

Dear Readers,

In the previous issue No 18 & 19 we have written about the new policy regarding R&D in Euro-zone with the main task to accelerate the growth of European economy and technology transfer (integrated target project networks, research training networks, Cost Actions etc.). I have expressed my question – why our Network with a long lasting experience (since 1989) and tradition in gathering high ranking specialists in such important topics, connected with sustainable development and lignocellulosic fibrous raw materials had got rather restricted financing, which reduced possibility of large scale activity. My dream is to explore the Network experience and abilities and create the new Network of Excellence in the scope of natural fibres. We have got the information about review of the activities of ESCORENA Networks done for European Commission by independent expert. There is a light in tunnel in connection with proposal of recommendation for funding the ESCORENA system activities, to be accepted by forum during the 33<sup>rd</sup> Session of the European Commission on Agriculture (ECA), 1-2 March 2004, Rome, Italy.

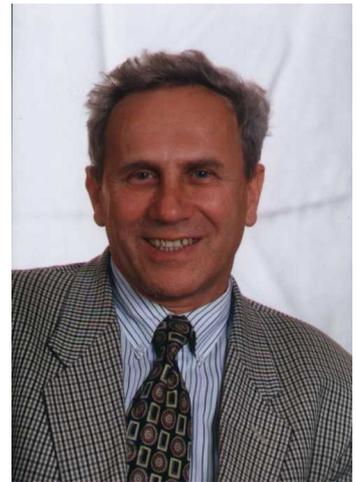
Let me repeat, I believe that our Network helps not only us-European inhabitants, but it could be useful for whole world and especially for developing rural areas.

Let me turn your attention strongly to the next Global Workshop of the Network, which will be held on October 24-28, 2004 in Banja Luka - capitol of Bosnia and Herzegovina, Republika Srpska. Please, read the 1<sup>st</sup> circular in this issue and you are welcome to register! We are convinced, that the conference and related project will help to the revival of textile industry related to bast plants, not only in Bosnia and Herzegovina but also in all Balkan countries. We do want to contribute to the recovery of post war Balkan countries.

I have good news for future events: the representatives of CSIR, Centre for Fibres, Textiles & Clothing Manufacturing & Materials Technology, Port Elizabeth, South Africa, during their visit at the Institute of Natural Fibres presented the proposal of hosting the next international conference of our Network by CSIR in South Africa, probably in October 2005.

Yours sincerely,

The Editor, Prof. Dr. Ryszard Kozłowski



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## STRUCTURE OF THE NETWORK

The Network is one of the thirteen Networks working within ESCORENA (European System of Cooperative Research Networks in Agriculture). The ESCORENA Secretariat is provided by **REU** – FAO Regional Office for Europe in Rome, Italy. Responsible Dr. Michel Larbier – REUS, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00100 Rome, Italy.

**COORDINATION CENTRE OF THE NETWORK:** Institute of Natural Fibres, ul. Wojska Polskiego 71 b, 60-630 Poznan, Poland, tel.: +48(0) 61 8480-061, fax/tel.: +48(0) 61 8417-830, E-mail: netflax@inf.poznan.pl

**Network Coordinator – Prof. Dr. Ryszard Kozłowski**, General Director of the Institute of Natural Fibres, Poznan, Poland, tel. +48(0) 61 8480-061



**Secretary of the Network – Maria Mackiewicz-Talarczyk M.Sc. (Agr.)**,  
Institute of Natural Fibres, Poznan, Poland, tel. +48(0) 61 8455 823

At present, the whole Network brings together 357 experts from 51 countries in the fields of research, economics, marketing and industry. Member countries are: Argentina, Australia, Austria, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Cuba, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Latvia, Lithuania, Mexico, Netherlands, Nigeria, Norway, Pakistan, Poland, Portugal, Republic of Serbia, Romania, Russia, Slovakia, Spain, South Africa, Sweden, Switzerland, Thailand, Turkey, UK, Ukraine, and the USA.

The Network is represented in **South America** by Prof. Dr. Alcides **Leão** (UNESP-Universidade Estadual Paulista, SP-18603-970 Botucatu, Brazil, tel. +55 14/6802 7163, fax +55 14/6821 3438, E-mail: alcidesleao@fca.unesp.br), and Ing. Agr. Daniel **Sorlino**, Cátedra de Cultivos Industriales, Facultad de Agronomía, Universidad de Buenos Aires, Av. San Martín 4453 (1417) Cap., tel: 4524-8074/8040, fax: 4514-8739, E-Mail: dsorlino@mail.agro.uba.ar, in **North America** by Dr. Paul **Kolodziejczyk**, Lead Scientist, New Crops & New Products, Olds College Centre for Innovation, 4500 -50th Street, Olds, Alberta, Canada T4H 1R6, Telephone: (403) 507-7970, FAX: (403) 507-7977, E-mail: paulk@admin.oldscollege.ab.ca, www.occi.ab.ca and in **the Near East** by Prof. Dr. Dardiri Mohamed **El-Hariri**, National Research Centre, El-Tahrir str., Dokki Cairo, Egypt, tel. +202/ 33 77164, fax: +202/ 33 70931, E-mail: elhariri\_d\_m@hotmail.com

## NETWORK WORKING GROUPS (WG):

### *Please note!*

*A more detailed description regarding the activities of the six Working Groups was provided in all previous editions of this bulletin and is available at the Network's web page <http://escorena.fao.org/>*

### **WG/1. Breeding and Plant Genetic Resources**

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### WG/2. Extraction and Processing

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### WG/3. Economics and Marketing

Chairman – **Albert Daenekindt M.Sc. (Ec.)**

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### WG/4. Quality

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The developments of the European program: **the COST Action 847:**

**TEXTILE QUALITY AND BIO-TECHNOLOGY**, coordinated by the Chairman of the Group Prof. S. Sharma and Dr. Johanna Buchert of VTT Biotechnology and Food Research, Finland are described in this issue.

**WG/5. Non-Textile Applications**

Chairman – **Prof. Dr. Ryszard Kozlowski**  
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**WG/6. Biology and Biotechnology**

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 Olds College Centre for Innovation, Alberta  
**Canada**



**In the Near East** – Prof. Dr. Dardiri Mohamed **El-Hariri**, National Research  
 Centre, Dokki Cairo, **Egypt**



## WORKING GROUP NEWS

### THE PROPOSAL TO CREATE A NEW WORKING GROUP

Dear Network members,

We still consider the proposal of given by Dr. Piero Venturi, Faculty of Agriculture, University of Bologna, Italy to create a new Working Group, dealing with agro-technique, to include topics connected with the presence of the fibre crop in the field: soil tillage; crop establishment (sowing); fertilisation; weed control; harvesting; plant physiology; interaction soil-crop and crop-environment (this last subject is not so relevant for flax but it is assuming more importance for hemp); first transformation at the farm, logistics of the transport and storage and, more in general, all the practices that can be included in agro-technique. We are looking forward to your comments and proposals.



## FLAX, HEMP AND ALLIED FIBRES IN THE WORLD

### Fibre Flax and Hemp in the Czech Republic

#### (present situation and future)

Šmirous Prokop and Hochman Miroslav *AGRITEC, Research, Breeding and Services Ltd.*

Flax (*Linum usitatissimum* L.) and hemp (*Cannabis sativa* L.) are the traditional crops grown in the Czech Republic. The area of fibre flax is 6000 ha, linseed 4 500 ha and hemp 100 – 150 ha at present. There is the precondition in this decade to increase the fibre flax area to 8 – 10 000 ha with long fibre production approximately 4000 tons for textile use.

It is expected to increase hemp area to 1500 – 2000 ha for homogenous fibre production for non textile applications. Dry hemp will be grown for energetical use. There is also developed the production of short fibre based on hemp and linseed stem processing resulting to paper production in paper industry.

### Fibre Flax in Czech Republic

Year of growing	Sowing area ha	Total harvest of retted stem t	Long fibre production t
1990	21425	81575	8500
1995	10200	34300	4650
2000	6302	13929	2235
2001	7094	17865	1600
2002	5885	15271	2080
2003	6003	14500	2100

#### Requirement of flax stuff in 2002 – 2005 for processing in the Czech Republic

Comodity/year	Scutching production t	Import t	Total t	EU quotation for the Czech Republic t
Long fibre 2000	1920	2360	4280	1923
Long fibre 2003	2100	2800	4900	
Long fibre 2005*	2500	2000	4500	
Short fibre 2002	3700	4200	7900	2866
Short fibre 2003	4000	4500	8500	
Short fibre 2005*	4500	4500	9000	

\* = prediction

#### Hemp and Oil flax in Czech Republic

Year of growing	Sowing area ha	Stem yield t/ha	Fibre content %
Hemp ( <i>canabis sativa</i> )			
2000	130	9,0	24,2
2003	115	8,4	23,6
2005*	250	9,0	24,0
Oil flax ( <i>linum u. v. oleifera</i> )			
			Seed yield t/ha
2000	3045	2,1	1,35
2003	4500	1,7	1,45
2005*	4500	2,0	1,55

• = prediction

#### References

1. MZe ČR: Len a konopí, situační a výhledová zpráva, Praha, 2003, 38 pp
2. Šmirous, P.: Fibre Flax in ČR. The Workshop FAO/SCORENA Network, Poznan, Poland, June 20-21 2003

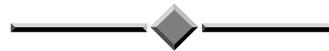
## ACTIVITIES OF THE FAO EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS

### OPEN COMPETITION FOR THE BEST PAPER OR POSTER PRESENTED DURING THE CONFERENCES OF THE FAO EUROPEAN CO-OPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS

The Network coordination centre proposes that the most interesting papers or posters presented during our network meetings and conferences, *if possible with the best implementation*, would enter the competition.

The special jury will judge all papers and posters presented during the year, and we will let you know the results in due course.

All Network members are cordially invited to participate in the competition to be continued the next year.



### Next Conferences Proposals



**3<sup>rd</sup> GLOBAL WORKSHOP  
(GENERAL CONSULTATION)  
OF THE FAO EUROPEAN  
COOPERATIVE RESEARCH NETWORK  
ON FLAX AND OTHER BAST PLANTS**

***“BAST FIBROUS PLANTS FOR HEALTHY LIFE”***  
**October 24-28, 2004**

**Banja Luka, Bosnia and Herzegovina, Republika Srpska**

**CALL FOR PAPERS  
PRELIMINARY REGISTRATION**

**Honorary Organizing Committee:**

Prof. Dr. Mladen Ivanic, Minister of Foreign Affairs of Bosnia and Herzegovina

B.Sc. Dragoljub Davidovic, Mayor-City Banja Luka

M.Sc. Rodoljub Trkulja, Minister of Agriculture, Forestry and Water Management

Prof. Dr. Marinko Bozic, Minister-Federal Ministry of Agriculture, Water Management and Forestry

Prof. Dr. Stojan Nikolic, Agricultural Institute Banja Luka

Prof. Dr. Džemal Kolunic, Ministry of Science and Technology

**Organized by:**

**Coordination Center of the FAO European**

Cooperative Research Network on Flax and other Bast Plants at the Institute of Natural Fibres, Poznań, Poland

**In collaboration with:**

Agricultural Institute of Republic of Srpska– Poljoprivredni Institut Republike Srpske, Banja Luka

<b>Central Organization</b>
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**Institute of Natural Fibres (INF)**

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**National Committee of Bosnia and Herzegovina:**

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K. Miloša 17, Banja Luka, T: +387 51 303 112, mob. +387 65 624 458, F: ++387 51 312-792, E-mail: polj.institut.bl@blic.net

#### **Co-organizers of National Committee of Bosnia and Herzegovina:**

Prof. Dr. Jovo Stojcic, the Secretary of the National Organizing Committee, Director, M.Sc. Miloš Nožinic-the deputy Secretary, Prof. Dr. J. Kondić, Prof. Dr. D. Gatarić, M.Sc. Vojo Trkulja, M.Sc. Dragan Mandic, M.Sc. Kojo Garic  
- City of Banja Luka

#### **International Organizing Committee**

Dr. M. Larbier– ESCORENA Coordinator FAO/Italy  
Prof. Dr. R. Kozlowski-Network Coordinator, INF, Poznań, Poland  
Eng. M. Mackiewicz-Talarczyk, Network Secretary, INF, Poznań, Poland

#### ***Network's representatives:***

Prof. Dr. D.M. El-Hariri, NRC, Cairo, Egypt (Near East)  
Prof. Dr. A. Leao, unesp, Botucatu, Brazil (South America)  
Dr. P. Kolodziejczyk, Olds College Centre for Innovation, Canada (North America)  
Dr. D. Sorlino, Universidad de Buenos Aires, Argentina  
(South America)

#### ***Network's chairmen:***

Dr. M. Pavelek, AGRITEC Plant Research, Šumperk, The Czech Republic  
Dr. A. Balabanova, ABI, Sofia, Bulgaria  
Eng. M. Tubach, IAF, Reutlingen, Germany

#### **Eng. O. Demangeat, N. SCHLUMBERGER & CIE, France**

Dir. A. Daenekindt, A.B.V., Kortrijk, Belgium  
Mr. G. Mackie, N. Ireland  
Dr. S. Sharma, The Queen's Univ. of Belfast, U.K.  
Dr. C. Morvan, Univ. de Rouen, France  
Prof. Dr. Poo Chow, University of Illinois, USA  
Prof. Dr. Atanas Atanassov, ABI, Kostinbrod, Bulgaria

#### **GENERAL INFORMATION**

**Conference Language:** The language of the 3<sup>rd</sup> Global Workshop is English

**Call for papers:** Experts working in scope of flax, hemp and allied plants in the field of genetic resources diversity, maintenance, molecular biology, genetics, cultivation, breeding, biotechnology, biology, biochemistry, phytopatology, harvesting, extraction of fibre, processing for textile and non-textile applications (non-woven, composites, agro-fine-chemicals, food, fodder, pharmacy and medicine, cosmetics, etc.), energy, textile and non-textile applications, marketing and trade are cordially invited to attend the event and submit proposals for oral or poster presentations.

**Preliminary registration** should be made with the enclosed registration by **1 April 2004**. Please indicate whether and on which topic you intend to present a paper or poster and provide a short 100 words abstract.

**The 2<sup>nd</sup> circular** with the registration fees and final registration forms will be mailed by **April 15, 2004**.

**Hotel accommodation and transportation assistance** will be arranged with the help Agricultural Institute of Republic of Srpska, Banja Luka.

