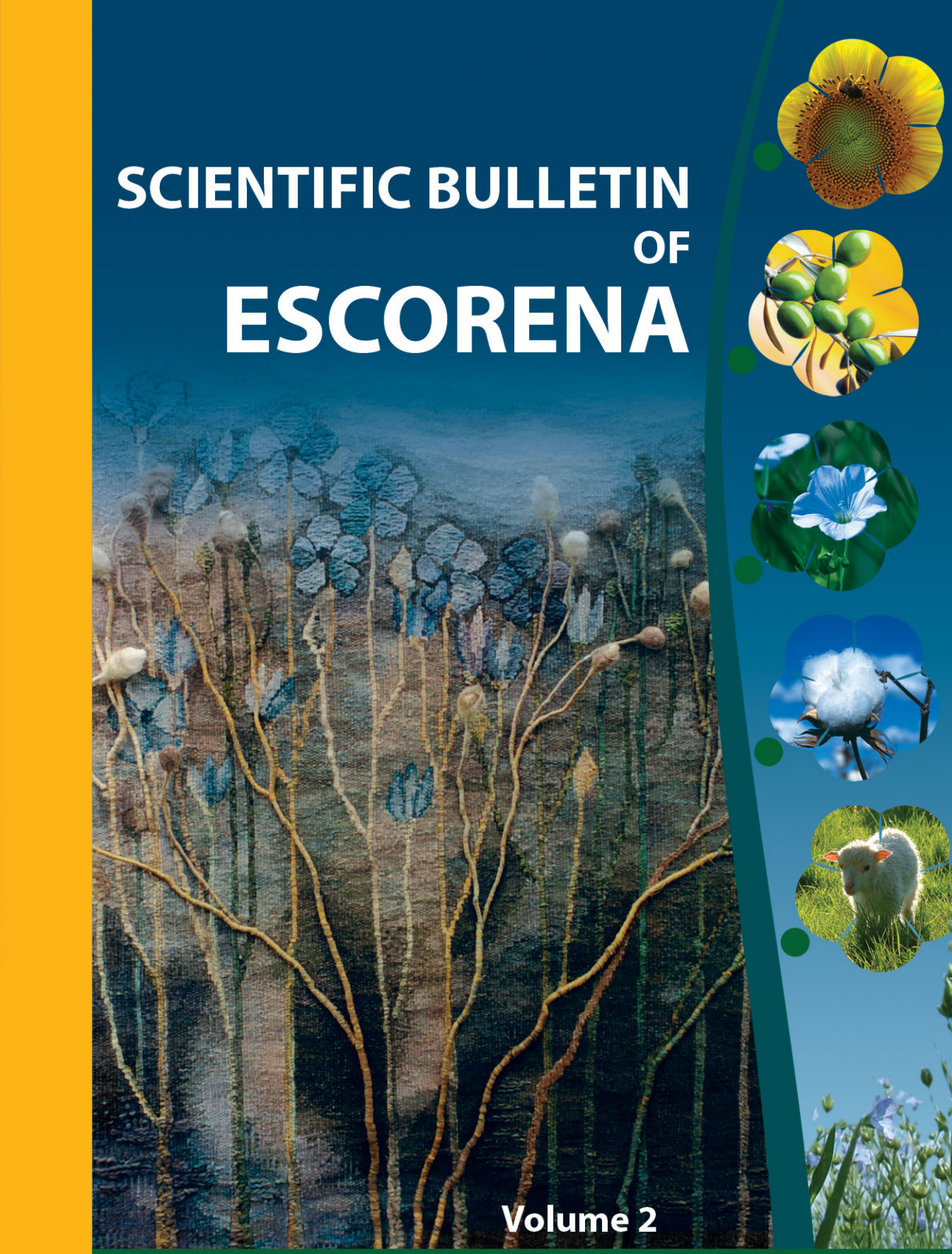
SCIENTIFIC BULLETIN OF ESCORENA



Volume 2

ESCORENA *European System of Cooperative Research Networks in Agriculture*

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Sectoral Operational Programme "Increase of Economic Competitiveness"

"Investing for your future"

PRIORITY AXIS 2 - Research, Technological Development and Innovation for Competitiveness
Operation 2.1.2: "Complex research projects fostering the participation of high-level international experts"
"Bast Plants - Renewable Strategic Resources for European Economy"

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Contents

Dear Readers! Dear Coordinators of ESCORENA Networks,

With great pleasure we announce the next volume of Scientific Bulletin of ESCORENA to report on activities of the nineteen Networks cooperating within ESCORENA System (European System of Cooperative Research Networks in Agriculture). The history and objectives of ESCORENA are presented in this volume. The volume 2 of the Bulletin will present the activities of the first group of the thematic knowledge Networks within ESCORENA.

The entire list of the Networks include:

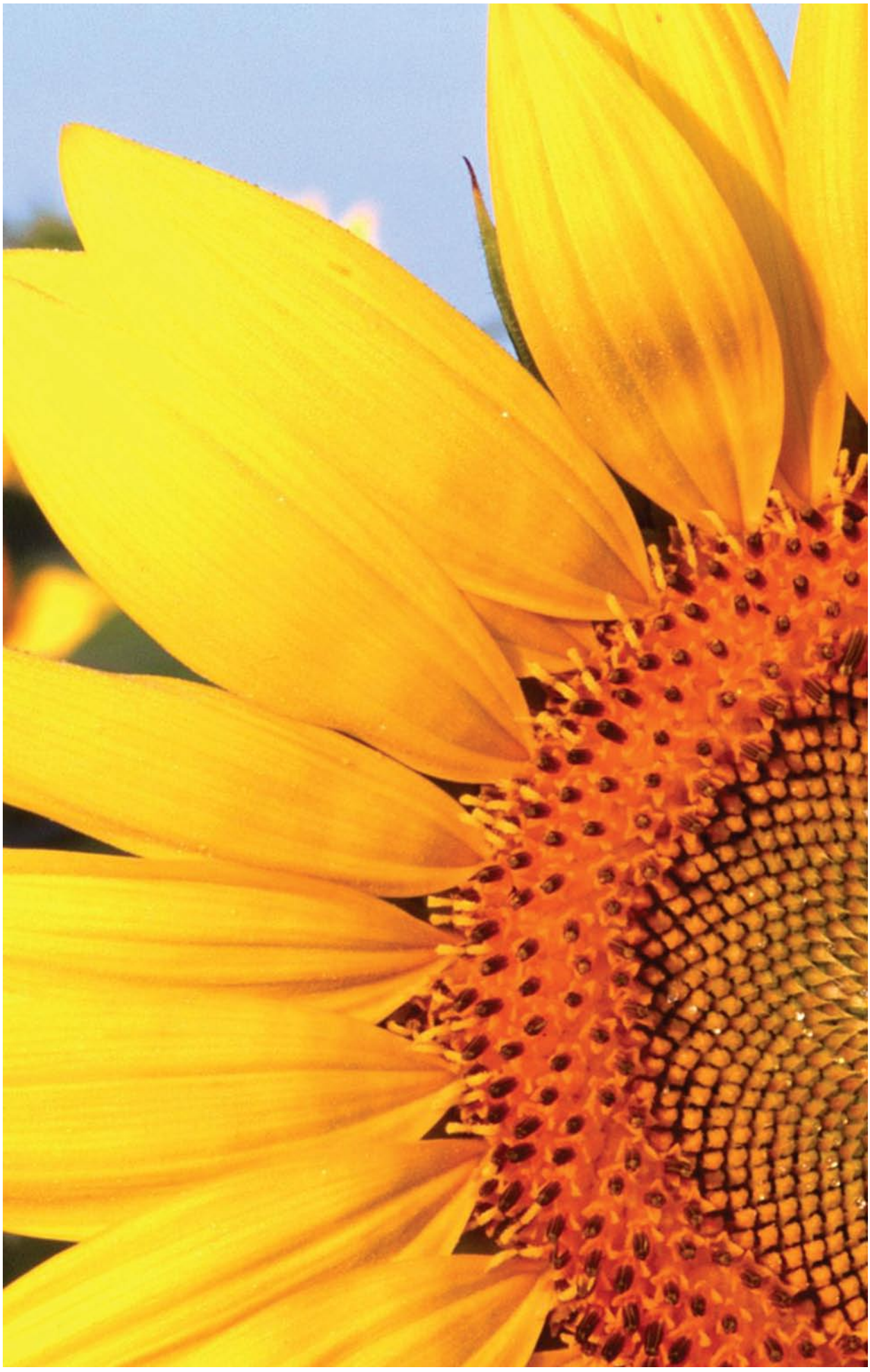
- *Agromarketing Network, coordinated by Belarus*
- *Apricot Network, coordinated by Armenia*
- *Buffalo Network, coordinated by Italy*
- *CENTAUR, Biomedical Technology, Epidemiology and Food Safety Global Network, coordinated by Czech Republic*
- *Cotton Network, coordinated by Greece*
- *Farm Animal Welfare (FAW), coordinated by Slovak Republic*
- *Flax and other Bast Plants Network, coordinated by Poland*
- *NACEE, Aquaculture Centres in Central, Eastern Europe, coordinated by Hungary*
- *NCDN, Capacity Development in Nutrition.*
  Thematic Knowledge Network Central and Eastern Europe, coordinated by Croatia
- *Network of Museums in Agriculture within International Association of Agricultural Museums (AIMA)*
- *Nut Network, coordinated by Spain*
- *Olives Network, coordinated by Spain*
- *Organic Edunet, coordinated by Greece*
- *Pastures & Fodders Network, coordinated by Belgium*
- *RAMIRAN (Recycling of Agricultural, Municipal and Industrial Residues in Agriculture), coordinated by United Kingdom*
- *Rice Network, coordinated by Italy*
- *Sheep and Goat Network, coordinated by France*
- *SREN (Sustainable Rural Environment and Energy) Network–coordinated by Germany*
- *Sunflower Network, coordinated by Serbia*

As you see, our Networks are connected with progress and sustainability in area of agriculture and agriculture industry. We do hope that ideas presented in this bulletin will inspire better serving to development of mentioned above areas.

Thanks to Romanian Government, Prof. Dr. Lizica Mihut – the Rector of the "Aurel Vlaicu"University in Arad and assistant Prof. Dr. Cecilia Sirghie of this University – the Deputy Coordinator of the European Cooperative Research Network on Flax and other Bast Plants, we have opportunity to print the Scientific Bulletin of ESCORENA. The financial support derives from the project: POS-CCE 210/2010: Acronim „BASEURES": "Bast Plants- Strategic Resources for European Economy", led by the "Aurel Vlaicu" University in Arad with my involvement in the project coordination. Also we would like to emphasize the important role of Mr. Michal Demeš, Information and Knowledge Management Officer of the FAO Regional Office for Europe and Central Asia (REU), Budapest in encouraging and mobilizing to the more effective work the thematic knowledge networks and us at the ESCORENA focal point.

On behalf of the Scientific Committee we will be grateful for expressing your comments and ideas regarding possible ESCORENA improvements.

Editor-in-chief Prof. Dr. Ryszard M Kozlowski,
ESCORENA Focal Point Coordinator
at the Institute of Natural Fibres & Medicinal Plants, Poznan, Poland



ESCORENA- Background, history and objectives

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Abstract:

ESCORENA (European System of Cooperative Research Networks in Agriculture) created under auspices of the FAO- FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. The paper presents the background, history and objectives of the ESCORENA. Focal Point of ESCORENA is coordinated since 2008 by the Institute of Natural Fibres & Medicinal Plants, Poznan, Poland- which acts an s the coordination center of the FAO/ESCORENA European Cooperative Research Network on Flax and other Bast Plants.

Keywords - ESCORENA, FAO, networks.

INTRODUCTION

The History of ESCORENA

The Seventh and Eighth FAO Regional Conferences for Europe held in Budapest, Hungary, 1971 and in Munich, Germany, 1973, respectively, discussed the role of FAO in agricultural research in Europe and recommended the establishment of a system of voluntary research cooperation under the aegis (auspices) of FAO.

These recommendations were based on the principle that in a period of rapid technological and scientific development, it was difficult for any one institution or country to undertake all necessary scientific research on any given subject matter.

The Seventh and Eighth FAO Regional Conferences for Europe recommended the basic purpose and main objectives of the system, namely to:

Promote voluntary exchange of information and experimental data on selected subject matters;

Support joint applied research on selected subject matters of common interest according to an accepted methodology, agreed division of tasks and timetable;

Facilitate voluntary exchange of persons, Germplasm and technologies;

Establish close links between European researchers and institutions working on the same subject and to stimulate interaction;

Accelerate the transfer of European technology advances to, and cooperation with, developing countries. [1]

The ESCORENA system has been supervised, promoted, sponsored by the FAO Regional Office for Europe, Rome, Italy. Since 2007, the new approach has been realized by Mr. Michal Demeš, Information and Knowledge Management Officer of the FAO Regional Office for Europe and Central Asia (REUT), Budapest, Hungary, namely, to provide the better ESCORENA Networks visibility on the base of the web communication, provided by FAO. The relevant website of ESCORENA system, created due to FAO initiative, funds and encouragement can be found at the address: http://www.escorena.net. [2]

Moreover, the Networks coordinators, gained a new chance to meet, discuss and revitalize the co-operation within ESCORENS system thanks to the European Regional Workshop on Internet-based communication support for ESCORENA Thematic Knowledge Networks in Agriculture, hold at the Institute of Natural Fibres, Poznan, Poland, 10-12 April 2008. Workshop supported by FAO/Budapest with kind acceptance and support of Mrs. Mária Kadleèiková, Regional Representative, FAO Regional Office for Europe and Central Asia (REUT), with an involvement of the Dr. Stephen Rudgard, KCEF, FAO, Rome and the IT department.

Ms. Nevena Alexandrova supports the activities of ESCORENA; in 2009 she was recruited as FAO Agricultural Research and Biotechnology Officer at REUT, FAO Budapest; molecular biologist by background, with more than 12 years of experience in agricultural research, research management, science communication and

informationsharing.

The member countries and participants discussed and accepted that the ESCORENA system would be coordinated on the base of an ESCORENA focal point since 2008 by the Institute of Natural Fibres & Medicinal Plants (INF&MP), Poznan, Poland - which acts as the coordination center of the FAO/ESCORENA European Cooperative Research Network on Flax and other Bast Plants.

Let us inform you that, following the Decree of the Minister of Agriculture and Rural Development in Poland issued on 19th December 2008, the Institute of Natural Fibres and the Research Institute of Medicinal Plants merged and formed the new organization called the Institute of Natural Fibres & Medicinal Plants on 1 January 2010.

Prof. Dr. Ryszard Michal Kozlowski accepted the honorable task to coordinate the activity of ESCORENA system focal point with a help of ESCORENA Secretary- Mrs. Maria Mackiewicz-Talarczyk and web support provided by Dr. Jorge Barriga-Bedoya. This activity of the Institute of Natural Fibres & Medicinal Plants have gained the approval of the local authorities (in 2008 by Mr. Arkadiusz Blochowiak, deputy Marshal -Honorary member of ESCORENA), by: the Ministry of Agriculture and Rural Development of Poland, advisor of the President of Poland Dr. J.K. Ardanowski as well. [2], [5].

II The Networks within ESCORENA (19)

- Agromarketing Network, Belarus
- Apricot Network-coordinated by Armenia
- Buffalo Network- coordinated by Italy
- CENTAUR-Veterinary Biotechnology, Epidemiology and Food Safety Network - coordinated by Czech Republic
- Cotton Network- coordinated by Greece
- Farm Animal Welfare (FAW)- coordinated by Slovak Republic
- Flax and other Bast Plants Network- coordinated by Poland
- NACEE- Aquaculture Centres in Central-Eastern Europe - coordinated by Hungary
- NCDN-Capacity Development in Nutrition.
  Thematic Knowledge Network Central and Eastern Europecoordinated by Croatia
- Network of Museums in Agriculture within International Association of Agricultural Museums (AIMA) [3]
- NUT Network - coordinated by Spain
- Olives Network- - coordinated by Spain
- Organic Edunet-coordinated by Greece
- Pastures & Fodders Network- coordinated by Belgium
- RAMIRAN (Recycling of Agricultural, Municipal and Industrial Residues in Agriculture) - coordinated by United Kingdom
- Rice Network- coordinated by Italy
- Sheep and Goat Network- coordinated by France
- SREN (Sustainable Rural Environment and Energy) NETWORK – coordinated by Germany
- Sunflower Network- coordinated by Serbia

III Publications of the escorena networks

Publications constitute a major vehicle for exchange of scientific information and the dissemination of research results. ESCORENA networks issue the following publications:

- a scientific refereed journal, Helia, published by the Sunflower Network;
- network journals (Herba and Olea) published by the Pastures and Fodder Crops and Olive Networks respectively;
- newsletters: Buffalo, Medoryzae, Nucis and Sheep and Goat Contact, Euroflax and Journal of NaturalFibers (published by Taylor & Francis) – of the Flax and other Bast Plants Network. [1], [5].

The ESCORENA system has got the bulletin since June 2009: Scientific Bulletin of ESCORENA, ISSN 2066 - 5687, bi-annual journal aiming to provide the information about the achievements and activity of the Networks within the ESCORENA system. The publisher and sponsor is the "Aurel Vlaicu University" in Arad, Romania, which gained the relevant funds due to the project: Project POS-CCE 210/2010: ACRONIM „BASEURES": "Bast Plants-Strategic Resources for European Economy".

IV JOINT APPLIED RESEARCH within the netowrks

According to information received from the Secretariat, several joint projects have been developed as a

result of the Networks meetings. Some of these projects were financed by European programs.

Particular results were obtained in the joint research programs, exchange of germplasm, in collection, conservation and utilization of plant genetic resources, sustainable management of natural resources, diversification of agricultural production (e.g. use of marginal lands for non-food agricultural production, such as flax and industrial hemp in industrially polluted areas) and in the development of sustainable production systems including improvements in quality of typical local products in support of rural employment and improvements in the economic position of rural population. Note activities of the Gene Bank of flax, hemp, linseed and a Bank of Natural Fibres at the Institute of Natural Fibres and Medicinal Plants, Poznan, Poland [1], [5], [6].

V COOPERATION WITH DEVELOPING COUNTRIES AND TRANSFER OF TECHNOLOGY ADVANCES

Cooperation with developing countries was carried out in the form of direct participation of 12 Near East countries in interregional networks, attendance of some representatives from other regions at network meetings and distribution of publications to institutions and individual researchers from developing countries in Latin America and Asia. [1]

VI COOPERATION WITH OTHER INTERNATIONAL ORGANIZATIONS

The signature of agreements between FAO and CIHEAM regarding the joint sponsorship of interregional research networks on Nuts, Pastures and Fodder Crops and Sheep and Goats, was an important step towards associating other international organizations in ESCORENA activities.

The cooperation between the Olive Network and the International Olive Oil Council (IOOC) continued during the period under review. It contributed to the broader participation of countries from the Mediterranean basin in the Network activities.

Cooperation with European and global INGOs active in technical areas covered by ESCORENA, has been maintained and in some cases further improved. A number of events has been jointly organized with relevant INGOs, such as EAAP, EGF, ICAC, ICAR, ISHS, ISO[1] and others.

[2] European Association for Animal Production (EAAP), European Grassland Federation (EGF), International Cotton Advisory Committee (ICAC), International Committee for Animal Recording (ICAR), International Society for Horticultural Science (ISHS) and International Sunflower Organization (ISO). [1]. The fibre ESCORENA Networks co-operated with FAO in the scope of preparations of the very successful International Year of Natural Fibres (IYNF) 2009, which aimed was to raise awareness of natural fibres, to promote efficiency and sustainability of the natural fibres, and to foster an effective international partnership among the various natural fibres industries. [4]

Moreover on 03.02.2010 Discover Natural Fibre Initiative was founded in Düsseldorf, Germany. CCI –The member organizations of the IYNF (International Year of Natural Fiber) Steering Committee will continue their cooperation as the DNFI (Discover Natural Fiber Initiative) beyond the year 2009. DNFI is an alliance of key international natural fiber associations/organizations including CCI, IWTO, ICAC, Bremen Cotton Exchange, ITMF and many others. Henrik Kuffner, Director General of IWTO, was elected as committee chair for the year 2010. The DNFI builds on the achievements of the IYNF 2009 and keeps the cooperation between the many different natural fiber organizations going.

VII Website of the escorena networks system

The objectives of the ESCORENA system, the directory of the Networks members, the publications, news, events, exchange of ideas is possible not only through the personal contacts and correspondence, but as well on the base of the web communication, provided by FAO with assistance of the INF. The relevant website of ESCORENA system, created due to FAO initiative, funds and encouragement can be found at the address: http://www.escorena.net [3], [5].

