Regional hemp textile chain

Marcel Toonen

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Why develop a regional hemp textile chain?

- Advantage for farmers
  - novel crops in rotation/competing price
- Advantage for textile companies
  - novel products to compete on world market
- New hemp variety
  - Chamaeleon
- Use strong points of region
  - textile machines industries

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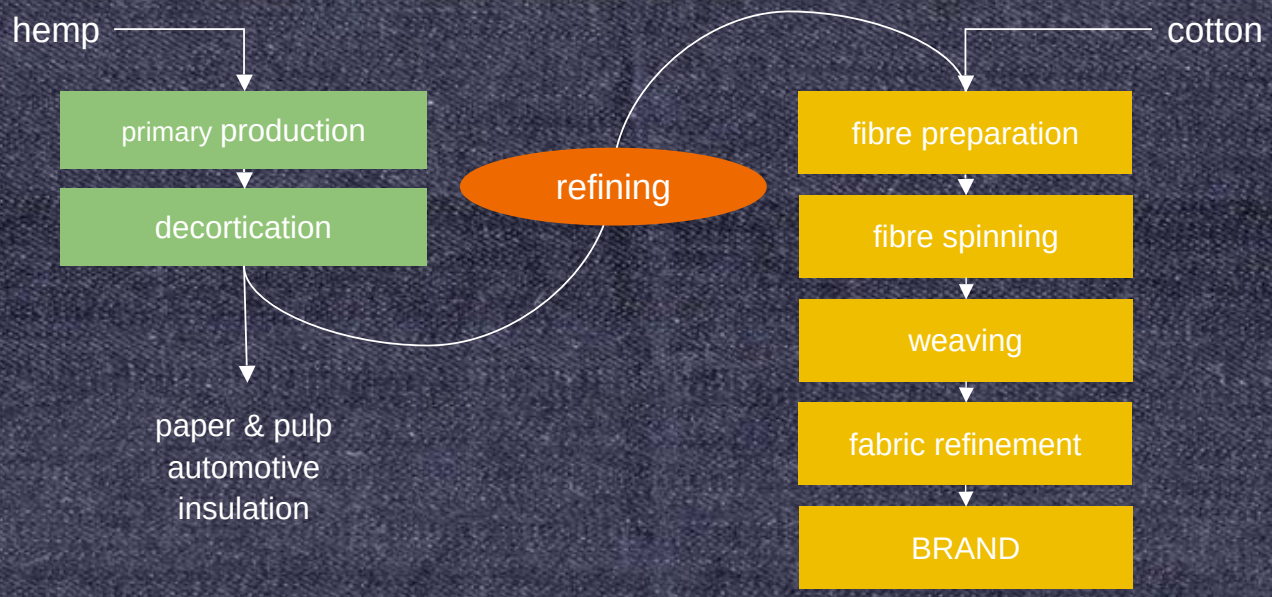
Production chains



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Refining

- Enzymatic treatment
- (Bio)chemical treatment
- Steam explosion
- Others

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Aim

To develop a regional hemp textile chain

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Goals

- Big ‘Brands’
  - large market volume
  - marketing
- Fibre refining
  - 2000 tons/year
- Cultivation
  - 2000 ha/year

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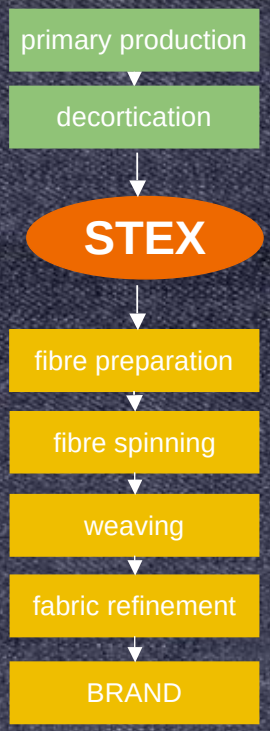
Interreg project: Regional hemp textile chain

- Cultivation/processing
  - Biologische Productenvereniging Achterhoek
  - Haus Riswick - Landwirtschaftskammer Nordrhein-Westfalen
  - Plant Research International
  - BaFa
  - IAF Reutlingen
- Textile
  - Deutsches Textilforschungszentrum Nord-West (DTNW)
  - BOOS Textile Elastics
  - Trützschler/Schlafhorst
  - Hecking Deoxtexis
  - Gardeur