#### **Conference Address:**

Banski Dvor, Banja Luka, Trg srpskih vladara 2

#### **PRELIMINARY PROGRAMME**

##### **3rd Global Workshop (General Consultation)**

#### ***“BAST FIBROUS PLANTS FOR HEALTHY LIFE”***

October 24-28, 2004; Banja Luka, Bosnia and Herzegovina, Republika Srpska

Sunday, October 24, 2004

Afternoon Registration and Reception

Monday, October 25, 2004

Morning Opening

Afternoon Plenary Session

Evening: Conference dinner

Tuesday October 26, 2004

Morning Scientific Session

Afternoon Scientific Session

Evening: Fashion Show

Wednesday, October 27, 2004

Morning Scientific Session

Afternoon Scientific Session

Thursday, October 28, 2004

Morning Closing the 3rd G. Workshop  
Study Tour

## SCOPE

### **Third Global Workshop (General Consultation) of the FAO European Cooperative Research Network on Flax and other Bast Plants to be held at the “Bansky Dvor“ - Congress Center” in Banja Luka, located in the centre of capitol.**

The goal of the Global Workshop is to present and discuss present state and future prospects of flax, hemp and allied bast fibrous plants in the field of genetic resources diversity, molecular biology, genetics, biotechnology, cultivation, breeding, phytopatology, harvesting, extraction of fibre, processing, textile and non-textile applications with special focus on contribution of bast fibrous plants and their derivatives to human health, comfort and ecology. The Global Workshop of the Network is the main Network's event. The General Workshop (the General Consultation) is de facto the continuation of four European Regional Workshops on Flax (Poland-“FLAX IN EUROPE. PRODUCTION AND PROCESSING”, Czechoslovakia - “FLAX AS A FIBRE AND OIL BEARING CROP”, Germany - “FLAX IN THE WORLD”, and Global Workshops: France - “PRODUCING FOR THE MARKET”, Bulgaria “BAST PLANTS IN THE NEW MILLENNIUM. We plan to hold 4 sessions:

- I. molecular biology, genetics, breeding;
- II. cultivation, harvesting, fibre extraction;
- III. processing and application for textile and non-textile applications including pharmacy, medicine, food, fodder, cosmetics etc, non-woven, biocomposites, agro-fine-chemicals, energy;
- IV. quality, new testing methods & economic aspects
- V. physiological and medical aspects of natural fibres in comparison with synthetics

*Let us join Banja Luka, Bosnia and Herzegovina!*

### **The letter from the representative of the Ministry of Agriculture, Forestry and Water Management of Republic Srpska, the Unit for Project Coordination, presented during the conference in Cairo, 9.12.2003, Egypt.**

Bosnia and Herzegovina is quite young post war country, which consists of two entities: Federation and Republic of Srpska. I come from Banja Luka in Republic of Srpska. Let me introduce myself shortly. I am Jovanka Cetkovic; work in the Ministry of Agriculture, Forestry and Water Management of Republic Srpska in the Unit for Project Coordination. I am speaking on behalf of the Minister of Agriculture, Forestry and Water Management of Republic of Srpska as well Director of the Agricultural Institute of Republic of Srpska – Banja Luka.

The Agricultural Institute of Republic of Srpska – Banja Luka is ready to organize the THIRD GLOBAL WORKSHOP (GENERAL CONSULTATION) OF THE EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS entitled BAST FIBROUS PLANTS FOR HEALTHY LIFE that should be held in the period from 24 – 28 October 2004 in Banja Luka. The Agricultural Institute of Republic of Srpska – Banja Luka has provided (received, got) all necessary Letters of Agreement for this event by all authorized governmental institutions in Bosnia and Herzegovina in July 2003. Namely, these institutions are;

1. Ministry of Agriculture, Forestry and Water Management of Republic of Srpska
2. City Banja Luka
3. Federal Ministry of Agriculture, Water Management and Forestry in Sarajevo and Ministry of Foreign Affairs of Bosnia and Herzegovina
4. Ministry of Foreign Affairs of Bosnia and Herzegovina

Participating the coordination meetings about this event in the Agricultural Institute of Republic Srpska - BL, I was pleasantly surprised with the progress by the host of the Conference. They have returned flax and hemp in Bosnia and

Herzegovina after 30 years, contracted flax production on about 30 ha for next spring, found market for it, organized trials and prepared Project Proposal for FAO entitled **Improvement of Bast Fibrous Plants Production and Processing in Bosnia and Herzegovina in the period 2003 – 2005**.

Experts from both Entities closely cooperate on the preparing of the Conference as well as Project development.

I am using this opportunity to express our thanks to Prof. dr Kozłowski and Mrs. Maria Mackiewicz (as well as dr Larbier) for their great efforts to animate the Authorities in our Country about the importance of this event.

We kindly invite all of you to participate the Conference BAST FIBROUS PLANTS FOR HEALTHY LIFE in Bosnia and Herzegovina (in Banja Luka) in next year.

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## Short information about on the 10<sup>th</sup> International Conference for Renewable Resources and Plant Biotechnology NAROSSA 2004, co-organized by the Institute of Natural Fibres, Poznan, Poland and the Coordination Centre of the Network

Dr. Frank Pudiel, ÖHMI Consulting GmbH, Berliner Chaussee 66, D-39114 Magdeburg, Tel: +49-391-8507-171, Fax: +49-391-8507-150, e-Mail: pudel@oehmi-consulting.de, www.oehmi-consulting.de

Date: 07.-08. Juni 2003  
 Venue: Magdeburg, Germany  
 Topics: 1. Plant biotechnology – pioneer for new products  
 2. Renewable resources in material applications  
 3. Processing, characterisation and application of secondary plant substances  
 4. Energetic use of biomass  
 Parallel events: - Trade fair for renewable resources and plant biotechnology  
 - European brokerage event of IRC-network  
 All information at: www.narossa.de

### ➤ *The proposal of international conference in South Africa*

The representatives of CSIR, Centre for Fibres, Textiles & Clothing Manufacturing & Materials Technology, Port Elizabeth, South Africa, during their visit at the Institute of Natural Fibres presented the proposal of hosting the next international conference of our Network by CSIR in South Africa, probably in 2005.

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## SOURCES OF INFORMATION

### Major links to information on network activities and/or network members

- <http://escorena.fao.org/> [ESCORENA, FAO, Rome – Network website]
- <http://iwn.inf.poznan.pl> [Institute of Natural Fibres, Poznan, Poland]
- <http://www.csl.gov.uk/ienica>, <http://www.ienica.net>
- [IENICA – Interactive European Network for Industrial Crops and their Applications in the Changing Millennium]
- websites of the Network Chairmen:
  - <http://www.agritec.cz> [Martin Pavelek, AGRITEC, Sumperk, the Czech Republic]
  - <http://www.fh-reutlingen.de> [Martin Tubach, Institut für Angewandte Forschung (IAF), Reutlingen, Germany]
  - <http://www.qub.ac.uk> [Shekhar Sharma, The Queen's University of Belfast, UK]
  - <http://www.univ-rouen.fr> [Claudine Morvan, Université de Rouen, France]

### Sources of Statistical Data:

<http://apps.fao.org> [FAOSTAT Database Results], <http://www.fao.org/es/esc/en/index.html>, <http://www.texdata.com>,  
<http://www.its-publishing.com>, [www.naturfaser-wirtschaft.de](http://www.naturfaser-wirtschaft.de)  
<http://www.fao.org/es/ESC/esce/escr/hardfibres/fiberse.htm> (Hard Fibres)

### Possibilities of cooperation with other Networks and Associations on Industrial Crops

- The Fibres Newsletter**, operated by Mr. Brian Moir, Commodities and Trade Division, FAO, Viale delle terme di Caracalla, 00100 Rome, ITALY, Fax: ++39 06 57054495, Tel: ++39 06 57054339, E-mail: [Brian.Moir@fao.org](mailto:Brian.Moir@fao.org)  
 To subscribe to the list, send an email to [mailserv@mailserv.fao.org](mailto:mailserv@mailserv.fao.org), leave the subject line blank, with the message : subscribe Fibres-Ind-L. The Commodities and Trade Division of FAO (ESC) has a new website: <http://www.fao.org/es/esc/>

2. **INFORM\_IENICA** – Industry Network for Renewable Resources and Materials – Interactive European Network for Industrial Crops and their Applications in the new Millennium. Coordinator of IENICA: Mr. Melvyn F. Askew, Ministry of Agriculture, Central Science Laboratory at York CSL/MAFF, SAND HUTTON, YORK, UK Y04 1LZ, tel. 44-1904-462309; fax: 44-1904-462256, E-mail: m.askew@csl.gov.uk, For more data see <http://www.csl.gov.uk/ienica>  
Coordinator of INFORM: Dr. Nigel Oliver, Operations Director, ACTIN, Pira House, Randalls Road, Leatherhead, Surrey KT22 7RU, UK, Tel: +44/1372 802054, Fax: +44/1372 802245, E-mail: info@actin.co.uk, Website:<http://www.actin.co.uk>
3. **Flax Council in Canada**; The Council is based in Winnipeg, with Mr. M. Barry Hall as President. Mr. Donald H. Frith has retired. The address of this institution is: FLAX COUNCIL OF CANADA, 456-167 Lombard Avenue, Winnipeg, Manitoba, Canada R3B 0T6, tel.: (204) 982-2115, fax: (204) 942-1841, E-mail: flax@flaxcouncil.ca
4. **Saskatchewan Flax Development Commission**, A5A-116-103rd Street East, Saskatoon, Saskatchewan, S7N 1Y7 Telephone: (306) 664-1901, Fax: (306) 664-4404, Email: saskflax@saskflax.com, Web site: [www.saskflax.com](http://www.saskflax.com)
5. **The Fiber Society** with Mr. Charles A. Cannon Professor as Secretary, Director Emeritus, Nonwovens Cooperative Research Center, College of Textiles, Box 8301, North Carolina State University, Raleigh, NC 27695-8301 USA, e-mail: subhash\_batra@ncsu.edu, web page URL: [thefibersociety.org](http://thefibersociety.org)
6. **International Hemp Association**, Postbus 75007, 1070AA Amsterdam, The Netherlands. Tel/fax: +31 (0)20 618-8758, E-mail: [iha@euronet.nl](mailto:iha@euronet.nl)
7. **European Industrial Hemp Association (EIHA)**. Coordinator: Dr. Michael Karus, nova – Institut, Institut für politische und ökologische Innovation, Nachwachsende Rohstoffe, Thielstr. 35, 50354 Hürth, Germany. tel: +49/2233 94 3684, fax: +49/2233 94 36 83, E-mail: [michael.karus@nova-institut.de](mailto:michael.karus@nova-institut.de)
8. **The Hemp Foods Industry**. Contact persons, John Roulac, call (800) 993-4367, Nutiva, P.O. Box 1716, Sebastopol, CA 95473. <http://www.nutiva.com/>
9. **Olds College Centre for Innovation Natural Fibre Centre (OCCI)**, 4500 -50th Street, Olds, Alberta, Canada T4H 1R6, Telephone: (403) 507-5206, FAX: (403) 507-7977, E-mail: [relvestad@admin.oldscollege.ab.ca](mailto:relvestad@admin.oldscollege.ab.ca), [www.occia.ab.ca](http://www.occia.ab.ca)

### Internet Hemp Information Sources

- <http://Hemp-CyberFarm.com/>(information about hemp events, research organizations, correspondence, current legislative efforts in the USA etc.)
- Hemptech: The Hemp Information Network (<http://www.hemptech.com/hnews.html>)
- <http://www.interlog.com/~ihn>, [www.naturfaser-wirtschaft.de](http://www.naturfaser-wirtschaft.de)
- [www.hemp.co.uk](http://www.hemp.co.uk) regarding **Hemp Food Industries Association** Contact person: Mr. Paul Beinhaim, E-mail: [paul@hemp.co.uk](mailto:paul@hemp.co.uk)
- <http://www.nutiva.com/>

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## LINKS OF THE FAO/ESCORENA EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS WITH DIFFERENT NETWORKS AND PROJECTS

The European Cooperative Research Network on Flax and other Bast Plants establishes links with the Cotton Network, intending to share and compare the achievements in scope of e.g. bioprocessing of fibres and materials.

The close cooperation of the Coordination Centre with the FAO Intergovernmental Group on Jute, Kenaf and Allied Fibres as well as the Intergovernmental Group on Hard Fibres resulted in the continuous participation of the Network Coordinator in the meetings of these Groups as well as in co-operation.

### The Network's members and the Coordination Centre are active in the co-operation and work within the following EU projects:

- **COST Action 847: Textile Quality and Biotechnology** (within *COST– European Co-operation in the Field of Scientific and Technical Research*). The Network's scientists are active in the work of two Working Groups: WG/1 "Quality assessment of natural fibres" (chaired by Prof. Dr. S. Sharma) and WG/2 "Bioprocessing of Bast Fibres" (chaired by Prof. Dr. R. Kozlowski). They are contributing to establishing unified quality assessment of bast fibres in Europe as well as to develop environmentally friendly production technologies for textile industry by using enzymatic processes (for more pieces of information see COST Action 847 news in this issue).
- **COST Action 628**. Life Cycle Assessment of Textile Products, Eco-Efficiency and Definition of Best Available Technology (BAT) of Textile Processing. Program, served by the EU, in scope of COST system. The duration: 4 years, from 9 November 2000 to November 2004. Chairwomen – Eija Nieminen, Dr. Techn., Director at University of Art. and Design, UIAH DESIGNIUM – The New Centre of Innovation in Design. Her address: Hämeentie 135 C, 00560 Helsinki, Finland. Numbers of Tel.: ++358 9 756 30424, Fax: ++ 358 9 756 30433. E-mail: [eija.nieminen@uia.fi](mailto:eija.nieminen@uia.fi) More details about activities of the Cost Action 628 were presented in Euroflax Newsletter No 17
- **INFORM-IENICA project** [Contract No QLK5-2000-00111]: the European Commission supports 3 year project, started on 22 April 2001, during the Inaugural Meeting at Central Science Laboratory (CSL) in York, UK.

IENICA is the Interactive European Network for Industrial Crops and their Applications in the Changing Millennium. Coordinator: Mr. Melvyn F. Askew, Ministry of Agriculture, Central Science Laboratory at York CSL/MAFF, SAND HUTTON, YORK, UK Y04 1LZ, tel. 44-1904-462309; fax: 44-1904-462256, E-mail: m.askew@csl.gov.uk, http: //www.csl.gov.uk/ienica). INFORRM is an Industry Network for Renewable Resources and Materials. The activities are coordinated by Dr. Nigel Oliver and Mr. Ian Bartle, Alternative Crops Technology Interactive Network Limited (ACTIN Ltd), PIRA House KT22 7RU, Leatherhead, UNITED KINGDOM. The EC/Brussels merged two independently submitted INFORRM and IENICA projects to act jointly and in close cooperation (*within Concerted Actions*). IENICA report on industrial crops and their applications prepared on the basis of the previous project is available and it is the first market-driven overview of the prospects for alternative crops and the industrial crop situation in Europe. It contributes to accessing and discovering the fascinating potential Europe has at its disposal in creating more sustainable industrial growth for future generations (see http: //www.csl.gov.uk/ienica).



## SPECIAL STUDIES, NEWS, FORUM OF THE DISCUSSION

### **Anther culture as a novel method of obtaining the new fibre flax variety ALBA 2**

*Rutkowska-Krause<sup>1</sup>, Mańkowska<sup>1</sup>, Rutkowska E.<sup>2</sup>, Rajewicz<sup>1</sup>.*

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#### **Introduction**

Fusarium wilt, caused by *Fusarium oxysporum* is a fungal disease that affects many crops and is important worldwide. It is also one of the most dangerous diseases of fibre flax plantations which can cause big loss of seed and fibre yield. Therefore, plant breeders must be aware of sources of resistance to pathogens that affect their crops [K. E. McPhee at al., 1999]. For this reason, breeding for increased resistance is the very important part of flax breeding programme [Andruszewska, 1989]. Our result confirmed the possibility of improvement in the resistance to Fusarium wilt through somaclonal variation.

Initial Alba cultivar has a good quality, fine fibre and therefore is important for the industrial purposes. However, it is middle susceptible to Fusarium wilt and big loss of yield can be noticed in weather permitting conditions [Andruszewska, Byczyńska, 1995]. New flax variety Alba 2, derived from initial Alba, obtained through anther culture is presently in preliminary trials in the Research Centre for Cultivar Testing (COBORU). Next year it will be included in the official DUS (Distinctness, Uniformity and Stability) and VCU (Value for Cultivation and Use) testing, in aim to be included into the Polish National List (NLI).

