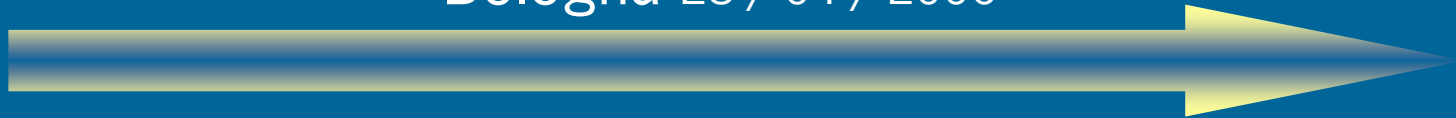


Hemp-Sys, *Integrated Quality system* of hemp fibre for textile processing

HEMP-SYS final conference

Bologna 28 / 04 / 2006



Jan E.G. van Dam

- objective

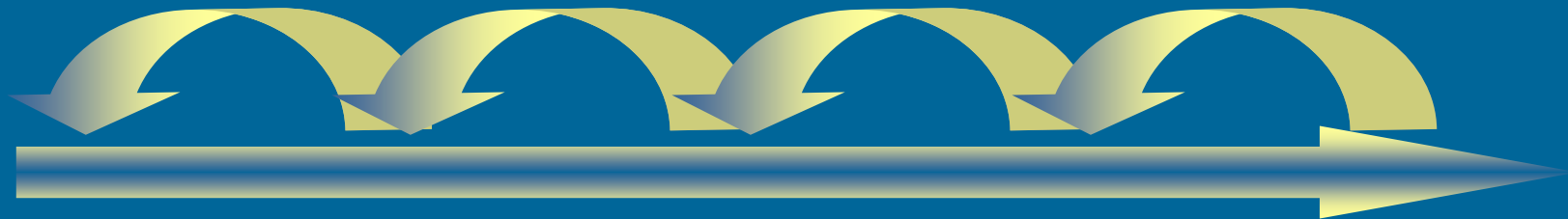
Integrated quality system for hemp textile production chain