Co-financed by Interreg IIIa



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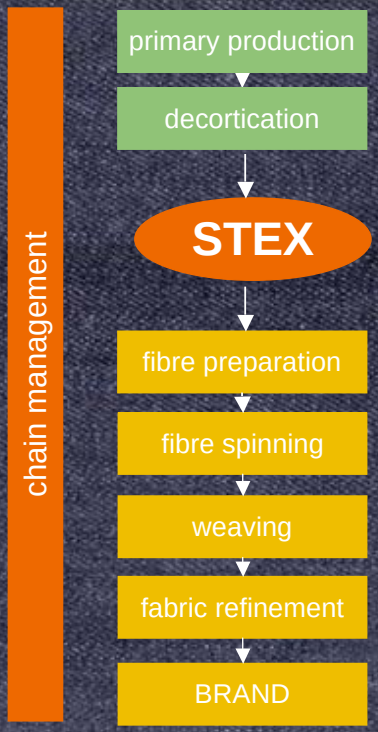
Interreg project: Regional hemp textile chain

- Chain management
  - BRUT
  - Vrisima
  - Stichting Food Valley, Wageningen
  - Universität Duisburg-Essen/FFT-Forschungsförderung und Transfer

Co-financed by Interreg IIIa



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Cultivation

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Processing

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Steam explosion

- impregnation
  - mild basic conditions
- 10’ high presure
- release through cyclone
- washing & drying

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Fibre refining

Chamaeleon fibre

Chamaeleon fibre
after STEX

Cotton
top quality

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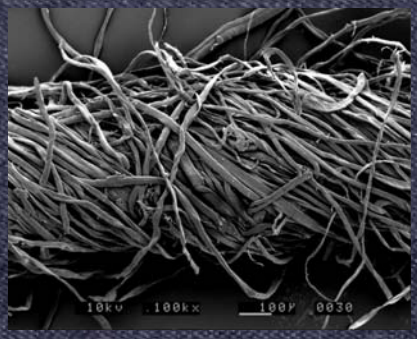
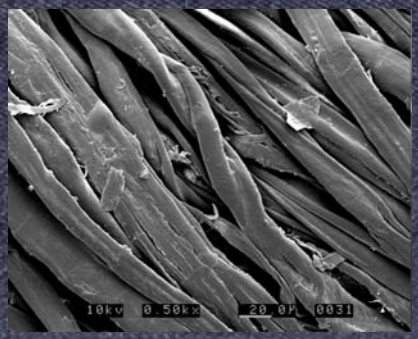
Spinning

- Fibre preparation (Trützschler)
  - 50% hemp 50% cotton sliver
- Rotor spinning (Schlafhorst)
  - 11.8 Nm, 10.2 cN/tex





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Applications

- Orthopedic textiles (BOOS)
  - moisture transport
- Denim fabrics (Hecking/Gardeur)
  - novel properties
  - → tensile strength (Zugfestigkeit)
  - ↑ moisture transport
  - ↑ abrasion resistance (Scheuerfestigkeit)
  - ↑ bending stiffness (Biegesteifigkeit)
  - ↑ rubbing fastness (Reibechtheit)

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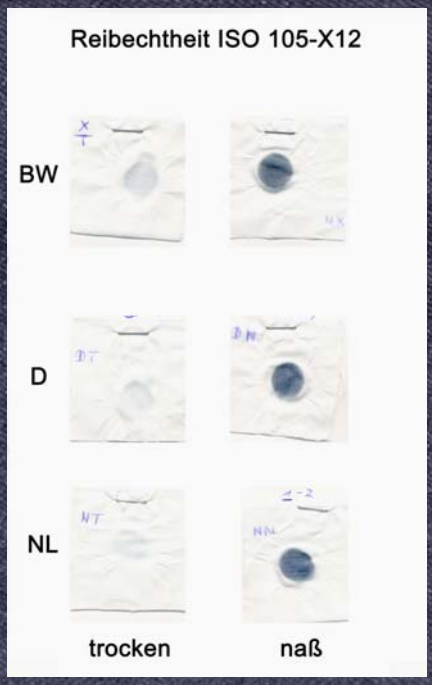
Denim fabric I

