

HEMP-SYS

Contract No QLK5-CT-2002-01363



Design, Development and Up-Scaling of a Sustainable Production System for HEMP Textiles: an Integrated Quality SYSTEMS Approach

Start date: 01.11.2002

End date: 01.11.2005

Kick off meeting: 10.02.2003

First International Conference of the European Industrial Hemp Association (EIHA) 23-24 October 2003

Introduction to HEMP-SYS

Why hemp for textile?

- Relative European lead in the field of long bast fibre.
- Dependence of European textile industry on imported fibre.
- There is a growing market demand for natural fibre.
- To provide farmers with an alternative crop, no food and economically sustainable.

The overall objectives of HEMP-SYS

- Developing an improved, ecologically sustainable production chain for high quality hemp fibre textiles coupled to an integrated quality system for stems, raw and processed fibres, yarns and fabrics based on eco-labelling criteria.
- Providing a comprehensive economic assessment of EU and international fibre hemp markets, consumer requirements and EU-production costs and returns.
- Disseminating as much as possible the knowledge generated using the latest information technologies.

The traditional hemp production chain

Cultivation



First
Transformation

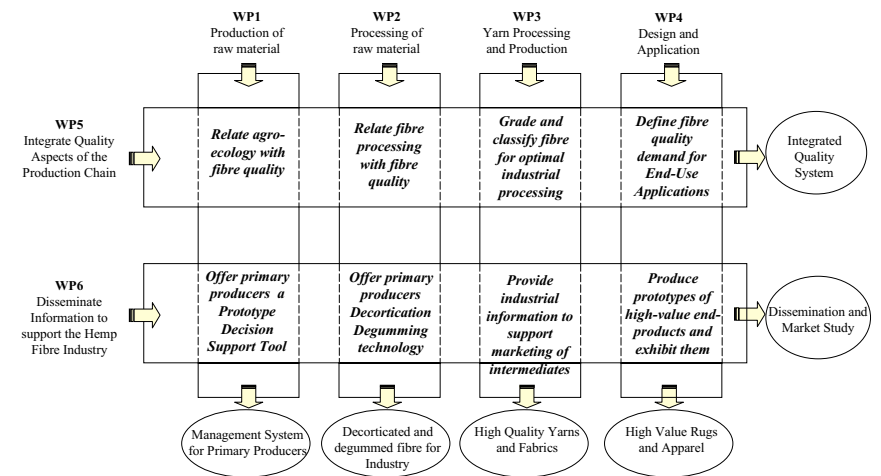


➔ Industry

Bottlenecks of the hemp for textile production chain

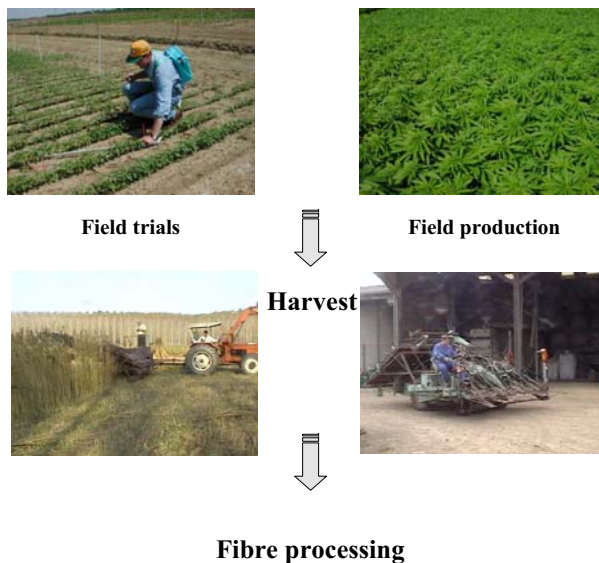
- **Legislation**
 - **Genotypes availability;**
 - **Revise agrotechnique;**
 - **Harvest;**
 - **Fibre separation;**
 - **Fibre retting;**
- Until the above are optimised there is a lack of availability of fibre of homogeneous quality and consistent quantity.**
- **Industrial experience in spinning and weaving;**
 - **Product development.**

Integration among WorkPackages



The production chain according to HEMP-SYS

WP1 Cultivation (G x E x M)



WP1: Production of raw material

ACTIVITIES:

- quantify the influence of different **local growing conditions** (soil, water, temperature, photoperiod), **genotype**, and **management** (plant density, irrigation, fertilisation, sowing and harvest time) on the **quantity and quality** of **hemp stem and fibre** to permit the development of environmentally and economically optimal fibre hemp production systems;
- quantify the **influence of natural photoperiod** and **temperature** on the timing and length of **hemp flowering** to permit prediction of and control over the moment of maximum fibre quality;
- develop a **Decision Support Tool** for tactical and semi-operational decisions to be made by primary producers to maximise fibre quality and economic return.