stem

fibre

yarn

fabric



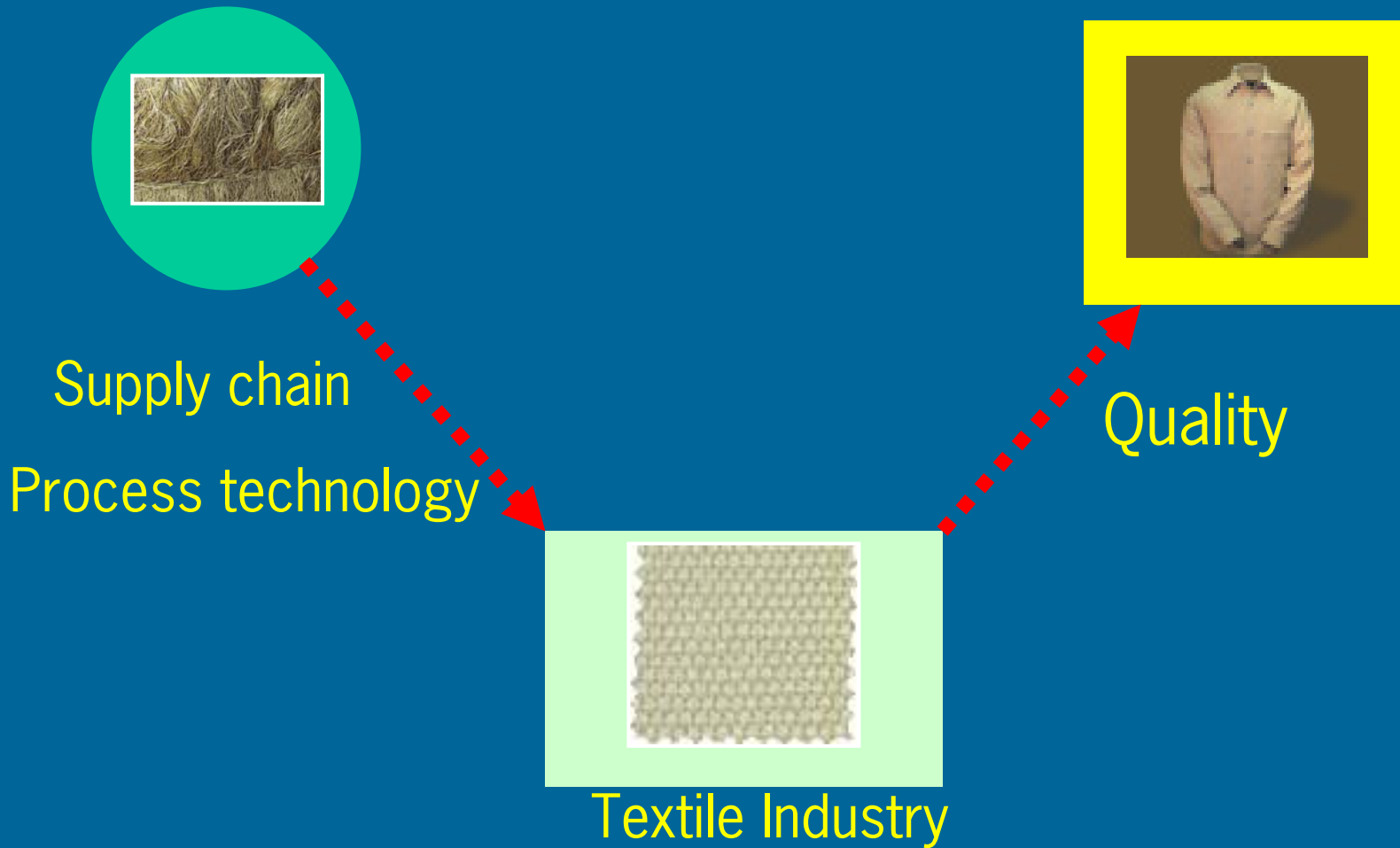
Objective and Methods

Competitive and innovative hemp fibre production chain for textile industry in EU

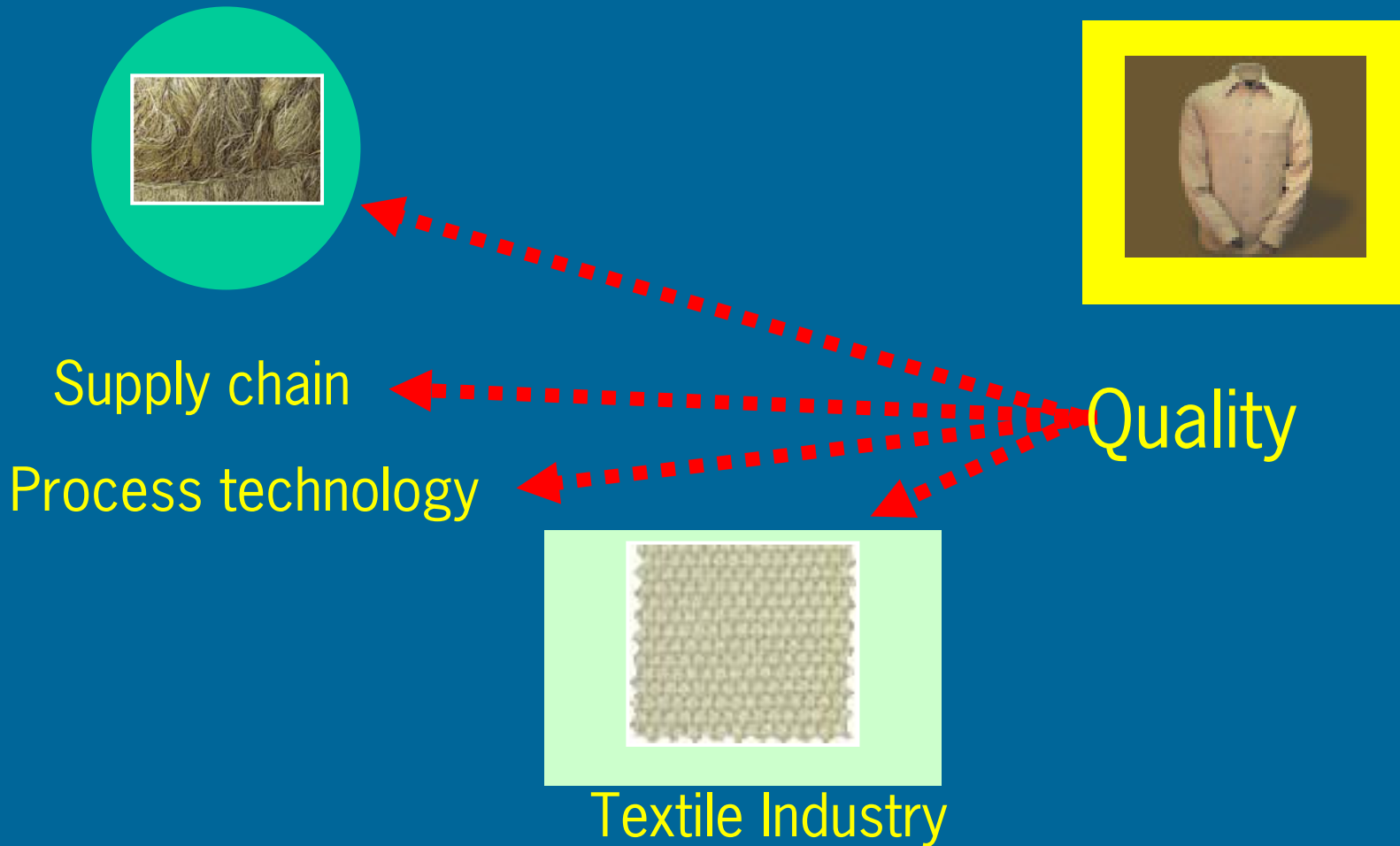
- raw material production and processing
- yarn production and processing
- quality control systems
 - **grading system**
 - **decision support system**
 - **labelling**



