

DIRECTIONS OF USE OF HEMP PRODUCTS IN THE WORLD

*Marchenko Zh. Yu.**RESEARCH STATION OF BAST CROPS IANE NAAS*

У статті проаналізовано сучасні напрями використання коноплепродукції у світі.

Problem essence. Industrial hemp is an annual bast plant with a specific scent to 4 meters high with THC content of between 0% and 0.08% which is grown to produce seeds, fiber and stock. It should be noted that hemp is a highly profitable crop, the seeds and stem can be fully used and produce about 50,000 different products including biocompozite, bioplastics, biofuels. According to scientists opinion this plant can become an ecological raw material of the future. Industrial hemp is causing more and more interest all over the world [1].

Analysis of last studies. 10th - 19th centuries hemp was the most common crop in the world. Hemp growing was wide-spread, its sown on hundreds of thousands of hectares. It was woven fabric of linen and clothes, made of rope and horse harnesses, ropes, sails and fishing nets from hemp. Hemp oil was used in food and industrial needs. From hemp oil high-quality paint, soap, oil for lamps and fixtures are produced. Paper textbooks by the end of the XIX century. and all first Bibles, maps, charts, flags were made of hemp. In China this crop was considered sacred, "elixir of immortality" was made of it, planted hemp monasteries and temples. In the USA state acts and dollars were published on hemp paper. У США на конопляному папері друкувалися державні акти і долари. Even in the Soviet Union in the first half of the twentieth century, hemp has a strategic importance and took 2nd place after oil.

The decline of this branch associated in particular with admission of hemp to the narcotic category (The only Convension OUN on drug substances, 1961). Since a few decades hemp has an image of "criminal" plant.

However, in the USSR the 60-80 years of the last century have hemp flourishing. In Ukraine it was sown over 104 thousands ha of hemp. Occupying an area for planting two percent in this crop economic profit from hemp branch was 38 per cent share of the total plant branch. The direction of industrial hemp use in the USSR is textile [2].

Main part. The development of modern hemp branch is impossible without the development of these industries in the global market. The main producers of hemp in the world are China, Chile, Europe, Korea, Canada, France and Russia (Table 1).

Table 1 – Sowing areas of technical hemp in the world in 2014, ha (data from Internet resources of relevant countries)

№	Country	Sowing area, ha
1	China	60000
2	Chile	42700
3	Canada	36000
4	Northern Corea	20000
5	Europe	15948
6	France	11000
7	Russia	2500

In the European Union hemp production is concentrated in France. It is one of the powerful platform of scientific and production potential of hemp branch. Hemp sowing area in 2014 in France was 11000 ha, that is 70% of total European sowings -15,948 hectares of this crop. The main companies that grow industrial hemp is shown in the following table (table. 2) In other countries (UK, Denmark, Czech Republic, Slovenia, Slovakia, Latvia, Estonia, Portugal) industrial hemp is grown for research purposes. Their sowing areas are not significant.

Table 2 - Sowing areas of industrial hemp in the European Union in 2014 (pointing enterprises)

Country	Company	Area (ha)	Total
Netherlands	HempFlax	534	1462
	DunAgro	928	
Germany	HempFlax (захід)	209	486
	HempFlax/BaFa(схід)	127	
	Hanf Farm	150	
Austria	BaFa	550	550
France	LCDA	5400	11000
	Internal Eurochanvre	1700	
	Planet Chanvre	850	
	Cavac	1100	
	CCPC	730	
	East Chanvre Інші (independent farmers)	120 650	
Italy	Assocanapa	500	500
Romania	HempFlax S.R.L.	650	750
	Agraficient S.R.L	100	
Hungary	HemproInt. GmbH & Co KG	250	350
	Hemp Factory	100	
Lithuania	Small farmers	850	850
Total:			15948

In the European Union hemp oil (45%) is produced from hemp seeds which is used in the food, chemical and pharmaceutical industries. This is the main direction of hemp seed usage. From the remaining seeds hemp flour,

hemp protein powder, cereals, hulled hemp seeds, hemp seeds for animal feed are produced.

Hemp fiber has the best mechanical properties of all natural fibers. In Europe it is mainly used for the production of pulp and paper (55%), insulation (26%), pressed forms (15%) and technical textiles (4%). Below are the list of companies from the paper industry and manufacturers of mattresses, blankets, insulation material (Table. 3) [3].