References

1. "Review of the Activities of the European System of Cooperative Research Networks in Agriculture (ESCORENA). Progress Report on Recommendation made at the 31st Session EUROPEAN COMMISSION ON AGRICULTURE (ECA). Thirty-second session, Rome, 7-8 March 2002. Document ECA 32/02/4-Rev.1

2. "Report of the European Regional Workshop on Internet-based communication support for ESCORENA Thematic Knowledge Networks in Agriculture", at the Institute of Natural Fibres, Poznan, Poland, 10-12 April 2008

3. Website of the ESCORENA system: http://www.escorena.net

4. Website of the International Year of Natural Fibres (IYNF) 2009: www.naturalfibres2009.org

5. Euroflax Newsletter

6. Website of the Institute of Natural Fibres: www.inf.poznan.pl

Agromarketing Network – prerequisites for its creation, prospects for the development

Guljahan Kurbanova, *Economist, FAO Regional Office for Europe and Central Asia, Head "AgroWeb Agromarketing" project*
Olga Pashkevich, *PhD, Republican Scientific Unitary Enterprise "Institute of System Studies in Agro-Industrial Complex of the National Academy of Sciences of Belarus", Coordinator of "AgroWeb Agromarketing" project*
Oksana Sivurova, *MSc, Head of "FAO Centre" Department, State Institution "Belarus Agricultural Library n.a. I.S.Lupinovich" of the National Academy of Sciences of Belarus, Manager of "AgroWeb Belarus" Internet site.*
Irina Kazakevich, *PhD, FAO National Correspondent in the Republic of Belarus*

Development of agromarketing system, both for the producers of agricultural products and commodity distribution networks, requires the realization of the appropriate policy, legislative framework, and effective governmental regulation. Such services involve the formation of market infrastructure, granting access to information on market situation, extension of agromarketing consulting services industry. Training in marketing at all levels is of interest at this time: from graduates of agricultural educational institutions to producers.

New market relations between agribusiness, commodity distribution network, and agricultural producers requires their constant development, for example, by means of contact interaction between the production and market groups, their amalgamation for promotion of common purposes, etc. In this regard, the statement and realization of projects on the enhancement of marketing policy, creation of services in the sphere of interaction "production activity - market", and training to realize the agribusiness strategies proved to be pressing and actual tasks.

Moreover, market information serves constitute a key factor which makes it possible for the agricultural producers and distributive networks to take rational decisions on problems concerning what kind of crops should be grown, in accordance with which technology, and where they could be sold.

The idea of creation of an Internet-portal on agromarketing has been initiated during the Regional Workshop on "Development of Thematic Knowledge Networks", in the framework of the project "Logicality and Sequence of the Information for Development of Agricultural Researches" initiated by the initiative of Coherence in Information for Agricultural Research for Development (CIARD) in Budapest (Hungary) in March 2010. One of the tasks of the international CIARD initiative is the formation of a target group of information technologies specialists at the national levels for the better understanding of international and national problems in agriculture.

Agromarketing Network is a part of AgroWeb Network for countries of Central and Eastern Europe and the former USSR (AgroWeb CEE). The main aim of AgroWeb CEE network is the promotion of collection, provision and marketing of information to help users to find information and contacts in the Central and Eastern European countries, including the countries of the Commonwealth of Independent States (CIS).

Activity of the international information AgroWeb community engages interchange of views on problems of information and communication technologies use, consideration and formulation of decisions, standards and information channels of knowledge management as a continuous process of searching, selection, organization and presentation of information which is necessary for staff professional development and is orientated towards members of the agrarian market in the former USSR countries and beyond. In the process of the project functioning there have been covered FAO initiatives, as well as programmes and projects which have been realized.

Functioning of the information portal Agromarketing Network includes the following:

- management activity, directed towards the establishment of mutually beneficial and well-balanced relations between coordinators of the portal and targeted audience for its efficient functioning;

- setting up contacts with the national coordinators in CIS countries for the purpose of cooperation within the frames of Agromarketing Network portal;
- formation of public opinion about the portal;
- carrying out the research and analytical work, policy formation, programme development and composition, communication and maintenance of inverse relationship with the portal users;
- review of the statistical information covering the dynamics of prices for the main types of agricultural products, volumes of agricultural production and foodstuffs, volumes of export and import of agricultural products and foodstuffs (volumes, directions, weighted average price);
- review of agrarian Internet resources, publications, and periodicals;
- creation of data area presenting information about educational institutions realizing education and training on agromarketing and agribusiness;
- announcement of events in the field of development of communication instruments and information technologies in the sphere of agromarketing.

It is important to note the importance of functioning of the Global Information and Early Warning System (GIEWS) which makes it possible to realize the evaluation of foodstuffs supply, influence of macroeconomic situation demand and supply in agricultural production branch, imminent danger for food security. Close collaboration with the FAO GIEWS system makes it possible to realize the continuous monitoring of the main food markets, information consolidation and its process to provide early warning of shocking and risk moderation, set up the integration system of information acquisition and processing, decision making taking into account the global development tendencies and prospects of agricultural products market.

Partners of Agromarketing Network are the following:

- The Food and Agriculture Organization of the United Nations (FAO) (Rome, Italy);
- FAO Regional Office for Europe and Central Asia (Budapest, Hungary);
- Information portal "AgroWeb Belarus" (Minsk, Belarus);
- Institute of System Studies in Agro-Industrial Complex of the National Academy of Sciences of Belarus (Minsk, Belarus);
- The European System of Cooperative Research Networks in Agriculture (ESCORENA) (Poznan, Poland);
- National Food Exporters Union (Russian Federation);
- Company "SovEcon" (Russian Federation).

The further functioning of the Agromarketing Network portal will make it possible for its participants to realize the following:

- accomplish the complex analysis of market environment, control the demand and supply balances, carry out in practice the short-term and long-term forecasting;
- realize the comparison with the similar periods of the preceding marketing years, take into consideration the influence of the world market factors, the neighbor countries markets, and internal market;
- develop activities and measures on the practicability of application of the different types of agricultural raw materials with due account for market situation, seasonality and other peculiar features;
- streamline expenses, find new marketing outlets, establish the logistical raw material and finished commodity streams, etc.

Besides, it is expected to incorporate the information Agromarketing Network portal into functioning of the European System of Cooperative Research Networks in Agriculture (ESCORENA).

Inclusion of Agromarketing Network portal into ESCORENA system will make it possible to extend international collaboration and cooperation in the sphere of organizing access to information resources and their extension and dissemination, as well as to provide higher accessibility of scientific research results. As a result, there could be created close relationships between the research institutes on the problems of voluntary exchange of information and experimental findings, encouragement and support of joint investigation projects, facilitating the technologies development, broad-ranging involvement of researchers, specialists and concerned parties into joint activities.

The activities of Apricot Network in 2010

Apricot Network is being developed under the principles and standards of the AgroWeb Network

Apricot Network joins to the ESCORENA system (European System of Cooperative Research Network in Agriculture) a European initiative to enhance sustainable agricultural development and food security by improving the use of information, communication, and associated technologies.

As a part of ESCORENA system Apricot Network use official name agreed by FAO REU (Budapest): Interregional Cooperative Research Network on Apricot.

Apricot Network Goals and Objectives

- Conducting cooperative research, based on international cooperation on Apricot
- Collecting statistical data on apricot and other drupaceous fruits,
- Consulting services, experts data bases,
- Development collaboration between the "Network" and other regional networks/organizations

Apricot Network Activities

- Facilitate the transfer of information relevant to apricot development to link all involved subjects and individuals from different countries to share experience, information, to communicate and look for possible solution for region specific conditions of the region.
- Analyzing apricots world market and its future trends, for related persons for find relevant and useful information concerning apricot on our network.

Initiate joint research and training programs (within the region).

- Facilitating collaboration and sharing knowledge among scientists and experts from fruit production, proceeding industry and trade,
- Facilitate efforts aiming at the better involvement of development programs.
- Facilitate the improvement of partnership between science, practice and producers associations.

Organizing Workshops, Conference s and Meetings and world-wide circulation of information,

- Assist the organization of global and regional meetings and conferences.

The Apricot Network is coordinated by the Ass. Prof. Dr. Ara HOVHANNISYAN, from Armenian State Agrarian University, how has been holding the position of Coordinator since 2009.

The Armenian State Agrarian University (ASAU) is an only higher education institution which deals with agricultural education, research and specific services to the agriculture sector (support to extension).

The numbers of students of ASAU increase to around 1200 students per year.

Coordinator of Apricot Nework, Ara HOVHANNISYAN, took a part of Regional Workshop on the "Development of Thematic Knowledge Networks", in the framework of "Coherence in Information for Agricultural Research for Development" (CIARD) 9-11 March 2010, Budapest - Hungary.

Around 25 participants were invited to the event from CIS, Russian Federation and CEE countries.

Prior to the forthcoming European Regional Conference, well established agricultural advisory research information networks and new communication platforms are planned to be set up and customized based on more advanced information management technologies during the course of the three days event, in support of educational, research, food and nutrition and other expert fields.

In 2009 with the financial support of FAO REU and technical support of FAO HQ, a new server has been set up in Rome to serve as common technical background for the AgroWeb CEE Network, ESCORENA and the Thematic Knowledge Networks operational in the framework of ESCORENA in the region.

After that, Coordinator of Apricot Nework Ara Hovhannisyan was participated in the FAO Workshop held in Yerevan, Armenia. 14-16 december 2010

Links with other site and International Organization:

1. XV International Symposium on Apricot Breeding and Culture will be held in Armenia in 2011 (June 20-24).

Coordinator of Apricot Nework Ara Hovhannisyan joins to The Coordination Committee of the XV International Symposium on Apricot Breeding and Culture and has actively participated in the organization of the International Symposium of International Society for Horticultural Science (ISHS).

The symposium announcement has been included in the Calendar of ISHS Events which is available both online at www.ishs.org/calendar as well as in quarterly publication Chronica Horticulturae.

All interested researchers, producers engaged in the apricot breeding, conservation and use of apricot genetic resources, orchards management and fruits processing are invited to the XV International Symposium on Apricot Breeding and Culture to be held in Yerevan, Armenia on 20th -24th June, 2011.

The symposium is an excellent opportunity to meet researchers, producers dealing with apricot, working in the field of apricot breeding, cultivation, apricot orchards management, fruits processing to discuss and share the research results, to debate on future targets. The symposium tours envisaging visit of historical place and specialized field excursion as well as special program for accompanying persons will be provided. We extend a warm welcome to all colleagues in the sector who share our interest in improving apricot cultivation and breeding technologies.

SCIENTIFIC COMMITTEE

***Prof. Dr, Samvel AVETISYAN**, Chair, Ministry of Agriculture, Armenia*
***Prof. Jean-Marc AUDERGON**, INRA UGAFL, France*
***Dr. Marisa BADENES, IVIA**, Valencia, Spain*
***Prof. Daniele BASSI**, Università degli StudI di Milano, Milan, Italy*
***Dr. Karim BAYMETOV**, Uzbek Research Institute of Plant Industry,Uzbekistan*
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***Ass. Prof, Dr. Gagik SANTROSYAN**, Armenian State Agrarian University, Armenia*
***Prof. Cristos XILOYANNIS**, University of Basilicata, Italy*

2. Hortivar (Horticulture Cultivars Performance Database)

Hortivar is FAO´s database on performances of horticulture cultivars in relation to agro-ecological conditions, cultivation practices, the occurrence of pests and diseases and timing of the production.

http://www.fao.org/hortivar/

3. CIHEAM Working group on the Apricot.

Local study of local Mediterranean apricot varieties with a view to breeding for production, disease resistance and product quality. Contacts between European Mediterranean researchers working on the apricot date from the eighties were established within the framework of the EC - DG VI Agrimed program.

http://www.iamz.ciheam.org/en/pages/contenidos/investigacion/info_detallada/albaricoque.htm

4. International Symposium on Organic Matter Management & Compost Use in Horticulture will present, discuss and explore options of using compost and other organic soil amendments for managing & improving horticultural soils and production systems, including amenity horticulture, nurseries, and protected cropping.

http://www.compost-for-horticulture.com/ International Buffalo Federation meeting

International Buffalo Federation meeting

April 26, 2010 Hotel Panamericano, Buenos Aires, Argentina, 6.30 p.m.
In connection with the activities of the FAO/ESCORENA Network on Buffalo
Prepared by Network Coordinator: Prof. Antonio Borghese, Former Director
Animal Production Research Institute, General Secretary International
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The President Eng. Federico Romero welcomed all the IBF delegates and reported the different running activities about the 9thWorld Buffalo Congress (April 25-28), that was a success for number of participants, represented countries, quality of lectures and papers, that produced a Proceedings book of 1102 pages, published on Revista Veterinaria, Faculdad de Ciencias Veterinaria, Universidad Nacional del Nordeste, Corrientes, Argentina, Vol.21, 2010, suppl.1, edited by Gustavo A. Crudeli, Exequiel M. Patino, José L. Konrad.

The General Secretary, prof. Antonio Borghese distributed the IBF list and the order of the meeting with the following points that were presented.

1. IBF activities the activities, as congresses and edited book in buffalo field in the period 2007-2010 were presented in an attached list.

2. Economic balance. The economic balance 2007-2010 with income and outcome were presented in an attached list.

The input is coming only from the delegates fees (100 US dollars paid every 3 years) and from FAO. The new IBF list will be composed accordingly with delegates who paid the fees. The output is coming particularly from the cost of the Buffalo Newsletter, very useful for changing information and sending news about buffaloes, but very expensive for printing and expedition cost.

Libertado Cruz proposed to ask high fees (1000 US dollars or more) to the official Buffalo Institutes and to the Companies working in buffalo, to increase the input. All the delegates approved, encouraging each other to find Institutes and Companies as IBF delegates.

3. Buffalo Newsletter. The Buffalo Newsletter edited by Antonio Borghese with FAO and IBF logos is a referent point of our activity: in 2009 was published the number 24, sent in 1600 copies, free of charge, to all the people working in buffalo field in many countries, but it is too expensive.

So the proposition to continue the Buffalo Newsletter production, but only in electronic version was voted by the delegates.

4. The Secretary Borghese showed the possibility to involve IBF in research projects: one proposition was presented to the Milano Expo 2015 named "The great farm" with the expo of draught animals (buffaloes too) in the world to produce work and food in the villages; the second project was presented by prof. Leopoldo Iannuzzi with the Italian Buffalo Breeders Association (ANASB) on the possibility to create a reference genome sequence and information on genetic variations of the buffalo species.

All the delegates were favourable to these developing activities of IBF.

5. The Secretary Borghese informed that FAO-ESCORENA organization, that moved the headquarter of the FAO Regional Office for Europe and Central Asia from Rome to Budapest and that includes all the FAO Networks, as buffalo too, organized in Budapest on March 9-11, 2010 the Regional Workshop on the "Development of Thematic Knowledge Networks in the framework of "Coherence in Information for Agricultural Research for Development (CIARD), where prof. Borghese was invited as Coordinator of the Inter-Regional Cooperative Research Buffalo Network. The "agrowebcee.net"portal (Typo 3 CMS) was created as a basis for the management of knowledge.

Now in the website www.agrowebcee.net in ESCORENA Buffalo Network is possible to find a lot of news about buffalo and about IBF (history, constitution and by-laws, activities), books, Buffalo Newsletter and more.

6. Election of the President 2010-2013 and of the country of the next World Buffalo Congress. At this point prof. Borghese remembered as 3 years ago, during the IBF meeting in Caserta, Argentina by Marco Zava

and Thailand by Rangsun Parnpai presented their candidatures to host the 9th World Buffalo Congress. At the moment of vote, Rangsun Parnpai renounced to his candidature and decided to support the Argentina proposal, requiring support from all the countries to hold the 10thWorld Buffalo Congress in Thailand in 2013, to avoid the vote that could provoke a division between Asian and American delegates.

Therefore the Secretary proposed prof. Parnpai as the IBF President for the period 2010-2013.

The assembly elected Parnpai as President with unanimous vote.

The new President Parnpai thanked the delegates and said, as he was elected also President of the Asian Buffalo Association (ABA) during the last Asian Buffalo Congress in Lahore (October 29, 2009), that he will organize the 7th Asian Buffalo Congress together with the 10thWorld Buffalo Congress in Phuket, Thailand on May 2013. For the first time in the history of IBF and ABA the two congresses will be unified.

This beautiful notice and the enthusiasm of the President Parnpai provoked a great applause and the congratulations of all the delegates.

IBF list 2011

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Biomedical Technology, Epidemiology and Food Safety Global Network

K. Hruska
Veterinary Research Institute, Brno, Czech Republic

Knowledge dissemination is the principal activity of the Biomedical Technology, Epidemiology and Food Safety Global Network, supported by the Veterinary Research Institute, Brno, Czech Republic. The Centaur Global Network collaborates with the EU research projects and with OIE Reference Laboratory for Paratuberculosis and OIE Reference Laboratory for Avian Tuberculosis, operating at the Veterinary Research Institute.

The Centaur Global Network Information are distributed by e-mail to network members and simultaneously archived at the network web page. This open access system means that all information is available not only for the Centaur Global Network members. Everybody can register as a person, interested in any or all of the 27 fields of interest. Information mainly refer to documents issued by FAO, EU, World Organization for Animal Health OIE, WHO and other authorities, meetings, conferences, workshops, new publications, food borne diseases outbreaks, emergency diseases, education and scientific matters. In total, 473 e-mail notifications were dispatched in 2010, mostly to distribution lists (27) Scientific information, (23) Education, (05) Zoonoses, (04) Food borne diseases and (08) Mycobacterial diseases.

The distance learning course on Good Research Practice was run twice in 2010. The first one, GRP 2010, closed in March and had 69 participants from 11 countries (Bangladesh, Cameroon, Czech Republic, Germany, Hong Kong, Kenya, Malawi, Nigeria, Spain, Uganda, United Kingdom). The second, GRP 2011, opened in October 2010 is not yet finished. This course had 104 participants from 27 countries (Australia, Bangladesh, Brazil, Cameroon, Czech Republic, Ethiopia, Ghana, India, Iran, Iraq/Kurdistan, Japan, Kenya, Korea, Macedonia, Malaysia, Mongolia, Nepal, Nigeria, Pakistan, Peru, Qatar, Serbia, South Africa, Spain, Sweden, United Kingdom, Zambia).

Databases on paratuberculosis and Crohn's disease digest were updated in 2010 with a total of 352 new publications, indexed in the Web of Science® (Thomson Reuters) database (212 and 140, respectively). Members of the Biomedical Technology, Epidemiology and Food Safety Global Network were informed about new publications by e-mails in weekly intervals. Both databases are available at the web page of the OIE Reference Laboratory for Paratuberculosis, hosted by the Veterinary Research Institute, Brno. Network members from Australia, Belgium, Bulgaria, Canada, Czech Republic, Egypt, France, India, Iran, Ireland, Italy, Saudi Arabia, Slovakia, Slovenia, Spain, Switzerland, The Netherlands, United Kingdom and USA requested 755 papers from those on offer.

Papers, published in journals indexed in the Web of Science database, were analysed and the results are available in three publications:

Analysis of publications on paratuberculosis from 1995 to 2009 with emphasis on the period from 2005 to 2009.

The importance of paratuberculosis, an infectious bowel disease of ruminants, and Crohn's disease, a type of inflammatory bowel disease in humans with suspected links with Mycobacterium avium subsp. paratuberculosis, is evident from the steadily increasing number of publications on these topics. Data from the Web of Science® databases were analysed according to authors, institutions, countries and funding agencies, involved in research. A summary of the descriptive data for the most frequently cited publications are presented.

Research on Mycobacterium avium during the period 1995 to 2009

Papers on Mycobacterium avium, published between 1995 and 2009 indexed in the databases Web of Science® (Thomson Reuters) and PubMed (U.S. National Library of Medicine) were analysed and 3377 papers, published by 11 197 authors from 2630 institution and 75 countries were compared. Mycobacterium avium is represented by four subspecies (M. avium subsp. avium, M. avium subsp. silvaticum, M. avium subsp. hominissuis, and M. avium subsp. paratuberculosis). Mycobacteria play an important role as human and animal pathogens and represent a potential risk to consumers as food and environmental pathogens and immunomodulators.

Mycobacteria in water, feedstocks and food: analysis of publications

Papers on mycobacteria in food, feed and water, published between 1945 and 2010 and indexed in the database Web of Science® (Thomson Reuters) were ranked according to authors, institutions, countries and source titles. The total number of papers on mycobacteria and food and mycobacteria and water were 1486 and 1419, respectively. More than 40% of the papers have been published in the last five years. In addition to publications in peer reviewed journals the archives of ProMED-mail and the Rapid Alert System for Food and Feed of the European Union were also searched. It is evident that much attention is being paid to mycobacteria in food, feed and water as they likely pose a public health risk.

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Prepared for the Scientific Bulletin of The European System of Cooperative Research Networks in Agriculture ESCORENA

Professor Karel Hruska
Brno 2010-01-05

Interregional Cooperative Research Network on Cotton

Report by former Coordinator: Dr. Urania Kechagia
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I. Objectives of the Network

The network was established in 1988 with the aim to promote synergy in cotton research among countries of the Mediterranean basin. In the process other non Mediterranean countries, with common interests in cotton production and consumption, joined the Network and presently includes members from all over the world.

The network member countries are: Algeria, Belgium, Bulgaria, Czech Republic, Egypt, Ethiopia, Germany, Greece, France, Italy, Iraq, Iran, Israel, Maroko, Poland, Spain, Sudan, Syria, Turkey and United States of America.

The Network maintains close cooperation with the International Cotton Advisory Committee (ICAC), which is an important channel of global information and it is partially sponsoring its activities.