#### **Material and methods**

The established plant regeneration system provided a basis for the creation of this variety. All the plants were obtained through the anther culture of flax (*Linum usitatissimum* L.) during the 5-year experiments, and were regenerated from callus. Callus was grown for few weeks – few months before the regeneration was achieved.

Anther explants were cultivated on the modification of Murashige & Skoog [1962] medium named Sh2 and containing 1 mg/l<sup>-1</sup> BAP, 0.005 mg/l<sup>-1</sup> NAA, 2.5% sucrose and 2.5% glucose and regenerated according to the protocol [Rutkowska, Mańkowska, 2002]

#### **R2 progeny of five Alba regenerants: Alba 989, 990, 991, 997, 1000, obtained in anther culture was tested according to the resistance to Fusarium wilt in infestation conditions, in the experiment conducted in vegetation hall.**

Seeds of R0 plants, deriving from anther culture were collected and sown separately in a vegetation hall. Experiment in a vegetation hall was established in aim to screen changes of resistance to Fusarium wilt of plants regenerated from Alba cultivar.

Before the establishing the experiment, soil was inoculated with mixture of few species of fungi from *Fusarium* genus. R2 progeny of four lines of Alba regenerants was sown in this infestation conditions – in four repetitions, 30 plants per pot – and the degree of infection was compared with control – certified seeds of Alba.

Inoculum was prepared in the following way: six species of fungi (*Fusarium oxysporum* f. *lini*, *Fusarium avenaceum*, *Fusarium culmorum*, *Fusarium gibbosum*, *Fusarium sambucinum* and *Fusarium poae*) were grown on the base of sterile wheat seeds. Then 50 ml of inoculum was added to each pot, in which 30 ml of wheat seeds with *Fusarium oxysporum* f. *lini* and 20 ml of wheat seeds with the other fungi [Andruszewska, Dryjanska, 1988]. Infected plants were counted three times: after the germination, when seedlings were 10-12 cm high and during the flowering.

- Very resistant > 95 % healthy plants in relation to the control
- Resistant 80-95% healthy plants in relation to the control

- Moderately resistant 50-80% healthy plants in relation to the control
- Moderately susceptible 30-50% healthy plants in relation to the control
- Very susceptible < 30% healthy plants in relation to the control

The resistance to Fusarium was also estimated during field tests for the next three generations of the regenerated plants, according to the Heimann's [1983] scale:

- 9- only healthy plants on the plot
- 8- single infected plants
- 7- to 8% of infected plants do 8 % spread regularly
- 6- small centers of infection covering to 15% of plot
- 5- centers of infection covering to 25% of plot
- 4- centers of infection covering to 35% of plot
- 3- centers of infection covering to 50% of plot
- 2- centers of infection covering more than 50% of plot
- plot completely or almost completely infected

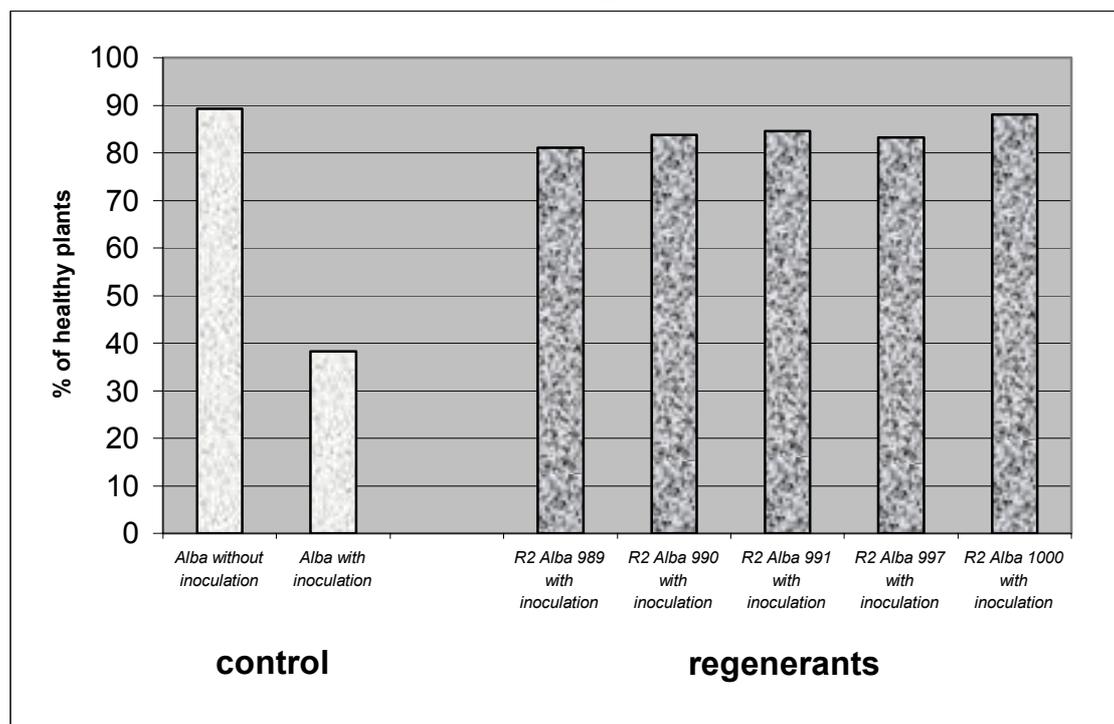
### Results

About 300 plants (R 0) were regenerated in anther culture of flax.

Testing the lines regenerated through anther culture, the distinct increase of resistance to Fusarium wilt was observed in comparison to the initial Alba cultivar. In our experiments it was evidenced that in some cases lines of Alba cultivar with increased resistance to Fusarium wilt were obtained.

**Fig 1.**

Resistance to Fusarium wilt of Alba cultivar and some R2 lines regenerated in anther culture



Study the correlation between resistance *in vivo* and reactions *in vitro* as well as *in vitro* selection were conducted by many authors and with many species. El-Kazzaz and Malepszy [1990, 1992] worked with the selection of *Cucumis sativus* plants resistant to Fusarium wilt regenerated in callus culture. Different concentrations of *Fusarium oxysporum* filtrate were the selective agents. Depending on these concentrations authors regenerated plants with different resistance to this pathogen. Similar research was conducted by Buiatti et al. [1984]. Chawla and Wenzel [1987] obtained barley plants resistant to fusaric acid through the *in vitro* technique.

In the experiments presented here, the increase of the resistance to Fusarium was spontaneous, selective factors were not used. It is supposed that this favourable change was caused by the somaclonal or gametoclonal variation. Unexpectedly the similar change was observed in few regenerants of Alba cultivar, obtained in three following years of the experiment.

**Table 1.** Three-year field test results of the resistance to Fusarium of the R2, R3 and R4 progenies of the nine lines regenerated through anther culture. According to Heimann's [1983] scale

Cultivar line (identity No.)	1996		1997		1998	
	progeny	resistance evaluation	progeny	resistance evaluation	progeny	resistance evaluation
Control Initial Alba		5		6		6
Lines of regenerants						
Alba 991	R2	8	R3	9	R4	8
Alba 997	R2	8	R3	9	R4	8
<b>Alba 1000</b>	<b>R2</b>	<b>9</b>	<b>R3</b>	<b>9</b>	<b>R4</b>	<b>9</b>
Alba 431/96		-	R2	8	R3	8
Alba 432/96		-	R2	9	R3	8
Alba 11/97		-		-	R2	8
Alba 12/97		-		-	R2	6

In all tests, the best was Alba 1000 line, in the greenhouse infestation experiment it had 88% of healthy plants and in the three year field experiment obtained a note 9 - infected plants were not observed

The result mentioned above shows that *in vitro* culture could sometimes cause favourable changes, useful for flax breeders. The next steps of breeding work on linseed has been carried out in the Experimental Station of the Institute of Natural Fibres, Pełkowo and at the infestation field in Sielec Stary.

Comprehensive specification of the results at the infestation field in Sielec Stary – data of the INF Phytopathology Laboratory (table 2, table3).

**Table 2.** Infestation field Sielec Stary, 2001

Variety	Average % of healthy plants	
	On the plot	Comparing to the control
Common control NIKE and NATASJA	74,4	100
Initial cultivar ALBA	40,3	54,2
F 6 Alba 431/75	55,9	75,1
F6 Alba 991/68	62,4	83,9
F6 Alba 1000/928/73	63,0	84,7
F6 Alba 997/998/72	73,6	98,9
F7 Alba 11/83	60,7	81,6
F6 Alba 432/76	70,7	95,0

**Table .3**

Average % of healthy plants in 2001-2003				
Lp	Cultivar	On the plot	Comparing to the standard %	Evaluation of the resistance
1.	Alba 431/96	50,4	120,6	Very resistant
2.	Alba 1000/95	50,4	125,8	Very resistant
3.	Alba 997/95	40,7	171,0	Very resistant
4.	Alba 432/96	40,7	162,7	Very resistant
5.	Alba 11/97	40,7	149,1	Very resistant
6.	Alba	67,8	74,3	Average resistant

In the experiments Alba cultivar and lines of regenerants were compared with the standard cultivar Natasja (very resistant).

**Table 4.** Results of the comparative experiment with 6 lines of Alba regenerants, Petkowo 2002

Lp.	Lines of Alba regenerants	% of healthy plants, greenhouse 2002	% of healthy plants, Sielec Stary, comparing to the standard	Total yield [t/ ha]	Straw yield [t/ha]	Seed yield [t/ha]
1	991/95/68	70,9		6,31	4,89	0,51
2	997/95/72	67,0	106,0	6,57	5,24	0,56
3	1000/95/75	62,4	103,9	6,63	5,37	0,51
4	431/96/75	69,4	107,8	6,00	4,76	0,47
5	432/96/76	76,9	99,8	5,69	4,27	0,44
6	11/97/83	64,5	97,9	6,13	4,71	0,55
7	Initial Alba	23,8		6,44	4,40	0,40

On the basis of the experiments conducted in aim to check resistance of 6 lines of regenerants, the line Alba 1000/95/75 was chosen to the further breeding programme. Its quality of fibre, and average yield can be compared to the initial Alba, however Alba 1000/95/75 has higher resistance to *Fusarium sp.*fungi.

In 2003 original Alba has been removed from the official list of cultivars, registered in Poland. Positive evaluation of Alba 1000/95/75 allowed submitting it to the preliminary tests in Research Centre for Cultivar Testing (COBORU) this year. The name Alba 1000/95/705 will be replaced by the new official name of variety Klara.

The results of initial test of Klara variety by COBORU are promising. Klara appeared very resistant to Fusarium wilt, in comparison with standard varieties such as Nike, Artemida, Modran. Only the flax variety Nike presents better features as far as total straw length and resistance to lodging is concerned.

The vegetation period of Klara is similar to this of Modran. Klara has got white flowers and has been submitted to COBORU registration in 2004.

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## Effects of the pajamas and sheets on bed with three different kinds of textile materials (linen, cotton, polyester) on the skin water content and digestion to the carbohydrate included in the breakfast. Recent progress of the research

*Prof. Dr. Tokura H., M.Sc., Eng. Zimniewska M. and Prof. Dr. Kozlowski R.*

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Tokura and his co-workers (1985, 1995, 1996a, 1996b, 1998a, 1998b, 1999, 2002) found that the human body is more stressful while wearing the synthetic fabrics than the natural fibres. Recently, Tokura et al. (2002) demonstrated convincingly that the sebaceous gland situated in the skin is more active while the body is covered by hydrophilic fabrics during night sleep than by hydrophobic ones. Recently, Tokura and Kikufuji (2004) disclosed that the skin water content became significantly higher when the young women slept, wearing cotton pajamas every night for one month than polyester pajamas during identical periods. Encouraged by these findings, we are collecting data concerning how the linen pajamas would influence the skin water content during night sleep differently, compared with the cotton and polyester pajamas. Our preliminary results showed that the skin water content seemed the highest in linen, intermediate in the cotton and the lowest in the polyester. Higher skin water content could prevent the penetration of odd substances from outside through the skin into the body more effectively, resulting in the prevention of the occurrence of atopic dermatitis, because if the skin is dry, the odd substances could enter through the skin into the body more easily, which could trigger the allergic symptom within the body and hence the induction of atopic dermatitis. Furthermore, the skin with higher water content seems youthful and beautiful. The physiological mechanisms why probable increase of the skin water content would occur mostly under the influence of the linen are due to less excitement of sympathetic nervous system and higher activity of parasympathetic nervous system. There are many evidences that if the body is covered by the synthetic fabrics, the sympathetic nervous system may be activated more greatly. Therefore, the vessels in the skin is vasoconstricted, resulting in less circulation and in less skin water content. If the body is more stressful during the nocturnal sleep, the movement of the gastrointestinal tract is inhibited and digestive juice is less secreted. Therefore, the digestion activity to the breakfast after rise is suppressed. These studies are now in progress.

### **Prof. Dr. Hiromi Tokura, Japan. Short Curriculum Vitae**

Hiromi Tokura is temporarily working at the Institute of Natural Fibres, Poznan, Poland. He was born on March 11<sup>th</sup>, 1939 in Kurume/Japan. As a first son of Professor Dr Noboru Tokura (bacteriologist), director of Tropical Medical Research Institute, Nagasaki University of School of Medicine, Japan and Kiyo Tokura. Hiromi Tokura studied Veterinary Medicine in Hokkaido University School of Veterinary Medicine, Sapporo, Japan. After graduating from Hokkaido University, he further studied physiology (chronobiology) for 5 years at graduate school of Hokkaido University. He got Ph.D. on January, 1975 in Nagoya University. Dissertation title was "Thermal and metabolic responses in the Japanese macaque, *Macaca fuscata*". He has studied circadian rhythms in the monkey species at Max-Planck-Institute fuer Verhaltensphysiologie in Germany for 1 year and 10 months as a fellow of Alexander von Humboldt Stiftung from 1975. He has worked as full professor and associate professor for 28 years at Nara Women's University. His field is environmental physiology, especially, chronobiology and clothing physiology. Eighteen graduate students got Ph.D. in Nara under his guidance.

## LETTERS TO THE EDITOR

Thu, 01 Jan 2004 From: Timothy Niedermann <tniedermann@videotron.ca>  
Subject: Flax In North America

Dear Prof. Kozlowski,

I read the most recent Euroflax Newsletter and wish to give you a short update on fibre flax production here. The flax machinery owned by Fibrex Québec, in Valleyfield, Quebec, have been sold to a foreign producer and have been exported. Eastern Flax Ltd, which owned flax machinery in Maine and South Carolina, has closed.

Eastern Flax Ltd never built a mill in Maine, and thus never produced flax there. It had bought the equipment owned by US Flax and Linen Inc., dismantled the mill that existed in Presque Isle, Maine and put the machinery in storage. Most of the agricultural machinery there was subsequently sold in Europe. The Eastern Flax Ltd facility in South Carolina operated for a while but has closed permanently.

Thus, I am sorry to report that no fibre flax production currently exists in North America.

Regards, Timothy Niedermann, Former President US Flax & Linen Co. Inc., Former Managing Director, Fibrex Québec.  
112, rue Percival, Montréal Ouest (Québec, Canada H4X 1T5, tél (514) 487-2243, cell (514) 831-5903, courriel  
tniedermann@videotron.ca

## NEWS ABOUT THE EUROPEAN PROJECTS WITH INVOLVEMENT OF NETWORK MEMBERS

### COST ACTION 847 "Textile Quality and Biotechnology"

**COST** = European Co-operation in the Field of Scientific and Technical Research. COST is an European program, served by the European Union in Brussels.

