

# European hemp industry 2001 till 2004: Cultivation, raw materials, products and trends

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## **Fibre plants in the EU**

In the European Union (EU), two fibre plants are being cultivated (apart from cotton in Greece and Spain): flax and hemp.

### *Flax*

Figure 1 shows the areas under flax cultivation in the EU since the year 2000. In the “old” EU member states, the area under cultivation amounts to more or less 100,000 ha in recent years. Together with the East European member states newly affiliated in 2004, flax cultivation in 2004 covers 120,000 ha (source: EU Commission 2004, Federal Ministry of Consumer Protection, Food and Agriculture 2004). France and Belgium are the most relevant cultivation countries. By far the largest part of flax production is done in a traditional manner: production of high-quality flax long fibre for the clothing textile industry, however, 60 to 80% thereof are exported to China for processing. Simultaneously, flax short fibre (tow) does emerge as by-product here that is used for textiles, composites, insulation material and pulp & paper.

Flax cultivation in East Europe has collapsed to a large extent since the 80ies - when it still amounted to more than 100,000 hectares - due to the lacking demand from Russia after the change.

### *Hemp*

Figure 2 shows hemp cultivation in the EU since 1993. While at the beginning of the 90ies hemp cultivation in the EU took place practically exclusively in France – for the production of specialty pulp – a range of other countries started cultivating hemp between 1993 and 2000. In most EU countries, first of all, the bans on hemp cultivation had to be overcome for this purpose which had

been enacted in many countries also for low THC industrial hemp, in the framework of worldwide marihuana prohibition. As a result of the “rediscovery of the agricultural crop hemp”, the areas under cultivation in the EU have approx. tripled – while the EU subsidies for the cultivation resp. the processing of hemp have been constantly decreasing at the same time. In 2004, the area under hemp cultivation in the EU amounted to approx. 16,000 ha.

Apart from the peak in hemp cultivation in Spain in the years 1997 till 1999, the areas under hemp cultivation have remained relatively constant in recent years – and the hemp peak is no such in fact: Hemp cultivation in Spain primarily was a matter of subsidy swindle. The straw was harvested and processed to merely a small extent in truth, the subsidy funds have been payed back to Bruxelles meanwhile – that`s why there is a grey tone in the chart.

Before the collapse of the UDSSR, the areas under hemp cultivation in Eastern Europe alone had amounted to almost 100,000 ha; the cultivation in Romania, Hungary, Bulgaria, Poland and the Czech Republic was of special importance. Not much of that is left nowadays. With the incorporation of new member countries in 2004, three new hemp cultivation countries entered the EU: Poland, Hungary and the Czech Republic (altogether approx. 1,500 ha). In the other Eastern European (non-EU) countries, the total area under cultivation today amounts to less than 3,000 ha.