Objectives of the Network are to develop research cooperation among scientists in fields related to cotton production and processing in the temperate zone. The cooperation is focused on identification of common problems and definition of joined actions towards their solution.

Completion of our objectives is attained through:

- Global or separate regular meetings aiming at,
- The exchange of information on research carried out by the member institutes
- Reporting and appraising on activities performed
- The planning of future activities on subjects of mutual interest
- Exchange of promising cotton genetic material
- Common variety trials
- Joined research projects on common problems

II. Present structure of the Network

The present structure of the Network was established in the previous consultation meetings (Thessaloniki 1992, Montpellier 1996) and was also revised in the global meeting in Adana, Turkey 2000.

The last plenary meeting of the network is programming took place from 29 September to 2 October, 2004 in Thessaloniki, Greece. During the meeting evaluation of the working group activities took place and revision of the working groups for higher effectiveness was discussed. The number of WGs was actually reduced to four including the main cotton research fields namely

- Woking Group 1.Genetics. Chairmen F. Xanthopoulos, O. Gencer

Includes Breeding, Variety trial and Biotechnology

- Woking Group 2. Agronomy. Chairmen M. Cretenet, M. El-Fouly

Includes Nutrition, Water Management, Crop Protection, Modelling

- Woking Group 3.Cotton Fiber and Yarn Quality. Chairmen J. P. Gourlott, M. Matusiak
- Woking Group 4. Marketing. Chairman M. Fok

III. Objectives of the working groups

WG1. Genetics

Breeding: One of the oldest groups, is mediating cooperative research among members in the following fields.

- Exchange of information on research in cotton breeding;
- Identification of germplasm with specific characters, stress tolerant, resistant to biotic and abiotic factors, early maturing, high yielding etc.
- Exchange of germplasm
- Evaluation of modern breeding methods;

- Joint strive for obtaining improved varieties for various zones;
- Establishment of a central germplasm bank for cotton
- Some of these targets have been already accomplished while others are in progress.

Variety Trials: The main objective of this group is designation of the best performing varieties to meet specific needs of the member countries, based on:

- Varietal performance under various factors;
- Variety - environment interaction, in the narrow and broad sense;
- Cottonseed and lint yield;
- Fiber and seed quality characters;
- Crop phenology;
- Physiological and agronomical characters.

Biotechnology: Objectives identified by the biotechnology group are the following;

- the role of fhytormones in the development of long-staple fibers;
- study of environmental factors affecting development of long-staple fibres;
- enhance expression of fiber genes regulated by phytormones;
- engineer cotton with gene constructs with potential to improve fiber quality;
- gene transcripts differentially expressed in fibers in response to phytormones;
- characterization of differentially expressed gene transcripts;
- isolation of clones from fiber cDNA and /or genomic library that represent fiber gene
- hormonally regulated in their expression.

WG 2. Agronomy

Cotton Nutrition: Optimization of cotton nutrition is the main task of this group and is approached by the following actions,

- study of the nutritional requirements of cotton plant;
- diagnostic measures and deficiencies under various conditions
- use and effect of foliar fertilizers and micronutrients
- means to increase the efficiency of nutrients use;
- study of variety - fertilizer interaction.

Water management: Optimization of plant- water relationship and the efficiency of water use, under various conditions, have been defined as first priority targets for this group. Efforts are made to activate this very important group.

Crop protection; In the objectives of this group are included;

- weed control;
- IPM as an interdisciplinary approach;
- insecticide resistance management;
- studies on dynamics of populations of cotton pests (aphids, bemisia).

Cotton Modeling: Is aiming at the creation and application of optimal models for cotton production but the objectives and function of this group are not fully defined yet.

WG3.Cotton Fiber and Yarn Quality.

Is among the oldest groups and its research activities are focused on:

- the study of fiber quality in respect to variety -environment interaction;
- the study of the most important parameters affecting spinning performance;
- standardization of the process for fiber quality evaluation;
- the evaluation of performance, of new and conventional instruments;
- increasing efficiency in testing of fiber quality parameters;
- the evaluation of methods to detect cotton stickiness;

WG 4. Marketing: Quite new but very active group its objectives and targets include issues like:

- analysis and assessment of income of cotton producers;
- economic analysis of cotton production systems;
- study of cotton sectors and policies in the member countries.

IV. Activities of the Network

- Establishment of a common collection of 260 accessions and a list of available cotton germplasm.

- Study of the most important factors influencing cotton yield and quality.
- Distribution of improved cotton cultivars among member countries aiming to increase profitability.
- Use of biotechnology in the development of cotton cultivars with special characters.
- An inventory of cotton growth regulators, application means, use and profits.
- Efficient use of macro and micro nutrients to improve yield and quality.
- Evaluation of different laboratory methods for fiber quality assessment and recommendations
- Standardization of methods for fiber quality evaluation in member countries.
- Study of factors affecting cotton marketability (stickiness, contamination etc).
- Recommendations for high efficiency in testing of fiber quality have been distributed among members
- Study of the inputs of varietal and environmental factors on fiber quality.
- Distribution of information on cotton production and processing to member countries.
- Training on cotton production and fiber technology (participants from members and developing countries).
- Enhancement of collaboration with as well as transfer of know-how to developing countries.

Regularly meetings of the Network take place every four years and the next plenary meeting would take place either in June or in September most probably in Greece.

V. Financial support for Network activities

Regular meetings are financed by FAO (Europe) but in global meetings the contribution of ICAC is substantial and it is mainly used to support participation of active members from developing countries. Organizational expenses are mainly covered by the host country assisted by contributions from private companies.

Research carried out by network members, either in the frame of mutual collaboration or in national basis is financed by the participating Institutes.

Only few groups are able to obtain assistance from private companies.

VI. Organizational difficulties and solutions

- The Cotton Research Network is interregional including members from Near-East also, but the relevant FAO office is not supporting our activities and this creates problems to participants from this area.
- Communication among members is not efficient due to lack of advanced means in some countries and to poor language knowledge by some members.
- Members from developing countries have not the means to participate in joined research activities, as well as in meetings.
- Political implications and local policies are usual constrains because they affect approvals and visas for participation as well as collaboration especially in the sensitive area of the Near-East
- The Cotton Network is actually supported by the FAO-Europe, while active involvement of the FAO-Near-East office would greatly promote our activities and solve many of the problems we face in that area.
- Use of e-mail facilities may improve communication but the problems due to language is very difficult to be overcame.
- National coordinators are key elements for effective functioning and strengthening of their role would certainly facilitate communication.
- Enhancement of our activities is greatly depended on motivations given to researchers for joining common research activities.
- Election of dynamic and competed chairman is of outmost importance in promoting activities of particular groups.
- Elimination or modification of groups with low or no activities (done in the recent meeting) would increase effectiveness.
- Regular meetings, of chairman and national coordinators (each year) and with broad participation (every two years) would certainly enhance activities and improve collaboration.

VII. Financial constraints and solutions

Financing is a key element for effective functioning of the network but also a major constraint because most of our members are coming from poor countries. The support of FAO-Europe is substantially curtailed in the recent years and ICAC is sources are and efforts have to be made to improve the existing support and to find additional sources (i.e. by the E.U.).

Note: the report was prepared by Dr Urania Kechagia in 2009. The new Network Coordinator is Prof. Oktay GENCER , CU Cotton Research and Application Center University of Cukurova, 01330 Adana – Turkey, Tel:0090 322 3386144 or 0090 322 3386797, E-mail: ogencer@cu.edu.tr

The European Cooperative Research Network on Flax and other Bast Plants

The European Cooperative Research Network on Flax and other Bast Plants
is one of the nineteen active networks working within
ESCORENA (European System of Cooperative Research Networks in Agriculture)
-see the website: www.escorena.net.
The contact person for ESCORENA at Food and Agriculture
Organization of the United Nations in Budapest, Hungary is Ms. Nevena Alexandrova,
Agricultural Research and Biotechnology Officer and Mr. Michal Demes,
Information and Knowledge Management Officer.
The supervising authority is the FAO Regional Office for Europe and Central Asia (REU),
Budapest. http://www.fao.org/world/regional/REU/
COORDINATION CENTRE OF THE EUROPEAN COOPERATIVE RESEARCH
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FAO promotes transfer of know-how and advances in methodology with clear sustainable development and socio-economic implications under the umbrella of the ESCORENA System. These important indications of FAO are the driving factors for the ESCORENA Networks, including Flax and other Bast Plants.

At present, the whole Network brings together 534 members on the mailing list (425 experts registered with membership questionnaire) from 54 countries in the fields of research, economics, marketing and industry. Member countries are: Argentina, Australia, Austria, Bangladesh, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Cuba, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Latvia, Lithuania, Mexico, Montenegro, Netherlands, Nigeria, Norway, Pakistan, Poland, Portugal, Serbia, Romania, Russian Federation, Slovak Republic, 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, Director, International Research Projects, Department of Agricultural, Food and Nutritional Science Faculty of Agricultural, Life and Environmental Sciences University of Alberta 2-06F Agriculture/Forestry Centre Edmonton, Alberta, Canada T6G 2P5, Tel: (403) 638 2166, E-mail: paulk@ualberta.ca. 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: profelhariri@netscape.net. Dr. Rajesh Anandjiwala represents the Network in Africa [National Fibre, Textile & Clothing Centre (NFTCC), CSIR, Manufacturing & Materials Technology Unit, e-mail: Ranandi@csir.co.za, Rajesh.Anandjiwala@upe.ac.za, fax: +27-(0) 41-583 2325, tel.: +27- (0) 41-508

3273, Address: CSIR, P.O. Box: 1124, Gomery Avenue, Summerstrand, Port Elizabeth 6000, South Africa; in Canada by Mr. Alvin Ulrich, Saskatchewan Flax Development Commission, 161 Jessop Avenue, Saskatoon, SK, Canada S7N 1Y3, tel.: 1.306.668.0130, fax: 1.306.668.0131, e-mail: aulrich@biolin.sk.ca. Mr. Ulrich will act as flax representative from Canada in the FAO/ESCORENA Network on Flax and other Bast Plants, with support from the Saskatchewan Flax Development Commission.

Please, note that Assis. Prof. Dr. Eng. Cecilia Sirghie, of the "Aurel Vlaicu"University, Romania has been appointed to act as the deputy Co-ordinator of the FAO/ESCORENA Network, in close co-operation with Prof. Dr. Ryszard Kozlowski since October 2007. Her contact data: Assist. Prof. Dr. Eng. Cecilia Sirghie, Director of University Research Development Innovation in Technical and Natural Sciences Institute, University " Aurel Vlaicu", Corp M., 2 Elena Dragoi Str., RO 310330 ARAD, Romania, E-mail: cecilias1369@yahoo.com, phone/fax: +40 257 36 90 91 or Mobile: +40 740096457.

The Institute of Natural Fibres, Poznan, Poland, in 2008 was encouraged by FAO in Budapest, Hungary to act as the ESCORENA Network (system) Focal Point. Prof. Dr. Ryszard M. Kozlowski has been encouraged to provide an advice to activities the other 15 Networks in scope of ESCORENA system in the direct connection with FAO, its priorities and expectations. Professor Kozlowski has got the 20 years experience in running and coordinating continuously the ESCORENA European Cooperative Research Network on Flax and other Bast Plants, acting within the ESCORENA system under FAO umbrella since 1989. The activities of the Networks of ESCORENA system are visible at: www.escorena.net

The ESCORENA Focal Point contributes to the ESCORENA Networks integration and co-operation, started to edit the Scientific Bulletin of ESCORENA in June 2009 (Scientific Bulletin of ESCORENA, Vol.1, June 2009. Publisher: Aurel Vlaicu University, Arad, Romania. ISSN 2066-5687). The coordination centre co-organized the European Regional Workshop on Internet-based communication support for ESCORENA Thematic Knowledge Networks in Agriculture, Institute of Natural Fibres, Poznan, Poland, 10-12 April 2008. The team of ESCORENA Focal point in Poznan took part in several Workshops devoted to the development of the web skills and Thematic Knowledge Networks.

THE SCOPE OF NETWORK ACTIVITIES:

Conducting cooperative research, based on international cooperation - the activity and involvement in the EU projects,

Facilitating collaboration and sharing knowledge among scientists and experts from industry and trade,

Organizing Global Workshops, Conference s and Meetings and world-wide circulation of proceedings,

Analyzing bast fibres world market and its future trends,

Collecting statistical data on flax and other bast fibres,

Consulting services, experts data bases,

Focusing on new textile and non-textile applications of flax, hemp and allied fibres and their by-products.

Conducting cooperative research - the activity of WG/4 Quality and WG/1 on Genetic Resources. The Network has the following Working Groups (WG): WG/1 Breeding and Plant Genetic Resources; WG/2 Extraction and Processing; WG/3 Economics and Marketing; WG/4 Quality; WG/5 Non-Textile Applications; WG/6 Biology and Biotechnology, led by the chairmen from several countries of Europe and the USA.

Natural fibres and natural lignocellulosic raw materials are produced mostly in rural areas and sometimes they are the only source of income for people living there. According to FAO statistics and INF&MP's data, their production frequently does not contribute efficiently enough to the economic development of the rural areas. FAO Network on Flax and Other Bast Plants is involved in the development of the rural areas, in spreading scientific information to increase productivity and processing level. The Network is involved in plant genetic resources protection and development as well. Coordination Centre cooperates actively on the basis of bilateral agreement with the world largest gene bank at the N.I. Vavilov Research Institute of Plant Industry (VIR) in St. Petersburg, Russia.

FAO in Rome is interested in the promotion of research cooperation and realisation of FAO Programs and Initiatives for Technical Cooperation and Partnership. There are fibre-oriented groups within FAO, namely Intergovernmental Group on Hard Fibres and Intergovernmental Group on Jute, Kenaf and Allied Fibres. The Groups conduct certain research on the above mentioned fibres, organise meetings, consultations and discussions attended by the members, provide relevant statistical data.

The fibre oriented (Flax and Cotton) Networks of ESCORENA system took active part in the celebrations and actions of the International Year of Natural Fibres 2009 (proclaimed by UN and FAO), contributing with the promotion of natural fibres and derived products, their beneficial influence on human body, with novel ideas,

fashion shows etc. Since 2010 the Network is involved in the activities of the group of stakeholders of the Discover Natural Fibres Initiative (DNFI). As a continuation of the International Year of Natural Fibres 2009 (IYNF 2009) initiative - the IYNF 2009 steering committee's member organizations have decided to extend the cooperation and projects among all relevant natural fibers organizations as a permanent ongoing project.

The Discover Natural Fibres Initiative (DNFI) is an alliance of leading international natural fiber associations and organizations including the Cotton Council International and the International Cotton Advisory Committee, both based in Washington; the Germany-based Bremen Cotton Exchange; the Switzerland-based International Textile Manufacturers Federation; and the Brussels-based International Wool Textile Organisation (IWTO), among other organizations. The DNFI's Secretariat was supposed to rotate annually to one of the alliance organizations. Henrik Kuffner, director general of IWTO, has been nominated committee chairman for 2010.

The members of the Flax and other Bast Plants network take part in several EU projects. The coordination centre and Network members took part in the Round Robin Test devoted to the flax fibre and straw quality and is recently involved in the works of the following projects: **4F CROPS**-Future Crops for Food, Feed, Fiber and Fuel, FP7- KBBE -2007-1, Grant agreement no: 212811, Coordinator: Dr. Eftinia Alexopoulouù, and **Crops2** Industry.

Non-food Crops-to-Industry schemes in EU27, Grant agreement no.: 227299, Coordinator: Dr. Myrsini Christou, Agronomist, Head of Biomass Department. Both from CRES - CENTRE FOR RENEWABLE ENERGY SOURCES AND SAVING, 19th km Marathonos Avenue, 190 09 Pikermi, GREECE.

EVENTS ORGANIZED DURING 21years of Network activities (from June 1989 to December 2010):

7 World conferences (4 European Regional Workshops, 3 Global Workshops), plus 18 international conferences, 11 meetings (Workshops) of Working Groups, 8 meetings of Coordinating Board and 4 meetings of Panel of Experts.

7 world conferences:

1989 — Poznañ, Poland	89 participants from 12 countries
1991 — Brno, Czechoslovakia	112 participants from 17 countries
1993 — Bonn, Germany	100 participants from 13 countries
1996 — Rouen, France	220 participants from 29 countries
2001 — Borovets, Bulgaria	84 experts from 22 countries
2004 — Banja Luka, BiH	150 experts from 25 countries
2007 — Arad, Romania	70 experts from 13 countries

Additionally: 25 international conferences, organized or co-organized by the FAO/ESCORENA Network:

1. Flax - Processing Seminar, June 28–29, 1994, Institute of Natural Fibres, Poznañ, Poland
2. Non-Textile Applications of Flax, November 14-15, 1994, Institute of Natural Fibres, Poznañ, Poland
3. Modern Flax Processing, March 15-16, 1995, Institute of Natural Fibres, Poznañ, Poland
4. Third Meeting of the International Flax Breeding Research Group, November 7-8, 1995, Saint-Valery-en-Caux, France
5. Flax and Other Bast Plants Symposium, 30 September and 1 October 1997, Institute of Natural Fibres, Poznañ, Poland
6. Hemp, Flax and Other Bast Fibrous Plants Symposium, September 24-25, 1998, Institute of Natural Fibres, Poznañ, Poland
7. Bast Fibrous Plants Today and Tomorrow, Breeding, Molecular Biology and Biotechnology Beyond 21st Century, September 28-30, 1998, St. Petersburg, Russia
8. Research into New Uses of Natural Fibres (1999). The FAO Intersessional Consultation on Fibres, November 15- 16, 1999, Institute of Natural Fibres, Poznañ, Poland
9. Symposium on Innovative Hemp Production and New Hemp Products (the News in Hemp Breeding, Cultivation, Harvesting and Processing), February 23, 2000, Institute of Natural Fibres in Poznañ, Poland
10. Third International Symposium on Natural Polymers and Composites – ISNaPol 2000 together with the conference "Progress in Production and Processing of Cellulosic Fibres and Natural Polymers" - Workshop of the WG/2 of FAO/ESCORENA Network, May 14 - 17, 2000, Sao Pedro, Brazil
11. Scientific Session "Natural Fibres Today and Tomorrow", June 28, 2000, Institute of Natural Fibres, Poznañ, Poland
12. International Conference "Bast Fibrous Plants on the Turn of Second and Third Millennium", September 18-22, 2001, Shenyang City, China.
13. Workshop of the FAO/ESCORENA Network: Mapping of European Germplasm for International Flax Data Base Creation, use in Breeding for different Flax and Linseed Varieties, September 18 – 19, 2002, Sumperk,

Czech Republic

14. Workshop of the FAO/ESCORENA Network , Working Group 1. Breeding and Plant Genetic Resources: "Evaluation of productivity, economic and agricultural value of fibre and oil flax cultivars grown in Europe", June, 20 – 21, 2003, Poznañ/Sielec Stary, Poland,

15. "Flax and Allied Fibre Plants for Human Welfare", December 8-11, 2003, NRC, Egypt

16. 11th International Conference on Renewable Resources and Plant Biotechnology NAROSSA® 2005, Institute of Natural Fibres, Poznañ, Poland, June 6-7, 2005

17. FAO/ESCORENA International Conference "Textiles for sustainable development", CSIR, Port Elizabeth, South Africa, October 23-27, 2005

18. Conference on Natural Fibres: Vision 2020, New Delhi, India, December 8-9, 2006. Organised by Prof. Dr. Sanjay Gupta of North India Section of Textile Institute (NISTI), Prof. R. Chattopadhyay and Prof. V. K. Kothari, Department of Textile Technology, Indian Institute of Technology, New Delhi, India, co-organized by the FAO/ ESCORENA Network

19. The 4th Global Workshop (General Consultation) of the FAO/ESCORENA European Cooperative Research Network on Flax and other Bast Plants: "Innovative technologies for comfort", University of Arad, Romania, October 7-10, 2007

20. 13th International Conference for Renewable Resources and Plant Biotechnology NAROSSA® 2007. June 18-19, 2007, Institute of Natural Fibres (INF), Poznan, Poland

21. FAO/ESCORENA 2008 INTERNATIONAL CONFERENCE ON FLAX AND OTHER BAST PLANTS, Saskatoon, Canada. July 21 to 23, 2008.

22. FIBRATEC 2008 -IV Symposium on Natural Fibers, Integral Use of Natural Fibers and its Applications and PROFIB 2008-Ist Workshop on Vegetable Fiber Advantage &Crop Residues, December 1-5, 2008, Convention Palace, Havana, Cuba.