WP1: Production of raw material

HEMP SYS - Field experiments

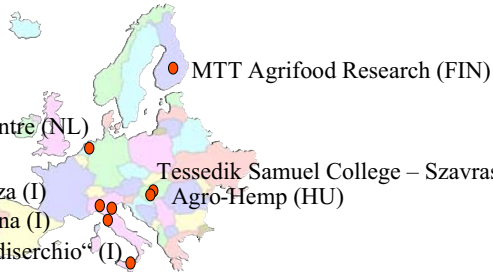
Wageningen University & Research Centre (NL)

Universita' Cattolica, sede di Piacenza (I)

Università degli Studi di Bologna (I)

Cooperativa Produttori Agricoli "Valdiserchio" (I)

Università degli Studi di Catania (I)



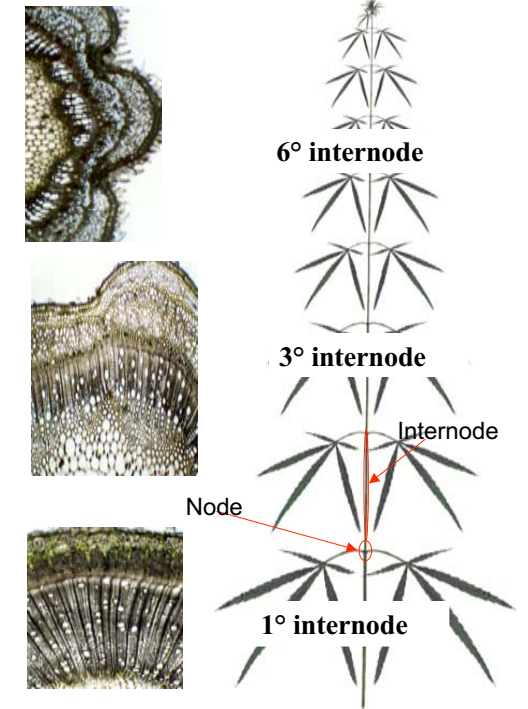
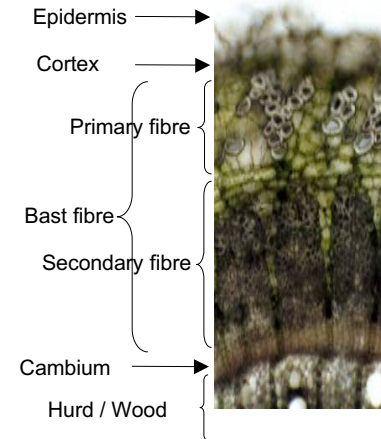
MTT Agrifood Research (FIN)

Tessedik Samuel College – Szavras (HU)

Agro-Hemp (HU)

Field experiments will determine how fibre quantity and quality is affected by:

- Harvest time
- Stem portion
- Plant density
- Water availability
- Genotype (monoecious vs dioecious)
- Environment



The production chain according to HEMP-SYS

Cultivation (G x E x M)



Field trials



Field production

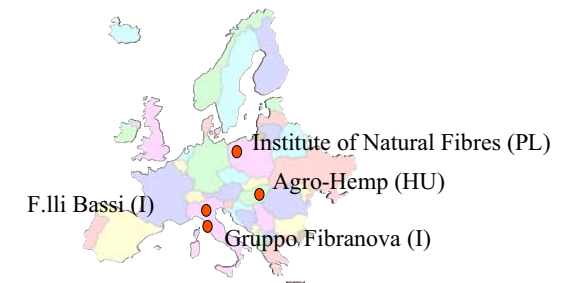
WP2

Harvest



Fibre processing

HEMP SYS – Harvesting



Institute of Natural Fibres (PL)

Agro-Hemp (HU)