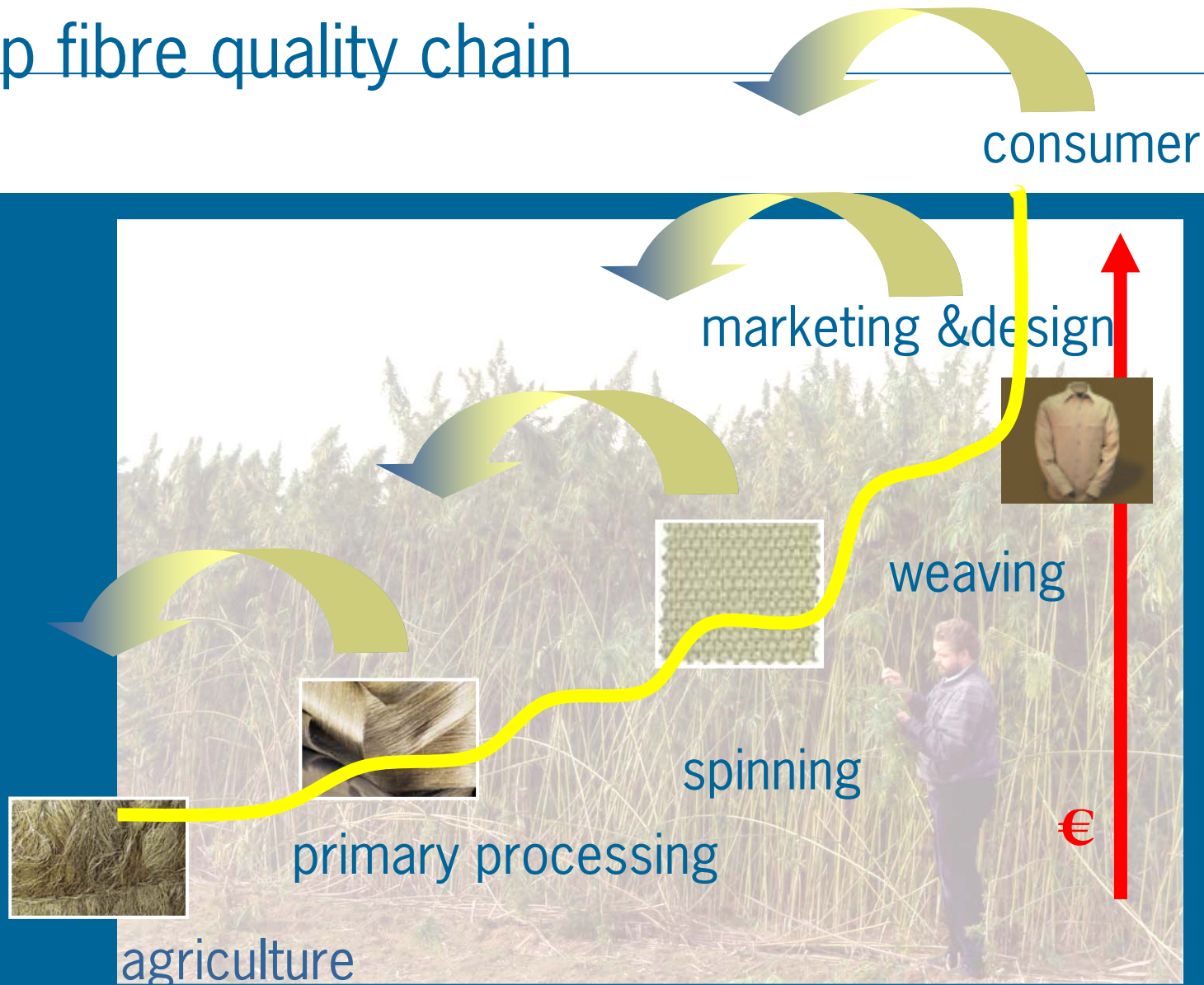
Agricultural production for textile market