23. 15th International Conference for Renewable Resources and Plant Biotechnology NAROSSA®2009, 8-9 June, 2009, Institute of Natural Fibres & Medicinal Plants, Poznan, Poland, Co-organization; main organizer Frank Pudel, PPM Pilot Pflanzenöltechnologie Magdeburg e.V., Magdeburg, Germany, Phone: +49-391-8189-162, Fax: +49-391-8189-18, E-mail: pudel@ppm-magdeburg.de, www.ppm-magdeburg.de

24. "Week of The Natural Fibres". Scientific Workshop And Exhibitions on Textiles and Non-Textiles Applications. FAO/ESCORENA European Cooperative Research Network on Flax and other Bast Plants and ESCORENA System, 21-26 June, 2009, University „Aurel Vlaicu", Arad, Romania

25. 16th International Conference on Renewable Resources and Plant Biotechnology NAROSSA®2010. 07-08 June, 2010. Magdeburg, Germany. Organizer: Dr.-Ing. Frank Pudel, PPM Pilot Pflanzenöltechnologie Magdeburg e.V., E-mail: pudel@ppm-magdeburg.de, website: www.ppm-magdeburg.de. Co-organizer: Institute of Natural Fibres & Medicinal Plants, Poznan, Poland, website: www.infmp.pl

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

Newsletter of the ad Hoc Research Group (the Group acted from 1989 to June 1993) - 9 issues

EUROFLAX Newsletter

Information Bulletin EUROFLAX Newsletter – 33 issues since 1994 (200 printed copies, reaches subscribers and Network members in 54 countries), available from the Institute of Natural Fibres & Medicinal Plants, Wojska Polskiego 71b, 60-630 Poznan, Poland, fax: +48 61 8 417 830, e-mail: irena.pniewska@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 & Medicinal Plants)
- "FLAX – AS A FIBRE AND OIL BEARING CROP", Brno, Czechoslovakia, 18-20 June 1991 (available from AGRITEC, Research, Breeding & Services Ltd, Zemìdelská 16, 787 01 Sumperk, 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 & Medicinal Plants)
- "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
• CD Proceedings of "Bast Fibrous Plants for Healthy Life", October 24-28, 2004, Banja Luka, Bosnia and Herzegovina, Republic of Srpska
• PROCEEDINGS of conferences (almost all available from the Institute of Natural Fibres & Medicinal Plants, 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
• 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. Wlokna 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
• Proceedings of the Workshop of the FAO/ESCORENA Network: Mapping of European Germplasm for International Flax Data Base Creation, use in Breeding for different Flax and Linseed Varieties, September 18 – 19, 2002, Sumperk, Czech Republic
• CD Proceedings of the Conference "Flax and Allied Fibre Plants for Human Welfare", December 8-11, 2003, NRC, Cairo, Egypt
• CD Proceedings of the Conference 11th International Conference on Renewable Resources and Plant Biotechnology NAROSSA® 2005, Institute of Natural Fibres, Poznan, Poland, June 6-7, 2005
• CD Proceedings of the FAO/ESCORENA International Conference "Textiles for sustainable development", CSIR, Port Elizabeth, South Africa, October 23-27, 2005
• Textiles for Sustainable Development. Editors: Rajesh Anandjiwala and L. Hunter (CSIR Materials Science and Manufacturing and Nelson Mandela Metropolitan Univ., South Africa), Ryszard Kozlowski (Institute of Natural Fibres, Poland) and Gennady Zaikov (Russian Academy of Sciences, Russia). (2007). Nova Science Publishers, USA, ISBN: 1-60021-559-9. https://www.novapublishers.com/catalog/product_info.php?products_id=5451
• CD Proceedings and Book of Abstracts of the International Conference on Natural Fibres: Vision 2020, December 8-9, 2006, New Delhi, India.
• CD Proceedings of. 13th International Conference for Renewable Resources and Plant Biotechnology NAROSSA® 2007. June 18-19, 2007, Institute of Natural Fibres (INF), Poznan, Poland
• Proceedings book of the FAO/ESCORENA 2008 INTERNATIONAL CONFERENCE ON FLAX AND OTHER BAST PLANTS, Saskatoon, Canada. July 21 to 23, 2008. Website: www.flaxbast2008.com. ISBN #78-0-9809664-0- 4.
• CD Proceedings of the 15th International Conference for Renewable Resources and Plant Biotechnology NAROSSA®2009, 8-9 June, 2009, Institute of Natural Fibres & Medicinal Plants, Poznan, Poland, available at the main organizer: Dr.-Ing. Frank Pudel, PPM Pilot Pflanzenoltechnologie Magdeburg e.V., Magdeburg, Germany, Phone: +49-391-8189-162, Fax: +49-391-8189-18, E-mail: pudel@ppm-magdeburg.de, www.ppm-magdeburg.

de

- CD Proceedings of the 16th International Conference for Renewable Resources and Plant Biotechnology NAROSSA®2010, 7-8 June, 2010, Magdeburg, Germany, available at the main organizer: Dr.-Ing. Frank Pudel, PPM Pilot Pflanzenoltechnologie Magdeburg e.V., Magdeburg, Germany, Phone: +49-391-8189- 162, Fax: +49-391-8189-18, E-mail: pudel@ppm-magdeburg.de, www.ppm-magdeburg.de
- Scientific Bulletin of ESCORENA, Vol.1, June 2009. Publisher: Aurel Vlaicu University, Arad, Romania. ISSN 2066-5687

Recent and future plans of FAO/ESCORENA European Cooperative Research Network on Flax and other Bast Plants in 2010 and 2011.

Conferences and events with the involvement of the Network:

- June 7-8, 2010. Magdeburg, Germany. 16th International Conference on Renewable Resources and Plant Biotechnology NAROSSA®2010. Organizer: Dr.-Ing. Frank Pudel, PPM Pilot Pflanzenöltechnologie Magdeburg e.V., E-mail: pudel@ppm-magdeburg.de, website: www.ppm-magdeburg.de. Co-organizer: Institute of Natural Fibres & Medicinal Plants, Poznan, Poland and the Coordination Centre of the Network
- October 3 – 6, 2010, Dubrovnik, Croatia. ITC&DC, 5th International Textile, Clothing & Design Conference - Magic World of Textiles. President of Scientific and Programme Committee: Ivo Soljaèié, Croatia. President of the Organisation Committee: Prof. Dr. Zvonko Dragèeviæ, University of Zagreb. E-mail: zvonko.dragcevic@ttf.hr, website: http://itcdc.ttf.hr. Conference under patronage of ESCORENA.
- August 11-13, 2010, Austin, Texas, USA. International Symposium on Renewable Feedstock for Biofuel and Biobased Products- The Role of Non-Food Fiber crops: Kenaf, Jute, Hemp, Flax, and Allied. Organized by CCG International Inc., Co-organizers: School of Human Ecology, The University of Texas at Austin. Supporter: Center for Biorefining, University of Minnesota. Contact: Aimin Liu, E-mail: liuxx063@umn.edu, E-mail: info@greenfibernet. com, Website: http://ccgconsultinginc.com/Documents/2010%20SymposiumAd.pdf
- November 29–December 3, 2010. Havana International Conference Center, Havana, Cuba. FIBRATEC 2010 - VI Symposium on Natural Fibers: Full Use and Applications. A part of the 15th Scientific Convention on Engineering and Architecture, President of Organizing Committee at CETER CUJAE: Dr. Tania Carbonell Morales, Havana, Email: taniac@ceter.cujae.cu. President of honour: Prof. Dr. Ryszard Koz^{3}owski, Institute of Natural Fibres & Medicinal Plants. Website: http://www.cciacuba.com/index.php?module=general13. Conference under patronage of ESCORENA
- 11th International Conference on Frontiers of Polymers and Advanced Materials – 11th ICFPAM, Pretoria, South Africa, 22-27 May 2011. Prof. Dr. R. Kozlowski – member of the organizing and scientific committee.

Future endeavours: Efforts towards creation of the e.g. European Platform for Natural Fibres or co-operate with another technology platforms, Developing the activities within ESCORENA system and ESCORENA Focal Point at INF&MP, Continue of the activities connected with the International Year of Natural Fibres 2009 (proclaimed by UN and FAO) e.g. through active involvement in the actions of the IYNF Steering Committee within the: DNFI - „Discover Natural Fibres Initiative", Searching for projects - to support financially the Network activities.

Prepared by: Network Coordinator Prof. Dr. Ryszard Michal Kozlowski and Secretary of the Network – Maria Mackiewicz-Talarczyk M.Sc. (Agr.), Institute of Natural Fibres & Medicinal Plants, Poznan, Poland

UNU/SCN Network for Capacity Development in Nutrition for Central and Eastern Europe (NCDN CEE)

www.agrowebcee.net/ncdn

The UN System Standing Committee on Nutrition (SCN), www.unscn.org, established a set of working groups (WG) on Capacity Development (CD) in close collaboration with the United Nations University (UNU). Currently there are nine SCN WGs, of which NCDNCEE is one.

NCDNCEE Capacity Development in food and nutrition is much more than formal training. It includes human resource development, organizational, institutional and legal framework development with aim of enhancing knowledge and skills. This is essential for the contribution of professionals to the improvement of the food and nutrition situation in all countries. CD is a long term, continuing process, gives primacy to national priorities, plans, policies and processes.

Participants over the last years came from the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Macedonia, Hungary, Poland, Republika Srpska, Romania, Serbia , Slovakia, Slovenia and facilitators came from the Netherlands and Norway.

Network for Capacity Development in Nutrition and link to following EC Projects:
EURRECA – European Micronutrient Recommendation Aligned, www.eurreca.org
Euro FIR - European Food Information Resource Network, www.eurofir.net
DIETS - Dieticians Improving Education Training Standards across Europe, Thematic Network for Dieticians in Europe, www.thematicnetworkdietetics.eu

The general objective of the NCDN CEE Network is to initiate and support CD activities in research and training in CEE countries based on country specific needs. Specifically to the region the objectives will be linked to the specific topics of interest for the Network at any time. This is to be open for new challenges following the changes in the various countries over time.

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Publications:

Mirjana Pavlovic, Cornelia Witthöft, Peter Hollman, Paul Hulshof, Maria Glibetic Janka Porubska, Fré Pepping, Arne Oshaug. Training and capacity building in central and eastern Europe through the EuroFIR and CEE networks. Food Chemistry 2009; 113:846-850

Pavlovic M, Pepping F, Michal D, Biro L, Szabolcs P, Dimitrovska Z, Duleva V, Parvan C, Filipovic H.A, Glibetic M, Oshaug A . Turning Dilemmas into opportunities: A UNU/SCN Capacity Development Network in Public Nutrition in Central and Eastern Europe, Public Health Nutrition 2009; 12 (8) 1046-1051.

Gurinovic M, Witthoft CM, Tepsic J, Ranic M, Hulshof PJM, Hollman PC, Porubska J Gohar A, Debeljak-MartacicJ, Petrovic-Oggiano G, Novakovic R, Glibetic M and Oshaug A. Capacity development in food composition database management and nutritional research and education in Central and Eastern European, Middle Eastern and North African countries, European Journal of Clinical Nutrition (2010) 64, S134–S138.

The FAO-CIHEAM Interregiona Cooperative Research Network on nuts

SUMMARY

The Network was established in 1990, after an expert consultation organized by FAO (REU, RNE and AGPS). Promotion of information exchange, joint applied research, exchange of germplasm and establishment of links between researchers were identified as the main objectives. In 1996, FAO and CIHEAM agreed to cosponsor the Network. CIHEAM was already involved in fostering research nut tree activities. Since the start of its activities, the Network received widespread support from different national and international institutions. Particular support has been received from the Spanish authorities, through INIA and IRTA institutes. The main activities carried out so far were: a) organization of specific meetings and workshops; b) promotion of R+D activities and support of training grants for young researchers; c) edition of inventories of germplasm and research lines, proceedings and reports; d) edition of the NUCIS Newsletter and e) organization of two international training courses on "Nut Production and Economy". Unfortunately, since 2002, due to a strong cut in the financial support received by FAO (REU), the activity of the Network on Nuts has had to be unavoidably and considerably reduced.

AIM

In this report, a summary account of objectives, background, organization and activities of the Network on Nuts is presented.

BACKGROUND AND AIMS

Most countries in the Mediterranean region have important economic activities related to nut crop production, trade and industry. These activities depend on several factors which need to be integrated in order to succeed. Some of these factors evolve quickly and it is necessary to adapt them to the changing conditions. The adaptation ability can make the difference between profit and loss.

Regarding the importance of the nut sector, FAO (REU, RNE and AGPS) called in 1990 an Expert Consultation with the basic aim of fostering cooperation between countries in Europe, North Africa and Near East on R&D issues in tree nuts. From the consultation the "Interregional Cooperative Research Network on Nuts"was established. Promotion of information exchange, joint applied research, exchange of germplasm and establishment of links between researchers were identified as the main objectives. Member institutions and researchers come from the 41 European and 30 Near East Region FAO member nations. Some Network members also come from outside of the two Regions. In 1996, FAO and CIHEAM agreed to cosponsor the Network. The Network is part of the ESCORENA (European System of Cooperative Research Networks in Agriculture) scheme of FAO (REU).

It is interesting to note that before the establishment of this Network CIHEAM was already involved in related activities regarding nut trees. Thus GREMPA ("Groupe de Recherches Méditerranéennes pour l'Amandier et le Pistachier" / Mediterranean Research Group for Almond and Pistachio) is a Working Group coordinated by CIHEAM since the seventies. During the eighties and the beginning of the nineties, part of these activities were carried out in collaboration with the AGRIMED programme of the DG VI of the European Commission. During the years 1990-96, a research project coordinated by CIHEAM was financed within the framework of the CAMAR programme of the European Commission.

From the start, the Nut Network has received wide support from research organizations of several European and non European countries. Particularly, two Spanish institutes have supported consistently the Network: the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA) and the Institut de Recerca i Tecnologia Agroalimentàries (IRTA). In addition, several international institutions like the International Plant Genetic Resources Institute (IPGRI) has provided wide support in its subject over the years. Also, close collaboration with the ISHS (International Society for Horticultural Sciences) has been carried out during the organization of several Symposia.

Around 2001, FAO (REU), due to budgetary restrictions, started a revision process of its policy of support to the networks included in ESCORENA, analysing the activities done and their interest. In a report presented in 2003, during the 33rd Session of the European Commission on Agriculture, the interest of the activities developed by the Network on Nuts was acknowledged and the Network was included among those considered to have a good potential for continuity also in the future. However, the budgetary restrictions from FAO (REU) in relation to ESCORENA, have not been solved yet. This fact has had a very negative influence on the normal functioning of the Network on Nuts the last years.

STRUCTURE AND ORGANIZATION

The Network structure is based in a Coordination Centre (Coordinator and Secretary), supported by different Subnetworks (Working Groups) having the mission of fostering and coordinate specific activities. IRTA Mas Bové has been the Coordination Centre from the start of the Network activities. Until April 2001 there was 9 Subnetworks (7 tree crop species and 2 disciplinary): Almond, Hazelnut, Walnut, Pistachio, Pecan, Chestnut, Stone Pine, Genetic Resources and Economics. From this date, and due mainly to budget limitations, the number of Subnetworks were reduced to 6, including almond and stone pine activities within the general coordination. Two representatives, one from each supporting institution (FAO and CIHEAM) are also integrated in managing the Network. Currently, the structure of the network is shown on Table 1.

The general activities of the FAO-CIHEAM Research Nut Network are proposed, discussed, agreed and planned in the Technical Consultations (participation of representatives of the member countries) and at the Coordination Board meetings (FAO and CIHEAM Officers, Network Coordinator and Subnetwork Liaison Officers). Two Technical Consultations (Turkey, 1990 and Morocco, 1996) and seven Coordination Board Meetings (Spain 1991, Turkey 1994, Portugal 1995, Morocco 1996, Italy 1997 and Spain 2001, 2009) have already been held.

ACTIVITIES

The main activities carried out during the fifteenth running years have been:

- Organization of specific meetings and workshops
- Promotion of R&D activities
- Edition of proceedings and reports
- Edition of inventories of germplasm and research lines
- Edition of the NUCIS Newsletter
- Organization of two international courses on "Nut Production and Economy"
- Training grants for young researchers

A short account of the cooperative activities and achievements is presented.

Technical Meetings

There has been collaboration with different institutions for the organization of international meetings (Congresses, Symposia, Meetings and Workshops). Since 1990, 35 meetings on nut tree crops, genetic resources and economics have been organized, alone or jointly with other institutions like ISHS, IPGRI, etc (Table 2). Financial support was given to 54 experts, from 16 different countries, to participate in them. Close collaboration in editing most of the corresponding proceedings has been made.

Promotion of R&D activities

A major issue of the Nut Network is the work carried out on genetic resources: conservation, characterization and use. Apart from the exchange of plant material between several institutions in various species, a number of activities listed below have been developed. Another major issue of the Network is its Subnetwork on Economics. This working group analyses issues related to science/society on production, marketing, trade and consumption. It can be pointed out also, in the field of joint applied research, that one project CAMAR CE/DG.VI ("Amélioration d'espèces à fruits à coque: noyer, amandier, pistachier") was successfully carried out.

Publications

The Network publishes directly or has actively participated on the edition of the following publications (Annex 1):

NUCIS Newsletter

The Coordination Centre publishes yearly, since 1993, the NUCIS Newsletter which is distributed world-wide for free to 1.400 readers from over 60 countries. This information bulletin presents the Network activities and planning, plus articles and reports on nut research in the world. In addition, it includes sections on news and notes, congresses and meetings, events to be held and recent bibliography.

Apart from the printed version, the issues of the NUCIS Newsletter are placed in the website:
http://www.iamz.ciheam.org/ingles/nuts.htm#publications

Proceedings and Reports

A list of the main references is presented in Annex 1.

Inventories of Germplasm Resources and Research Activities

A reference list is given in Annex 1.

Species descriptors list

Main contributions are listed in Annex 1.

Training

Advanced Courses

On the initiative of the Research Network on Nuts, two Advanced International Courses on "Nut Production and Economics" have been organized by CIHEAM-IAMZ, FAO, and some national institutions. Both courses were designed for graduates working in R&D and professionals of the sector. Each course was attended by some 30 students from over 15 countries of the Mediterranean Basin, Near East and Central and South America. Students gave a good grade to the overall outcome of both courses. The first course was held at Reus, Spain in November 1994 and the Second was held at Adana, Turkey in May 1998.

Fellowships

Two CIHEAM fellowships for short stays (3 months) at IRTA Mas Bové (Reus, Spain) were granted to students from Adana University (Turkey, 1998) and from Ecole National d'Agriculture (Meknes, Morocco, 1999) for training on almond breeding.

IRTA-Mas de Bover, February 2010
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Structure of the Network on Nuts.

Network on Nuts	**General Coordination**
Nut Tree Crops	Mercè Rovira Institut de Recerca i Tecnologia Agroalimentàries (IRTA) Centre de Mas de Bover Crta. Reus- El Morell, km. 3.8 E-43120 Constantí (Tarragona), Spain Tel:34-977 328 424. Fax: 34-977 344 055. E-mail: merce.rovira@irta.cat
Subnetworks	**Subnetwork Coordination / Liaison Officer**
Almond	Francisco Vargas Institut de Recerca i Tecnologia Agroalimentàries (IRTA) Centre de Mas de Bover Crta. Reus- El Morell, km. 3.8 E-43120 Constantí (Tarragona), Spain Tel:34-977 32 84 24. Fax: 34-977 34 40 55. E-mail: francisco.vargas@irta.es
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Pistachio	Bekir Erol Ak University of Harran, Faculty of Agriculture Departament of Horticulture 63200-Sanliurfa, Turkey Tel: 90-414 247 26 97, Fax: 90-414 247 44 80. E-mail: beak@harran.edu.tr
Stone Pine	Sven Mutke Depto. Sistemas y Recursos forestales. Centro de investigación forestal CIFOR-INIA Crta. Coruña, km. 7,5 28040 Madrid, Spain Tel: 34 91 347 68 68, Fax: 34 91 347 67 67 E-mail: mutke@inia.es
Walnut and Pecan Genetic Resources + NUCIS + Secretary	Mercè Rovira Institut de Recerca i Tecnologia Agroalimentàries (IRTA) Centre de Mas de Bover Crta. Reus- El Morell, km. 3.8 E-43120 Constantí (Tarragona), Spain Tel:34-977 328 424. Fax: 34-977 344 055. E-mail: merce.rovira@irta.cat
Economics FAO	Regional Office for Europe and Central Asia (REU): Benczur utca 34 H-1068 Budapest (Hungary) Tel: 36- 1 4612000. FAX: 36 1 3517029. E-mail: maria.kadlecikova@fao.org
CIHEAM	Dunixi Gabiña Instituto Agronómico Mediterráneo de Zaragoza (IAMZ) Apartado 202. 50080-Zaragoza, Spain Tel: 34-976 71 60 00. Fax: 34- 976 71 60 01. E-mail: gabina@iamz.ciheam.org

Technical Meetings.