	Rubbing fastness		Abrasion resistance (destroyed after…)
	dry	wet	
cotton	3	1-2	50 000 rotations
25% hemp (Rheden)	4	1-2	ca. 55 000 rotations
25% hemp (Bedburg-Hau)	3-4	1-2	

(5 = very good / 1 = bad)



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Demin fabric II

	Cotton		Hemp (Rheden)		Hemp (Bedburg-Hau)	
Drop penetration time	44 min		6 sec		5 sec	
	Warp (Kette)	Weft (Schuss)	Warp (Kette)	Weft (Schuss)	Warp (Kette)	Weft (Schuss)
Water uptake W_n [%]	29.7	30.4	31.8	38.4	31.6	37.8
Water retention W_t [%]	38.2	39.4	41.4	48.0	40.4	47.3

$$W_n = \frac{m_w}{m_0} \qquad W_t = \frac{m_w}{m_{tr}}$$

m_0 = Fibres
m_w = Water content
m_{tr} = Dried fibres

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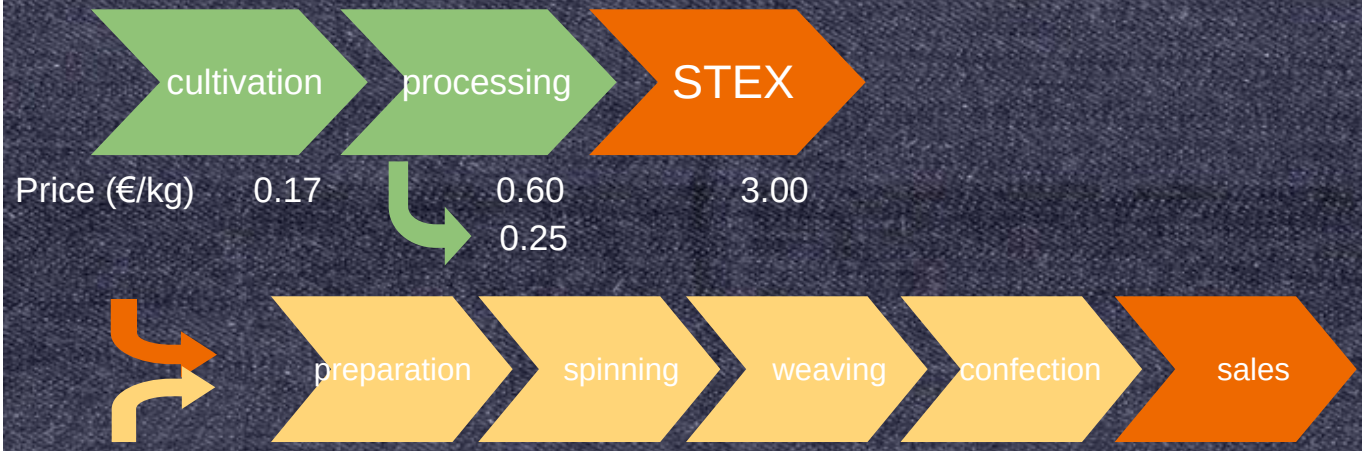
Economics (estimated amounts)



Price (€/kg)	0.17	0.60 0.25	3.00		
Price (€/kg)	2.05	2.25	6.30	9.80	9.20/jeans
Cotton (€/kg)	1.10	1.30	4.50	8.00	8.00/jeans

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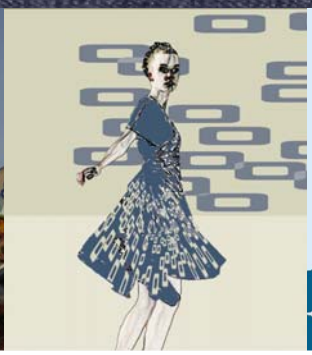
Prospects

- Sample collection
  - Sustainable
  - Lifestyle
  - 'Made in Germany'
- Business plan
  - develop STEX plant
  - Investors
- Secure fibre supply



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Ministerium für Wirtschaft, Mittelstand und Energie des Landes Nordrhein-Westfalen NRW.

Ministerie van Economische Zaken

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