Nineteen COST countries had signed the Memorandum of Understanding to participate in the COST Action 847. The number of registered scientists is 95: Austria (3), Belgium (5), Bulgaria (2), Czech Republic (2), Germany (9), Denmark (1), Estonia (3), Finland (9), France (2), UK (9), Greece (9), Hungary (5), Italy (3), Lithuania (2), the Netherlands (7), Poland (9), Portugal (8), Romania (7) and Yugoslavia.

**The period:** from June 15, 2000 to February 2005

**The basic document:** Memorandum of Understanding: MoU 245/00

**Chairperson:** Dr. Johanna Buchert, VTT Biotechnology, Tietotie 2, P.O. Box 1500, Espoo, Finland, tel: + 358 456 5146, fax: + 358 94552103, E-mail: johanna.buchert@vtt.fi, <http://www.vtt.fi/bel>

**Vice-Chairperson:** Prof. Dr. Shekhar Sharma, The Queen's University of Belfast, Department of Applied Science, Faculty of Agriculture & Food Science, Newforge Lane. Belfast BT9 5PX, N. Ireland, tel.: +44/ 1232 250 666, fax: +44/1232 668375, E-mail: Shekhar.Sharma@dani.gov.uk

**The managing body: Management Committee (MC). Action Web site:** <http://www.vtt.fi/bel/cost847>

The **main objective** of this Action is to develop environmentally friendly production technologies for the textile industry by using enzymatic processes. By using these biotechnical methods, energy or chemicals can be saved or, alternatively, the final product quality can be improved. In the COST action, new applications using enzymes acting on both cellulose- and protein based textile materials will be studied and developed. This will be achieved by exchanging research information within European research units active in textile biotechnology oriented research.

More details about activities of the Cost Action 847 were presented in Euroflax Newsletter No 17

#### **The latest news regarding the COST Action 847 activities:**

- COST 847 Meeting of WG 1 and WG/4 in Belfast, Ireland, 29-30.1.2004
- COST 847 WG 2 and WG 3 Meetings, 26-27.02.2004, Maribor, Slovenia
- INTB04. 3rd International Conference on Textile Biotechnology 2004, June 13 - 16, Graz University of Technology, Austria in connection with the Annual Workshop of COST Action 847 (see p. 20)
- COST 847 Management Committee Meeting, Sofia, Bulgaria
- COST 847 WG 1 and WG 2 Meetings, 23-24.09.2004, Budapest, Hungary

**Let us turn your attention to the proposal, presented in the EUROFLAX Newsletter No 1/2002 (17) regarding a "Distributed Sample Library"** [Activity of WG/1 Quality assessment of natural fibres] prepared by Dr. Eddy Baetens, CENTEXBEL Gent, Belgium. We are looking forward to your comments and contributions. This issue is connected with an important factor- the quality of the raw materials.



## NEWS REGARDING PUBLICATIONS ON NATURAL FIBRES

### PUBLISHING ACTIVITY OF THE FAO EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS since 1989

#### **"NATURAL FIBRES – WLOKNA NATURALNE" – a Yearbook of INF**

A publication that is probably the only one in the world, which contains scientific publications regarding natural fibres (an English-Polish version yearbook), edited by the Institute of Natural Fibres – Coordination Centre of the FAO Network. The publication is advised by the international team of Honorary Editors: Mr. A.M. Allam/Egypt, Mr. A. Atanassov/Bulgaria, Mr. A. Bozzini/Italy, Mr. A. Bledzki/Germany, Mr. D. Cremaschi/Italy, Mr. A. Daenkindt/Belgium, Mr. D. M. El-Hariri/Egypt, Mr. H.P. Fink/Germany, Ms. U. Kechaiga/Greece, Mr. R. Kessler/Germany, Mr. P. Kolodziejczyk/Canada, Mr. J. Lappage/New Zealand, Mr. M. Lewin/USA, Mr. B. Mac/Poland, Mr. G. Mackie/Northern Ireland, Mr. T. Matsuo/Japan, Ms. C. Morvan/France, Mr. F. Munder/Germany, Mr. K. Perepelkin/Russia, Ms. Anna Pretova/Bulgaria, Mr. R.M. Rowell/USA, Mr. Shen Anjing/China, Mr. D. Sorlino/Argentina, Mr. H. Tokura/Japan, Mr. G. Venturi/Italy, Mr. Zainal Arifin M. Ishak/Malasya, and Mr. V.V. Zhivetin/Russia.

Since 2004 *Natural Fibres* will be replaced by a new quarterly *Journal of Natural Fibres* and will be published by a recognized publishing house The Haworth Press, Inc. in New York, USA [for more details see: [www.haworthpressinc.com](http://www.haworthpressinc.com)]. **All scientists are welcome to publish relevant papers in this publication.** Contact: Prof. Dr. Ryszard Kozłowski; fax/tel.: +48(0) 61 8417-830, E-mail: sekretar@inf.poznan.pl or co-editor for USA Richard Kotek Ph.D., College of Textiles North Carolina State University, Raleigh, E-mail: rkotek@unity.ncsu.edu, tel: (919) 515-6585, fax: (919) 515-6532

**EUROFLAX Newsletter**

**Information Bulletin EUROFLAX Newsletter – 20 issues since 1994** (400 printed copies, reaches subscribers and Network members in 51 countries), available from the Institute of Natural Fibres, Wojska Polskiego 71b, 60-630 Poznan, Poland, fax: +48 61 8 417 830, E-mail: boint@inf.poznan.pl.

**PROCEEDINGS of the European Regional and Global Workshops:**

- **“FLAX IN EUROPE”**, Production and Processing, Poznan, 19- 21 June 1989 (available from the Institute of Natural Fibres)
- **“FLAX – AS A FIBRE AND OIL BEARING CROP”**, Brno, Czechoslovakia, 18-20 June 1991 (available from AGRITEC, Research, Breeding & Services Ltd, Zemědělská 16, 787 01 Šumperk, The Czech Republic, E-mail: agritec@agritec.cz)
- **“FLAX IN THE WORLD”** Bonn, Germany, 15-17 June 1993 (available from the Institute of Natural Fibres)
- **“PRODUCING FOR THE MARKET”** – Proceedings of the 4th European Regional Workshop on Flax, 25-28 September 1996, Rouen, France (available at the Institut Technique du Lin 5, Rue Cardinal Mercier, 75009 Paris, France, tel.: +33/1 42 80 40 56, fax: +33/ 1 45 26 24 27)
- **“BAST PLANTS IN THE NEW MILLENNIUM”** – Proceedings of the Second Global Workshop, 3-6 June, 2001, Borovets, Bulgaria

**PROCEEDINGS of conferences (almost all available from the Institute of Natural Fibres, Poznan, Poland):**

- The First Flax Genetic Resources Workshop, Poznan, Poland, 9-10 November 1993
- The Second Flax Genetic Resources Workshop Brno, 8-9 November 1994
- First Workshop of the Non-Textile Applications of Flax Working Group 14-15 November 1994, INF, Poznan, Poland
- Modern Flax Processing – The First Workshop of the Extraction and Processing Working Group, 15-16 March 1995, INF, Poznan, Poland
- Breeding for Fibre and Oil Quality in Flax – Proceedings of the Third Meeting of International Flax Breeding Research Group 7-8 November 1995, Saint-Valéry-en-Caux, France (a few copies are available from Eng. Jean-Paul Trouvé, CETEAL, Saint-Pierre-Le-Viger, 76740 FONTAINE-LE-DUN, France, tel.: +33/ 35974133, fax: +33/35971318)
- Proceedings of the Symposium: Flax and Other Bast Plants, held at the Institute of Natural Fibres, 30.09 and 1.10.97, Poznan, Poland
- Newsletter of the ad Hoc Research Group (the Group acted from 1989 to June 1993) – 9 issues
- Proceedings of the Hemp, Flax and Other Bast Fibrous Plants Production, Technology and Ecology Symposium, 24-25 September 1998, Poznan, Poland
- Proceedings of the Bast Fibrous Plants Today and Tomorrow, Breeding, Molecular Biology and Biotechnology Beyond 21st Century, 28-30 September 1998, St. Petersburg, Russia
- Book of abstracts of the Fifth International Conference on Frontiers of Polymers and Advanced Materials (ICFPAM) and NATO Advanced Research Workshop on Polymers and Composites for Special Applications; 21 and 25 of June 1999, Institute of Natural Fibres, Poznan, Poland
- Research into New Uses of Natural Fibres (1999). Seminar Materials of the FAO Intersessional Consultation on Fibres, 15-16 November 1999, Institute of Natural Fibres, Poznan, Poland
- Innovative Hemp Production and Hemp Products (The News in Hemp Breeding, Cultivation, Harvesting and Processing). Seminar Materials. 23 February 2000, Institute of Natural Fibres, Poznan, Poland
- The Natural Fibres. Włokna Naturalne. Special Edition Vol. XLIV 2000. Special Jubilee Edition – Proceedings of the International Scientific Session: “Natural Fibres Today and Tomorrow”, held on 28 and 29 June 2000, Institute of Natural Fibres, Poznan, Poland
- Proceedings of the Conference Bast Fibrous Plants at the Turn of Second and Third Millennium, 18-22 September, 2001, Shenyang, China

**OTHER RELATED PUBLICATIONS****Industrial Crops**

- Newsletter of IENICA – The Interactive European Network for Industrial Crops and their Application, available at: <http://www.ienica.net/>
- IPGRI Newsletter for Europe, published by the International Plant Genetic Resources Institute, Rome, Italy. E-mail: m.colas@cgiar.org
- FIBRES & TEXTILES in Eastern Europe, published by the Institute of Chemical Fibres, Lodz, Poland, E-mail: iwch@mazurek.man.lodz.pl
- Green – Tech Newsletter. Edited by Prof. Dr. Hans Derksen – chairman of the Platform for Renewable Raw Materials P.O. Box 822, 3700 AV Zeist, The Netherlands. Fax: +31 (0) 30 691 73 94

- Fabulous Fibre. The Natural Fibre Centre Newsletter. Olds College Centre for Innovation Natural Fibre Centre (OCCI), 4500 –50th Street, Olds, Alberta, Canada T4H 1R6, Telephone: (403) 507-5206, Fax: (403) 507-7977, E-mail: relvestad@admin.oldscollege.ab.ca, www.occi.ab.ca
- Polish Flax and Hemp Chamber bulletin - Biuletyn Informacyjny Polskiej Izby Lnu i Konopi: “LEN I KONOPIE”, ISSN 1731-4828, Poznan, Poland, E-mail: hempflax@inf.poznan.pl
- Journal of Ivanovo State Textile Academy, Ivanovo, Russia: Scientific and Technical Journal – Technology of Textile Industry (available at <http://education.ivanovo.ru/IGTA/OURJOURN.htm>)
- International Textile Bulletin and Nonwovens/Industrial Textiles. Published by ITS Publishing. International Textile Service P.O. Box, CH-8952 Schlieren/Zürich, Switzerland
- CSL News, published by Central Science Laboratory, Sand Hutton, York, UK. E-mail: [science@cls.gov.uk](mailto:science@cls.gov.uk)
- The newest issue of the **Journal of Textile and Apparel, Technology and Management (JTATM)**, is available (<http://www.tx.ncsu.edu/jtatm>).

## Hemp

- Journal of Industrial Hemp – the journal of the IHA (E-mail: [iha@euronet.nl](mailto:iha@euronet.nl)) – International Hemp Association in the Netherlands, edited by The HAWORTH Press, INC, New York, London, Norwood (Australia), E-mail: [BCohen7719@aol.com](mailto:BCohen7719@aol.com), <http://www.haworthpress.com>
- Journal of Cannabis Therapeutics – a sister journal of Journal of Industrial Hemp, edited by The HAWORTH Press, INC. (New York, London, Norwood (Australia), E-mail: [BCohen7719@aol.com](mailto:BCohen7719@aol.com))
- Leson Gero, Pless Petra: Hemp Food and Oil for Health – Your Guide to Cooking, Nutrition, and Baby Care; HEMPTECH, 64 p., Sebastopol 06/99
- Roulac John W.: Industrial Hemp, Practical Products – Paper to Fabric to Cosmetics. HEMPTECH/Chelsea Green Publishing, 50 p., Sebastopol 06/96 [[john@hemptech.com](mailto:john@hemptech.com), HEMPTECH, (707) 823-2800, [www.hemptech.com](http://www.hemptech.com), P.O. Box 1716 Sebastopol, California 95473 <+> Fax (707) 823-2424, Fax orders: (419) 281-6883, E-mail orders: [orders@bookmaster.com](mailto:orders@bookmaster.com)]
- Bocsa I., Karus M.: The Cultivation of Hemp – Botany, Varieties, Cultivation and Harvesting. HEMPTECH/Chelsea Green Publishing, 186 p., Sebastopol 02/98
- Grotenhermen F., Karus M., Lohmeyer D.: Hemp Foods and THC Levels: A Scientific Assessment. HEMPTECH/Chelsea Green Publishing, 67 p., Sebastopol 10/98
- The Hemp Commerce & Farming Report, (c) 1999 Ahem, Arthur Hanks. Contact at the E-mail address: [jfreeman@ssm.net](mailto:jfreeman@ssm.net), <http://www.hempreport.com>
- John E. Dvorak, E-mail: [boston.hemp@pobox.com](mailto:boston.hemp@pobox.com) invites you to visit the archives by performing a DejaNews power search for Dvorak, hemp, and archives: [http://www.dejanews.com/home\\_ps.shtml](http://www.dejanews.com/home_ps.shtml)
- [www.maff.gov.uk/farm/acu/acu.htm](http://www.maff.gov.uk/farm/acu/acu.htm) – there are several good papers related to utilization of natural fibres on the UK MAFF web site
- H. Burczyk: Hemp Cultivated for Seeds – The Manual for Hemp Farmers (available at the Institute of Natural Fibres, Poznan, Poland)
- Kozłowski R., Władyka-Przybylak M.: Chapter 10 Natural Polymers Wood and Lignocellulosic. – in book “ Fire Retardant Materials” ed. by Horrocks, Woodhead Publishing Limited, Cambridge, Great Britain, 1999
- Kozłowski R., Władyka-Przybylak M: Chapter 14 Uses of Natural Fiber Reinforced Plastics in book "Natural Fibres, Plastics and Composites” ed.by F.T. Wallenberger and Norman E.Weston Kluwer Academic Publishers, Boston, Dordrecht, New York, London 2004

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## INFORMATION ABOUT INTERNATIONAL CONFERENCES ON NATURAL, LIGNOCELLULOSIC FIBRES

### 2004

Events organized by the FAO/SCORENA European Cooperative Research Network on flax and other Bast Plants

- October 24-28, 2004, “**BAST FIBROUS PLANTS FOR HEALTHY LIFE**” - 3<sup>rd</sup> GLOBAL WORKSHOP (GENERAL CONSULTATION) OF THE FAO EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS, Banja Luka, Bosnia and Herzegovina, Republika Srpska. Contact person in Bosnia and Herzegovina: BSc. Miloš Nožinic, Agricultural Institute of Republic of Srpska, Banja Luka, K. Miloša 17, T: +387 51 303 112, mob. +387 65 624 458, F: ++387 51 312-792, E-mail: [polj.institut.bl@blic.net](mailto:polj.institut.bl@blic.net). Contact person of the Coordination Centre: MSc Maria Mackiewicz-Talarczyk, Tel.: +48/61/ 8 455 823, mobil: +48/604 16 91 15

Conferences with the Network's and the Institute of Natural Fibres organization input:

- March 2-4, 2004. **The 7<sup>th</sup> All-Russian Fair/Exhibition/Conference „Russian Flax”**, Vologda, Russia. Organizer: FGUP TSNILKA - The Federal State Enterprise - Central Scientific-Research Institute for Integrated Automation of Light Industry, Contact: Fair Exhibition Organization Center: “Flax House” Federal State Enterprise, ul. Shabolovka 26, 117049 Moscow, Russia, Tel/Fax: +70 (95) 237-35-45. 237-12-55. 236-63-32, E-mail: nauka@tsniilka.ru
- March 17-19, 2004. **60th FLAX INSTITUTE conference**, Wednesday evening, Registration/Visiting, Thursday and Friday a.m. Program, at FARGO, ND, at Doublewood Inn (Ph. 1-800-433-3235, 13th Ave. South, exit from I-29 at 13th Ave. South, east 4-5 blocks). Room reservations also can be made via e-mail at bwdoublewood@corpcom.net or phone +1/ 701-235-3333. Contact person: Ms. Lisa Johnson <lisa.johnson@ndsu.nodak.edu> for more details.
- March 5 -6, 2004, **International Symposium “Hemp: Perspectives for Advanced Utilization”**, Novotel, Villanova di Castenaso (Bologna), Italy. Organiser: Experimental Institute for Industrial Crops. Bologna. Contact person: Dr. Paolo Ranalli, Istituto Sperimentale per le Coltive Industriali, Viadi Corticella 133, 40128 - Bologna Tel. +39(051)6316847, Fax +39(051) 374857, E-mail: p.ranalli@isci.it, <http://www.isci.it/home.html>
- March 29-30, 2004. **International Bast & Leaf-Fiber Textile Conference**, Beijing, China followed by the four important exhibitions-Yarn Expo, Knitting China, CHIC, and Intertextile from March 31 to April 3. Organisers: Mr. Zhao Hong Director, International Trade Office, China National Textile Industry Council V. President, China Textile International Exchange Center and Mr. Zhang Shiping, President China Bast & Leaf-fiber Textile Association, Beijing, China. E-mail: hongchinatex@yahoo.com.cn
- April 27 -28, 2004. **5<sup>th</sup> Global Wood and Natural Fibre Composites Symposium**, Kassel, Germany. Organized by Prof. Prof. A.K. Bledzkiego, [www.kutech-kassel.de](http://www.kutech-kassel.de)
- June 07 -08, 2004. **10 International Conference for Renewable Resources and Plant Biotechnology NAROSSA@ 2004**, Magdeburg, Germany. Contact person: Dr. Frank Pudel, ÖHMI Consulting GmbH, Berliner Chaussee 66, D-39114 Magdeburg, Tel: +49-391-8507-171, Fax:+49-391-8507-150, E-mail: pudel@oehmi-consulting.de, [www.oehmi-consulting.de](http://www.oehmi-consulting.de). The event is conducted in conjunction with the international Fair (7-9.06.2004) and the European Technology-Brokerage (Contact: Helga Ilchmann, E-mail: [ircpost@tti-md.de](mailto:ircpost@tti-md.de))
- June 13-16, 2004. **INTB04, 3rd International Conference on Textile Biotechnology 2004**, Graz University of Technology, Austria (the 3<sup>rd</sup> Annual Workshop of COST Action 847). Contact person: Dr. G.M. Guebitz, Professor, HOD, Graz University of Technology, Department of Environmental Biotechnology, Petersgasse 12, A-8010 Graz, Austria, Tel: (+43) 316 873 8312, Fax: (+43) 316 873 8815, Mobile: (+43) 664 5722600, E-mail: [guebitz@ima.tu-graz.ac.at](mailto:guebitz@ima.tu-graz.ac.at). [www.guebitz.com](http://www.guebitz.com)

*Other conferences, symposia and meetings joint with natural fibres in 2004*

- March 26, 2004. **Fifth Intersessional Consultation on Natural Fibres**, FAO Headquarters, Rome, Italy. Contact person: Dr. Brian Moir. E-mail: [Brian.Moir@fao.org](mailto:Brian.Moir@fao.org)
- May 10 –14, 2004. **2<sup>nd</sup> World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection**, Palazzo dei Congressi, Rome, Italy. See preliminary conference programme on-line on: [www.conference-biomass.com](http://www.conference-biomass.com)
- May 17 – 20, 2004. **Spring Symposium on Fibers, Fibrous Structures and Filtration**, Radisson Hotel, Clayton (St. Louis) Missouri USA, The Fiber Society, [www.thefibersociety.org](http://www.thefibersociety.org)
- May 23-27, 2004, **The Textile Institute 83rd World Conference. Quality Textiles for Quality Life**. Shanghai, P. R. China, Contact: 83rd TIWC Secretariat, College of Textiles, Donghua University (formerly China Textiles University), Shanghai 200051, P. R. China, Fax: ++86-21-62193061, E-mail: [ti04shanghai@dhu.edu.cn](mailto:ti04shanghai@dhu.edu.cn)
- May 31 and June 1, 2004. **4<sup>th</sup> Annual FIBREX CONFERENCE**, Edmonton, Canada, followed by PULP AND PAPER TECHNICAL ASSOCIATION OF CANADA (PAPTAC) Non-wood Fibres Committee meeting and Symposium on June 2<sup>nd</sup> and 3<sup>rd</sup>. Organised by the Alberta Research Council (Canada) and Natural Fibre Association of Brandenburg (Germany).. Contact person: Paul F. Layte, P. Eng. Vice-President, Advanced Materials, Sensors and Intelligent Systems. Tel: +1/780-450-4639, E-mail: [layte@arc.ab.ca](mailto:layte@arc.ab.ca)
- June 7 - 9, 2004. **The Fifteenth Annual BCC Conference on Flame Retardancy; Recent Advances in Flame Retardancy of Polymeric Materials**. Holiday Inn Select, Stamford, CT, USA, Contact: Sharon Faust - conference coordinator, Phone: (203) 853-4266, ext. 304, E-mail: [conference@bccresearch.com](mailto:conference@bccresearch.com), <http://www.bccresearch.com/flame2004/>
- July 7-8<sup>th</sup>, 2004. **Eco Textile 04, "The way forward to Sustainable Development in Textiles"**, The Bridgewater Hall, Manchester (organized by Textile Institute)
- August 8-13, 2004. **Eleventh International Conference on Composites/Nano Engineering, ICCE-11**. Hilton-Head Island, S. Carolina, USA. Contact person: Prof. Dr. David Hui, E-mail: [DHui@uno.edu](mailto:DHui@uno.edu), [www.uno.edu/~engr/composite](http://www.uno.edu/~engr/composite)

- August 18-21, 2004. II International Conference **Plant Ontogenesis in Natural and Transformed Environments. Physiological and Biochemical Aspects**, L'viv, Ukraine. Contact person: Mrs. Nataliya Shuvar, Plant Physiology and Ecology Dept., Ivan Franko National University of L'viv, Hrushevs'ky St., 4, L'viv, 79005, Ukraine. Tel.: +38 (0322) 96-43-34, E-mail: onto2004@franko.lviv.ua, <http://bioweb.franko.lviv.ua>
- August 25 – 28, 2004. **The First EuroScience Open Forum 2004- ESOF2004**, 2004, Stockholm, Sweden
- September 7 –11, 2004. **XXI National textile Technicians Congress and VII National Textile Industry Fair, II International Symposium in Textile Engineering II SIENTEX**, Convention Centre – Natal Rio Grande do Norte, Brazil
- 24 September, 2004 **International Conference on Environmentally – Compatible Forest Products – ICECFOP**, 22, Oporto, Portugal
- October 3 - 6, 2004. **Magic World of Textiles, 2<sup>nd</sup> International Textile, Clothing @ Design Conference**, Dubrovnik, Croatia. Organised by: Univeristy of Zagreb. Contact person: Contact person: Prof. Dr. Zvonko Dragčević, Phone/Fax: ++385 1 37 02 599, E-mail: zvonko.dragcevic@zg.htnet.hr, zvonko.dragcevic@ttf.hr, <http://www.itcdc.htnet.hr>
- October 24 - 28, 2004. **Global Workshop of the FAO/SCORENA Network**, Bosnia and Herzegovina (see above)
- October 31 - November 02, 2004. **7<sup>th</sup> Pacific Rim Bio-Based Composites Symposium & Pre-Symposium Workshop on Surface characterization of Wood**, Nanjing, P. R. China, Organized by Nanjing Forestry University.

#### Internet conferences:

- **First International Internet Conference: Progress in Textile Science and Technology (FIICPTST), Technical University, Liberec, the Czech Republic** opened on the web sites on the address <http://gacr.kod.vslib.cz> from the 20th January 2004 and will be lasted to the 31<sup>th</sup> May 2004. Contact person: L. Sodomka. E-mail: lubomir.sodomka@vslib.cz

#### 2005

- 17-21 September 2005. International Conference on Industrial Crops and Rural Development 2005 Association for the Advancement of Industrial Crops (AAIC) Annual Meeting, Murcia, Spain. Contact: Dr. Maria Jesus Pascual-Villalobos, Tel: 34 968 366768, Fax: 34 968 366792, E-mail: MJesus.Pascual@carm.es, website: [www.aaic.org/2005mtg.htm](http://www.aaic.org/2005mtg.htm), Title and author submission deadline: 30 April 2004



## REPORTS ON THE EVENTS

### The report on the International Conference of the FAO/SCORENA European Cooperative Research Network on Flax and other Bast Plants “Flax and Allied Fibre Plants for Human Welfare”. National Research Centre (NRC), December 8 – 11 2003 in Cairo, Egypt.

Prepared by: Prof. Prof. Dr. D.M. El-Hariri, President of the conference, NRC, Cairo, Egypt, E-mail: [dardiria@yahoo.com](mailto:dardiria@yahoo.com)  
 Accepted and completed by: Prof. Dr. R. Kozłowski, coordinator of the conference, the SCORENA Network Coordinator, Poznan, Poland, E-mail: [netflax@inf.poznan.pl](mailto:netflax@inf.poznan.pl)

#### The summing up of the Conference

This statement attempts to provide an overview about activity of the International Conference of FAO/SCORENA European Cooperative Research Network on Flax and other Bast Plants entitled:

#### “Flax and Allied Fibre Plants for Human Welfare”

This conference was held under the patronage of:

H.E. Prof. Youssuf Wally, Deputy Prime Minister and Minister of Agriculture and Land Reclamation, Egypt.

H.E. Prof. Mofeed Shehab, Minister of Higher Education and Scientific Research, Egypt.

H.E. Prof. Hany M. El-Nazer, President of the National Research Centre (NRC), Egypt.

The conference was held at Conference Hall of NRC during the period 8-11 December, 2003. The activities of the conference were attended by about 120 participants from NRC, Agricultural Research Centre (ARC), staff members of Egyptian Universities, the General Organization of Controlling Drugs and some commercial business men of spinning & weaving, clothing and flax processing. About 90 scientific experts from abroad represented 22 countries, i.e. Belarus, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, China, Czech Republic, Egypt, France, Germany, Hungary, Japan, Lithuania, Norway, Netherlands, Poland, Russia, Romania, Slovak Republic, Sweden, South Africa Republic, and the USA. In addition, about 12 participants from Argentina, Australia, UK, India, Italy and Vietnam were registered to attend the conference, but unfortunately they apologized at the last moment. Forty-three oral presentations and nineteen posters were presented.

At the end of all presentations, Prof. El-Hariri the President of the Conference and Prof. R. Kozłowski the coordinator of the conference and the FAO European Cooperative Research Network on Flax and other Bast Plants, which acts within SCORENA system have the honour to close and sum up the conference activities. We asked kindly all chairmen

of eight Scientific Sessions to express their opinion and remarks. The general output and conclusion can be summarized as follows:

1. Chairmen indicated that all of us enjoyed the conference for high deliberation and advanced level. It provides an excellent opportunity for exchange knowledge, technology, and more discussion among distinguished scientists.
2. There was a clear sharing of new information, experience and insights in renewable resources of bast fibre applications, which will be demanded greatly for future. More research work is needed to improve quality of all diversified flax products to be accepted in the international markets.
3. Flax fibre and linseed products must be put in standardization on the international level. Also these new products must be controlled to specific qualifications.
4. All participant joined the special study tour at middle Delta, Gharbia Governorate 140 km from Cairo where more flax cultivated area and machinery of flax processing, retting, fibre extraction, grading of fibres, spinning, weaving of flax fibres and preparation for export were located. The experts were satisfied about this important visit. They learned more about flax during this important visit.
5. Oriented research work must be considered to create link between agricultural and industrial responsible bodies to encourage agro-industrial products with high quality grades more suitable for end user, and this in turn must increase the added value of flax marketing.
6. We do hope to encourage FAO as well as ESCORENA to push hard the activity of our research Network on Flax and other Bast Plants and this can be achieved through involvement in FAO projects for sustainable development programs.
7. We also hope to up-grade our network to be an international research network hence its activities are broaden and spread out in about 55 countries and its members became more than 360 experts. It also has representatives in many different places all over the world, i.e. South America, North America, and Middle & Near East in addition to the coordination centre of the FAO Research Network on Flax and other Bast Plants, which still acts at the Institute of Natural Fibres (INF), Poznan, Poland since more than 15 years ago.
8. All participants agreed to offer more thanks to Prof. Hany El - Nazer, President of NRC, and his co-workers for hosting the conference and valuable help during the conference period as well to FAO Regional Office for Near East especially Dr. Mohamed Al Braithen, Director General and Dr. Fawzi Taher, Regional Crop Production Officer of FAO (RNE), Cairo, Egypt, for their kind help.
9. More thanks are also given to Mr. Wlodzimierz Bogusz, charge d'Affair of Polish Government in Polish Embassy, Cairo, Egypt for his kind sharing us at the opening ceremony. Also Dr. R. Peczak, and Mr. Jarmolowicz-Chwiedorowicz Tadeusz from Poland (VIP) for attending our activity of the conference.
10. All participants wished to thank and acknowledge Prof. Dr. D.M. El-Hariri, President of the conference as well Prof. Dr. R. Kozlowski, coordinator of the conference and General Director of INF, Poznan, Poland, and Mrs. Maria Mackiewicz-Talarczyk M. Sc. (Agr.) for their kind help, which will be reckoned and unforgotten. The great success of the conference must be due to their hard work and fruitful cooperation.

The conference materials has been edited and delivered: the Proceedings of the conference contain the texts of the presentations, edited on CD as well as the printed material I- The Book of Abstracts (70 pages of papers' and posters' abstracts). The materials are available from the conference President: Prof. Dr Dardiri Mohamed El-Hariri, NATIONAL RESEARCH CENTRE, El-Tahrir str., Dokki, Cairo, Egypt, Phone: +202/3669955, +202/ 33 71362, fax: +202/ 33 70931, E-mail: elhariri\_d\_m@hotmail.com, dardiria@yahoo.com.

### **The contents of the conference proceedings on the compact disk (CD)**

#### **Oral presentations**

##### **Plenary Session**

Flax in Ancient Egypt

Helmi F. , Egypt

The Role of Natural Textiles in Support of Health

Zimniewska M., Kozlowski R

Strategy and Achievements of Fiber Crops Research Section, A.R.C, MOLAR

Momtaz A. and Technical Staff of F.C.R.S

#### **Scientific Session I – Biotechnology, Genetic Resources, Breeding**

Basic Studies on Ramie (*Boehmeria nivea*.) Germplasms and its Utilization

Jieyucheng Daijianpin, Xuyin, China

Dihaploid Production in Flax by anther and Ovary Cultures

Pretova A., Obert B., Bartosova Z, Slovak R.