Fig. 1: Areas under flax cultivation in the EU between 2000 and 2004

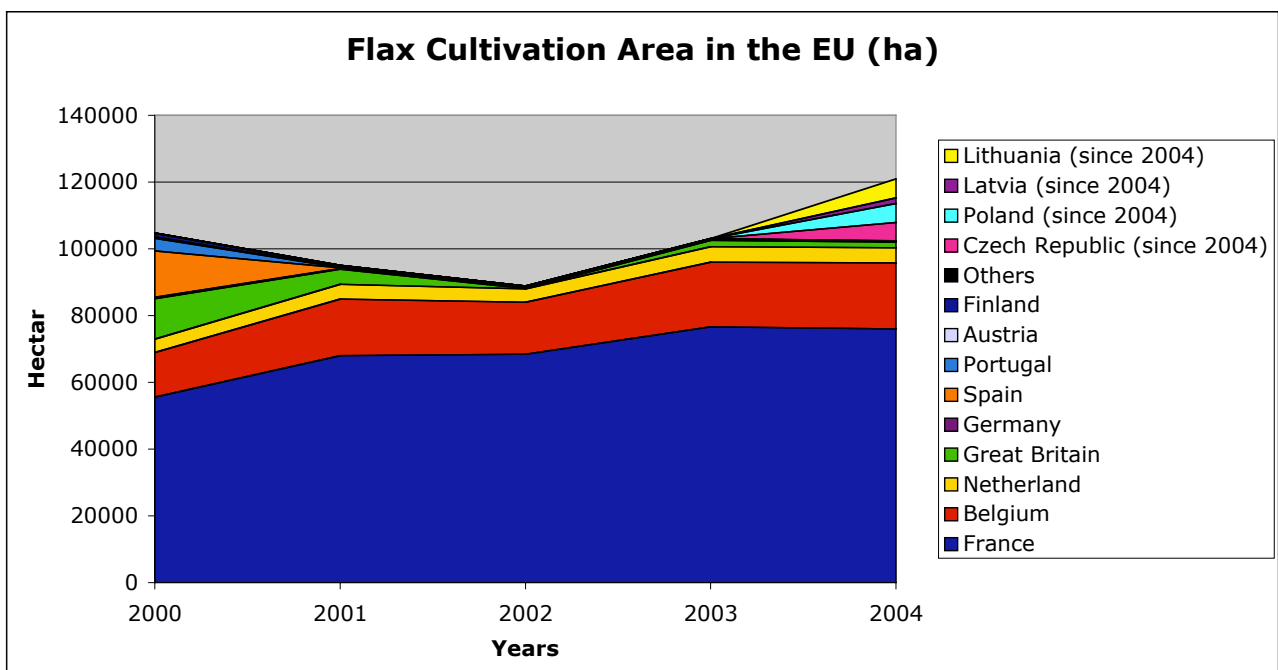
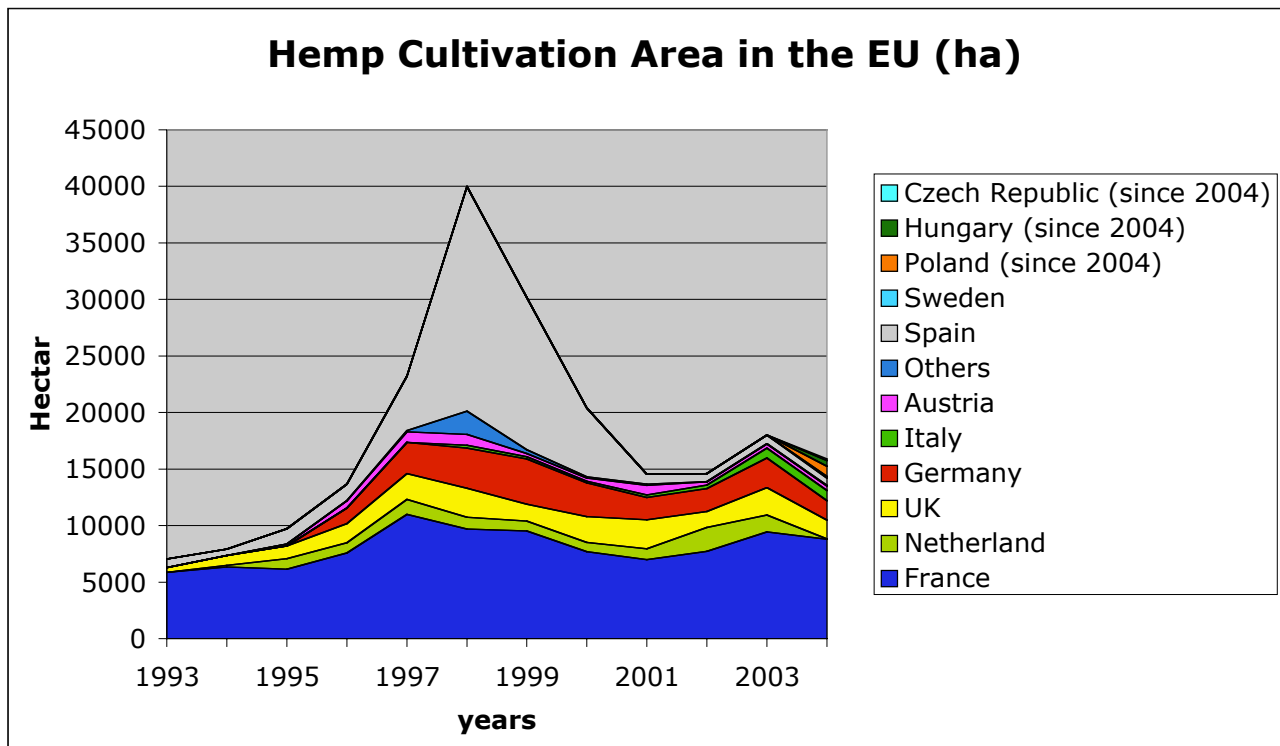


Fig. 2: Areas under hemp cultivation in the EU between 1993 and 2004



**Detailed data provided by the „European Industrial Hemp Association (EIHA)“**

The data presented in the following are based on up-to-date market surveys that have been conducted by the „European Industrial Hemp Association (EIHA)“ between 2001 and 2004.

