

Hemp industry on a global course of expansion

The 4th International Conference of the „European Industrial Hemp Association (EIHA)“ revealed a globally increasing interest in hemp raw materials due to worldwide raw material shortages. Hemp fibre reinforced plastics at the Olympic Games 2008 in China.

On 21 and 22 November 2006, 90 hemp experts from 23 countries and five continents met in Hürth in the Rhineland (Germany) to exchange views on the current status quo and future trends of the global hemp industry. Special highlights of the conference: The manifold industrial applications of hemp in China as well as the interest of the wood material industry in hemp as alternative raw material for board materials.

China: Numerous hemp applications

Erik Shi of the Chinese hemp company Yunnan Industrial Hemp Inc. (Kunming City/China, www.yunnanhemp.com) reported on large growth rates in the Chinese hemp industry. Hemp seeds and oil with their polyunsaturated fatty acids are selling well in the food industry, the likewise high-value hemp proteins are serving as power food for athletes – as already today particularly in North America. Hemp fibres are used in the paper and automotive industry (see below), but also as reinforcement of plastics for window frames and floor coverings for the interior and exterior. These products shall be used on a large scale also at the Olympic Games 2008 in Peking. Furthermore hemp hurds are processed into lightweight boards that are exported as “agroboards” to South Africa, for example.

North America: Success story hemp seeds and oil

In North America, hemp so far has been cultivated mainly for the food industry. The Canadian hemp industry can look back on successful years and has cultivated almost 20,000 hectares of hemp exclusively for seed use for the first time in 2006, with the hemp seeds going into the US food industry for the most part. The USA are amongst the small number of countries worldwide in which industrial hemp cultivation still is forbidden – to the Canadian farmers’ delight. Right now some projects are going on in Canada in order to utilise hemp fibres and hurds as well; amongst other things, they are about the reinforcement of Polylactide (PLA) with hemp fibres to extend the field of applications of this bioplastics. But interest is shown also by the chipboard industry that is in search of new raw materials due to wood shortages, definitely considering larger hemp projects.

Daniel Kruse of Hempro International (Düsseldorf/Germany, www.hempro.com) gave a competent overview of the worldwide development of the hemp food industry. Compared to North America and China, Europe still is clearly lagging behind – nevertheless, also in Europe the market for hulled hemp seeds and hemp oil is growing. In Great Britain, hemp muesli bars and hemp oil have already made it into supermarkets. In Germany, distribution is primarily done via the internet and farm shops.

Europe – hemp textile projects, insulation material and automotive industry

In Europe, presently a lot of activities are going on that give reason to expect an extension of the meagre areas under cultivation of currently scarcely 16,000 ha. For example, Bengt Svennerstedt of the Swedish University of Agricultural Sciences (Alnarp/Sweden, www.jbt.slu.se) reported on the interest of the Swedish companies IKEA, Volvo and Saab in hemp fibres and hurds.

Exceptional growth rates can be found in the Czech Republic, where hemp cultivation has been rediscovered in recent years, today already amounting to more than 1,000 ha again. Here, above all, the development of new harvest and separation techniques, as presented at the conference by Jaroslav Skoumal, the managing director of CANABIA (Hodonin/CZ, www.canabia.cz), is interesting.

Hemp textiles

In Italy, the Gruppo Fibranova company (Perignano, www.gruppofibranova.it) is planning considerable investments to reintroduce hemp fibres to the Italian textile industry. For this purpose, the hemp fibres shall be separated into high-grade long fibres (price 2.5 to 3 €/kg) by means of enzymes (bio-degumming) and wet spun, as reported by Cesare Tofani, managing director of Gruppo Fibranova and member of the board of directors of the EIHA. For the simultaneously accumulating short fibres, technical applications are aimed at, as e.g. the reinforcement of plastics.

There is also another project heading for bringing hemp back onto the textile market. In the region “Euregio Rhein-Waal“, a German-Dutch project team for years has been examining the textile value-added chain from cultivation to hemp jeans. Here the hemp fibre is separated by means of steam explosion, a technique that was developed already in the eighties at the IAF in Reutlingen (Germany, www.iaf.fh-reutlingen.de). Project leader Marcel Toonen of Plant Research International (Wageningen/NL, www.pri.wur.nl) is convinced that the first hemp jeans from respectively Germany and the Netherlands will be available on the market within the next years – at prices merely slightly higher than those of other brand jeans.

Participants from Asia pointed out that they are also about developing hemp textiles as alternative to cotton textiles.

Insulation material and automotive industry

Bernd Frank, German hemp pioneer and member of the board of directors of the EIHA, gave an extensive introduction to his company Badische Naturfaseraufbereitung (BaFa, Malsch/Germany, www.bafa-gmbh.de). The BaFa has gained positive experience with the first new hemp cultivar from the Netherlands: The strain Chamaeleon yields good harvests and a bright fibre that is easy to decorticate. The main markets for his hemp fibres are the insulation material and automotive industry, the hemp hurds are mainly marketed as horse bedding, and the hemp seeds so far have been going into the aviculture sector for the most part. In the ecological construction sector in Germany, France and Great Britain, construction and insulation materials made of hemp hurds (mostly lime bound), as well as fibre insulation mats are increasingly used.