Biodiversity and Breeding as Basic Factors for Widening of Bast Plants Growing and Application  
Atanassov A, Balabanova A, Bulgaria

Studies on Selection of Feeding Gene Germplasms in Ramie  
Jueyucheng Daijianping, Xuying Sunzhiming, Jiangyanbo, China

Flax Hypocotyl a Plant Model to Study the Composite Structure of Fibres  
Andeme-Onzighi Ch., Douchiche O., Driouich A., Morvan C., France

The Development of the Study on Technique for Introducing  
Exogenous DNA into Flax in China  
Wang Yu Fu, Kang Qing Hua, Liu Yan, Li Xi Chen, Liu Shao Jun, China

Agronomical Properties of the Czech Flax and Linseed Breeding Materials in Comparison with Registered  
Varieties  
Pavelek M., Tejklova E., Czech R.

N.I. Vavilov Research Institute of Plant Industry, St. Petersburg, Russia: Inheritance of the vegetative period  
stages duration in flax  
Brutch N., Russia

Wild Species, Landraces and Primitive Cultivars - utmost Value to Humanity  
Silska G., Heller K., Poland

Effect of Variety and locations on Growth, Yield Components of Roselle, *Hibiscus subdariffa* L., and its Infestation with  
the Spiny Bollworm, *Earias insulana* (Boisd).  
Ottai, M.E.S., Abdel Moniem A.S.H. and El-Mergawi, Egypt

### **Scientific Session II - Agrochemistry and Plant Protection**

Increasing Resistance of Fibre Flax Plants to Drought Stress  
Byczynska M., Heller K., Poland

Characterization of Flax-Root-Colonising Fungi and their Implication in Root Rots (Flax Scorch).  
Cariou-Pham E., France

Ecological Methods of Flax Protection Against Diseases  
Langner K., Andruszewska A., Poland

### **Scientific Session III - Harvesting and Primary Processing**

Assessment, Evaluation @Acknowledgement of a New More Controllable Method for Extracting Vegetable Fibers  
Allam A., Egypt

Degumming of Fibrous Plants based on Osmotic Pressure Phenomenon.  
Allam A., Kozlowski R., Konczewicz W., Egypt and Poland

Advanced Technology for the Decortication Technology for Flax and other Bast Fiber Plants  
Munder F., Füll Ch., Hempel H., Germany

Efficient System for Bast Fibrous Plants Decortication  
Kozlowski R., Mankowski J., Kubacki A., Poland

### **Scientific Session IV - Spinning, Weaving and Finishing**

Improving Quality of Linen and Linen-containing Fabrics with different Finishing Methods.  
Ciszar E., Somlai P., Dornyi B, Hungary

Cellulosic Functional Fibres and Textiles  
Laszkiewicz B., Kozlowski R., Poland

Biotechnology to Aid Cottonizing of Flax and Hemp Fibers  
Sedelnik N., Poland

Internal structure of blended flax yarn  
Sayed I., Kremenakova D., Krupincova G., Czech R.

Pretreated Flax Fibers Bundling Tendency  
Militky J., Kremenakova D., Antonov V., Czech R.

*Linen and Hemp Core Yarns Produced by the Friction Spinning System on Machine Dref 3*  
Sedelnik N., Poland

The Quest of Colour – Properties of Natural Dyestuffs in the Applications to Linen, Jute and Silk  
Kazmierska M., Schmidt-Przewozna K., Poland

### **Scientific Session V-Standardization and Quality Aspects**

Developing a Sampling Protocol to Enhance the Profitability of Flax Straw Processing  
Ulrich A., Canada

Review of Standards for Quality Estimation of Flax in Europe  
Wasko J., Mackiewicz-Talarczyk M., Poland

Results of Quality- oriented Research on Hemp (*Cannabis sativa* L)  
Ivanyi I., Izsaki Z.

### **Scientific Session VI-Composites and Miscellaneous**

Natural Fibre Reinforced Composites  
Kozlowski R., Wladyka-Przybylak M., Poland

Physiological Significance of Hydrophilic and Hydrophobic Textile Materials during Intermittent Exercise in Humans under the Influences of Warm Ambient Temperature with and without Wind  
Tokura H., Kozlowski R., Japan and Poland

Bio-Logical Non-textile Products from Flax and Hemp  
Kolodziejczyk P., Canada

Modification and Characterization of Natural Fibres for Reinforced Polymer  
Pinnow M., Fink H.-P., Germany

Natural Fibers Based Composites – An Commercial Approach to Replace Man Made Fibers  
Leao A., Caraschi J.C., Giacomini N.

Oriented Strandboard (OSB) Panels Made from Kenaf Stalks and Aspen  
Chow P., Bajwa D.S, USA

Sustainable Building Material Products from Bio Fibres  
Svennerstedt B., Sweden

New Generation of Ecological Polyester Laminates by using Natural Fibres  
Kicko-Walczak E., Grzywa E.

### **Scientific Session VII- Linseed**

Beneficial Effect of Linseed as a Source of Pharmaceutical and Dietetic products. The State-of-art  
Kozłowska J., Kozłowski R., Poland

Highlight on Functional Foods, with Special Reference to Flaxseed  
Al-Okbi S. Y., Egypt

Linseed and Hempseed Quality as Affected by N and P Supply  
Izsaki Z., Ivanyi I., Simandi P., Hungary

Impact of Feeding Bread Enriched with Flaxseed on Plasma Profile of Hyperlipidemic Rates.  
Doha A. M., El-Hariri D.M. and Al-Okbi S. Y., Egypt

**Scientific Session VIII - Bast Fibrous Plants in the World**

Activities on Bastfibres in Germany – Recent achievements and development potentials  
Tubach M., Germany

Fibre Flax Production in Lithuania  
Jankauskiene Z., Endriukaitis A., Bacelis K., Lithuania

**POSTER SESSION**

The Use of Molecular Markers in Flax (*Linum Usitatissimum*) Breeding  
Vromans J., Stam P., van Eck H., The Netherlands

Formation of Phloem Fibres in Flax (*Linum usitatissimum* L. c.v. Belinka) Plants  
Petrovska B., Kieft H., Ageeva M., Emons A.M.C., van Lammeren A.A.M., Slovak Republic

In Vitro Selection of Salt-resistant Mutant in Kenaf (*Hibiscus cannabinus* L.)  
Jie yucheng, Dai jianping, Xuying, Lunjuan, China

Genes, controlling flowers and seeds colour and shape in flax  
(history of investigations and present state of the problem)  
Porokhovina E.A., Brutch N.B., Russia

The Effect of Variety on the Flax Yield  
Kondic J., Nozinic M., Bosnia & Herzegovina, Republika Srpska

Mycotoxins in the Flax Seed Depending on the Growing Technologies  
Bjelkova, M., Hajslova, J., Hochman, M., Kralova, J., Nevrklova, M., Odstrcilova L., Schulzova V. Sypecka, Z.,  
Czech R.

Review of Harvesting Technologies for Hemp Grown for Seeds and the INF Technology of Mechanical Harvesting of  
Hemp Grown for Seeds  
Kaniewski R., Kozlowski R., Kubacki A., Poland

Contributions of INCDTP to the Development of the Mechanical and Enzymatic Processing Technologies for Bast Yarns  
and Fabrics  
Dan M., Iorga I-V, Popescu A., Visileanu E., Romania

Improvement of Spinnability of Elementarized Flax Fibres with Regard to Their Surface Properties  
Czekalski J., Binkowska B., Patejuk-Duda A., Sapieja A., Poland

Improving Quality of Linen and Linen-Containing Fabrics  
with Different Finishing Methods  
Csizsar E., Somlai P., Dornyi B., Hungary

Enzymatic Treatment of Bast Fibrous Plants, Fibres and By-Products  
Kozlowski R., Batog J., Konczewicz W., Poland

Significant Factors Influencing the Performances of Flax Fibres Reinforced  
Composite Materials Produced by Resin Transfert Molding  
Baley C., Breard J., Morvan C., Grohens Y., France

Flaxseed in National Lithuanian Medicine  
Jankauskiene Z., Lithuania

Fibre Flax and Hemp in the Czech Republic  
(Present Situation and Future)  
Smirous P., Hochman M., Czech Republic

Comparison of the Demand for Linen Clothes Made of Woven and Knitted Fabrics Based on the Sales Results of Pilot  
Production at the Institute of Natural Fibres  
Florysiak M., Muzyczek M., Poland

Project for the Cultivation of 100 000 Feddans of Flax  
Allam A., El-Hariri D. M., Egypt

**Note:** After the conference in Cairo, December 8-11, 2004 we have received several letters of congratulations due to the success of the event.

Here is a copy of the letter sent by the president of the National Research Centre in Cairo.

Prof. Dr. Ryszard Kozłowski, Network Coordinator, Director general of INF, Institute of Natural Fibres, ul. Wojska Polskiego 71b, 60-630 Poznan, Poland

Dear Professor Kozłowski,

Thank you for your nice letter. I am really delighted that your international conference on flax and other bast plants "Flax and allied fiber plants for human welfare" was held at National Research Centre –Egypt and it was really very successful conference so I am looking forward to continuous cooperation wishing you always luck and success. With best wishes,  
Prof. Dr. Hany El-Nazer, President of National Research Centre (NRC), January 2004, Dokki Cairo, Egypt.

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**Report on the Workshop on Evaluation of productivity, economic and agricultural values of fibre and linseed flax cultivars grown in Europe, organized under auspices of the FAO/SCORENA European Cooperative Research Network on Flax and Other Bast Plants, Working Group 1. Breeding and Plant Genetic Resources, which was held on June 20-21, 2003 at the Institute of Natural Fibres, Poznan, Poland**  
*Maria Mackiewicz-Talarczyk (M.Sc., Eng Agr) and Prof. Dr. Henryk Burczyk, Institute of Natural Fibres, Poznan, Poland. E-mail: netflax@inf.poznan.pl*

The Workshop was organized by the Institute of Natural Fibres (INF), Poznan, Poland, represented by Professor Henryk Burczyk and by the Coordination Centre of the FAO/SCORENA European Cooperative Research Network on Flax and other Bast Plants, represented by its coordinator Professor Ryszard Kozłowski, Director General of the INF, with the assistance of the Network Secretary - Maria Mackiewicz-Talarczyk, M.Sc.(Agr.).

The Workshop was aimed at:

- gathering of main flax breeders from European countries on the occasion of the 50<sup>th</sup> Anniversary of the INF's Experimental Farm in the village of Sielec Stary, known for its achievements in flax breeding,
- familiarizing with flax varieties cultivated in European countries, their productivity, economic and agricultural values as well as methods of the evaluation of the above parameters,
- initiating cooperation between the participants of the Workshop.

The Workshop has been attended by 64 experts from 13 countries of Europe and Asia: Belarus, Belgium, Bulgaria, Czech Republic, Egypt, Latvia, Lithuania, Northern Ireland, the Netherlands, Poland, Russia, Ukraine, United Kingdom. The event consisted of four scientific sessions at which 14 lectures and 12 posters were presented, as well as a study tour to the Experimental Farm at Sielec Stary.

The lectures have been presented by experts from Egypt (NRC, prof. D.M. El-Hariri), Czech Republic (Dr. M. Pavelek, AGRITEC), Belarus (Prof. Dr. I.A. Golub, Flax Institute), Bulgaria (Dr. A. Balabanova, AGROBIOINSTITUTE), Poland (Prof. Dr. K. Heller, Eng. G. Silska of INF and Dr. I. Bartkowiak-Broda, IHAR), Lithuania (Dr. Z. Jankauskiene, Upyte Research Station of LIA), Ukraine (Prof. Dr. I. Karpets, Institute of Agriculture of the Ukrainian Academy of Agrarian Sciences, Prof. Dr. V. Kovaliv, Institute of Agriculture "Polissya" and Dr. A. Shuvar, Institute of Agriculture and Stock Breeding), Russia (Dr. I. Uschapovsky, VNIIL), Latvia (Prof. Dr. I. Rashal, University of Latvia).

The oral presentations have described the evaluation of productivity, economic and agricultural values of fibre and linseed flax cultivars grown in those countries, the survey of applied breeding methods, development of the new flax varieties, the performance of Polish flax varieties tested in other countries, new system of seed-growing of highly productive varieties of flax, the use of pre-breeding material in breeding of flax varieties

The issue of photosynthates and energy production in different flax cultivars has been described as well.. The detailed list of the presentations is available from the Institute of Natural Fibres.

The most interesting presentations will be published in one of the next issues of the Journal of Natural Fibres.

Posters presented during the workshop concerned the following topics: flax genetic resources, situation of flax in Poland, Czech Republic and Lithuania, Polish and Russian collections and breeding programs, technological and agricultural values of Polish fiber flax cultivars, evaluation of Polish and other flax varieties in conditions of other countries, morphological characters as productivity markers for flax (*Linum usitatissimum* L.). Moreover, the poster presentations have dealt with such issues as genetic control of quality traits in fiber flax varieties, electron-microscopic study on cell membranes and organelles

of bast fiber in different genotypes of fiber flax, comparison of fatty acid composition in oil from linseed of different origin, genetic control systems of seed productivity and oil content in seeds from linseed cultivars. Some other detailed contributions to genetics and biotechnology of flax were included in the poster session as well.

Oral and poster presentations as well as discussions have pointed to a significant progress that occurred in the scope of fibre flax and linseed breeding during recent years. At the same time a growing need for more activities in genetics and breeding of flax was emphasized.

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### Summary about NAROSSA 2003

*Dr. Frank Pudel, ÖHMI Consulting GmbH, Berliner Chaussee 66, D-39114 Magdeburg, Tel: +49-391-8507-171, Fax: +49-391-8507-150, e-Mail: pudel@oehmi-consulting.de, www.oehmi-consulting.de*

On June 16<sup>th</sup> and 17<sup>th</sup> the 9<sup>th</sup> International Conference for Renewable Resources and Plant Biotechnology in a row NAROSSA 2003 took place in the beautiful ambience of a venerable park hotel in Magdeburg, Germany.

200 science, industry and political representatives from 7 different countries attended the conference.

An international program committee had set up varied programs with 2 plenary lectures, 50 lectures and 40 posters, structured into the following topics:

- Trends in plant biotechnology
- Combustion, gasification, fermentation
- Analytic, chemical modification
- Biofuels
- Materials
- Extraction of value and active substances
- Commodities
- Socioeconomic aspects, sustainability, market penetration.

Moreover, several companies and institutions were also represented on the accompanying exhibition.

The use of renewable resources demands for value added chains, beginning with the plant growing, cultivation and harvest, the production of by-products and the manufacture into products up to ecologically useful exploitation. Above all, NAROSSA 2003 was therefore a platform for people from different scientific, industrial and political sectors, who wanted to get talking to each other for joint projects.

All participants expressed very positive feelings on NAROSSA 2003 and many of them want to come back to Magdeburg for the next event.