In the European Union (EU), there are presently about 15 to 20 companies which are engaged in the primary processing of hemp. While in Eastern Europe the traditional processing line with water retting and long fibre separation partially is still being practised – by means of which also spinnable long fibre qualities can be produced – in the “old” EU member states, solely field retting and total fibre line are applied. In Italy, however, projects are running for processing hemp in the same way as flax - in the textile long fibre line.

The leading European primary processors of hemp, for the most part EIHA members, constitute the survey basis for the following data on cultivation, production and product lines. These companies are:

Tab. 1: Interviewed hemp companies – data sources of the market figures

<b>Company</b>	<b>EIHA status</b>	<b>Survey 2002</b>	<b>Survey 2003</b>	<b>Survey 2004</b>
NAFGO (D) (formerly: AGRO-Dienst)	Member since 2000	Yes	Yes	Yes
BaFa (D)	Member since 2000	Yes	Yes	Yes
Gruppo Fibranova (I)	Member since 2003	No	No	No (commercial production not yet started)
HAV NafiTech (D)	Member since 2005	No	No	No
Hemcore (UK)	Member since 2000	Yes	Yes	Yes
HempFlax (NL)	Member since 2000	Yes	Yes	Yes
Hempron (NL)	No member	Yes	Absorbed by HempFlax	Absorbed by HempFlax
LCDA (F)	Member from 2000 till 2004	Yes	Yes	partially (some data had to be estimated)
Vernaro (D)	No member	Yes	Absorbed by HempFlax	Absorbed by HempFlax
Yunnan (China)	Associated member since 2004	No	No	No

The mentioned companies have – depending on the year considered – a stake of between 70 and 90% in the total area under hemp cultivation in the EU, and the same stake in hemp fibre production in the EU. Therewith they constitute a good and representative basis for the following market statements.

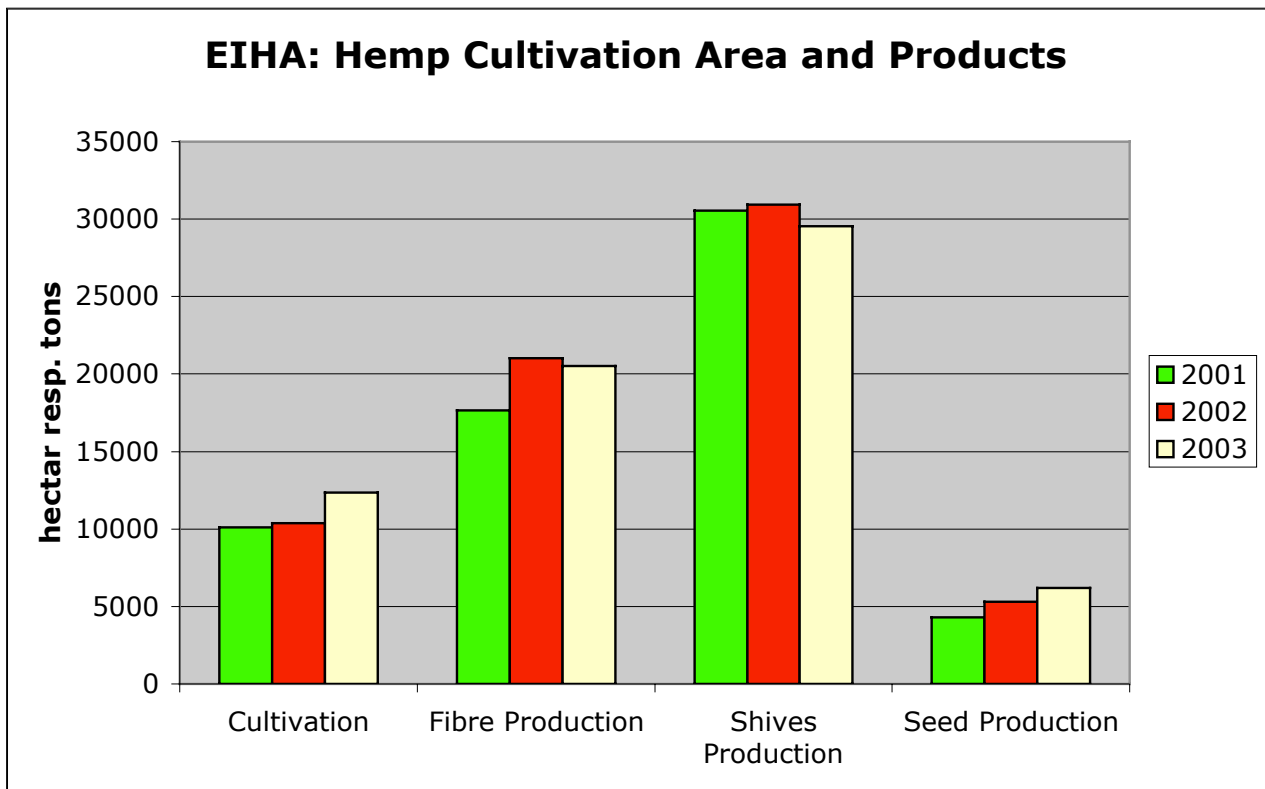
The „European Industrial Hemp Association (EIHA)“ was founded in the year 2000 as informal federation at first, in the framework of the international congress „3. BIORESOURCE HEMP“ in Wolfsburg (Germany). The official formation of the association will take place in the first half of 2005. One of the companies mentioned above, LCDA (F), has resigned from the EIHA at the end of 2004. At the beginning of 2005, with HAV NafiTech (D) another new member joined. The company AGRO-Dienst (D) has newly structured itself at the end of 2004 and is now called NAFGO (D). With Yunnan Industries Hemp, the EIHA also has its first non-European associated member.