Agricultural production for textile market



Hemp fibre quality chain



Hemp fibre quality and end-use

leaves & dust

fuel

shives

**animal bedding
particle board**

short fibre, tow

**paper and pulp
composites
non-woven**

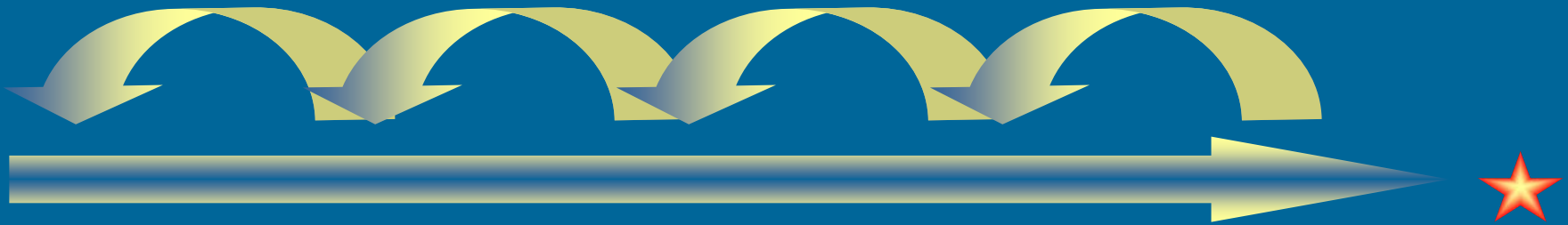
long fibre

textiles



HEMP fibre applications

- Lower fibre *grades* for
 - paper production
 - fibre reinforced composites
 - hemp (fibre / cellulose) non-wovens
 - rope and twine
- Highest grade **A** for hemp textile production



Qualified production chain


- objective quality assessment
 - standardisation of quality measurements
- reduced dependency on organoleptic methods
- improved logistic supply chain
 - up-stream / down-stream integration
- efficient use of raw materials, with highest added value
- tracking and tracing / labeling

Hemp fibre quality **grade A** for textiles

- Agricultural crop production
grade A for textiles
- Fibre extraction process
grade A for textiles
- Fibre cleaning and preparation
grade A for textiles
- Textile processing & design
- **Consumer perception**