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## STATISTICAL DATA ON FLAX

## FLAX CULTIVATED AREA [ha]

## Fiber Flax

	1998	1999	1999 [acres]	2000	2001	2002	2003
AUSTRIA	*635	*350	865	*450	*130	154 <sup>x</sup>	142 <sup>x</sup>
BELARUS	80000	***70000	172977	81800	o	o	o
BELGIUM	**11211	**12176	30024	****13355	****16990	15567 <sup>x</sup>	19250 <sup>x</sup>
BULGARIA	***58	***58	143	300	210	470	o
CHINA	***101000	***101000	249,581	o	o	o	o
CZECH REPUBLIC	4117	6348	15,687	6302-linseed; 2240-fibre flax	7095	5885	5900
DENMARK	*44	11	27	*45	*19	0 <sup>x</sup>	0 <sup>x</sup>
EGYPT**	14000	14500	25,831	o	o	o	o
ESTONIA	***323	115	o	240	27	30	o
FINLAND	613	850	2,100	*1016	*405	202 <sup>x</sup>	97 <sup>x</sup>
FRANCE	*43708	*49129	121,403	****55629	****67970	68416	74439 <sup>x</sup>
GERMANY	*416	*570	1,409	402*	*297	299 <sup>x</sup>	225
IRELAND	1*	o	o	o	****0	o	o
ITALY	o	o	o	o	****1	0 <sup>x</sup>	20 <sup>x</sup>
LATVIA	***2200	***2000	5,436	300-linseed; 1600-fibre flax	o	o	o
LITHUANIA	6500	8600	21,251	8600	9 600	9346	
NETHERLANDS	*3306	*3570	8,822	*4016	*4415	4000 <sup>x</sup>	4615 <sup>x</sup>
POLAND	2548	1223	3,022	4082	4900	4900	6000
PORTUGAL	*1500	4678*	11,560	****3522*	****0	0	o
RUSSIA	107340	104050	256,032	107 610	127 361	o	o
SPAIN	*87727	*122400	302,463	****13595	*342	60 <sup>x</sup>	2 <sup>x</sup>
SWEDEN	*320	*1327	3279	*21	****32	25	0
UKRAINE	31200	***21900	54,117	19300	28280	28200	o
UNITED KINGDOM	*16700	*14000	34,595	****11816	*4430	156 <sup>x</sup>	175 <sup>x</sup>

Total flax cultivated area in EU countries: in 2000 \*\*\*\*103867 ha, in 2001 \*\*\*\*94631ha, in 2002 : 88 885ha

Source: Data provided by relevant countries

\* / A. Daenkindt: Algemeen Belgisch Vlasverbond, Oude Vestingsstraat 15, B-8500 Kortrijk, Belgium

\*\* / D.M. El-Hariri, Dept. of Fibre Crops, NRC, Egypt

\*\*\* / FAOSTAT Statistical Database Results 1997 <http://apps.fao.org>

\*\*\*\* / Mr. Jordi Petchamé Ballabriga, Administrateur, Olives, huile d'olive et plantes textiles, D.G. VI.C.4 - Loi 130 7/126, European Commission, Rue de la Loi 200, B-1049, Bruxelles, Belgium

\*/54<sup>ème</sup> Congrès CELC – Berlin, Réunion d'information Générale / Section commune Culture-Teillage

*note : in all tables the mark % means data not available*

## LINEN MARKET/PRICES IN THE EU

**Prices of main products and by-products of flax in Belgium (similar as in other countries of the EU)**

Source: VLAS Berichten, the newspaper of the Algemeen Belgisch Vlasverbond, issue No: 20–24 Oktober, 2003, Oude Vestingsstraat 15, 8500 Kortrijk, Belgium, Director; Mr. Albert Daenekindt. The subscription of this newspaper can be ordered at the above address. Contact: fax: + 32/56/22 79 30, E-mail: bvlasverbond@skynet.be

**Scutched flax**

Water-retted		Dew-retted	
<b>long fibre</b>			
<b>Quality</b>	<b>Prices EURO/100kg</b>	<b>Quality</b>	<b>Prices EURO/100kg</b>
lower quality	up to 185.92	lower quality	111.55 – 161.13
medium quality	185.93 – 235.50,68	medium quality	161.14– 198.31
		better quality	198.32– 223.10
very good quality	235.51 – 260.29	very good quality	from 223.11
<b>short fibre</b>			
lower quality 12.40 – 16.10 EURO/100kg			
medium quality 16.11 – 22.30 EURO/100kg			
higher quality 22.31 – 27.25 EURO/100kg			
<b>by-products</b>			
<ul style="list-style-type: none"> <li>• wasted parts of the straw; dew retted price: up to 3.10 EURO/100kg</li> <li>• wasted parts of the straw price: 3.72 EURO/100kg</li> <li>• by-products from deseeding price: 2.48 EURO/100kg</li> <li>• short scutched fibre wastes: up to 9.92 EURO/100kg</li> <li>• shives used for particleboard production: from 0.74 EURO/100 kg</li> </ul>			

**EUROPEAN SUBSIDY FOR THE CULTIVATION OF FLAX AND HEMP**

Submitted by Dir. A. Daenekindt: Algemeen Belgisch Vlasverbond, Oude Vestingsstraat 15, B-8500 Kortrijk, Belgium

**1999**

Idem 1998 and 1997, with the exception that the amounts are no longer in terms of Ecu but Euro.

Subsidy per hectare (gross = net): **815,86 Euro** (25% farmer/75% scutcher).

**2000**

Subsidy per hectare (gross = net): **795,46 Euro** (25% farmer/75% scutcher).

**2001**

With the crop 2001 started a new and completely modified Common Organisation of the Markets in flax and hemp, containing a subsidy for the grower and a subsidy for the primary processor of the flax straw.

**1. Grower**

Flax and hemp are included in the subsidy system for some arable crops (including the obligation to lay fallow 10% of the arable crops area). Subsidy 2001 (basis) for fibre flax and hemp: 75,63 euro/ton. This amount has to be multiplied by the “historic yield for cereals” that has been fixed for each agricultural region. Belgium, for instance, has 13 different agricultural regions, and the subsidy amount for flax fluctuated between 509 and 275 euro per hectare.

**2. Primary processor (scutcher)**

A subsidy is given to the primary processor for the quantity of fibres that is produced:

- 100 euro per ton for long flax fibres;
- 90 euro per ton for short flax fibres and hemp fibres.

**3. Additional subsidy**

In some regions (Netherlands, Belgium and North of France) an additional subsidy is assigned to the fibre producer:

- for northern regions: 120 euro per hectare;
- in southern regions: 50 euro per hectare.

**2002**

Same system as for the crop 2001, but change of some subsidy amounts.

**1. Grower:** basis subsidy 63 euro/ton (instead of 75,63 euro);

**2. Processor (scutcher):**

- 160 euro per ton for long flax fibres;
- 90 euro per ton for short flax fibres and hemp fibres.

**3. Additional subsidy (NL/B/F)**

- for northern regions: 120 euro per hectare;
- in southern regions: 50 euro per hectare.

## COUNTRY DATA ON FIBRE FLAX

## BELARUS

	1995	1996	1997	1998	1999	2000
Cultivated area [ha]	96800	78500	73600			81800
Straw yield [t/ha]	2.80	2.80				
Long fibre yield [t/ha]	0.25	0.18				
Long fibre production [t]	15500	14.300				
Short fibre yield [t/ha]	0.36	0.44				
Short fibre production [t]	35100	34600				
Percentage of dew retting [%]	99.2	97.50				
Mill consumption of flax [t]	20800	23800				
Seed yield [t/ha]	0.24	0.30				
Yarn production [t] (wet + dry spinning)	16056	16600				
Production of textiles [1000 m]	35100	35800				
Particleboards production [m <sup>2</sup> ]	3000	2237				
Export of seed [t]	°	°				
Export of yarn [t]	°	–				
Export of fibre [t]	194000	18100				
Export of linen textiles (fabrics) [1000 m]	3900	1260				

sent by: S.P. Tkachev, A.V. Krugliakov, A. Lopatyniuk, BELINTERGROPROM, Minsk, Belarus (data from 1993-1995),  
P.P. Gulevich, Ministry of Agriculture of the Rep. of Belarus, Minsk, Belarus (1996)  
I.J. Jarmolovitch, Ministry of Statistics and Analysis of RB, Minsk, Belarus (2000)

## BULGARIA

	1996	1997	1998	1999	2000	2001	2002
Cultivated area [ha]	300	200	58	58	300	210	470
Straw yield [t/ha]	3.05	2.5				2.4	
Long fibre yield [t/ha]	°	°					
Long fibre production [t]	29	12	12			25	
Short fibre yield [t/ha]	°	°					
Short fibre production [t]	341	33	49			57	
Percentage of dew retting [%]	0	0					
Mill consumption of flax [t]	1471		697			116	
Seed yield [t/hm <sup>2</sup> ] [t/ha]	0.72	0.40					
Yarn production [t] (wet + dry spinning)	1045	456	398			84	
Production of textiles [1000 m]	2598	973	1935			1080	
Particleboards production [m <sup>2</sup> ]	0	0					
Export of seed [t]	0	0					
Export of yarn [t]	21	0					
Export of fibre [t]	0	0					
Export of linen textiles (fabrics) [1000 m]	257	350	577			600	
Export of cloth (1000 m <sup>2</sup> )	1095	405	639			903	
Import of fibre [t]	689	396	884			82	
Import of yarn [t]	40	°	50			3	
Import of textiles [1000 m]	°	°					
Import of seed [t]	°	°				16	
Import of linen cloth [1000 m]	°	°					

sent by: Dr. A. Balabanova, AgroBioInstitute, 2232 Kostinbrod-2, Bulgaria

## CZECH REPUBLIC

	1997	1998	1999	2000	2001	2002
Cultivated area [ha]	2155	4117	5348	6302	7095	5900
Harvested [ha]	2090	3719	5232	5911	5566	
Straw yield [t/ha]	3.19	3.01	3.34	2,36	3,23	
Long fibre yield [t/ha]	0.32	0.3	0,39	0,35	0,24	
Long fibre production [t]	1739	1235	2098	2235	1591	
Short fibre yield [t/ha]	0.53	0.5	0,53	0,42	0,44	
Short fibre production [t]	2586	1835	2797	2661	3141	
Percentage of dew retting [%]	100	100	100	100	100	
Mill consumption of flax [t]	17354	11200	17484	16811	18526	
Seed yield [t/ha]	0.51	0.51	0.56	0,50	0,5	
Yarn production [t] (wet + dry spinning)	4081	3850	4835	5301	4300	
Production of textiles [1000 m]	10166	12160	*	*	*	
Particleboards production [m <sup>2</sup> ]	31070		0	0	0	
Export of seed [t]	1100	730	1340	3421	2526	
Export of yarn [t]	1487	1202	1364	1839	1430	
Export of fibre [t]	168	100	90	267	207	
Export of linen textiles (fabrics) [1000 m]	8124	°	*	*	*	
Export of cloth (more than 85% linen) [t]	1705	1830	2138	2470	1996	
Export of cloth (less than 85% linen) [t]	211	180	184	264	183	
Import of fibre [t]	1516	2248	2925	3001	3303	
Import of yarn [t]	81	79	349	456	279	
Import of textiles [1000 m]	1354	°	*	*	*	
Import of seed [t]	40	771	561	449	356	
Import of linen cloth (more than 85% linen) [t]	289	16	512	609	514	
Import of linen cloth (less than 85% linen)[t]	58	28	76	103	78	

sent by: H. Suchomelová, P. Šmirous, S. Krmela, ATOK Praha, Flax Union CR, Šumperk-Temenice, Czech Republic

## ESTONIA

	1995	1997	1999	2000	2001	2002
Cultivated area [ha]	185	323	115	137 <sup>1)</sup>	27 <sup>1)</sup>	30
Straw yield [t/ha]	0,870	0,198	0,513	0,577	3,9 <sup>2)</sup>	
Long fibre yield [t/ha]						
Long fibre production [t]	°					
Short fibre yield [t/ha]						
Short fibre production [t]	°					
Percentage of dew retting [%]	°					
Mill consumption of flax [t]	°					
Seed yield [t/ha]	°0,373	0,303	0,513	0,212 <sup>1)</sup>		
Yarn production [t] (wet + dry spinning)	°					
Production of textiles [1000 m]	°-	10	3910	7070		
Particleboards production [m <sup>2</sup> ]	°					
Export of seed [t]	°	276	452	71	317 <sup>3)</sup>	
Export of yarn [t]	°34358	13868	50970	132339	99786 <sup>3)</sup>	
Export of fibre [t]	°399	454	236	1282	2002 <sup>3)</sup>	
Export of linen textiles (fabrics) [1000 m]	°					
Export of cloth [1000 m <sup>2</sup> ]	°17217	180	166217	249532	296539 <sup>3)</sup>	
Import of fibre [t]	33322	5123	62834	137460	148850 <sup>3)</sup>	
Import of yarn [t]	1662	886	19775	22568	6895 <sup>3)</sup>	

sent by: Mr. Einar Kikkas, Department of Agriculture, Ministry of Agriculture, Tallinn, Estonia

## FINLAND

	1997	1998	1999	2000	2001	2002	2003
Cultivated area [ha]	943	800	850	1067	405	202	97
Straw yield [t/ha]							
Long fibre yield [t/ha]							
Long fibre production [t]							°
Short fibre yield [t/ha]							°
Short fibre production [t]							°
Percentage of dew retting [%]	100	100	100	100	100		°
Mill consumption of flax [t]	300	300	300	300	300		°
Seed yield [t/ha]							°
Yarn production [t] (wet + dry spinning)							°
Production of textiles [1000 m]							°
Particleboards production [m <sup>2</sup> ]							°
Export of seed [t]							°
Export of yarn [t]							°
Export of fibre [t]							°
Export of linen textiles (fabrics) [1000 m]							°
Export of cloth (less than 85% linen)[t]							°
Import of fibre [t]							°
Import of yarn [t]							°
Import of textiles [1000 m]							°
Import of seeds [t]							°
Import of linen cloth (more than 85% linen) [t]							°
Import of linen cloth (less than 85% linen) [t]							°

sent by: Juha Pirkkamaa, Agropolis Ltd, Agropolis-Engineering, FIN-31600 Jokioinen, Finland

## LATVIA

	1996	1997	1998	1999	2000
Cultivated area [ha]	1240	1600	220/2200	200/2000	300/1600
Straw yield [t/ha]					
Long fibre yield [t/ha]	0.59	0.62	0.62	1.06	0.77
Long fibre production [t]	790	960	1340	2100	1100
Short fibre yield [t/ha]	°				
Short fibre production [t]	°				
Percentage of dew retting [%]	°				
Mill consumption of flax [t]					
Seed yield [t/ha]	0.33	0.23	0.30	0.29	0.32
Yarn production [t] (wet + dry spinning)	°				
Production of textiles [1000 m <sup>2</sup> ]	623	606	411	545	262
Particleboards production [m <sup>2</sup> ]	°				
Export of seed [t]	-	-	-	-	0.0
Export of yarn [t]	136.8	739.2	632.7	790.9	829.4
Export of fibre [t]	362.8	913.2	844.8	830.7	679.5
Export of linen textiles (fabrics) [%]	...	...	...	...	...
Export of cloth [1000 m <sup>2</sup> ]	....	516.3	1584.5	1613.9	2911.4
Import of fibre [t]	438.6	2002.3	1786.3	2087.0	1715.0
Import of yarn [t]	15.9	36.5	465.7	360.2	794.4
Import of textiles [1000 m]	...	...	...	...	...
Import of seed [t]	104.7	135.0	82.6	159.7	128.5
Import of linen cloth [1000 m]	...	259.3	221.0	264.6	480.9

sent by U. Apels, Department of Information, Ministry of Agriculture of the Republic of Latvia, Republic Sq. 2, Riga, LV-1981,