It is to be expected that after the official formation of the EIHA in 2005, several other companies and national hemp associations will join the association.

### Cultivation

The areas under cultivation of the interviewed hemp companies (see table 1) amounted to between 10,000 and 12,300 ha in the years 2001 till 2003. The average hemp straw yields in these years amounted to between 5.3 and 6.2 t/ha.

Fig. 3: Area under hemp cultivation and the most important products



### Production

The amount of hemp fibres produced in the EU has constantly increased over the last ten years and is expected to amount to more than 25,000 tons per year in the years 2002 and 2003 (worldwide production is estimated at 60,000 to 80,000 t). The companies mentioned in table 1 have produced almost 18,000 tons of hemp fibres altogether in 2001, and about 21,000 tons in 2002 and 2003, what accounts for approx. 80 to 90% of total EU production. Approx. 30,000 tons of hurds (2002 and 2003) and more than 6,000 tons of hemp seeds (2003) were produced by the companies as value-adding by-products.

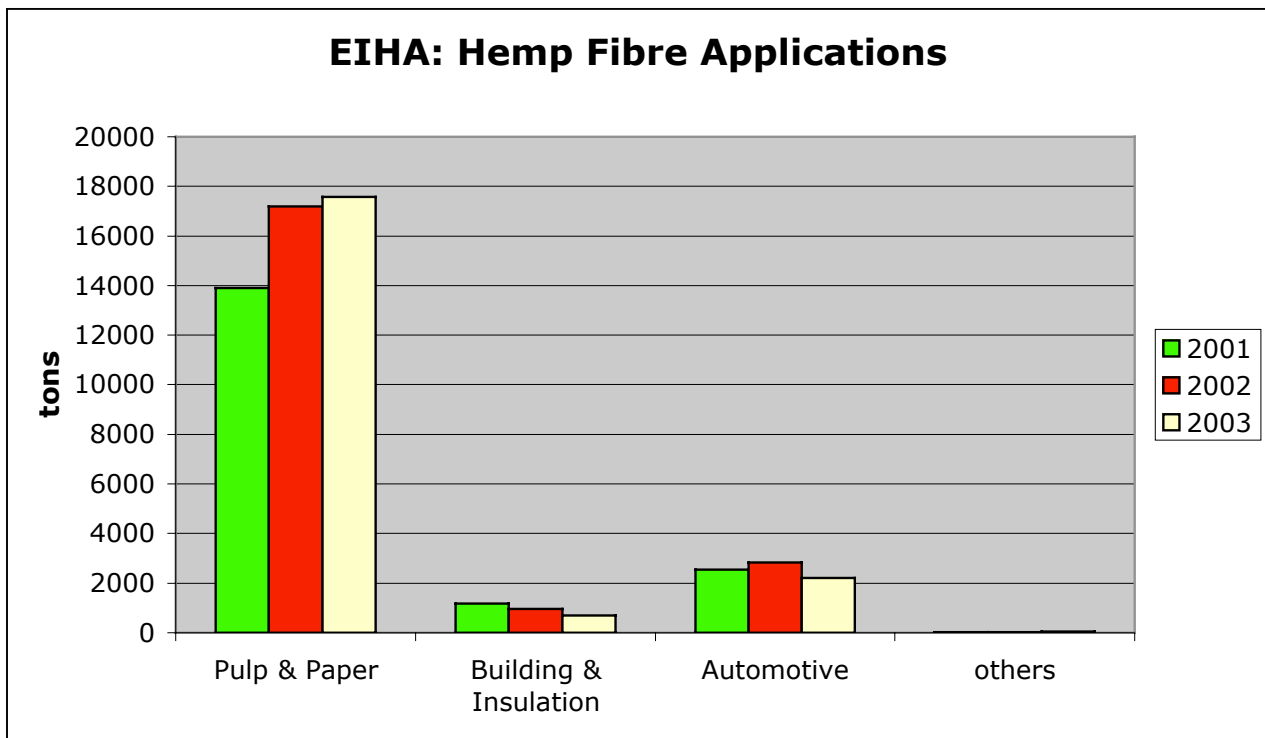
## Markets for hemp fibres

Hemp fibres from EU cultivation and production so far do find only three relevant markets (see fig. 4) which shall be closer considered in the following.

Other possible applications such as agro- and geotextiles, mattresses, shoe lifts, fibres for animal nest-building and many more are negligible right now in terms of amounts. Also the traditional fields of application such as twines or also textile yarns and fabrics do not play any role in the EU – except for the current projects in Italy.

Natural fibre reinforced plastics are a potential new promising market also beyond the automotive industry.

Fig. 4: The most important applications for hemp fibres in the EU



### *Specialty pulp for cigarette papers and technical applications*

With a market share of approx. 70 to 80% (related to tons) of the hemp fibre market, this traditional field of application still is the by far most important product line. In absolute figures the turnover remains widely constant except for yearly fluctuations, the relative share of hemp fibre applications, however, has decreased significantly (five years ago, the share still amounted to more than 95%).

Thin and tearproof cigarette papers are the most important field of application for specialty pulps made from flax and hemp fibres. Small amounts of these pulps are also used for applications such as technical filters.