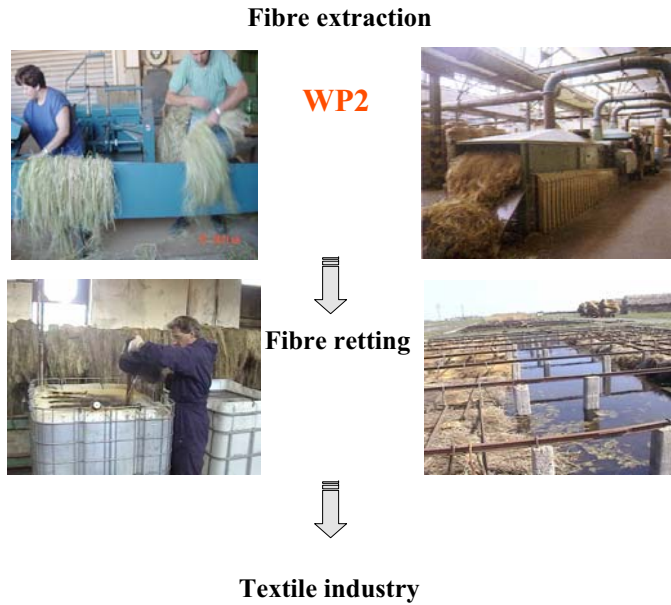
F.lli Bassi (I)

Gruppo Fibranova (I)

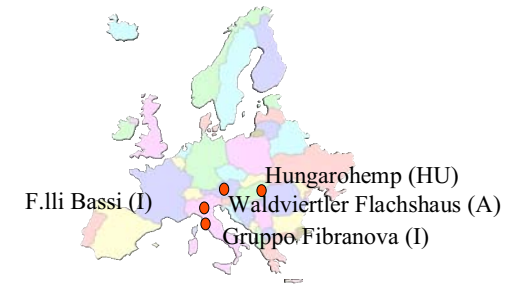
Evaluation of existing **harvesting systems**:

- Traditional reaper and binder (Agro Hemp)
- Modified reaper and cutter (Fibranova, INF)
- Prototype self propelled decorticator (F.lli Bassi)

The production chain according to HEMP-SYS



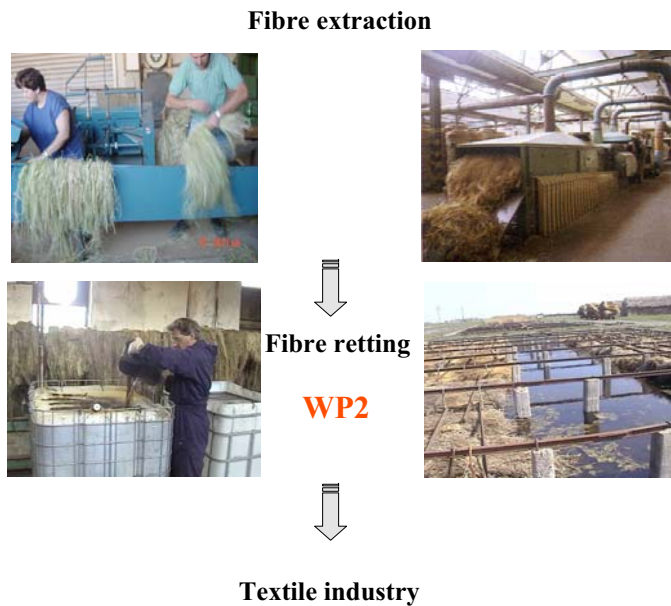
HEMP SYS – Decortication/Scutching



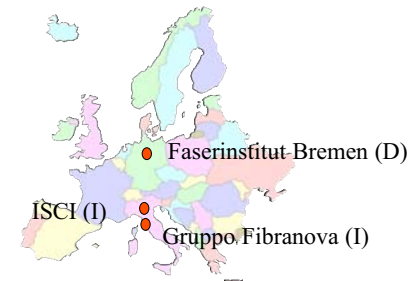
Test and compare different **decortication systems**:

- Traditional hemp scutching line (HungaroHemp)
- Modified flax scutching line (Waldviertler Flachshaus)
- “Green” on field decortication (F.lli Bassi)