Date	**Venue**	**Meeting**
1990, June	Yalova (Turkey)	Expert Consultation on the Promotion of Nut Production in Europe and Near East Regions. Nut Network establishement
1991, October	Tarragona (Spain)	International Walnut Meeting Meetings of the Subnetworks on Walnut and Pecan Meeting of the Coordinaton Board
1992, September	Alba (Italy)	Third International Congress on Hazelnut Meeting of the Subnetwork on Hazelnut
1993, May	Agrigento (Italy)	First International Almond Congress Meeting of the Subnetwork on Almond
1993, May	Sciacca (Italy)	IX GREMPA Pistachio Meeting Meeting of the Subnetwork on Pistachio
1993, October	Spoleto (Italy)	International Congress on Chestnut Meeting of the Subnetwork on Chestnut
1993, November	Antalya (Turkey)	Second Pecan Subnetwork Meeting
1994, September	Adana (Turkey)	First International Symposium on Pistachio Nut Meeting of the Subnetwork on Pistachio Meeting of the Coordinaton Board
1995, June	Zaragoza (Spain)	Meeting of the Subnetwork on Economics
1995, June	Alcobaça (Portugal)	Third International Walnut Congress

		Meetings of the Subnetworks on Walnut and Genetic Resources
		Meeting of the Coordinaton Board
1995, June	Palermo (Italy)	IPGRI-FAO Workshop on Genetic Resources on Pistacia
1995, September	Rafsanján (Iran)	First National Workshop on Pistachio Nut
1995, November	Madrid (Spain)	Meeting of the Subnetwork on Stone Pine
1996, July- August	Ordu (Turkey)	Fourth International Hazelnut Congress Meetings of the Subnetworks on Hazelnut and Genetic Resources
1996, October	Meknes (Morocco)	X GREMPA Meeting (Almond and Pistachio) Meetings of the Subnetworks on Almond and Pistachio Meeting of the Coordinaton Board First Technical Consultation of the Network
1996, December	Zaragoza (Spain)	Meeting of the Subnetwork on Economics
1997, October	Roma (Italy)	Meeting of the Coordinaton Board
1998, June	Braunschweig (Germany)	IPGRI-ECP/GR-FAO European Symp. on Plant Gen. Res. for Food and Agric.
1998, October	Bordeaux (France)	Second International Symposium on Chestnut Meeting of the Subnetwork on Chestnut
1998, December	Irbid (Jordan)	IPGRI Workshop Genetic Resources on Pistacia
1999, September	Sanliurfa (Turkey)	XI GREMPA Meeting (Almond and Pistachio) Meetings of the Subnetworks on Almond and Pistachio
1999, September	Bordeaux (France)	Fourth International Walnut Symposium Meeting of the Subnetwork on Walnut
2000, February	Valladolid (Spain)	First International Stone Pine Symposium Meeting of the Subnetwork on Stone Pine
2001, April	Zaragoza (Spain)	Meeting of the Coordinaton Board
2001, May	Zaragoza (Spain)	III Intern. Symposium on Pistachios and Almonds and XII GREMPA Meeting Meetings Subnetworks on Almond, Pistachio, Gen. Resources and Economics
2003, May	Mirandela	XIII GREMPA Meeting (Almond and Pistachio)

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Proceedings and Reports

MENINI, U.G.; OLEZ, H.; BUYUKILMAZ, M.; OZELKOK, S. (eds.). 1991. Proceedings of the "Expert Consultation on the Promotion of Nut Production in Europe and the Near East Regions". Nut Production and Industry in Europe, Near East and North Africa. Yalova, Turkey, 1990. Published by FAO and MAFRA. FAO, REUR Technical Series B, 411 pp. (Number of papers: 31).

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recherches menées au titre du Programme CAMAR CE/DG.VI, contrat 8001-CT90-0023). Options Méditerranéennes, Serie B 16, 147 pp. (Number of papers: 8).

GOMES PEREIRA, J.A., MARTINS, J.M.S., PINTO DE ABREU, C. (eds). 1997. Proceedings of the "Third International Walnut Congress". Alcobaça, Portugal, 1995. ISHS. Acta Horticulturae 442, 445 pp. (Number of papers: 70).

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FAO-CIHEAM Network on Nuts, February 2010.doc

ESCORENA Olive Network

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Starting and developm

The ESCORENA Olive Network was established in 1974 through the cooperation of the FAO Office for Europe (REU), the FAO Plant Production and protection Division (AGP) and the Center for the Improvement and Demonstration of Olive Production Techniques (CEMEDETO) of Córdoba, Spain. The FAO Regional Project for the Improvement of Olive Production (while still in operation) and the Instituto nacional de Investigaciones Agrarias (INIA) of Spain have also supported the Olive Network, which grew and developed to involve the participation of most of the Mediterranean Basin research centers.

The activities of the Network were Technical Consultations every four years (the last Technical Consultation took place in 1997), Working Groups Meetings in between every two Consultations and a periodical Bulletin (OLEA). The Technical Consultations Working Group meetings have devoted great attention to the exchange of scientific information by means of presenting and discussing papers. Taking into account the reorientation and restructuring of ESCORENA agreed on by the Network Coordinators in the 80's, the Olive Network decided to establish different Working Groups to facilitate a better division of the work to be done in the future. At its latest structure the Network consisted of Four Working Groups: Genetic Resources and Plant material, Production Techniques and Productivity, Plant Protection and Olive Oil Technology and Quality.

The Network Bulletin OLEA reached 24 issues in the 1974-1997 period, including the publication of the summaries of the presented papers to the first three International Society For Horticultural Science sponsored Symposia on Olive Growing held in Cordoba (1989), Jerusalem (1993) and Chania (1997).

A review of the ESCORENA Olive Network activities was carried out in 2003. In February 2004 a meeting was held in Sfax to attempt to reinitiate the activities of the Network and recommended the 33rd Session of the European Commission for Agriculture (ECA) the continuity of the Olive Network.

Current activities

Currently, the purpose of the Network is the establishment of a permanent forum for interchange scientific and technical information among people involved in these activities at different levels (research, transfer of technology and olive and olive oil production and distribution).

Four main activities have been tried since the last Session held in 2004:

1. A close relation with AARINENA Olive Network, a similar initiative for the Near Asia and Northern Africa Countries, to ensure transfer of technology from ESCORENA to AARINENA countries

2. To promote applications of joint R+D projects by participants of different countries to international funding agencies. Two applications to the Cost Actions (2005 and 2006) to fund an specific Project on Genetic Resources and Breeding did not succeed.

3. Reinitiate the publication of OLEA as an essential tool for communication among scientists, technicians and olive growers and industrials of both Networks. During 2006 and 2007 two Issues of OLEA (25 and 26) have been published and distributed to more than 360 readers of 20 countries. OLEA is also sponsored by the INIA (Spanish Institute for Agricultural Research), the IFAPA (Agricultural and Fishery Research and Training Institute) and the UCO (University of Córdoba).

4. In 2009 with the financial support of FAO REU and technical support of FAO HQ, a new server was set up in Rome to serve as common technical background for the AgroWeb CEE Network, ESCORENA and the Thematic Knowledge Networks operational in the framework of ESCORENA in the region, including the ESCORENA Olive Network (http://agrowebcee.net/olive/)

Prospects

The olive oil and table olive production, trade and industry are emblematic economic activities and typical

healthy products of the traditional diet of the Mediterranean countries. To accomplish sustainable development and food security, a future combined effort of R+D is needed.

The new ESCORENA Olive Network will provide an opportunity for cooperation and publishing papers on current innovations in the different olive growing countries. Specific objectives in the near future will be to promote applications of joint R+D projects by participants of different countries to international funding agencies, the publication and distribution of OLEA and to communicate scientific and technical information through the web site (ongoing activities, forthcoming events, book reviews, etc.). OLEA can become an essential tool for communication among scientist, technicians and olive growers and industrials. The new publication of OLEA will provide an opportunity for periodic papers on current innovations in the different olive growing countries. The sponsorship by FAO will guarantee its international character.

The Olive network will be open to any research institute, university or producer association in the field of olive. A new structure is planned for the reorientation of the Network activities in the following years. A complete database including countries, institutions, people and activities will be implemented in the near future and update continuously on the web as a first step for web-based platform for collaboration or discussion.

Organic.Edunet Network

Organic.Edunet is a multilingual federation of learning repositories with quality content for the awareness and education of European youth about Organic Agriculture and Agroecology. The Organic.Edunet network currently consists of 16 project partners (http://project.organic-edunet.eu/organic/partners/index.html) and 85 affiliated partners (http://project.organic-edunet.eu/organic/partners/affiliated.html) from all over the world.

The Organic.Edunet eContentplus targeted project (http://project.organic-edunet.eu) aimed to facilitate access, usage and exploitation of digital educational content related to Organic Agriculture (OA) and Agroecology (AE). It has deployed a multilingual online federation of learning repositories, populated with quality content from various content producers. In addition, it has deployed a multilingual online environment (the Organic. Edunet Web portal, www.organic-edunet.eu), translated in 14 languages so far, that facilitates end-users' search, retrieval, access and use of almost 11.000 educational resources available in the learning repositories. During the first year after its deployment (1/1/2010-1/1/2011), the portal has received approximately 25.000 visits and 126,000 pageviews from almost 16,500 unique visitors coming from 140 countries all over the world. These numbers are constantly increasing, as the portal retains its functionality and is further supported by other projects.

The project studied educational scenarios that introduce the use of the Organic.Edunet Web portal and content to support teaching of topics related to OA and AE in two cases of formal educational systems, i.e., high schools and agricultural universities. For this purpose, two handbooks providing instructions for scenario development as well as examples of scenarios were produced, for school and university level respectively. Furthermore, the Organic.Edunet project evaluated project results in the context of pilot demonstrators in pilot educational institutions, as well as through open validation events where external interested stakeholders were invited. In addition, the products of the Organic.Edunet project include a specially designed OA ontology and a repository tool (Confolio - http://www.confolio.org/wiki/Introduction/Main), with its user interface translated in 17 languages so far.

The Organic.Edunet project was successfully over during the Organic.Edunet Final Conference, which took place during September 16th & 17th 2010 in Budapest, Hungary. In total, during the two days of the event, more than 200 people from more than 50 institutions and 25 countries attended the Conference.

During the three years of the Organic.Edunet project, a number of technological tools were developed and facilitated:

1. The Confolio tool: Confolio is an e-Portfolio tool, developed and used for the indexing, storing, retrieving and describing digital educational resources with metadata records. It provides the interface for interconnecting the network of digital educational repositories. Its interface has been translated in 17 languages so far and more translations have been scheduled. As of today, four different installation of the Confolio repository tool exist in four different servers:

- http://informatics.aua.gr:8080/confolio/apps/Default.html (Agricultural University of Athens – AUA, Greece)
- http://confolio.virtuelleschule.bmukk.gv.at (Federal Ministry for Education, Arts and Culture – BMUKK, Austria)
- http://confolio.vm.grnet.gr (Greek Research & Technology Network – GRNET, Greece)
- http://oe.confolio.org (Royal Institute of Technology – KTH, Sweden)

2. The Organic.Edunet Web portal: the portal provides a multilingual user interface for accessing the resources available in the networked repositories. Its interface has already been translated in 14 languages and more translations are pending. The portal includes a special section for schools, which contains educational resources and scenarios appropriate for school level, images and games. It provides access to the two handbooks (for school and university level respectively) as guides for scenario development. It facilitates 4 different search mechanisms (text, browsing, tag based and semantic search), contains basic information about the networked repositories and extended help options in the form of videos, texts and guides. Even though the Organic.Edunet project has ended, the Organic.Edunet Web portal is still functional and its sustainability will be assured by the support of other projects (e.g. Organic.Mednet, Organic.Balkanet and CerOrganic).

3. A new ontology set was developed to cover the specific needs of the project. It has been revised and is now in the final version. It has been translated in 16 languages so far and provided in OWL (http://project. organicedunet. eu/organic/files/document/OrganicEdunet_D2.2.3a_final.pdf).

4. A new metadata application profile (Organic.Edunet LOM Application Profile) was used for the description

of the educational resources with metadata records. This profile is compliant to the IEEE Learning Object Metadata (LOM) standard (http://project.organic-edunet.eu/organic/files/document/OrganicEdunet_D5.1.2_final.pdf).

5. Two handbooks were developed for the implementation of educational scenarios at school and university level respectively. They provide guidelines for the introduction of the educational scenarios in the teaching process as well as examples of existing scenarios. These handbooks are available in English.

The Organic.Edunet network is constantly developing, thanks to activities that still take place:

- A number of institutes have been contacted in order to become affiliated partners of the Organic.Edunet network.
- The Organic.Edunet Web portal is currently revised in terms of usability and content. More translations of its user interface are expected to be available in the first months of 2011 and a new section for providing access to handbooks for training scenarios will be designed.
- Partners have been contacted in order to continue the task of translating the metadata of the available learning resources in additional languages.
- The process of populating the learning resources is still ongoing. New resources are uploaded and made available through the Organic.Edunet Web portal.

The history and activities of the FAO/CIHEAM Research and Development Network on Pasture and Fodder Crops

Peeters A., Mosimann E. and Porqueddu C.

The network has been created in 1978. It aims at exchanging scientific and technical information, managing working groups on targeted research activities that lead to the development of common methodologies and results, development of research projects, publications, organization of technical stays and training of researchers. It includes two sub-networks: the 'Mountain Pastures sub-network' and the 'Mediterranean Forage Resources sub-network'. In 2010, it is coordinated by a network coordinator (Prof. Dr Alain Peeters. RHEA, Gentinnes, Belgium. Email: alain.peeters@rhea-environment.org) and two sub-network coordinators (Mountain Pastures: Dr Eric Mosimann. Agroscope Changins-Wädenswil (ACW), Nyon, Switzerland. ?Email: eric.mosimann@ acw.admin.ch; Mediterranean Forage Resources. Dr Claudio Porqueddu. CNR-ISPAAM, Sassari, Italy. Email: c.porqueddu@cspm. ss.cnr.it).

The Mountain Pastures sub-network existed first as a working group since 1962. It became the sub-network on Mountain Pastures of the FAO cooperative research network on Pastures and Fodder Crops in 1978. The liaison officers in charge of the coordination of the sub-network were successively: Dr J. Caputa (Switzerland) (1962 – 1976), Dr J-P. Charles (Switzerland) (1977 – 1985), Dr J. Troxler (Switzerland) (1985 – 1996), Prof. Dr A. Peeters (Belgium) (1996 – 2007), Dr E. Mosimann (Switzerland) (2008 -). Between 1963 and 2007, 25 meetings were organized: Switzerland (1963), Switzerland (1964), Austria (1965), Italy (1966), Germany (1967), Poland (1968), France (1969), Yugoslavia (1970), Rumania (1972), Czechoslovakia (1974), Switzerland (1976), Austria (1978), Germany (1981), Italy (1983), France (1985), Yugoslavia (1987), Poland (1989), Switzerland (1991), Norway (1994), Slovakia (1996), Rumania (1998), France (2000), Spain (2003) in collaboration with the FAO Sheep and Goat network, Italy (2005), Bulgaria (2007) and Switzerland (2009). The next meeting will take place in Poland in 2011. In 2010, about 400 members from 27 countries are registered. The objectives of the sub-network are : (1a) before 1989, stimulating contacts between European researchers from both sides of the iron curtain; (1b) after 1989 and the collapse of communism, the first goal of the network has sensibly changed, the topics of the meetings have evolved towards the new development needs of Central and Eastern European countries (methods and tools of extension, quality and promotion of the products, restoration of abandoned land); (2) implementing a place of dialogue on the specific problems of forage production in mountain; (3) creating a complementary role compared to the European Grassland Federation (EGF) where most papers dealt with forage production in the lowlands; (4) stimulating discussions and contacts in small groups of people (about 50-80 per meeting) with similar needs. Meetings are organised once every two years. In the last 30 years, the main research topics were: PLANT – ANIMAL: Quality and productivity of herb species and natural grassland types; Methodological aspects of permanent grassland characterisation; Biodiversity and feeding value of mountain grasslands; Comparison of the effect of sheep and cattle on the vegetation; Altitude grasslands for dairy cows; Role of grazing in the management of agro-pastoral mountain areas; Adapting management to the new challenges of mountain areas. ENVIRONMENT: Quality of the environment in mountain pastures. PRODUCT QUALITY: Quality characterization and promotion of mountain animal products; Sustainable grazing, nutritional utilization and quality of sheep and goats products. DEVELOPMENT METHODS: Methods and tools of extension for mountain farms. Three topics have been identified for future activities: Sustainable grazing systems; Quality of animal mountain products; Quality of the environment (biodiversity conservation and restoration; landscape management (importance of grazing as an ecological management tool); water quality).

The Mediterranean Forage Resources sub-network was created in 1980. During the 1980th and at the beginning of the 1990th, part of its activities were carried out in collaboration with the AGRIMED programme of the DG VI of the European Commission. During the years 1990-1996, research projects were financed within the framework of the CAMAR and AIR programmes of the European Commission. Since 1995, CIHEAM (International Centre for Advanced Mediterranean Agronomic Studies) co-sponsored, through its Mediterranean Agronomic Institute of Zaragoza (IAMZ), the network activities that are important for Mediterranean countries. The sub-

network organises general meetings every two years. The last meetings were organized in Greece (1993), France (1995), Spain (1997), Italy (2000), Tunisia (2002), Greece (2003), Spain (2003) in collaboration with the FAO Sheep and Goat network, Portugal (2008) and Spain (2010). The next meeting will take place in Turkey in 2012. The sub-network includes participants from 16 countries (Algeria, Australia, Bulgaria, Chile, Egypt, France, Greece, Israel, Italy, Morocco, Portugal, Serbia, Slovenia, Spain, Tunisia, Turkey). The objectives of the sub-network are the study and improvement of forage crop production on irrigated and rain-fed land, the development and management of Mediterranean rangelands; the study of forage feeding value, by-products and rangelands of the Mediterranean. During many years, three projects were active: Rangeland utilization (Dr M. Etienne); Forage and grazing systems (Prof. Dr A. Pardini); Genetic resources and improvement of legumes (Dr H. Marrakchi). The proceedings of the meetings are published in the CIHEAM journal 'Options Méditerranéennes' and are available on-line at the CIHEAM web-site: www.ciheam.org . The PowerPoint presentations of the two last meetings of the sub-network are available in the web site of IAMZ: http://www.iamz.ciheam.org/en/pages/paginas/pag_investigacion3b.htm.

Results and impacts of the network

The results of the activities carried out within the framework of the Network on Pastures and Fodder Crops range from the more or less formal exchange of information to the development of large-scale research projects, as well as formal meetings and seminars and a large number of publications. Moreover, a large majority of the researchers working in pastures and forage crops in the Mountain areas and the Mediterranean Region participate in the network. There is a good connection with many European research centres.

Meetings have created links between research teams. Many young scientists from the South, the Centre, the East of Europe and from North Africa have been trained in North-West Europe. Among these researchers, many hold important responsibilities in research institutions of their own countries. Many young students and scientists from West Europe have achieved training periods in Central and East Europe. Many senior scientists from both parts of Europe and North Africa have achieved short-term stays in the framework of common research or continuous training. Important scientific and technical links were also established between researchers from South Europe and North Africa with scientists of Australia and Chile, especially on the topic of pasture legumes.

The impact of the Mediterranean sub-network can be measured not only by the research activities, but also by the economic development activities of the Mediterranean countries since almost all the large development bodies of the Mediterranean interested in small ruminants participate actively in this sub-network.

Some recent publications

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Etienne M. (ed.) (1996) Western European Sylvopastoral Systems. INRA Editions: 276 pp.

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RAMIRAN - The leading network on Recycling organic residues in agriculture

The "Recycling Agricultural, Municipal and Industrial Residues in Agriculture Network (RAMIRAN)"is a research and expertise network dealing with environmental issues relating to the use of manure and other organic residues in agriculture. It is organized within the framework of the FAO ESCORENA: European System of Cooperative Research Networks in Agriculture (http://www.escorena.net/), which was established in 1974 as a means to promote voluntary research cooperation among interested national institutions involved in food or agriculture in European countries.

RAMIRAN evolved in 1996 from the much smaller Animal Waste Network, that had been active since 1978, and the scope was expanded to include many other organic residues (industrial and municipal) which are used on land as organic manures and soil amendments. It is in principal a European network, but also open to interested experts from other parts of the world. It has no official members, but about 400 people from over 30 countries are registered in its participation list.

The network provides an invaluable means of exchanging ideas, information and experiences on topics that are becoming increasingly important at a national and international level. The main objectives of the network are to:

- Promote the exchange of methodologies, materials and processes;
- Progress knowledge on the environmental assessment of organic residues recycling in agriculture;
- Identify research priorities

The main activity of RAMIRAN is a scientific conference organized every two years, usually attended by about 100-150 participants. In the past, RAMIRAN also hosted a number of working groups dealing with more specific topics such as sanitary aspects, gaseous emissions or heavy metals in agriculture. In 2003 a special working group first produced a "Glossary of Terms on Livestock Manure Management" which proved very valuable in harmonizing the use of terms relevant to organic residues and their environmental relevance. Today the focus is on task groups, short-term teams with a clear task that can be achieved in a defined time of ideally 1-2 years and maximum four years. These tasks make use of the potential of RAMIRAN arising from its membership of experts. This means that, for example, surveys about management techniques, environmental, economic or social issues in connection with manure and other organic residues or interdisciplinary studies are ideal topics for such special tasks.

The 14th conference was held in Lisbon in September 2010 (Treatment and Use of Organic Residues in Agriculture: Challenges and Opportunities Towards Sustainable Management) and was the largest RAMIRAN conference to date. Over 200 delegates from more than 40 countries participated, presenting approximately 300 oral and poster contributions.