Without essential technical enhancements and/or the development of new fields of application, one cannot expect large growth rates in this segment. Only a small part of hemp fibres for the pulp sector is traded freely, the largest part goes into integrated process chains from raw material to end product. France is the most important country for the use of hemp fibres in the specialty pulp sector.

#### *Automotive industry*

The use of thermoplast and thermoset (duroplast) natural fibre press-moulded parts, e.g. as interior door panelings or car boot linings, today already is a standard in the series production of a lot of automobiles. This especially applies to medium-class and luxury class vehicles of the German automotive production. At the moment (2003), about 25,000 tons of natural fibres such as flax (52%), hemp (13%), jute, kenaf, sisal and abaca (altogether 35%) are used in the production of passenger cars per year in Europe, primarily in the interior, however, in first series already also in the exterior (underbody).

In recent years, these applications have increasingly gained importance for European hemp: In 1996, less than 1% of hemp fibres were used for composites. In recent years, the share has increased to 10 to 15%. In countries such as Great Britain, the Netherlands and Germany, the share even amounts to more than 50%, and partly to more than 90%. The slight decrease in 2003 occurred mainly as a consequence of the price competition towards kenaf and jute fibres from Asia. Exotic fibres have been available at favourable prices in the years 2003 and 2004, also due to the strong euro, and as a consequence, European flax and hemp do face considerable pricing pressure and have lost market shares. Basically, however, a considerable market potential does exist here.

As a result of new production technologies – especially natural fibre (NF) injection moulding with polypropylene matrix (PP) - new fields of application are presently developed also beyond the automotive industry. For example, flap discs respectively fan grinding discs with a PP hemp carrier material were released to the market by a leading German manufacturer at the end of 2004. Relevant amounts of hemp fibres will be sold here for the first time probably in 2005.

Experts particularly call the PP NF injection moulding technology a “sleeping giant”. Interesting material properties along with competitive prices lay the basis for a market success.

