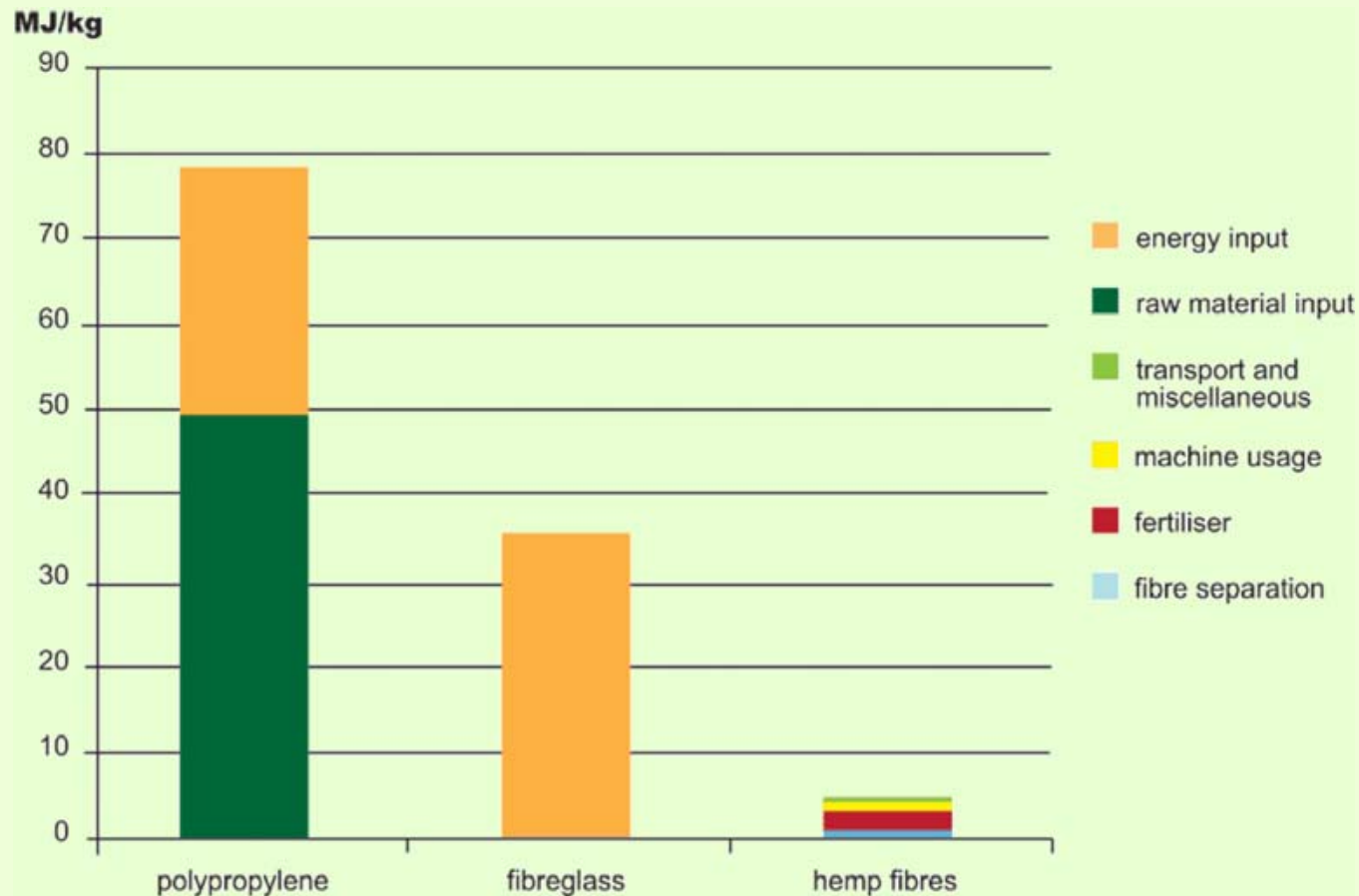
- 108 kg CO₂/m³



Ecology (1)

- Hemp exhibits **excellent ecological credentials in its cultivation**. Virtually all Agrochemicals are completely eliminated. Hemp is also well suited to growing under an organic regime.
- The Ernst and Young study (2005) reported that Hemp is associated with “**an environmentally conscious cultivation**”. It requires considerably less input in terms of water, fertilisers and does not require Agrochemicals.
- Analysis that have been made in several European Countries and North America have studied **life cycle, eco and energy balances for various product lines**. Where Hemp has been used in applications it has yielded **definite ecological advantages**. These product lines include amongst others, Hemp **replacing glass fibres in composites and insulation**, Hemp fibres **instead of Cotton** in the Textile Industry and Hemp Shives **replacing conventional materials in the construction** industry.

CER_p-Cumulated Energy Requirement



Ecology (2)

- In the Karus et al. (2006) study on **natural fibre reinforced plastics**, the summary stated that: **"Finite resources were spared, there was less pressure on the environment and CO₂ emissions were reduced. If biopolymers were used these benefits are of course further enhanced."**
- Murphy & Norton 2008: "All **insulation** materials are beneficial to the environment because they save energy and reduce global warming potential. However, **NFIs (Natural Fibre Insulation) have the added benefit that they sequester CO₂, making a further contribution to reducing global warming potential.** The authors therefore consider it worthwhile to take advantage of the scope to develop **the environmental profile of the NFI materials and to boost their market presence."**

R. Murphy, A. Norton (Imperial College): Life Cycle Assessments of Natural Fibre Insulation Materials. (PDF-document, 2.2 MB) Final Report, published on 2008-02-27. This study was undertaken at the instigation of the National Non-Food Crops Centre (the NNFCC), with funding provided by the UK Department for Environment, Food and Rural Affairs (Defra).

Summary

Hemp is **good for agriculture, the environment and enhances regional development.**

Hemp will and is playing an important role in the production of **innovative biomaterials** like natural fibres **reinforced plastics, insulation and construction materials.** Hemp fibre can improve the technical profile of **bioplastics** for use in durable applications.

Economy



Economy

– the currently very difficult situation

- **Competition from other natural fibres** from Asia, Africa and South Africa which limit the market price of natural fibres.
- **Competition from flax tow**, which is cross subsidized by high processing aid for flax long fibres (160 resp. 200 €/t). Without the short fibre processing aid (90 €/t) this unbalanced situation will lead to extremely unfair competition between flax and hemp (only France, Belgium and The Netherlands will profit).
- **Competition from high cereal prices**, which makes it extremely difficult to get farming areas for hemp and other niche crops.
- **Competition from energy crops**; energy crops receive subsidies in most European countries due to their CO₂ benefits – hemp receives no subsidies at all despite its CO₂ benefits. This leads to unfair competition for farming areas.

Economy

– the risk and the solution

- Without processing aid the whole European hemp branch **will not survive the next three years.**
- The **increasing demand for biomaterials**, natural fibres reinforced (bio)plastics, insulation and construction materials has to be met by **natural fibre imports** from Asia, Africa and South America.
- **A great chance** for agriculture, biodiversity, regional development, innovation and ecology – and R & D spending with a volume of a few 100 Mio. € **would be lost!**
- **The ideal solution: A single processing aid** – same amount for all produced natural fibres over the next years (recommended by most natural fibre experts).
- **The minimum solution:** Keep the existent processing aid for short fibres until 2013. That means less than 3 Mio €/year (15.000 ha x 2 t fibre/ha x 90 €/t).