New Task groups established at the Lisbon conference which will be working over the next 2 years included:

- Anaerobic Digestion and utilization of digestates; an extension of an existing survey
- The global role of Anaerobic Digestion to address sustainability drivers/ determinants
- Residual N effect from organic residues; a review and survey on national guide values
- The effect of slurry separation on total NH3 and GHG emissions
- Translation of The RAMIRAN Glossary of Terms

Tom Misselbrook and Harald Menzi
Network Coordinators

Sonolysis of DeniLite laccase: effects on enzimatic activity

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We report in this study that the sonolysis of DeniLite laccase in absence or in the presence of an emollient leaded to good results, and without major enzymatic activity loss in the first 10 minutes of ultrasonication. The processes and the stability of the enzyme has been investigated by means of cyclic voltammetry. For all cases the direct electron transfer (DET) of laccase has been registered at highly ordered pyrolytic graphite electrodes. The stability of the enzyme was analyzed under aerobic conditions.

Keywords
Laccase; Redox potential, Cyclic Voltammetry, Ultrasound.

Introduction

The use of enzymes in the textile industry has registered a significant growth over the last 30 years, being the third most significant segment of the industrial enzymes market.

The textile industrial processes are heterogeneous, due to the fact that the substrates are the insoluble fibers while the enzyme is found in solution. This situation leads to high and unacceptable processing times due to mass transport limitation.

It is well known that ultrasound enhances the mass transference in wet processes and thus power ultrasound appears to be a very promising alternative technique as a means of accelerating mass transfer in textile wet processes such as dyeing or scouring (Yachmenev, Blanchard et al. 1998; Yachmenev, Blanchard et al. 1999). The application of the ultrasound changes the fundamental functional properties of proteins such as surface activity, surface hydrophobicity, protein structure and intermolecular interactions.

The sonolysis of water produces radicals and the quantity of radicals is increased with the increasing of the frequency and the energy.

Materials and methods

Samples and materials

Laccase (EC 1.10.3.2) from DeniLiteTM was purchased from Novo Nordisk, Denmark and used as received. The buffer constituents were purchased from Sigma-Aldrich.

Electrode preparation

For all experiments was used as working electrode a glassy carbon electrode. Prior to the experiments the surface of the glassy carbon electrode was successively polished with 5, 1, 0.3 and 0.05 μm alumina polish (Buehler Ltd, USA) and then rinsed with 8 M nitric acid and distilled water before use.

Electrochemical measurements

All the electrochemical experiments were performed using a Voltalab 30 Potentiostat (Radiometer Analytical, France), controlled by the Voltamaster 4 (version 5.6) electrochemical software. The working, counter and reference electrodes were respectively: glassy carbon electrode (0.07 cm2), coiled platinum wire (23 cm) and an Ag|AgCl electrode filled with 3M NaCl (BAS, Bioanalytical Systems, West Lafayette, IN, USA). The supporting electrolyte used in the electrochemical cell was a solution of 0.1 M acetate buffer pH 4.5.

Ultrasound equipment

In the experiments where the samples were ultrasonicated, was used an ultrasonic bath with an electrical generator with frequencies of 37 kHz. The glass cell was not sealed, so that all experiments were conducted in presence of the atmospheric oxygen, while cold water was circulated around the cell for refrigeration.

Results and discussion

Laccases are members of the multicopper oxidase family of enzymes that includes ascorbate oxidase

(L-ascorbate oxygen oxidoreductase, EC 1.10.3.3) and ceruloplasmin [Fe(II) oxygen oxidoreductase, EC 1.16.3.1]

The blue copper phenol oxidases, also known as laccases, can be also involved in lignin degradation (Thurston 1994). Laccase benzenediol: oxygen oxidoreductases, EC 1.10.3.2) catalyzes the oxidation of orthoand paradiphenols, aminophenols, aryl diamines, polyphenols, polyamines, and lignin, as well as some inorganic ions coupled to the reduction of molecular dioxygen to water.

From an electrochemical point of view all laccases can be divided into three groups depending on the potential of the T1 site: low, middle and high potential laccases. The low potential group includes laccases from trees, e.g., Rhus vernicifera with a potential of the T1 site of about 420 mV (vs. NHE) (Reinhammar 1971; Reinhammar 1972). The middle group includes laccases from basidiomycetes like Myceliophthora thermophila (Xu 1996), basidiomycete C30 (Klonowska 2002), Rhizoctonia solany (Xu 1996), and Coprinus cinereus (Schneider 1999)]. The enzymes have a potential of the T1 site ranging from 470 to 710 mV (vs. NHE). The high potential laccases (e.g., those from Trametes (Polyporus. Coriolus) hirsuta (hirsutus), T. versicolor, T. villosa) have a potential of the T1 site of about 780 mV(vs.NHE) (Reinhammar 1972; Xu 1996; Koroleva, Yavmetdinov et al. 2001).

Cyclic voltammogram of bare glassy carbon electrode with laccase present in solution which was oxygen-saturated at pH 4.5 is shown in Fig. 1. As can be seen from this figure there are present peaks due to the redox species present in the DeniLiteTM and a peak at around 840 mV vs. NHE which is attributed to the presence of laccase.

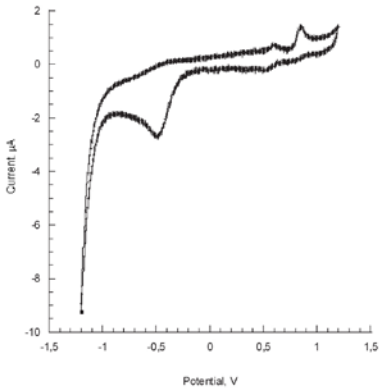

Figure 1. Cyclic voltammograms at glassy carbon electrodes in in presence of laccasse. The cyclic voltammogram is registred at a scan rate of 10 mV/s, in 0.1 M acetate buffer pH 4.5.

The radicals formed by cavitation are very reactive and can promote several physical and chemical reactions. The reactions promoted by them, together with the heat generated by ultrasound (cavitation phenomena) can seriously interfere with enzyme activity and stability.

To evaluate this effect, were prepared four sets of enzyme solutions as it follows: one in which the enzyme concentration was 1% and another one were the enzyme concentration was 2%, the other two solutions were prepared as previously but a solution of 2,5 % emollient was added. All 4 solutions were tested in absence and in the presence of ultrasonication, resulting 8 different experiments.

For each case a sample aliquot was collected every 5 minutes, and used in the electrochemical cell without further treatment. The results interpreted from cyclic voltammograms are plotted and shown shown in Figure 2.

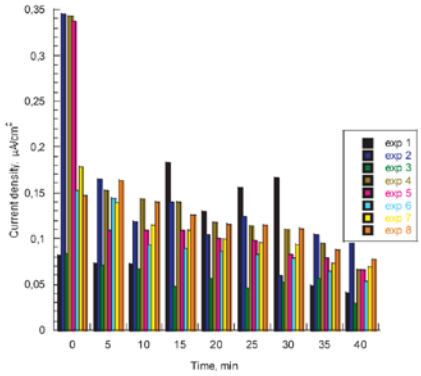

Figure 2. Results obtained for the collected samples, where the current density is measured for the peak that appears at 840 mV vs NHE. (The solutions components are as follows: exp 1- 1% laccase, and no ultrasonication, exp 2-

2% laccase and no ultrasonication, exp 3 and 4 same as exp 1 and respectively 2, but in presence of ultrasonic irradiation, exp 5 and 6- 1% laccase, and 2,5 % emollient, without and respectively with ultrasonication, and exp 7 and 8- 2% laccase and 2,5 % emollient, in absence and in presence of ultrasonic irradiation. All solutions contain 0,8% surfactant).

Based on the results presented in Figure 2 it can concluded that the results at time 0 should not be taken into account since possible misinterpretations can occur (e.g. due to a lack of proper mixture of the sample components).

On the other hand, starting from time 5 minutes until the end of monitoring of the experiments, there are no big differences between results. Of course, a small decrease of the enzyme is observed due to the prolonged ultrasonication time, but it should be taken into account also the fact that the enzyme solution kept at the room temperature for the same period of time, also suffers from a small lose of enzymatic activity.

It can be concluded that the best results in presence of ultrasonic irradiation are obtained in the case when 2% laccase is used. Even the addition of an emollient to the system does not significantly affect the results.

Conclusions

This paper comes to demonstrate that cyclic voltammetry can be an usefull tool for determination of redox potential. Moreover, the results obtained are giving useful informations on the stability of laccase used in presence of emollients and ultrasonic irradiation.

The obtained results are useful for the future attempts to obtain performing materials enzymatically treated in ultrasounds processes, and that offers safety and comfort.

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Obtaining flax lignans for nutraceuticals or functional food purposes (Literature review)

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Abstract:
Flaxseeds contain the largest amount of lignans; the major lignan found in the seeds is secoisolariciresinol, which is present in a polymer, secoisolariciresinol diglucoside. Lignans are ascribed many health effects: reducing tumor development: size, growth and metastasis; protection against breast cancer, prostate cancer, colon cancer; protection against osteoporosis; they have an antioxidant activity; they can act as a hipotensive agent. Lignans can be extracted from flaxseeds by: HPLC; HPLC-MS; LC-MS/MS; Supercritical CO2 extraction; Ultrafiltration.

Keywords: flaxseed, lignans, secoisolariciresinol diglucoside, phytoestrogens, antitumor activity, antioxidant activity, antimicrobial activity

Flax

Official Latin name: Linum usitatissimum

Family: Linaceae

Common Names: Annual Flax, Chih-Ma, Common Flax, Flax, Flaxseed, Golden Flax, Lini semen, Hu Ma, Kahtan, Keten, Kettan, Kittan, Lin, Linaza, Lino, Linseed, Linseed Flax, Linum usitatissimum.

The scientific name of flax is Linum usitatissimum. Usitatissimum which in Latin means most useful, a worthy name for a plant used for food and fiber.

Flax is sown in winter and flowers in late spring. With blue flowers that open only in the morning, flax is one of the most beautiful crops when flowering. The time to collect it is in September when fully ripe.

Flaxseeds come in two basic varieties: brown and yellow or golden. Most types have similar nutritional characteristics.

Although flaxseed has been consumed by human as food for thousands of years, industrial uses of flax oil have predominated since the industrial revolution.

Seed structure

Hand-dissected flaxseed is made up of 55% cotyledon, 36% seed coat and endosperm (hull), and 4% embryo. The cotyledons are the major oil storage tissue, containing about three-quarters of the seed oil. About 22% of the oil is found in the seed coat and 3% in the embryo.

The seeds are 4–6 mm in length, and the seed coat, which may range in color from deep brown to yellow variegated; they are usually smooth and shiny.

Flaxseed composition

Humidity %	Protein %	Lipids %	Fiber %	Ash %	Reference
7.4	23.4	45.2	-	3.5	Mueller *et al.* (2010)
4 – 8	20 – 25	30 – 40	20 – 25	3 – 4	Coskuner and Karababa (2007)

Flax is rich in fat, protein and dietary fiber. Flaxseed contains omega-6 and omega-9 essential fatty acids, linolenic, linoleic and oleic acids, mucilage, cyanogenic glycosides (linamarin), fiber, protein, potassium, calcium,

magnesium, phosphorus, zinc, iron, lecithin, and vitamins A, B and E.

Flaxseed (Linum usitatissimum) contains many biologically active phytochemicals that are beneficial to human health. One group of these phytochemicals is currently being extensively investigated for its biological roles in preventing the onset of hormone-related cancers. These are the flaxseed 8-8'linked lignans (1), a subclass of the structurally very diverse lignan natural products widely distributed throughout the plant kingdom (2). Typically, in different plant species, the lignans exist as phenylpropanoid pathway derived dimmers and are found in all plant parts including stems, roots, leaves, flowers, seeds, oils and exuded resins.

The first known report of a new phytoestrogenic complex, termed "a new diglucoside", was published by Bakke and Klosterman, in 1956, (3) wherein methanol and barium methoxide were used to hydrolyze this polymer into a series of less complex compounds. Since the discovery of mammalian lignans it has been assumed that the only precursors of mammalian lignans are secoisolariciresinol diglucoside and matairesinol (4). One of the substances identified was secoisolariciresinol diglucoside.

Lignans are secondary plant metabolites which are produced from shikimic acid via phenylpropanoid pathway. They develop from flavonoid precursor and are responsible for conferring resistance to plants against pathogens and predators. (14)

Lignans are defined to be compounds possessing a 2,3 dibenzylbutan structure and include matairesinol, secoisolariciresinol, lariciresinol, isolariciresinol, pinoresinol, olivil and other compounds, and modifications thereof including diglucosides.(15)

Table 1. Food sources with lignan content

Source	The lignan content (µg/100 g fresh weight)	Major lignan	Reference
Flaxseed	301129 - 370987	Secoisolariciresinol	(Mazur et al 1996, Milder et al, 2005a)
Rye	10377	Syringaresinol	(Smeds et al, 2007)
Wheat	7548	7-hydroxymatairesinol	(Smeds et al, 2007)
Broccoli	1325	Lariciresinol	(Milder et al, 2005a)
Strawberry	334 - 1578	Pinoresinol, Secoisolariciresinol	(Meagher and Beecher, 2000, Milder et al, 2005a)
Barley	1071	7-hydroxymatairesinol	(Smeds et al, 2007)
Corn	1049	7-hydroxymatairesinol	(Smeds et al, 2007)
Sunflower seed	891	Sesamin	(Moazzami and Kamal-Eldin, 2006, Smeds et al, 2007)
Green bean	273	Lariciresinol	(Milder et al, 2005a)
Soy flower	130	Secoisolariciresinol	(Mazur et al, 1998)
Bell peper (red)	113	Lariciresinol	(Milder et al, 2005a)
Orange	78	Lariciresinol	(Milder et al, 2005a)
Tea (English blend)	71	Pinoresinol	(Milder et al, 2005a)
Tomato	58	Lariciresinol	(Milder et al, 2005a)
Pea (jar)	34	Pinoresinol	(Milder et al, 2005a)
Brown bean (jar)	26	Lariciresinol	(Milder et al, 2005a)
Potato (boiled)	20	Lariciresinol	(Milder et al, 2005a)
Coffee (brewed)	19	Secoisolariciresinol, Lariciresinol	(Milder et al, 2005a)
Lettuce (iceberg)	11	Secoisolariciresinol	(Milder et al, 2005a)
Apple (Elstar)	1	Lariciresinol	(Milder et al, 2005a)

Flaxseeds are the richest edible source of lignans (Milder et al 2005a). Variation in flaxseed lignan concentrations depend on the variety, location, and crop year (Westcott and Muir, 1996).

Flaxseeds are increasingly used in food products or as a supplement. High concentration can be found especially in seeds and nuts (Milder et al, 2005). Secoisolariciresinol diglucoside (SDG) is the most important lignan in flaxseed.

In most plants free lignans are present, but in flaxseeds, lignans are incorporated into a polymeric structure (Kamal-Eldin et al, 2001) which is referred to as a lignan macromolecule. The most abundant lignan found in flaxseed secoisolariciresinol diglucoside is esterified to hydroxy-methyl-glutaric acid forming the backbone of the lignan macromolecule (Kamal-Eldin et al, 2001).

The primary lignan found in flaxseed is 2, 3 bis (3 methoxy-4hydroxybenzyl) butane 1, 4 diol (secoisolari-

ciresinol) which is stored as the conjugate secoisolariciresinol diglucoside (SDG) in its native state in plant. Flaxseed contains levels of this phytoestrogens which are 75-800 times grater than any plant food. The plant lignan cathecolic nordihydroguaiaretic acid is a potent antioxidant previously used by the food industry.

Plant lignans can be converted by intestinal bacteria into the so-called enterolignans, enterodiol and enterolactone

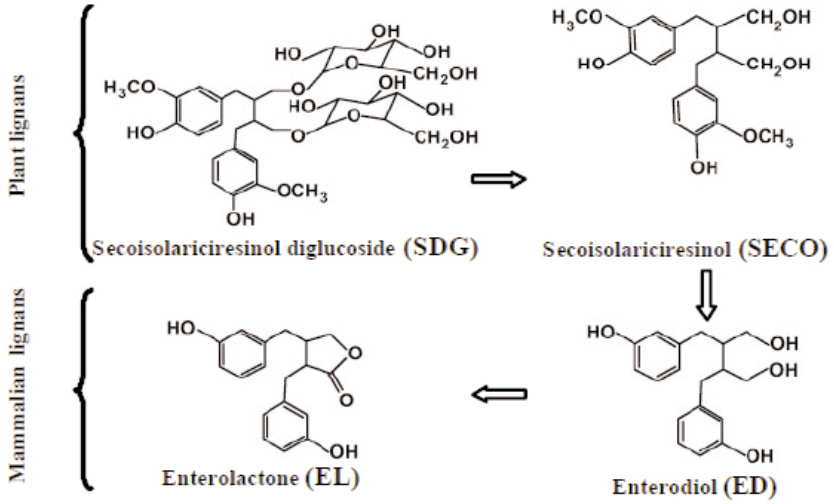
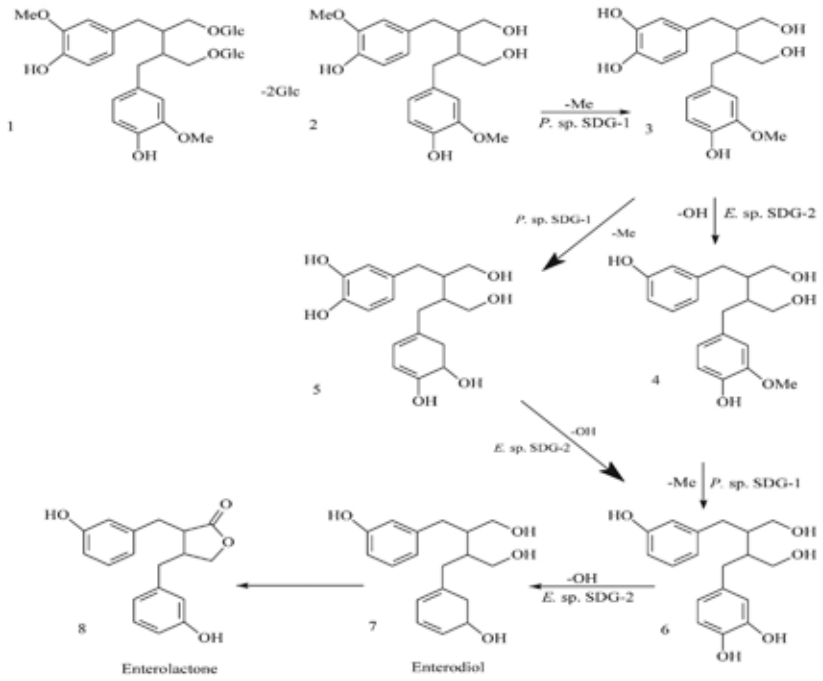


Figure 1 - Chemical structures of the plant lignan secoisolariciresinol diglucoside and its metabolites.

Not the plant lignans, but the mammalian lignans enterolactone and enterodiol are responsible for the health effects related to lignans consumption. This is because in human plasma mainly mammalian lignans have been found. The mammalian lignans are formed by a multi step conversion reaction by the microflora of the human colon.



Possible Pathway for the Transformation of SDG by Peptostreptococcus sp. Strain SDG.$_1$ and Eubacterium. sp. Strain SDG.$_2$, Human Intestinal Bacteria

Lignans: nutrition and health effects

Lignans can be integrated in functional foods, nutraceuticals or pharmaconutrients (all terms indicating

nutrients or nutrient enriched foods that can prevent or treat diseases) (Hardy, 2000).

The main mechanisms via which lignans exert their health effects are by influencing the estrogen metabolism and by their antioxidant activity. Because of their influence on estrogen metabolism, lignans are functionally classified as phytoestrogens.

Protection against certain types of cancer and protection against osteoporosis are often ascribed to lignans (5). Upon exposure to flaxseed a reduction in tumor development, size, growth and metastasis was shown in a research done on breast cancer in rats and mice (Thompson et al, 1996).

On prostate cancer the effects of flaxseed lignans are less noticeable. Flaxseed inhibited the growth and development of prostatic carcinoma in mice (Lin, 2002).

During menopause the level of estrogens drops. These decreases lead to a higher incidence of osteoporosis in post-menopausal women (Kiberstis et al, 2000). Phytoestrogens are shown to reduce this increase in osteoporosis (Picherit et al, 2000), although the effect of lignans is not completely clear yet (Power et al, 2006; Ward et al, 2001).

An antioxidant activity is ascribed to SDG (Prasad, 1998). Most of lignans containing hydroxyl group was suggested to exhibit antioxidant action according to the number or position of hydroxyl group (33). It has been found that by administering secoisolariciresinol diglucoside from flaxseed in substantially pure form to a human or a non-human animal, development of hypercholesterolemic atherosclerosis can be prevented with a reduction in total cholesterol. (13, 20)

Flaxseed ingestion produces potentially anticarcinogenic lignans in the colon. This study determined that flaxseed decreases the risk for colon carcinogenesis. In the descending colon of supplemented groups, the total number of aberrant crypts and foci were significantly reduced by 41-53% and 48-57%, respectively. Flaxseed may reduce the risk for colon carcinogenesis. (34)

SDG is useful for the treatment of diabetes mellitus (13). Lignans can prevent the development of Types I and Types II diabetes by 71% (Prasad, K. Proc. of the American Diabetes Association, (1999)), act as a hipotensive agent with the ability of lowering the blood pressure without affecting the heart rate (16, 17, 18), provides benefits against Lupus Nephritis (19), and reduce development atherosclerosis in animals.