#### *Construction sector (insulation mats)*

In the last three years, between 3.5 and 6.5% of EU hemp fibres were sold in the construction sector. The decrease in 2003 has to do with the general situation in the building industry. In most EU countries, the sale of insulation materials is more and more decreasing because of declining building activities.

In 2003, a market introduction program for insulation materials made from renewable resources has been started in Germany which has already effected considerable sales impulses in 2004. Through this, significantly higher sales amounts of hemp insulation materials are to be expected in 2004.

According to first estimates (January of 2005), in the framework of the market introduction program 2,000 to 2,500 tons of hemp fibres from EU cultivation went into the production of insulation materials in 2004 – compared to approx. 700 tons in 2003.

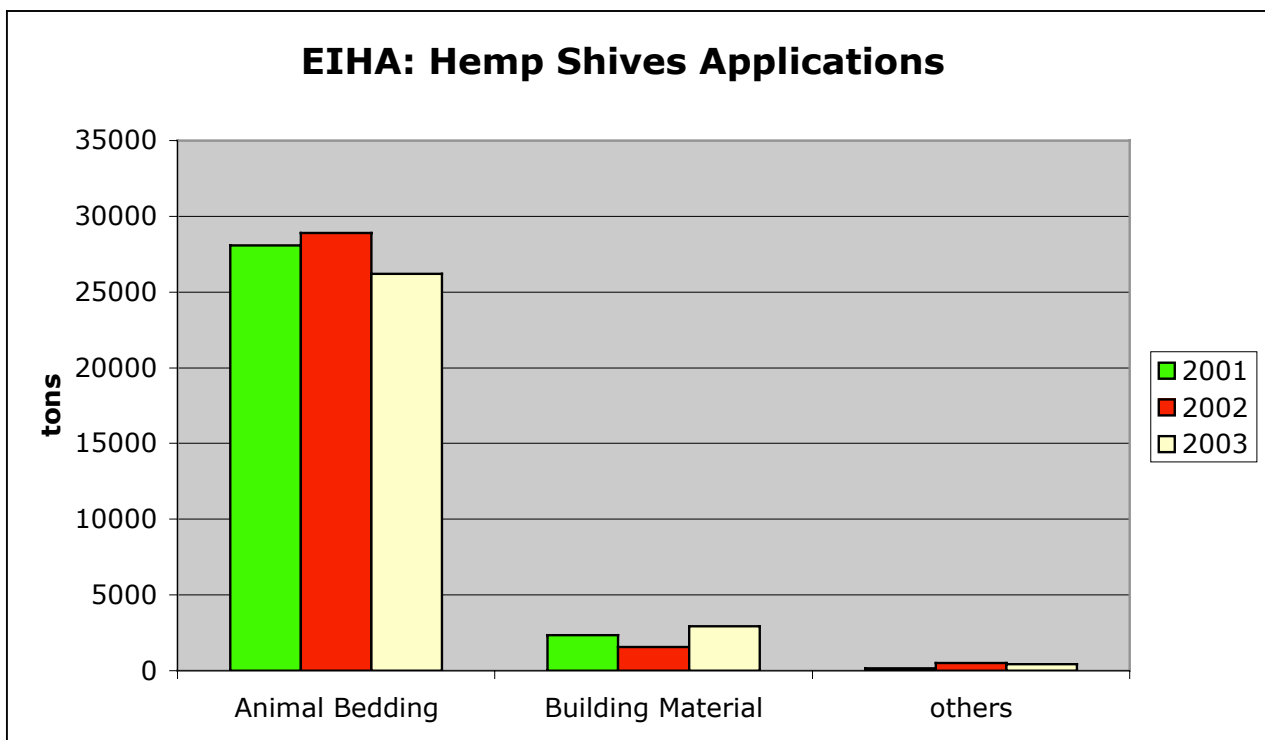
### *Cultivation mats for cress*

In Germany, about 50 tons of hemp fibres are processed into cultivation mats for cress. In the category “other”, this is the most important application. Cultivation mats made from hemp/flax have already achieved substantial market shares (over 50% in some regions) in the cultivation mat segment; the absolute figures, however, are subject to limitation due to the kind of application.