## LITHUANIA

	1997**	1998	1999**/	2000**/	2001	2002
Fibre Flax Cultivated area [ha]	6100	6500	8 800	8 600	9600	9346
Fibre Flax Harvested area [ha]					3637	6154
Straw yield [t/ha]	3.1	3.4	1,8	3,2	3,8	3,6
Long fibre yield [t/ha]	0.33	0.36	0,20	0,34	0,38	0,37
Long fibre production [t]	2030	2300	1 720	2 900	1400	2300
Short fibre yield [t/ha]	0.50	0.54	0,30	0,50	0,59	0,57
Short fibre production [t]	3033	3500	2 580	4 300	2130	3500
Percentage of dew retting [%]	100	100	100	100	100	100
Mill consumption of flax [t]	5063	5800	4 300	7 200		7000
Seed yield [t/ha]	0.47	0.43	0,42	0,31	0,35	0,39
Yarn production [t] (wet + dry spinning)	2917		3 128	2 735		
Production of textiles [1000 m]	11781		20 000	17 700		
Particleboards production [m <sup>2</sup> ]	–					
Export of seed [t]	–					
Export of yarn [t]	204		219	162		
Export of fibre [t]	199			9 380		
Export of linen textiles (fabrics) [1000 m]	76					
Export of cloth (1000 m <sup>2</sup> )	9098		15 800	14 486		
Import of fibre [t]	1399			8 385		
Import of yarn [t]	3					
Import of textiles [1000 m]	1					
Import of seed [t]	0	10			35	
Import of linen cloth [1000 m]	–					

sent by: \*/ calculated data

sent by: \*\*/ O. Juknevičienė, Minist. of Agricul., Dep. of Strategy of Plant Production, Prospekt Gedimino 19, Vilnius, Lithuania; completed by Dr. Director Algimantas Endriukaitis, LIA – The Lithuanian Institute of Agriculture Upyte Research Station, Linininku 3, Upyte, 38 294 Panevezys Distr., LITHUANIA

## POLAND

	1998	1999	2000	2001	2002	2003*
Cultivated area [ha]	2548	1223	4082	4900	4900	6000
Straw yield [t/ha]	2.93	2.64	2.3°	2.16	2.2	3.89
Total fibre yield [dt/ha]	4.1	3.7	3.2	3.2	3.3	5.8
Long fibre production [dt]	6480	7664	8777	10454	10780	23200
Short fibre production [dt]	3240	3832	4388	5226	5390	11600
Percentage of dew retting [%]	100	100	100	100	100	100
Mill consumption of flax [t]	5074.8	1882	2321°	°6123	6880	6760
Seed yield [t/ha]	0.7	0.6	°	°	°	0.4
Yarn production [t] (wet + dry spinning)	3024	889	1362°	°5950	6669	7400
Production of textiles [1000 m]	7658	4607	4563°	3953°	4380	4500
Particleboards production [m <sup>2</sup> ]	°	°	°	°	°	°
Flax/Hemp Export of seed [t]	°	°	°	°	°	39/1
Flax/Hemp Export of yarn [t]	458	°	°	°	°	3800/2
Flax/Hemp Export of fibre [t]	°	°	°	°	°	820/12
Export of linen textiles (fabrics) [1000 m]	4875	4480	3241°	°2371	°2550	3100
Export of cloth [1000 m <sup>2</sup> ]	°	0	°	°	°	°
Flax/Hemp Import of fibre [t]	2052	803	°	°	°	3790/24
Flax/Hemp Import of yarn [t]	339	345	°	°	°	840/1
Import of textiles [1000 m]	°	0	°	°	°	867
Import of seed [t]	°	0	°	°	°	3967/319
Import of linen cloth [1000 m]	°	°	°	°	°	°

Source: H. Smarzynski, Polish Flax Foundation, Institute of Natural Fibres, Poznan, Poland (to 1999)

\*/ estimated data; \*\*/ in 1000m<sup>2</sup>; / includes rural fibre produced in 1997 and 98. Data from 2000-2003 by Polish Flax and Hemp Chamber. Year 2003; data in fields 1-11-prognosis by Polish Flax and Hemp Chamber, 12-22-data for 9 months of 2003 acc. to data of the Ministry of Agriculture and Rural Development and of Ministry of Economy.

## RUSSIA

	1996	1997	1998	1999	2000	2001
Cultivated area [ha]	153460	113860	107340	104050	107610	127 361
Straw yield [t/ha]	1.74	0.95	1.43	1.02	2.11	
Long fibre yield [t/ha] <sup>1</sup>	0.43 <sup>4</sup>	0.25 <sup>4</sup>	0.43 <sup>4</sup>	0.36 <sup>4</sup>	0.55 <sup>1</sup>	
Long fibre production [t] <sup>1</sup>	58990 <sup>2</sup>	23400 <sup>2</sup>	33540 <sup>2</sup>	23700 <sup>2</sup>	51170 <sup>2</sup>	58000 <sup>2</sup>
Short fibre yield [t/ha]	°	°				
Short fibre production [t]	°	°				
Percentage of dew retting [%]	°	°				
Mill consumption of flax [t]	°	°				
Seed yield [t/ha]	0.14	0.13	0.08	0.10 <sup>5</sup>	0.17	
Yarn production [t] (wet + dry spinning) single -thread yarn	36632 <sup>3</sup>	31565 <sup>3</sup>	17093 <sup>3</sup>	20108 <sup>3</sup>	19806 <sup>3,4</sup>	16787
Production of textiles [mln m <sup>2</sup> ]	111	105	68.8 <sup>1</sup>	90.4 <sup>2</sup>	113 <sup>4</sup>	98.4
Particleboards production [m <sup>2</sup> ]	°	°				
Export of seed [t]	0.2	–	49			
Export of yarn [t]	212	906	433			
Export of fibre [t]	181	1934	969			
Export of linen textiles (fabrics) [1000 m]	12829 <sup>3</sup>	13932 <sup>3</sup>	30214 <sup>3</sup>			
Export of cloth [1000 m <sup>2</sup> ]	–	–				
Import of fibre [t]	6764	11932 <sup>3</sup>	11682			
Import of yarn [t]	49	570	456			
Import of textiles [1000 m]	4782 <sup>3</sup>	5692 <sup>3</sup>	61365 <sup>3</sup>			
Import of seed [t]	24	19	147			
Import of linen cloth [1000 m]	°	°	°			

sent by: Alexander Goncharov, Deputy Chief Of Department Of Foreign States Statistics And International Cooperation  
Goskomstat Of Russia, Moscow, Russia

<sup>1/</sup>for 1 ha harvested area; <sup>2/</sup>data for long fibred flax; <sup>3/</sup>unifilar linen production, <sup>4/</sup>data for I-X/2001

## UKRAINE

	1996	1997	1998	1999	2000	2001	2002
Cultivated area [ha]	54500	39975	31200	21 900	1930	28200	28200
Straw yield [t/ha]	2.08	1,9	2,4		2.4	2.6	2.4
Long fibre yield [t/ha]	0.10	0.12	0.155		0.19	0.18	0.15
Long fibre production [t]	5440	4680	4836		2509	5076	4323
Short fibre yield [t/ha]	0.22	0.17	0.205		0.29	0.34	0.29
Short fibre production [t]	11900	6196	6396		5597	8598	8357
Percentage of dew retting [%]	100	100	100		100	100	
Mill consumption of flax [t]	17000						
Seed yield [t/ha]	0.18	0.15	0.18		0.29	0.30	0.28
Yarn production [t] (wet + dry spinning)	7630						
Production of textiles [1000 m]	19.80*						
Particleboards production [m <sup>2</sup> ]	90						
Export of seed [t]	°						
Export of yarn [1000 \$ USA]	353						
Export of fibre [t]	°						
Export of linen textiles (fabrics) [1000 \$ USA]	2813						
Export of cloth [1000 m <sup>2</sup> ]	°						
Import of fibre [t]	°						
Import of yarn [t]	°						
Import of textiles [1000 m]	°						
Import of seed [t]	°						
Import of linen cloth [1000 m]	°						

sent by Prof. Dr. :I. Karpets, Agriculture Institute of Ukrainian Academy of Agrarian Sciences, Chabany, Ukraine  
\*/ in mln m<sup>2</sup>

## STATISTICAL DATA ON LINSEED

## LINSEED AREA HARVESTING [ha]

Linseed Area Harv [ha]	Year	
	1999	
<b>Total World</b>	<b>3,489,786</b>	
<b>Total Europe</b>	<b>598,111</b>	
<b>Linseed Area Harvesting in Individual Countries (ha)</b>		
Afghanistan	39,000	
Argentina	101,000	
Australia	4,400	
Bangladesh	69,820	
Belarus	70,000	
Belgium-Luxembourg	10,000	
Brazil	17,000	
Bulgaria	58	
Canada	811,500	
Chile	1,000	
China	570,000	
Croatia	15	
Czech Republic	2,017	
Ecuador	75	
Egypt	15,000	
Eritrea	3,000	
Estonia	323	
Ethiopia	71,000	
France	44,500	
Germany	110,048	
Hungary	200	
India	930,000	
Iran, Islamic Rep of	744	
Iraq	590	
Italy	1,000	
Kazakhstan	50,000	
Kenya	900	
Latvia	2,200	
Lithuania	6,100	
Mexico	2	
Nepal	55,000	
Netherlands	4,000	
New Zealand	500	
Pakistan	7,974	
Poland	3,724	
Romania	2,504	
Russian Federation, in 1997 – 92,360; in 1998 – 60,500	61,250*	
Slovakia	322	
Spain	91,000	
Sweden	14,100	
Tunisia	2,200	
Turkey	300	
Ukraine	26,000	
United Kingdom	101,000	
United States of America	135,170	
Uruguay	2,500	
Uzbekistan	3,000	

Source: FAOSTAT Database Results – <http://apps.fao.org>

\* A. Surinov, General Director, State Commit. of the Rus. Federat. on Statist., (GOSKOMSTAT of Russia),  
Dep. of Foreign States Statistics and  
Intern. Cooper., Moscow, Russia

## STATISTICAL DATA ON LINSEED (FLAXSEED)

Data about linseed cultivation area, provided by certain countries:

<b>Czech Republic</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
Cultivated area [ha]	600	646	2251	1700	3280	2385

sent by: H. Suchomelová, P. Šmirous, S. Krmela, ATOK Praha, Flax Union CR, Šumperk-Temenice,  
Czech Republic

<b>Finland</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Cultivated area [ha]	2207	2051	2079	1372	1558

sent by: Juha Pirkkamaa, Agropolis Ltd, Agropolis-Engineering, FIN-31600 Jokioinen, Finland

<b>Latvia</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Cultivated area [ha]	1600	220	200	300	

sent by U. A: pels, Department of Information, Ministry of Agriculture of the Republic of Latvia,  
Republic Sq. 2, Riga, LV-1981,

<b>Russia</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Cultivated area [ha]	92360	60500	62000	87630	

Sent by: Alexander Goncharov, Deputy Chief Of Department Of Foreign States Statistics and  
International Cooperation Goskomstat Of Russia, Moscow, Russia

## STATISTICAL DATA ON INDUSTRIAL HEMP

## HEMP HARVESTED AREA

Fibre Hemp Area Harvested [ha]	Year			
	1996	1997	1998	1999
Bulgaria		48	8	8
Canada	0***	0***	2000***	1200***
Chile	4,200	4,200	4,200	4,200
China	58,000***	15,000	15,000	15,000***
Croatia	14	14	14	14
Hungary	1,200***	900***	1,077	1,077
Korea, Dem People's Rep	17,000	17,000	17,000	17,000
Korea, Republic of	250	250	250	250
Romania	1,000***	2,000***	3,080	3,000***
Russian Federation	11,490*	9,490*	6260*	10,230*, 16,980*in 2000
Ukraine	4,000***	3,500***	2,000	2,000
Yugoslavia, Fed Rep of	679	1,000***	1,000***	1,000***

Source: FAOSTAT Database Results – <http://apps.fao.org>

\*A. Surinov, General Director, State Commit. of the Rus. Federat. on Statist., (GOSKOMSTAT of Russia), Dep. of Foreign States Statistics and Intern. Cooper., Moscow, Russia

\*\*H. Smarzynski, Polish Flax Foundation, Institute of Natural Fibres, Poznan, Poland

\*\*\*Michael Dr. Karus, nova –Institut für politische und ökologische Innovation, Nachwachsende Rohstoffe, Thielstr. 35, 50354 Hürth Germany

## HEMP HARVESTED AREA IN EUROPEAN UNION COUNTRIES AND IN POLAND

COUNTRY OF EU	Fibre Hemp Area Harvested [ha]					
	1996*	1997*	1998*	1999*	2000/2001**	2002*
Austria	661	938	974	289	287	277
Belgium			0	1	0	0
Denmark			26	23	7	0
Finland	2	53	1218	93	59	0
France	7588	10980	9682	9515	7700	7729
Germany	1362	2766	3553	3993	2967	2035
Italy	0	0	255	197	151	300
Ireland	0	23	28	22	6	0
Luxembourg	5	13	13	0	0	0
Netherlands	893	1322	1055	872	806	2100
Portugal			770	185	4	0
Spain	1450	4828	19860	13473	6103	691
Sweden					0	0
UK	1697	2293	2556	1517	2245	1413
Switzerland	150	200	250	250	250*	
<b>Total area in EU</b>	<b>*13658</b>	<b>*23216</b>	<b>*39990</b>	<b>*30179</b>	<b>**20404</b>	<b>**14584</b>
Poland –data by CSO	200	300	100	100	200	83 In 2003– 101 ha

Source: \*Michael Dr. Karus, nova –Institut für politische und ökologische Innovation, Nachwachsende Rohstoffe, Thielstr. 35, 50354 Hürth Germany

\*\*Mr. Jordi Petchamé Ballabriga, Administrateur, Olives, huile d'olive et plantes textiles, D.G. VI.C.4 - Loi 130 7/126, European Commission, Rue de la Loi 200, B- 1049, Bruxelles, Belgium

## RUSSIA, HEMP CULTIVATION IN RUSSIAN FEDERATION IN 1995-1999

Year	Hemp cultivated area in Russia	Summary output of hemp fibre
	Total [ha]	[tonnes]
1995	9170	4300
1996	11490	4030
1997	9490	2980
1998	6260	2190
1999	10230	4140
2000	16980	7070

sent by: A. Surinov, General Director, State Commit. of the Rus. Federat. on Statist., (GOSKOMSTAT of Russia), Dep. of Foreign States Statistics and Intern. Cooper., Moscow, Russia

## Future plans

2004

**10 International Conference for Renewable Resources and Plant Biotechnology NAROSSA® 2004**, June 07 -08, 2004. Magdeburg, Germany. Contact person: Dr. Frank Pudel, ÖHMI Consulting GmbH, Berliner Chaussee 66, D-39114 Magdeburg, Tel: +49-391-8507-171, Fax:+49-391-8507-150, E-mail: pudel@oehmi-consulting.de, www.oehmi-consulting.de. The event is conducted in conjunction with the international Fair (7-9.06.2004) and the European Technology-Brokerage (Contact: Helga Ilchmann, E-mail: ircpost@tti-md.de)

**3rdGLOBAL WORKSHOP (GENERAL CONSULTATION) OF THE FAO EUROPEAN COOPERATIVE RESEARCH NETWORK ON FLAX AND OTHER BAST PLANTS, entitled: “BAST FIBROUS PLANTS FOR HEALTHY LIFE”, October 24-28, 2004, in Banja Luka, Bosnia and Herzegovina, Republika Srpska.**

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Organizers: **Institute of Natural Fibres (INF), Coordination Centre of the FAO European Cooperative Research Network on Flax and other Bast Plants, ul. Wojska Polskiego 71b, 60-630 Poznań, Poland, T: +48 61/ 84 80 061, F: +48 61/ 84 17 830, E-mail: netflax@inf.poznan.pl**

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**Secretary of the Network – Maria Mackiewicz-Talarczyk M.Sc. (Agr.)**

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