Lignans have antimicrobial activity for Escherichia Coli, for Aspergillus flavus and Aspergillus niger. (35)

Methods of extraction lignans from flaxseeds

Since the discovery of their physiological value, lignans have been extracted from flax and other plants, in a variety of ways. Once extracted, lignans can be added to food or taken in a concentrated form, in an attempt to take advantage of their functionality and benefits.

Methods for preparation of lignans and other phenolic compound have been reported in literature. In 1956 Bakke and Klosterman described a process for extracting lignans from defatted flax using methanol dioxine (21). However lignans are known to occur as a complex in flax with cinnamic acid glucosides and other compounds. Sodium and barium methoxides have been used for methanolysis to release lignans free of other compounds (22). Almost all of the lignans present in flaxseed occur as components of a soluble ester linked complex and do not occur as free glucosides or aglycone. (23)

Most of the patented techniques for the extraction, isolation, and purification of SDG are conducted on defatted flaxseed and whole flaxseed.

Traditionally, solvent extraction has been used to recover lignans, typically with alcohols like methanol or ethanol, or acetone isopropanol, and butanol to extract the complexes form of SDG (24) due to the polar nature of these phenolic compounds.

Although the alcohols themselves can be used it has been found that a mixture alcohol with water is surprisingly superior in its extraction capability. Alcohol mixed with water gives the best blend for extraction.

Methanol has been found to be the most effective solvent in terms of extraction effiencity. Aqueous ethanol is also highly effective and it's preferred from considerations of safety to health and handling.

The alcohol solvent is preferably mixed with the flaxseed meal in a liquid to solid ratio in the range 2:1 to 50:1.

This extraction is either combined with, or followed by, hydrolysis of the lignan macromolecule using acid, base or enzyme. Use of large quantities of an organic solvent, such as methanol, requires its removal which usually involves high temperatures.

The lignans must first be extracted from their biological matrix before separation and detection by chromatographic techniques. Because secoisolariciresinol diglucoside is a complex polymeric structure and the SDG in flaxseed exists as a "polymer" consisting of five SDG residues interconnected by four 3-hydroxyl-3-methyl glutaric acid residues this has been difficult. For the large variation in SDG values reported for flaxseed in the literature incomplete extraction of SDG from this polymer may have been partly responsible (6, 7, 8).

Lignans can be extracted from flaxseed by various methods:

- Ultrafiltration (29)
- HPLC analysis (9, 30, 31)
- HPLC-MS (9, 10, 11, 12)
- Supercritical CO2 extraction (30)
- Flash chromatography (C18 column) (30)
- LC-MS/MS (32)

Precautions

Flaxseed has several compounds that may negatively influence health and well-being. In some cases, the negative impact might simply be an assumption based on literature reports of similar compounds from other foods. The 2 components that have been questioned most frequently are the cyanogenic glycosides and linatine, an antipyridoxine factor. Cyanogenic glycosides are not exclusive to flaxseed. These compounds can be found in a number of plants including brassica vegetables and especially cassava. Many of the health concerns regarding cyanogenic glycosides stem from studies showing that cassava was toxic to animals and humans (McMahon and others 1995). However, cassava contains significantly more cyanogenic glucosides than flaxseed. Furthermore, the release of hydrogen cyanide from flaxseed would be minimal and below the toxic or lethal dose. At the recommend daily intake of about 1 to 2 tablespoons, approximately 5 to 10 mg of hydrogen cyanide is released from flaxseed, which is well below the estimated acute toxic dose for an adult of 50 to 60 mg inorganic cyanide and below the 30 to 100 mg/d humans can routinely detoxify (Roseling 1994). Daun and others (2003) reported that a person would have to consume 8 cups (1 kg) of ground flaxseed to achieve acute cyanide toxicity.

In addition to cyanogenic glycosides, trypsin inhibitor, linatine, and phytic acid are other Antinutrients contained in flaxseed. Trypsin inhibitor activity (TIA) in flaxseed was low when compared to those in soybean and canola seeds. Bhatty (1993) reported laboratory-prepared flaxseed meals containing 42 to 51 units of TIA, which was slightly higher than 10 to 30 units observed by Madusudhan and Singh (1983) and commercially obtained flaxseed meal (14 to 37 units). The contents of phytic acid were significantly different among cultivars.

Flaxseed in hole, ground or defatted has been incorporated in to animal feeds and food products such as breads, cookies, muffins. It has also been used for supplementing fiber levels in meats products. However, the amounts witch can be used are regulate since high oil content of flax and the presence of mucilage contribute to excessive caloric intake and laxation.

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Obtaining bast plants oils with specific nutritional and functional properties (Literature review)

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Abstract

In food applications, bast plants seeds are more often used than oils because of there better stability and the presence of fiber, lignans, omega-3 and omega-6 fatty acids, which have health benefits. According to industry standards, cold pressing is achieved when the temperature of oil coming from the extruder does not exceed 35oC and pressing is performed under protection from oxygen, usually under a blanket of nitrogen. Good practice requires utilization of expellers, which have the ability to cool parts of the press, which are in contact with seeds and oil to control the temperature during processing (8). These oilseeds are produced in industrial quantities and can be considered as potential sources of new oils with specific nutritional and functional properties.

Keywords: omega-3 and omega-6 fatty acids, functional food, native cold pressed oil.

Introduction

Oils and fats have been constituents of human nutrition from ancient times. First, they contain the highest level of energy of all components of food; second, they supply essential elements for the body. However, the fundamental reason for their early and varied use was certainly the fact that they contribute to the development of flavor, making dishes tasty and giving them a good, smooth mouth-feel. This explains in part why the consumption of fat is still very high today, even though the segment of the population performing hard labor has diminished greatly compared with the past, rendering a very high supply of calories no longer necessary.

The importance of fats for humans, animals and plants lies in their high content of energy, which permits the greatest possible storage of energy in the smallest possible amount of food substance. In addition, fats allow humans and animals to consume fat-soluble vitamins and provide them with essential fatty acids, that is, those indispensable fatty acids that their bodies are unable to synthesize themselves.

Fats are omnipresent in nature, although in the most diverse quantities. In the human body, they play a decisive role as well, beginning with the nutrition of the infant with breast milk. During the first 5 d, breast milk contains an average of 29.5% fat; from d 6 through 10, the amount is 35.2% and later 45.4% (1). In the course of life, a human living in the industrial world satisfies an average of >40% of energy demand with fat. Metabolized in the human body, fats yield 38 kj/g of energy (9 kcal/g). In this exothermic reaction, 2000 ml of oxygen per gram of fat is consumed and 1400 ml of carbon dioxide is produced (2). In addition to 63 tons of water, 0.5 tons of alcohol, 8 tons of carbohydrates and 2 tons of proteins, humans consume 3 tons of fat during their lives.

Components of Fats and Oils

Glycerol (propane-l,2,3-triol) is the one and only alcohol to which fatty acids are esterified into triglycerides, i.e., oils and fats. Living organisms synthesize glycerol from hexose; in the body, this reaction is much faster than the synthesis of fatty acids. That is why glycerol is always vailable in sufficient quantities (3) for the synthesis of fats.

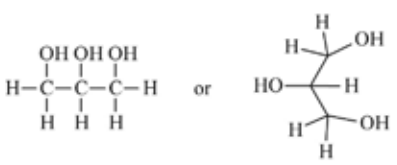


Fig. 1. Glycerol structure

Fatty Acids. Today, >200 fatty acids are known to occur in fats and oils. Only a handful have a share >3% in the triglycerides of edible oils and fats. A further handful fall in the region of 0.5-3.0%. All others exist only as traces in common oils and fats; they can be found in higher amounts in special species.

Naturally occurring fatty acids are usually monobasic and unbranched. They are aliphatic monocarbonic acids, mainly saturated or mono- or bi-unsaturated. Higher degrees of unsaturation occur in marine oils. In animal and vegetable triglycerides, even-numbered chain lengths between 4 and 26 carbon atoms dominate; in waxes, chain lengths up to 38 exist. In fats of microorganisms, odd-numbered chain lengths can constitute up to 15% of all fatty acids. In the beginning of fat chemistry, high amounts of C, fatty acid (margaric acid) had been found. This later proved to be a mixture of C16 and C18 that could not be separated with the analytical methods of that time (4).

Availability of fats and oils

An important contributor to the availability of fats and oils is the fact that most fats and oils production is controlled by factors other than the demand. Corn and cottonseed oils are clearly byproducts, whereas soybeans are specifically crushed to meet the demands for meal. Sunflower, canola, and peanut plantings are subsidized and controlled by the governments of the major countries producing the oils. Palm kernel oil production is dependent on palm oil requirements, as it is grown in the same fruit bunch. Olive, coconut, and palm oils are all produced from the fruit of trees that have long productive life spans, therefore, their production cannot be adjusted to demand changes from year to year. Animal fats are dependent on meat consumption, and butter output is subject to milk production. Thus, the availability of fats and oils is not geared to demand (5).

Vegetable fats and oils

Almost all plants contain fats or oils, mainly in their seeds. The amount varies from very little to as much as 70 - 80%. For a plant to be suitable for oil production on the scale required today, it must meet the following two criteria:

(i) The oil or fat content must reach the minimum for commercially viable exploitation.

(ii) The plant must be suitable for high acreage cultivation.

The only exceptions are plants that contain oils or fats unique in their composition or with properties that cannot be found elsewhere. The number of oil-bearing plant varieties is quite high. However, only a limited number are exploited and traded worldwide; many are of regional importance only or serve very special purposes. In principle, there are two groups of fats and oils, denominated after their source, namely, pulp oils and seed oils.

Pulp Oils. Pulp oils occur finely dispersed in the fruit's endosperm, which has a very high water content. They require special treatment, preferably immediately after harvesting. Any mechanical stress that leads to damage of the cells, but also aging as such, initiates enzymic reactions that lead to fat splitting or other spoilage. This means that pulp oils are usually extracted in close proximity to the location of origin, which usually is smaller decentralized oils mills near the plantations.

In addition to the two main contributors (palm oil and olive oil), there is a third that is produced in small quantities, namely, avocado oil. This oil is very edible; however, because of its high price, low tonnage and high image, it is used mainly in cosmetics.

Seed Oils. In contrast to pulp oils, oilseeds are less sensitive toward spoilage because they are much more stable mechanically and have a much lower water content. It is therefore much better to store the seeds than it is to store the oil because the seeds are equipped by nature with protective mechanisms and protective substances. These mechanisms have to ensure that the energy reserve of the seed, namely, the fat, can survive the time to germination-and that may be very long. Even seeds of wellknown plants that are not at all connected with oils and fats contain triglycerides, sometimes in surprising amounts.

Table 1. Fat Content of Nonoil Seeds

Seed	Fat (%)
Apple	20
Apricot	40
Lemon	50-54
Coniferae	25-30
Tomato	25

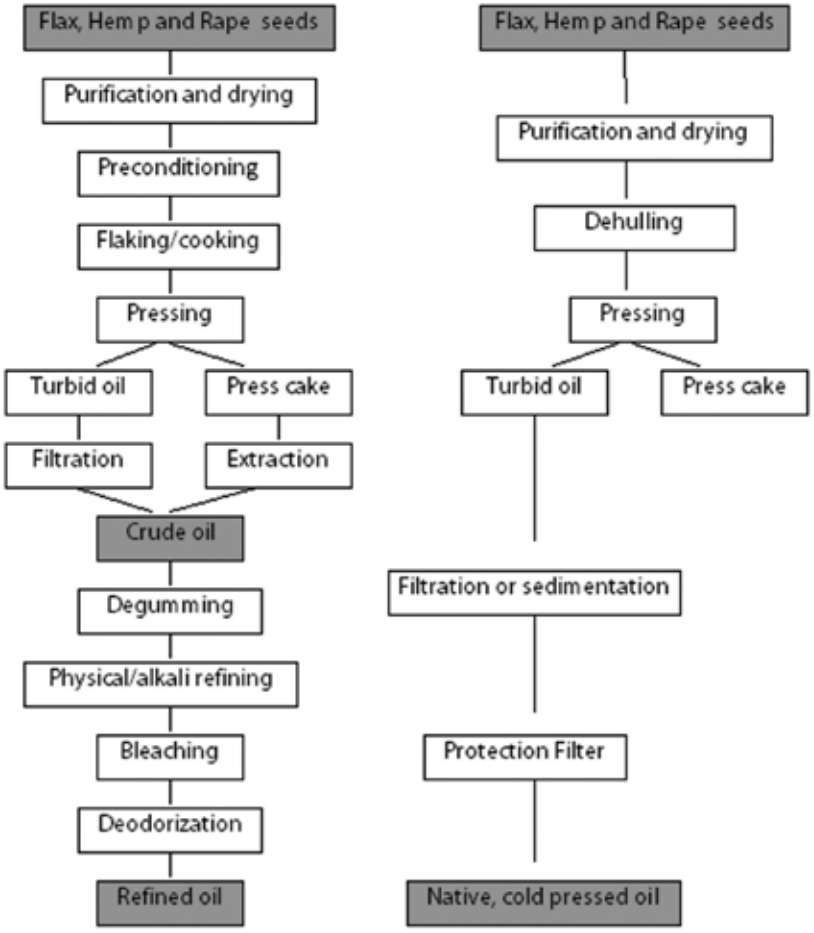
Despite their high fat/oil content, most of these seeds are not used for oil production; the number of seeds extracted is very limited. Some of the potential seeds for oil extraction occur as waste in the production process of other food (e.g., tomato seeds in tomato juice production or grape seeds in wine-pressing); however,

they are contained in matrices that are very difficult to process; therefore they cannot be extracted economically today. Others grow wild and are dispersed in regions difficult to access, such as the babassu palm, for example. Some plants with high oil content contain unwanted components that are difficult to separate, or their extraction meal is of no use at all (4).

Oilseed Extraction

Most oilseeds require some degree of cleaning and preparation before the oil is separated from the solid portion of the seed. Foreign matter reduces oil and protein yields, adversely affects oil quality, and increases wear and damage to the processing equipment. Stems, pods, leaves, broken grain, dirt, small stones, and extraneous seeds are the typical components of the foreign material found in flax, hemp, soybeans, sunflower seeds, safflower seeds, canola seeds, and peanuts. High-capacity dry screeners are used to remove all materials that are over or undersize by utilizing a combination of screens and aspiration. Permanent or electromagnets also are used for the removal of tramp iron objects.

Fig. 2 . The two major oil extraction methods (6):

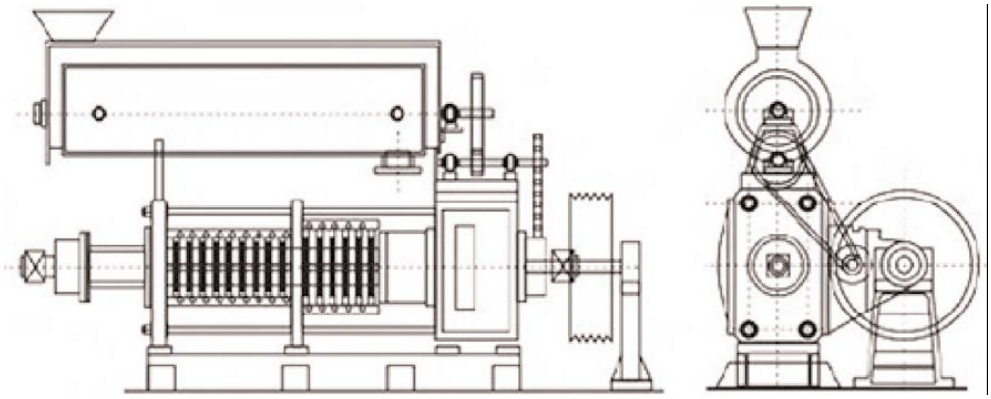


Expeller or Screw Press Extraction

The aim of the pressing process is to separate the oil from the solid phase of the seed material. The press cake, which can contain 3 to 10% oil, is usually ground into meal and sold as a protein source. After settling and filtration to remove fine particles, the crude oil is then processed into finished product formulations. Continuous screw presses are used for the mechanical extraction of soybeans, flaxseed, peanuts, copra or coconut, palm kernel, and other oilseed varieties in various parts of the world (5).

Lower expelling temperatures of cold-pressed oil at 35 to 60°C improves the oil quality with regard to phospholipids and color over the warm-pressed oil at 70 to 110°C. However, oil yield and the levels of nutritional components, such as tocopherols, carotene, and phenolic acids are improved with the higher temperature pressing. Enhanced crude oil quality obtained by expelling rather than solvent extraction may allow milder processing conditions, such as elimination of caustic refining in favor of acid degumming and a lower deodorization temperature (5).

Different manufacturers for oil presses in the market and their design functionality vary from one manufacturer to another, but in general the principle is nearly the same for all presses. Most of them consist of a rotating screw shaft within a horizontal barrel (6).



Extraction of flax, hemp and rapeseed oil

Flaxseed is the annual cultivar of Linum usitatissimum L. Flax is a member of the Linaceae family that includes ten genera and more than 150 species (7). The crops grown for both seed and fiber are generally called dual-purpose flax. Initially, the same variety was used for both oil and fiber production. Today, oil and fiber varieties are different and specifically designed to serve the actual end use. Fiber varieties usually have longer stem, 80–120 cm tall, with fewer branches, fewer seed capsules, and smaller seeds. Although oil type has shorter and heavily branched stems, 60–80 cm tall, with a higher number of seed capsules and larger seeds. Flaxseed is covered with fibrous hull accounting for 25 to 45% of the seed weight and contains 2–7% by weight of water-soluble carbohydrates. These components called mucilage can interfere during processing (8). Flaxseed contains approximately 25% protein, 10% moisture, and 35–45% of oil (8, 9, 10). Enzyme linase is always present in flaxseed, and it decomposes glucosides to many products, including hydrocyanic acid, one of the most toxic substances. Newly developed varieties of flax have lower amounts of glucosides in the seed. During processing, small amounts of glucoside can be transferred into oil, whereas these compounds are water-soluble.

Flaxseed contains a high amount of oil, but expressing oil from it is difficult and often double pressing is required to efficiently remove oil from the seeds. Before crushing, cleaned seeds are tempered to achieve a moisture level of 9.5% to 10%, this will minimize the formation of fine particles when seeds are cracked or flaked and will maximize removal of oil from them. Moisturized seeds are passed through sets of corrugated and smooth rolls to be cracked and flaked, respectively. The flax oil for human consumption is cold-pressed, and further purification of oil is not applied. According to industry standards, cold pressing is achieved when the temperature of oil coming from the extruder does not exceed 35oC and pressing is performed under protection from oxygen, usually under a blanket of nitrogen. Good practice requires utilization of expellers, which have the ability to cool parts of the press, which are in contact with seeds and oil to control the temperature during processing (8).

Flaxseed is the richest source of plant lignans containing 75–800 times more than that in other oilseeds, cereals, legumes, fruits, and vegetables (11). These plant origin components act in mammalians as hormone-like phytoestrogens. Lignans are compounds with a dibenzylbutane skeleton, which have been found in many higher plants (11, 12). Plant lignans, namely, secoisolariciresinol diglycoside (SDG) and matairesinol (MAT), are the main compounds among flaxseed lignans. Furthermore, it has been suggested that lignans have antimiotic, antiestrogenic, antiviral, antibacterial, antifungal, and antioxidant properties (12 - 25).

The presence of plant lignans in flax oil makes it nutritionally more valuable than any other oil. When high levels of ALA and linoleic acid are considered in the whole equation, flaxseed oil serves as the best oil in terms of its nutritional and health value.

Hemp is probably one of the first plants to have been used (and later cultivated) by people (26). Throughout history and in separate parts of the world, hemp has often been an important plant revered for its psychoactivity and useful for medicine, as a source of fibre, and for the food provided by its seed.

Extraction of oil from hemp seed is not being carried out on a large scale at the present time. That being processed, is sometimes relatively unhomogenous, mature seeds mixed with green ones. This is due to the difficulty of finding the optimal time for harvesting, since not all seeds reach maturity simultaneously, especially in hemp undeveloped for seed production. The presence of unripe seeds not only increases seed crop moisture content, it also lowers oil yield and modifies its taste.

After harvest, hemp seed undergoes a drying process that reduces its moisture content to 10% or less,

so as to prevent sprouting during storage. Batches of this material are then fed into a hydraulic screw press and a pres sure of 500 bars is progressively applied, resulting in only a minor elevation in temperature. Best quality oil is obtained from the first fractions recovered. Approximately 35% of the available oil remains in the seed cake (27). The pressing process is sometimes repeated with this crushed residue to obtain a small additional amount of oil, although quality is decreased.

This "cold pressing" does not allow an extraction yield equal to that of techniques employing solvents or high temperatures, but it has the advantage of minimizing degradative changes in the oil. A small amount of oil is also unrecovered during the subsequent filtration process. Further refining procedures should be avoided in order to preserve the native qualities of this product. Bottling must occur quickly and filling under nitrogen into opaque bottles, then refrigerating, offers significant protection against oil degradation due to oxidation and the action of light, although freezing is necessary for long-term storage. Addition of anti-oxidants extends shelf life of the product at room temperature (28).