HEMP-sys *Grading System* in the textile chain

Textile production	combing / drawing spinning weaving / finishing	finest yarn
Primary process	extraction	 ultra clean long fibre
Secondary process	cleaning	
Varieties / Agronomy	morphology, yield stem quality stem dimensions	low THC sowing and harvest fertilizer / climate / soil

Prototype *Grading system* (HEMPSYS Europe)

Quality	cleanness	fibre	length cm
• Textile grade A (99.9%)		parallel fine	>15
grade B		“ “ coarse	
grade C		cottonized fine	
grade D		“ “ coarse	2.5-3.5
• Composite grade (96-99%)		cut	3-15
• Technical grade (50-70%)		random	-

Decision support system

- Hemp Production - growing conditions for textile use
 - soil, water, temperature, photoperiod
 - genotype
 - management
 - * density, irrigation, fertilizer, sowing and harvest time
 - decision support system

grade A for textiles



Decision support system (2)

- Hemp processing (post harvest handling)
 - from harvest to ribbon preparation
 - decortication, degumming
 - * Yield losses / homogeneity
 - Yarn production
 - cleaning and quality control
 - spinning performance
- grade A for textiles**
- Design
 - yarns and fabric transformation to fashionable end-products



Decision support system (3)

Integrating Quality aspects of the production chain

relationships between

crop growth conditions, genotypes management

fibre extraction techniques

and **quality parameters** of

stem

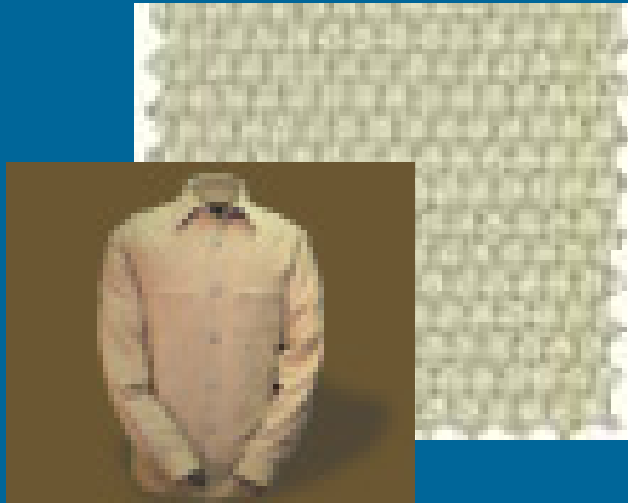
raw and processed fibre

yarns and fabrics

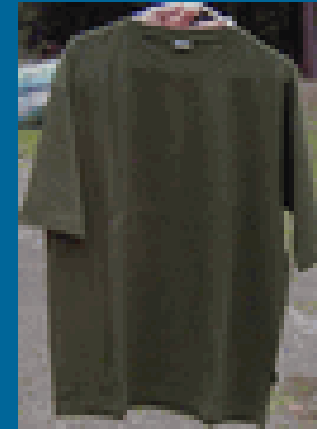


Hemp textile products

Design and consumer perception



“bluhemp”



“sweet grass”



“tribal fibre”



Conclusions HEMP-SYS (1)

**Production of high quality fibre
is made possible only through:**

up-stream integration of industry

and

downstream integration of agro-industry

Better prediction of fibre quality in the field requires:

*verification of data, improvements of methods,
gain of confidence*

Conclusions HEMP-SYS (2)

Grading system for Hemp fibre supply chain requires organisation of:

- Hemp processing Industries
- Protocols for Agronomical management
- Tracking and tracing system of raw materials
- Grading systems for raw materials and half-products
- Education of graders, farmers and processors
- Labeling for market promotion and quality certification

Conclusions HEMP-SYS (3)

Hemp fibre quality testing for textile processing :

- standard protocols and data exchange
- correlation of processing conditions and input - output product quality data (yield and performance)
- feedback mechanism in the production chain (tracking and tracing)

Conclusions HEMP-SYS (4)

Hemp bast fibre can find highest added value in textiles

Whole crop utilisation in other end-uses (paper pulp, composites, building materials.etc.) requires coordination of supplies

Quality control is essential in the whole production chain



Hemp fibre has high quality



**Thank you
for your
attention**