Production of pulp and paper with fiber and hemp straw is innovative and beneficial for the environment. It does not contain substances such as chlorine and sulfur which are characteristic of traditional technologies.

Table 3 – Hemp paper industry in Europe

Company	Country	Products
Agrochanvre	France	Hemp fibre
ArjoWiggins	Netherlands, France	Valueble papers
CelesaCelulosa de Levante SA	Spain	Flax and hemp cellulose
LCDA	France	Hemp cellulose
CAVAC	France	Hemp cellulose
Eurochanvre	France	Hemp cellulose
Dunafin (DelfortGrp)	Hungary	Paper for cigarettes

The table shows that France is the leading country in this industry (5 companies). But it should be noted that there is a lot of competition for the production of paper from wood and bamboo.

Natural insulation materials from grown resources is a good alternative to conventional insulation materials. During the construction of the roof they are far superior to conventional materials due to a better ability to retain heat. Insulation materials for buildings are not only protect from the cold in winter, but also the heat of summer. In Europe, people understood the benefits of environmentally friendly materials, so there are a number of companies that produce such products including those of Bast Crops (table 4).

Table 4 - Manufacturers of mattresses, blankets, insulation material from hemp fiber in Europe

Company	Country	Products
Blackmountain	Germany	Insulation material
Buitex	France	Insulation material from hemp and flax fibre
Cannabrick	Spain	Insulation from hemp fibers
Cavac, Biofibl isolation	France	Insulation from hemp and flax fibers
DieterFellerhof	Germany	Insulation from hemp fibers
SachsenLeinene.V.	Germany	Bags made of flax and hemp fibres
Eurochanvre	France	Building and insulation material
Eurohanf	Austria	Insulation
EcoTechnilin	Germany	Insulation material of flax and hemp felt
FillieredeChanvre	France	Insulation from hemp fibers
HockGmbH&Co KG*	Germany	Hemp insulation rolls
HanffaserUckermark	Germany	Insulation from hemp fibers
Hemflaxbv	Netherlands	Insulation, hemp insulation materials
HempTechnologyLtd#	Germany	Insulation, panels for cars
Isohemp	Belgium	Insulation material from hemp fibers
NaporoKlima	Austria	Insulation material from hemp fibers
PlaneteChanvre	France	Building material
Spanotech	Belgium	Hemp, cellulose insulation
SteicoGroup	Germany	Hemp insulation materials
Technichanvre	France	Mattresses from insulating material with hemp fiber
Terrachanvre	France	Hemp insulation materials
Valnat	France	Hemp and flax insulation material

Hemp scutch is used as bedding for horses and other animals (62%). Another direction of hemp scutch usage is construction (15%). In Europe the construction of environmentally friendly buildings with hemp is extended. [4].

China has the largest hemp sowing areas in the world. The climatic conditions favor the development of the industry. The area under cultivation of industrial hemp in China reaches 60 thousands ha. Traditionally, this industrial hemp is grown for fiber for textile production which occupies 80% of the total use. Also it is received cables, ropes and paper from hemp fibre.

The second use of hemp in China is for food. It produces a series of food products such as hemp oil, protein powder, flour, hulled hemp seeds and other products that are particularly useful for improving digestion and strengthening the immune system.

Hemp is widely used in medicine. This culture is considered one of the major fifty plants of Chinese herbal medicine. The medical use of herbal medicines are different from shelled seeds and grass that are very useful both for medicinal purposes and as preventive one. The main uses of hemp in China listed in the table. 5.

Таблиця 5 – The main uses of hemp in China

Straw → fibre → textile, clothing, rope, paper
Seed → hemp oil, hulled seeds, protein powder, flour
Seed → beauty products, paints
Leaves and blossoms → recycled product → pharmaceutical cosmetics, antibacterial soap, agrochemical fertilizers

In the South part of America the leader in hemp production and processing is Chile. Industrial hemp is cultivated in the area of about 43 thousands hectares. Hemp is used mainly for the production of hemp oil, which occupies 85% of the total use of industrial hemp. In Chile the technical hemp is widely used for medical purposes.

Canada is the third powerful producer of industrial hemp. The sowing area is 36 thousands ha. In Canada industrial hemp is grown in three provinces: Alberta, Saskatchewan, Manitoba.

The main direction of hemp use in Canada is food (85%). It is produced a variety of food products from hemp seeds: hemp oil, protein powder, flour, organic seeds, pastries, coffee, ice cream and others. In Ukraine the production of textiles and bio-composites based on hemp is actively developing [5]. In Canada there are several companies on manufacturing products with hemp (table 6).