### *Markets for hurds*

Parallely to the production of fibres, hemp hurds do accumulate. Depending on the respective residual hurd content of the produced fibres, the relation between hurds and fibres amounts to 1.5 : 1 and 2 : 1. In the EU, on the whole approx. 35,000 tons of hemp hurds were produced in recent years. The most important product lines are animal beddings and building materials (see fig. 5). The added value from the sale of hurds is of great importance for the overall economy of hemp utilisation. Without a high-quality utilisation of hurds, hemp fibres cannot be marketed at competitive prices.

Fig. 5: The most important applications for hemp hurds in the EU



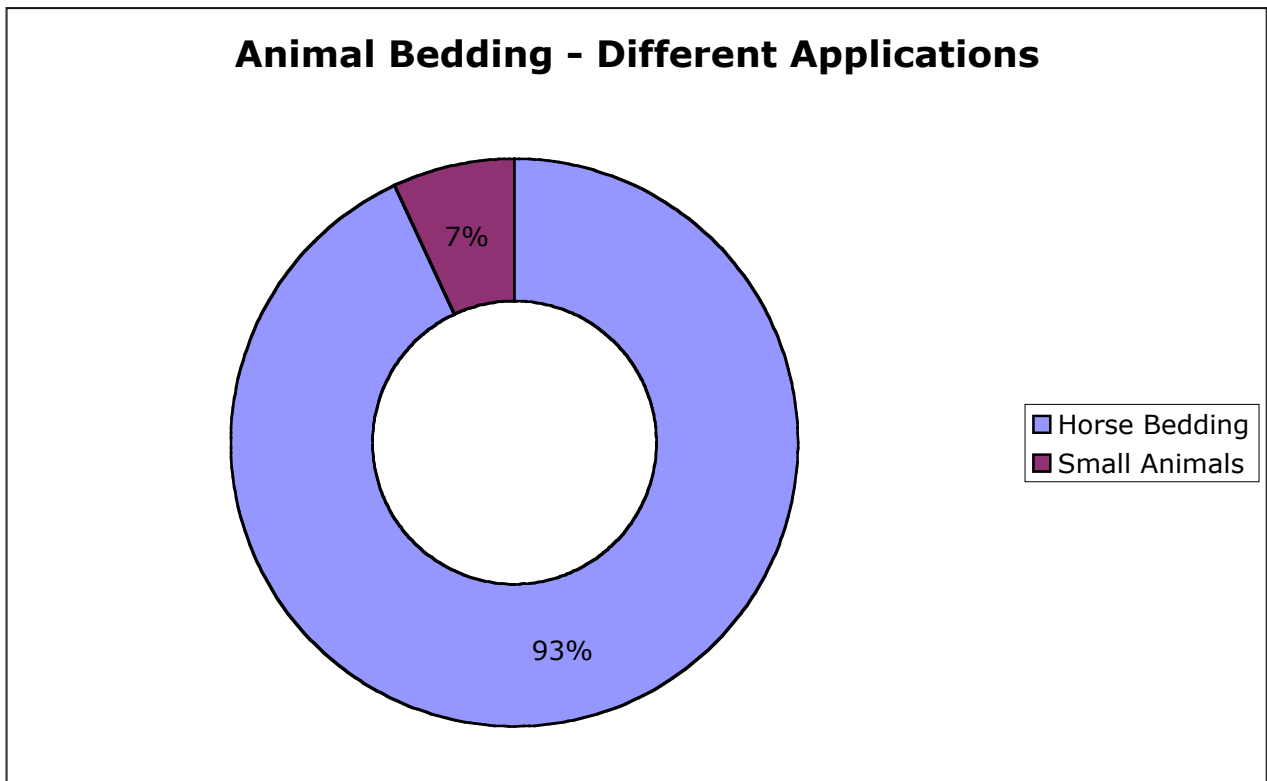


### *Animal bedding*

Approx. 95% of hemp hurds (cleaned) are marketed as animal bedding, 93% of which as horse bedding and 7% as bedding for small animals such as rabbits, hamsters, mice, but also birds (see fig. 6).

Hemp hurds do sell as animal bedding mainly because of their properties: good absorbency, easy handling and fast composting after use.