The production chain according to HEMP-SYS



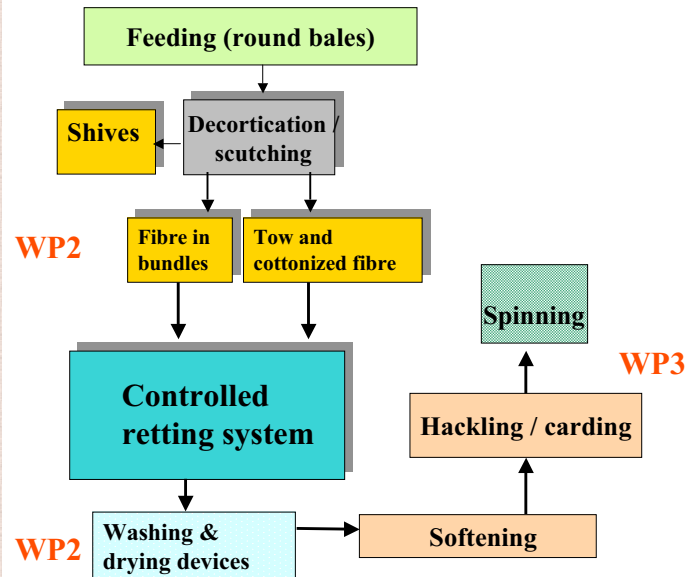
HEMP SYS – Retting



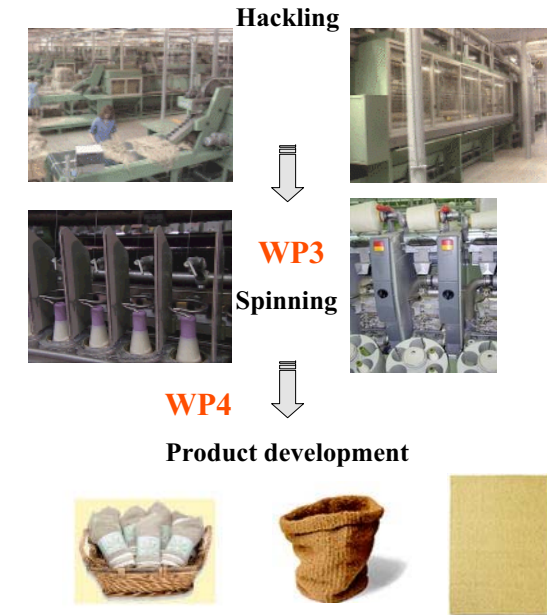
Test and compare different **controlled retting processes**:

- Microbiological liquor
- Enzymatic products

HEMP SYS – PROCESSING key targets



The production chain according to HEMP-SYS

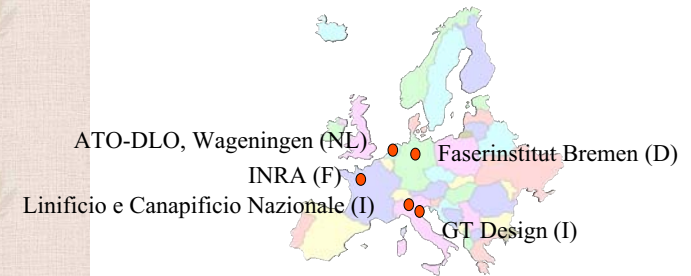


HEMP SYS – Industrial processing and product development



- To obtain an improved quality control of hemp raw fibre material, yarn spinning and fabric production
- To produce high quality hemp yarns and fabrics serving as intermediate products for high value end-use
- To produce prototypes of high value and fashionable hemp-based end-products that demonstrate the potential for hemp as raw material for textile end-products.

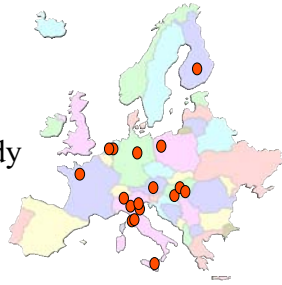
HEMP SYS – Quality determination, LCA



Development of objective methods for quality assessment in the production chain (for hemp stems, raw and processed fibre, yarns, and fabrics).

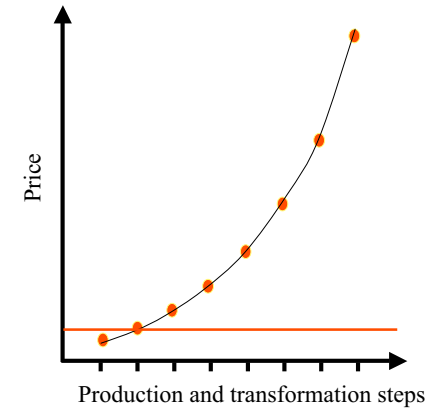
HEMP SYS – Economic analysis, dissemination

Everybody



To provide an integrated and comprehensive economic analysis of EU and international fibre hemp markets, consumer needs and EU-production costs and returns.

Added value distribution along the production chain



HEMP-SYS



THANK YOU for YOUR ATTENTION

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