Michael Carus, managing director of nova-Institut (Hürth/Germany, www.nova-institut.de) and EIHA, as well as Dirk Fischer of the worldwide leading mechanical engineering company for natural fibre press-moulded parts, R+S Technik GmbH (Offenbach/Germany, www.rstechnik.de), gave an overview of the use of hemp and other natural fibres in the automotive industry. According to Carus, in the year of 2005, for the first time 19,000 tons of natural fibres were used in the German automotive production, mainly press-moulded parts, but also in injection moulding and press flow-moulding parts. Fischer impressively showed how the natural fibre press-moulding technique developed in Germany is conquering the

world. In recent years, his company has been delivering respective facilities to Iran, India and China – and right now, several new projects are about to begin. In the new Chinese medium-class limousine “Brilliance” that has been available also on the German market since December 2006, 80% of the interior parts were realised based on natural fibres materials – a new record.

Paper industry

The hemp consultants Pierre Bouloc and Francois Desanlis reported on numerous research and development activities with regard to new applications of hemp in France. Particularly interesting are projects that intend to gain quality paper from the whole plant – without the cost-intensive detour via upstream decortication. Due to the rising wood prices, the paper industry shows interest in hemp for the first time in decades. In this context, hemp pulp is particularly suitable for upgrading recovery paper, thanks to its longer fibres.

Fibre separation

Other projects dealt with the advancement of separation techniques; here chemical and enzymatic techniques are examined, or also the processing way of hemp silage which is especially interesting in case that the final products can be produced directly from the wet silage. Such a process chain was shown for different building products by Ralf Pecenka of the Institut für Agrartechnik (ATB, Potsdam/Germany, www.atb-potsdam.de).

For being able to enhance the separation technique, first of all detailed knowledge about the biological glues between fibres and hurds is required. Here the University of Leeds (www.leeds.ac.uk) is doing basic research that was presented on the congress by Tony Blake.

Lightweight boards

The new economic interest in hemp is not restricted to the paper industry. Also the wood material industry is suffering from the high wood prices and deteriorated availabilities – also due to the energy sector`s demand for wood. It is therefore searching for alternative raw materials. Different companies from Canada and Europe for the first time in decades showed concrete interest in large-scale hemp cultivation for the production of lightweight boards. Since last year, the Kosche company from Much (Germany, www.kosche.de) has been the first to offer hemp lightweight boards that are particularly suitable for the use in lorries, camping vehicles and the shipbuilding sector.

New developments

Jörg Müssig of the Faserinstitut Bremen (FIBRE/Germany, www.faserinstitut.de) introduced a seminal combination in theory and practice: Natural fibre reinforced bioplastics. Especially the properties profile of the bioplastics PLA which is commercially available on the market can be improved by means of hemp and other natural fibres, becoming more attractive in terms of prices at the same time. Müssig showed own attempts and examples from Japan, a kenaf reinforced PLA handy housing as well as one from Germany, a PLA hemp fibre jewel case.

Frank Otrember of M-Base (Aachen/Germany, www.m-base.de) gave a comprehensive overview of the properties of polypropylene natural fibre granulates for injection moulding applications compared to talcum-filled and glass fibre reinforced PP as well as PC/ABS. Otrember draws the following conclusion: „Many interesting properties“, such as the high form stability under pressure and temperature.

The Dutch company NPSP Compositen BV (Haarlem/NL, www.npsp.nl) is manufacturing diverse products using the RTM technique („Resin Transfer Moulding“). Managing director Willem Böttger calls his material „Nabasco“, if the reinforcement is done with natural fibre nonwovens. The nonwovens come from Germany, as fibres, hemp and flax are used.

Examples of application are mushroom-shaped guideposts for bicycle paths, housings of radar units (glass fibres do disturb the radar rays), boats, furniture and loudspeakers. At the end, NPSP presented wall elements with long hemp fibres in which the embedded fibres are not only used for reinforcement, but also for a 3D design effect.

Raw material shift and competition

Michael Carus of nova-Institut (Hürth/Germany, www.nova-institut.de) revealed the background of the increasing interest in hemp. The transition from fossil to renewable resources („raw material shift“) leads to a shortage and price increase of biomass and particularly wood. That makes a fast growing, high-yielding and mechanically strong plant such as hemp interesting for many branches: The plastics and composite, automotive, furniture, building, paper and textile industry.

Economist Sven Ortman, nova-Institut, presented the price developments of mineral oil and plastics as well as competing natural fibres on the world market over the past years. Considerable price increases can be found everywhere. European natural fibres such as flax and hemp are more and more becoming competitive – although in the next five years, they surely still will be dependent on certain EU subsidies.

Kyoto-Protocol

With regard to the Kyoto Protocol, Mireille Portmann from Savigny-sur-Orge (France) showed how hemp can contribute to decreasing the greenhouse gas emissions. The fixed goal is a decrease of the worldwide greenhouse gas emissions by 5.2% until 2012. The project „Grow your house“ aroused particular interest, running in South Africa and making sustainable development possible for the regional population, simultaneously reducing the CO₂ emissions by 90%. It is about houses that are built almost entirely from hemp (building and insulation materials).

Conclusion

The mood on the 4th EIHA Conference was substantially different from previous years. One could sense the shift on the raw material markets, the shortages and price increases particularly of wood. For the first time since the nineties, there was a real interest, a real demand – although still noncommittal – for large amounts of industrial hemp for different branches. One could sense a new interest in hemp. This became clear also through a large number of new projects and investments, ideas and products as well as a couple of new actors.

European Industrial Hemp Association (EIHA)

The EIHA was officially founded at the end of 2005, but already now has 30 members. Most of them come from Europe, but also companies from Australia, Canada and China count amongst the members, as there still is no worldwide association. From now on, the lectures of the conference are no longer made available on CD, but only available for the members (membership fee starts from 200 €/year) who can find a lot of specialised information in the large internal database. On the website www.eiha.org, interested people can find an overview lecture with all current data on the European hemp industry.

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