Fig. 6: Animal bedding made from hemp hurds– different fields of application



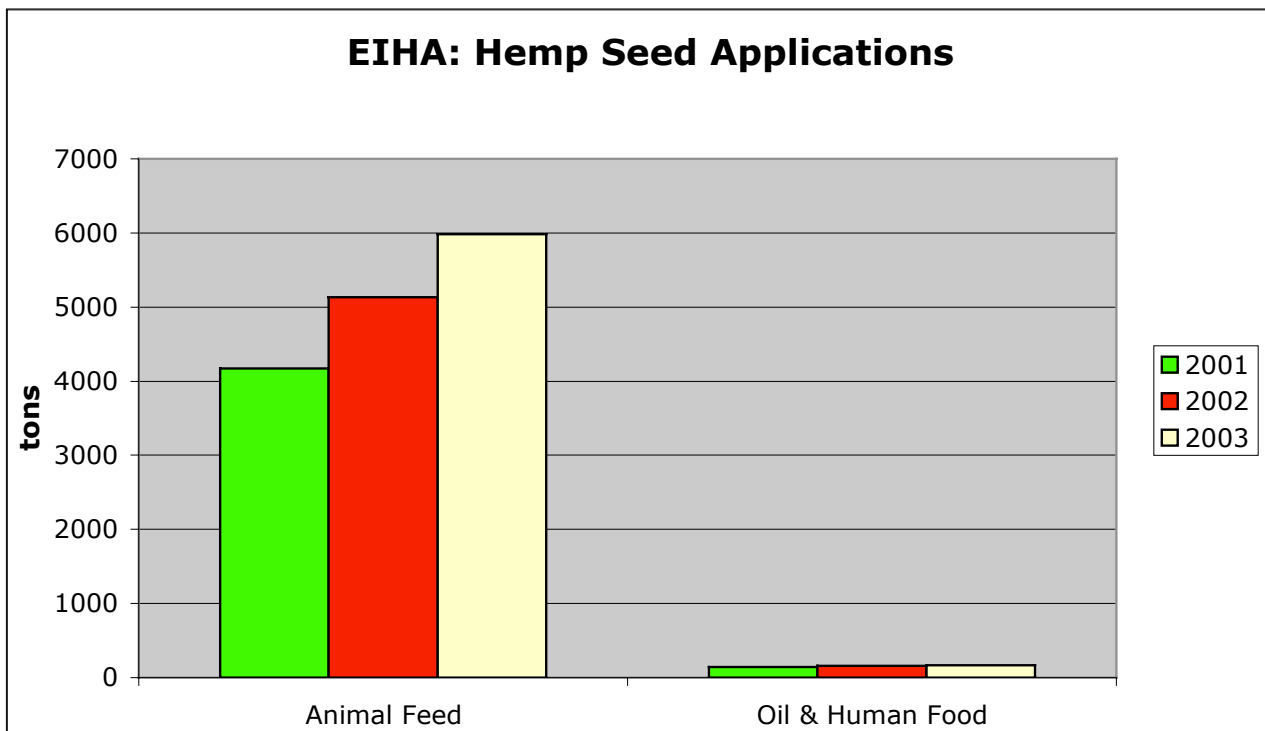
### *Construction sector*

About 5% of hemp hurds are used for lime and loam construction as additives and also as pour-in insulation. Hurd boards in the manner of lightweight chipboards do offer another big potential that has not yet been tapped. The building technique in France, where already hundreds of complete houses have been built with the combination of hemp hurds and lime, is widely advanced. This building technique shall now be introduced in other countries, too.

## *Hemp seeds*

Hemp seeds, along with fibres and hurds, are produced predominantly in Central- and Southern Europe. More than 6,000 tons of hemp seeds were produced in 2003 by the hemp companies mentioned in table 1. Hemp seeds are of nutritional interest mainly because of their fat acid spectrum. Fig. 7 shows the most important sales markets.

Fig. 7: The most important sales markets for hemp seeds in the EU



### *Animal feed*

More than 95% of hemp seeds are sold in the animal feed sector, mainly as bird feed, with smaller amounts being used as bait by anglers. The attractiveness of this sector strongly depends on the dollar exchange rate and its impact on the competitiveness towards imports from China.

### *Food & body care*

The remaining just under 5% are used in the food sector in the form of whole grains, as hulled hemp seeds and as hemp oil, small parts are also used in the body care and cosmetics sector.

The sectors food and body care do represent still small niche markets with an above average growth rate. The expansion of these sectors mainly depends on adequate marketing activities, the qualitative eligibility of hemp seeds and oil is beyond question in this context.

The example Canada shows how important information and image campaigns, as well as suitable products and their marketing, are. Here 3,500 ha of hemp were exclusively cultivated in 2004 for seed applications in the food sector.

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