Table 6 - Companies which are growing and processing industrial hemp in Canada

№	Companies	Products
Food		
1	Aliments Trigone	Organic products for human consumption.
2	AtlanticHealingHempInc.	Hemp food products: hulled hemp seeds, protein powder, hemp oil
3	BioridinalFood&ScienceCorp	Products containing omega acids: hemp oil, hulled hemp seeds, protein powder.
4	CanadaHempFoods, BCCanada	Hemp protein powder, hemp seeds collapsed, organic hemp oil, organic hulled hemp seeds.
5	Chii Hemp Industries Inc.	Hemp protein powder, hulled hemp seeds, organic hemp oil, organic hulled hemp seed, hemp flour.
6	Cool Hemp	Organic hemp food: ice cream, coffee, cookies, protein powder.
7	Hemp Oil Canada	The leader among the companies involved in food production of hemp. Their products: hemp oil, hulled hemp seeds, hemp protein powder, hemp flour, hemp seeds coffee, biscuits, pastries.
8	HighonHealth	Hemp seeds, hemp oil and cosmetics.
9	Manitoba Harvest Hemp Foods & Oils	Hemp food.
10	Miracle Source	Hemp protein powder, hemp oil, hulled hemp seed, roasted hemp seeds, hemp flour, coffee with hemp seeds.
11	Naturally Splendid	Hemp oil, face and skin creams.
12	Parkland Industrial Hemp Growers	They grow and process technical hemp for seed and fiber.
13	Terramax	Hulled hemp seeds, hemp protein, hemp oil, hemp milk, coffee, flour, baking.
Fibre		
14	Composites Innovation Centre	Composite materials with hemp fibers.
15	Plains Industrial Hemp Processing Inc	Hemp fiber, hemp scutch, fuel pellets, insole.
Cosmetics		
16	Atlantic Healing Hemp Inc.	Hemp food, hulled hemp seeds, protein powder, hemp oil; cosmetics, face creams and body shampoos and others.
17	High on Health Hemp Products	Hemp seeds and hemp oil, hemp protein, hemp cosmetics of oil.
18	Soaps Lotions & More Inc.	Liquid soap, lotion, cream with hemp oil.
19	The Red Soap Company LLC	Hemp soap.

Conclusions. As we see people understood in the world that hemp is a crop that can be used differently. Overall hemp seeds are widely used in food; fibers - in the textile industry and for the manufacture of pulp and paper; scutch - for construction and as bedding for animals. There is an increase in the production of industrial hemp in the world constantly expanding the scope of their application, new possibilities of hemp are appeared, such as environmentally friendly and renewable products and the automotive industry.

An ecological side of hemp usage is of great interest, namely: using natural materials instead of synthetic materials; industrial applications of hemp can save valuable natural resources, such as forest resources; hygienics, high strength, natural bactericidal hemp; wastes generated during hemp processing have a wide range of industrial applications which reduces the use of natural resources, such as construction materials.

1. Коноплі: монографія / за ред. М.Д. Мигаля, В.М. Кабанця. – Суми : Видавничий будинок «Еллада», 2011. – 384 с.

2. / Парсяк В.Н. Маркетингові дослідження : навчальний посібник / Парсяк В.Н., Рогов В.К. – Херсон: Олді-плюс, 2004. – 200 с.

3. *Industrial Hemp* [Електронний ресурс]. – Режим доступу: http://www.agmrc.org/commodities_products/fiber/industrial-hemp/

4. European Industrial Hemp: Pulp & Paper, Insulation, Biocomposites& Construction, Food & Feed and Pharmaceuticals – May 2014 [Електронний ресурс]. – Режим доступу: <http://eiha.org/downloads/>

5. *Canadian Hemp Trade Alliance – Links* [Електронний ресурс]. – Режим доступу: <http://www.hemptrade.ca/links.php>

НАПРАВЛЕНИЯ ИСПОЛЬЗОВАНИЯ КОНОПЛЕПРОДУКЦИИ В МИРЕ

Марченко Ж.Ю.

В статье проанализированы современные направления использования коноплепродукции в мире.

DIRECTIONS OF USE OF HEMP PRODUCTS IN THE WORLD

Marcgenko Zh.Yu

Modern directions of use of hemp products in the world are analysed in the article.