Rapeseed oil is the world's third most important source of vegetable oil after palm and soybean (29). The rapeseed production has witnessed a steady upward movement during the past 25 years and presently, it contributes about 14% of the global vegetable oils. More recently, the introduction of low erucic acid varieties enhanced its value as edible oil, particularly among the health conscious consumers and varieties with low glucosinolates increased the value of its defatted meal for use as a feed for livestock. The development of double-low varieties (canola) (30) has made rapeseed one of the major plant oil sources at the global level, and now there is a constant tendency to increase its share in production of oilseeds (31).

The aim of the extraction method is to optimize the oil yield with simultaneous maintenance of the oil quality, whereas the method used for this aim depends on the application for which the oil is provided (6).

Chemical composition of flax, hemp and rapeseed oil

Main components of vegetable oils, including flax, hemp and rapeseed oils, are triglycerols and usually contribute more than 90% of all components (32).

Component	Flax	Hemp	Rapeseed
Fatty Acids (%)			
C16:0	5.3	6 – 9	-
C18:0	3.3	2 - 3	7
C18:1	17.9	10 – 16	56
C18:2	14.7	50 – 70	30
C18:3	58.7	15 - 25	7
SFA	8.6	11	7
MUFA	17.9	12	56
PUFA	73.4	77	37
Tocopherols	347(ppm)	150 mg/100g	700-1000 (mg/kg)
Omega 3 – Omega 6 Ratio	4 : 1	1 : 3	1 : 4

Table 2. Composition of flax, hemp and rapeseed oil (32)

Fatty acid composition of regular flax oil is different from other commercial oils because of the very high contribution of ALA, usually above 50%. Because of the high content of this unique fatty acid, flaxseed and flax oil are often used as food supplements, where enrichment with omega-3 fatty acids is needed. This fatty acid is susceptible to oxidation; it oxidizes 20–40 times faster than oleic acid and 2–4 times faster than linoleic acid (33). This property makes the oil a good material for paint and plastic production where fast oxidation is required. Flax oil contains low amounts of saturated fatty acids.

Non-refined hemp seed oil extracted by cold-pressing methods varies from off-yellow to dark green and has a pleasant nutty taste, sometimes accompanied by a touch of bitterness. The seed (and therefore the extracted oil) normally does not contain significant amounts of psychoactive substances (34, 35). Trace amounts of THC, sometimes found upon analysis, are probably due to contamination of the seed by adherent resin or other plant residues (36, 37), although reports to the contrary exist (38).

Analytical data reported for the fatty acid composition of hemp seed oil (39, 40, 41, 42, 43), together with an analysis performed on an oil produced in Switzerland from a monoecious variety, reveals that it is unusually high in polyunsaturated fatty acids (70-80%), while its content in saturated fatty acids (below 10%) compares

favorably with the least saturated commonly consumed vegetable oils. This high degree of unsaturation explains its extreme sensitivity to oxidative rancidity, as the chemical "double-bonds" that provide such unsaturation are vulnerable to attack by atmospheric oxygen. This degradation is accelerated by heat or light. For this reason, the oil is unsatisfactory for frying or baking, although moderate heat for short periods is probably tolerable. Cold pressed oils are not considered suitable for deep-frying, although Chinese use them in stir-frying (44). It is best consumed as a table oil, on salads or as a butter/margarine substitute for dipping bread, similar in use to olive oil. Proper steam sterilization of the seed probably does not cause significant damage to the oil, but does destroy the integrity of the seed, allowing penetration by air and molds. If this procedure is required, it should be done at a legally bonded facility immediately before release of the seed for further processing. By the same reasoning, one should avoid eating whole hemp seed that has been subjected to any cooking process, unless reasonably fresh.

The two polyunsaturated essential fatty acids, linoleic acid (C18:2w6) or "LA" and linolenic acid (C18:3w3) or "LNA", usually account for approximately 50-70% and 15-25% respectively, of the total seed fatty acid content (42, 45). A 3:1 balance has been claimed optimal for human nutrition (46). Cannabis seed from tropical environments seems to lack significant quantities of LNA (47, 42).

The contribution of linolenic acid in oil showed a wide range and was affected by the growing conditions. Temperate variety oils are less saturated, perhaps due to a natural selection in northern latitudes for oils with a higher energy storage capacity or which remain liquid at a lower temperature. Cool temperatures during the 10–25 days after flowering are the main cause for higher amounts of linolenic acid in flax oils. This phenomenon was also observed for other oilseeds such as hemp, canola and soybean (48, 49, 50). It will be interesting to see if this trend continues for Nordic varieties.

The range of results found in some analyses may be attributable to differences in crop ripeness, since formation of polyunsaturated fatty acids is incomplete in immature Cannabis seed (47). This suggests that a maximum ripening of the seed and the culling of immature seed are important considerations for the production of a quality oil. Likewise, proper seed sampling criteria are also crucial for representative analyses.

Purification methods

Purification of native, cold pressed oil means separation of solid impurities, mainly particles of the seeds. This is an important step to ensure the quality of the oil for a long storage. Disrupted particles of the seeds contain enzymes and also adherently microorganisms that can metabolize the oil to form degradation and metabolism products impairing especially the sensory quality of the oil. Depending on the settings of the screw press, speed of the rotating screw shaft, size of the press cake exit, temperature during pressing, and moisture of the seed, the amount of solid components in the oil ranges between 1% and 13%. The main aim of this type of purification is the separation of the two phase system consisting of oil (liquid phase) and seed particles (solid phase). In general, two different methods, sedimentation and filtration, are in use, depending on the performance of the plant. A third method, centrifugation of the crude oil, is not widespread but seems to be very gentle.

Sedimentation uses the different density of the liquid and solid phase which leads to a slow settling of the solid particles as a result of gravity. There are two possibilities to use this method. The first one can be used as a batch system, at which a container is filled with crude oil and seed particles are allowed to sediment within 15–30 days. The method is only suitable for small plants with a low production of oil up to 50 kg/h. A drawback of this type of purification is the long contact of oil with the disrupted seed material. Investigations have shown that sedimentation in the batch system over a period of 21 days impair the oil quality significantly in comparison to other types of purification (51). From this point of view, a second method seems to be more practical. This method is working continuously using a multilevel sedimentation tank, at which addition of crude oil, removal of purified oil, and elimination of enriched solid particles take place simultaneously.

Filtration is the mechanical separation of solid and liquid phase, which allows removing insoluble solids or suspended material from a liquid by passing it through a porous medium only permeable for the liquid phase. In small and medium-sized plants, this is mostly achieved by means of the formation of a filter cake from the seed particles between porous filter materials within a pressure gradient. The filter cake improves the result of the filtration. Sometimes filter aids can be used to increase the effect of the filter materials. These are inert cellulose materials that improve the formation of a filter cake for the filtration process. Filtration in small and mediumsized plants is carried out by use of chamber filter presses or vertical pressure plate filters, which enable a much higher output in comparison to sedimentation. The last step of the purification process in small and mediumsized plants is passing the oil through a fine pored protection filter to ensure a defined clarity of the oil.

Native, cold pressed oil as edible oil is also in the market as natural turbid oil, which is not or only insufficient purified. The intensity of the sensory attribute seedlike, typical for native oil, is stronger than in purified native oil. However, this type of oil has some problems with the formation of free fatty acids as a result of the formation of metabolism and degradation products from enzymes and microorganisms located on the seed particles 51).

Therefore, a longer storage of these oils is not advisable.

Effect of refining on contaminants

Like many other products from agriculture oilseeds sometimes contain contaminants such as aflatoxins, poly cyclic aromatic hydrocarbons (PAHs), pesticides, or traces of metals. Most of these contaminants are ubiquitous in environment in low concentrations, but sometimes high amounts can be found as a result of improper processing. For example, drying of seeds by open fire results in high amount PAHs in the oil or sometimes farmers use pesticides to improve the result of harvest or to keep the quality of the seeds during storage without following the appropriate waiting periods. In principle, these compounds have no place in food and the aim must be to keep the amount as low as achievable.

Refining provides different possibilities to reduce the amount of contaminants in the resulting oil to a very low level. On the other hand, it must be taken into consideration that these possibilities do not exist during processing of native, cold pressed oils. The producer is particularly responsible for the quality of the raw material; otherwise, everything that is soluble in oil can be found in the product after processing, with no chance to remove it afterward.

Each step of the refining process contributes to the purification of the oil. Removal of aflatoxins is exhaustive during refining. During neutralization, with bases up to 98% of aflatoxins are destroyed because the lactone binding of the molecule is broken. Aflatoxins are removed completely during bleaching, resulting into no aflatoxins in refined oils.

At higher temperatures for a longer time, the removal of PAHs from the oil is possible if the amounts at the beginning are not too high. If the amount of heavy PAHs is high, use of charcoal is the method of choice, while light PAHs are removed during deodorization.

A removal of trace metals as comprehensive as possible is necessary to ensure the oxidative stability of the oil during storage because metals catalyze the degradation of fatty acids. A part of these compounds is removed during degumming and neutralization by carrying away with gums or soaps (6).

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Raw materials characteristics of fibre plants in Europe. COTTON

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Plan:

Introductory remarks, general classification

Trends in evaluation of physical, chemical, mechanical properties of cotton, modern quality measuring and standardization of cotton

Cotton research and future

Cotton raw material characteristic - evaluation of the physico-mechanical properties and quality parameters of cotton as a raw material for the specific final products.

1. Introductory remarks, general classification

Mankind learned to utilize cotton about 5000 years B.C. Also some sources announced that in Middle Egypt cotton was grown before flax was known. India generally was recognized as the cradle of the cotton industry. In written sources (Herodotus 445 B.C.) we have found "There are trees which grow wild (India), the fruit of which is a wool exceeding in beauty and goodness that of sheep. The Indians made their clothes of this tree wool."

Also cotton was evidently known to the Greek soon after the invasion of India by Alexander the Great. In other part of the world including the Americas, cotton was also known (Peruvian cotton). In 1748 first North America cotton was sent to England, and first cotton mill in the USA was created at Beverly [Mass. in 1787). From this time we observe decreasing of dominated flax by users and growing production and consumption of cotton up to 1940 — when man-made fibres emerge and started to dominate: fibre on textile world.

Now the balance in production, processing and consumption of natural and man-made fibres is achieved, contrary than it was in "the nylon era" (up to 1970). Among natural fibres cotton dominates with production 25.2 mio tons annually.

Vegetable seed fibre – cotton is mainly composed from cellulose. Below 10% of the weight of the raw fibre consist of waxes, protein, pectate and minerals.

Terminology of cotton

The English word cotton is coming from Arabic katan (guta, kuteen) - this name originally denoted for flax.

Below are given some names for cotton in different languages:

- Arabic: Gatu, kotan, kutn, katan, gutn, or kuteen
- China- hoa main
- Egypt - Coton
- France-coton
- Greece- vamvax
- Germany- Baumwolle
- Italy-cotone
- India-Pucu
- Iran- Pembeh or poombch
- Japan- Vatta ik or vatta noki
- Mongolia- Kohung
- Poland- Bawe^{3}na

- Russia- Khlopok
- Tahiti- Vavai
- Thailand- Tonfaa

[Mattews'Textile fibers-sixth edition John Willey & sons Inc.]

Cotton is fibre attached to the seed- many species of the Gossypium-belonging to Melvaceae. Plant is a bush, growing in subtropical countries in warm, humid climate. From the genus Gossypium there are the four main commercial species: G. Arboretum, G. Herbaceum (the old World cotton from Africa and Asia), G. Hirsutum from Africa and Asia and G. barbadense, G. Hirsutum (the New World cotton) from the Americas. 80 % of the world fibre production is of Gossypium Hirsutum, about 10% is long and extra long fibres varieties of G. Barbadense and the rest is of the two short fibres Asiatic types. [Textiles, No Three 1992]

Tendency to more eco-friendly fibres turn attention to naturally coloured cotton. This is produced from naturally coloured cotton varieties by traditional breeding and can be also obtained by DNA engineering.

Generally naturally coloured cotton is finer, shorter and weaker (see table 1). The properties of such naturally coloured cotton are discussed in table 1. Wide range of permanent colour can be produced from green and brown cotton. Naturally coloured cotton has pigmented fibres with the colours as a part of the lumen. Interesting is that exposure to sunlight tend to deepen the colour (flavonoids are the major colours contributors).

[Naturally coloured cotton: Growing awareness. Wasif A.I. & Singh Vivek L.Textile And Engineering Institute, Ichalkaranji. Colourage Annual 2005, p. 89]

Table: 1.The physical properties of the naturally coloured cotton

Cotton	Spun length	Ur %	Fineness	Strength	Elongation	Ash content
	(2.5) mm		microns	g/tex	%	
Brown	20.10	48.5	3.9	19.50	5.2	1.15
White	19.50	47.8	3.2	18.98	5.6	0.88

Table 2. Fibre properties of naturally coloured cotton

Fibre properties of coloured cotton	DDCC-1	HYBRID
2.5 Span length (mm)	24.5	26.6
UR	46.0	50.6
Microns	3.7 – 4.5	3.8
Tenacity 3.5 mm gif	18.7 – 21.3	23.4
Counts	30's	40's

[Naturally coloured cotton: Growing awareness. Wasif A.I. & Singh Vivek L.Textile And Engineering Institute, Ichalkaranji. Colourage Annual 2005,p. 89]

Cotton is cultivated in North and South America, India, China, Africa, Australia, and in Europe in Turkey, Greece, Bulgaria, Uzbekistan, Israel (more than 80 countries grow cotton in the world). The best conditions for cotton growing are between 37th degree of South and North geographical latitude and requires 6-7 month warm weather. Flowering cotton ranges from 80-110 days, opening of the ball happen between 55-80 days (the long fine varieties take longer time to mature).

Cotton fibre is classified into three basic commercial groups.

a) top-quality fibres with staple length between 30-65 mm. Known type is Egyptian.

b) medium length with staple length 20-30 mm (mostly American upland variety)

c) lower grade-staple length less than 20 mm (Asiatic and Indian fibres).

Below some special characteristic data: cotton increases the strength by 25 % when wet, no extensible – good conductor of heat, absorbing water (standard moisture regain 8.5%). It shrinks on washing, especially when strongly alkaline washing solution is used; weakened by hot concentrated bleaches, scorch above 240oC, susceptible to damage by mildew in damp conditions, no attacked by moths, yellowing and weakened in exposed to sunlight, resistant to alkalis, damaged by acids, easily dyed, easily flammable, poor resistant to wear. Note: scorch mean burnt or become burnt on the surface, to make or become discoloured in this way. [Textiles Magazine Spring 1994]

2. Trends in evaluation of physical, chemical, mechanical properties of cotton, modern quality measuring and standardization of cotton

The physical, chemical, mechanical properties of cotton and derived fibre determine suitability of cotton as a raw material for semi-finished and final products.

The best exploitation of cotton fibres and products derived from them mainly depends on research and innovations in textile industry. This provides diversified products for a large spectrum of applications. Several objective methods of characterization of the raw materials, semi- and ready products have been developed. The characterisation of textile materials is conducted by: traditionally employed technique – organoleptic assessment, but as well using more objective such as e.g. optical, electron microscopy and other methods. SEM (scanning electron microscopy) is widely used also in research and practical analyses of textiles. In 1982 was introduced scanning probe microscopy (SPM), because procedure of testing required high vacuum and covering of the textile materials with conductive metals. SPM – in atomic scale allows for characterization and measuring of a number of surface properties, such as adhesion, friction, electric and magnetic forces. ESEM – Environmental Scanning Electron Microscopy can work in high vacuum mode, low vacuum mode and ESEM mode. This mode can be used for examination of vacuum compatible or gold/carbon coated non-conductive samples. The ESEM mode is useful for testing hydrated, oily or outgassing samples - in its natural state. SPM and ESEM are useful not only for describing microstructure of textiles, but also the influence of processing techniques. ESEM is a very sufficient tool for structural characterisation of textiles without any special preparation. Fibre surface characterise effect of friction, wetting, dyeing, biocompatibility and other properties. Fibres according to their features meet different area of applications. [Textiles 2007 No 2]

Cotton quality measuring.

Generally cotton quality testing using instruments is used for in international commerce, where large numberof instruments in well organised and efficient laboratories is applied. These High Volume Instrument (HVI) systems can accurately measure length, strength, micronaire, length uniformity index, colour Rd, colour +b, and trash content. The new instruments characterise maximum allowable tolerances for accuracy and precision listed below: in table 3 procedure of testing is standardised.

Table 3. Maximum allowable tolerances for accuracy and precision of the cotton testing instruments

Fibre Property	Accuracy	Precision
Length (inch)	± 0.018	±0.012
Uniformity (percent)	±1.200	±0.800
Strength (g/tex)	±1.500	±1.000
Micronaire (units)	±0.150	±0.100
Colour (Rd) (units)	±1.000	±0.700
Colour (+b) (units)	±0.500	±0.300
Trash (% area)	±0.100	±0.040

["Instrument –based Cotton Quality Evaluation Systems", Norma R. McDill, U.S. Department of Agriculture presented at: 62nd Plenary Meeting, International Cotton Advisory Committee, Gdansk, Poland, September 7-12, 2003], [Textile Progress, vol. 30 Number ½ 80. J. Pegram. Quality Control and Testing]

Fibre testing provides accurate information on how fibre properties will affect yarn and ultimately fabric quality. The focus is on providing testing equipment that will predict how the fibre will perform in subsequent

processing or in end-product. Example Rothschild MC-CT RO 2005 Mini Card can measure fibre cohesion and drawing force in staple fibres, without the need of producing a sliver. An electronic control of fibres in sliver and rowing- for optimization of evenness is performed by tensiometer, which measures force in the card and evaluates the data through Window-based software. Zweigle's F 460-stick-Slip Friction Tester measures gliding properties (drafting behaviour delivery process). Machine tests different crimp levels, finishes and blend levels.

SDL's Quickspin system has been updated and designed to produce 200 of open end spun yarn from one meter of sliver within 10 min. The sliver can be produced by mill processes or can come from the F10213 Microdust and Trash Analyzer. This allows a rapid determination of the raw material characteristics and anticipates yarn quality. This can also be useful for blending or colour shading of different slivers. Especially for cotton testing Zellweger uster developed new Intelligin for optimizing the ginning process. This instrument is an on line machine and using this is significant improvement of efficiency of the ginning process- by continuous on line measurement of fibre moisture, trash level and colour grade. Cotton can be cleaned, dried and ginned more efficiently, thus reducing short fibre content and neps.

Cotton can be custom ginned based on preselected fibre qualities. This system includes an of line module for micronaire measurement.

Uster HVC Spectrum–improved previous models HV1-posses completely automated sampling, maturity index measurement and ability to function under less stringent lab conditioning requirements by incorporation of a moisture sensor. This is used for all short, medium and long staple cotton.

The system can also include optional nep and UV modules. Conventional HVI (High Volume Instrument) measurement of cotton fibre maturity is based on near infrared spectroscopy-the latest has attempted to correlate the HVI data to reference method based on measuring wall thickness and perimeter.

The Sticky Cotton Thermodetector (CIRAD France) uses heat and pressure to generate sticking points of a cotton sample in contact with Al-foil- A high speed version –SPL-CIRAD H2SD- High Speed Cotton Stickiness Detector. This instrument provides an assessment of sticky cotton of sample in less than 30s. The yarn testing the Uster Tester 4 SH measures diameter, shape, yarn structure, dust and trash content, also evenness, imperfections and hairiness. The trash particles can be measured from 100 ìm to 1750 ìm. The Tester 4 SH can classify each yarn tested based on Ulster Statistics, which are incorporated into the software. The software can also simulate yarn boards and woven and knitted fabrics.

The OASYS (Optical Assessment System through Yarn Simulation) optically scans yarns independently of mass distribution and transmits the yarn profile to OASYS software, which simulates woven or knitted fabrics according to the users' specifications.

[Textile Progress, vol. 30 Number ½ 80. J. Pegram. Quality Control and Testing]

Standardisation of cotton sampling and testing

Procedure of cotton testing is standardised. The classification process is primarily the same. The samples flow through steps of receiving, traying, conditioning. High Volume Instrument (HVI) systems have to be the same. In USA each office issues the same equipment and computer network. U.S. Department of Agriculture cotton standards for instrument calibration of length, strength, length uniformity index and micronaire have become Universal Standards. The HVI colorimeters and trash meters are calibrated using tiles with known values. The data are collected and analyzed to monitor performance, prevent problems and make necessary adjustment.

The testing laboratory and the cotton conditioning area must have an atmosphere maintained as follows: temp. 21 ± 0.6 degree Celsius, relative humidity 65 % ± 2 percent. For testing purposes, a cotton sample must be taken from opposite sides of a cotton bale. Each portion should be approximately: 300mm long and ca 150mm wide and should have approximately the same mass. The total sample submitted for testing should weigh approximately 225 g, and be identified with an identification tag (coupon) rolled between the sides giving the bale number. Cotton samples must be brought to a moisture content that is at equilibrium with the approved atmospheric conditions before testing; moisture content between 6.75 and 8.25% (dry mass basis) prior to instrument testing. Cotton samples can be conditioned passively or actively, not covered by sacks, wrappers or any bother coverings, conditioning takes usually 48 hours. ["Instrument – based Cotton Quality Evaluation Systems", Norma R. McDill, U.S. Department of Agriculture presented at: 62nd Plenary Meeting, International Cotton Advisory Committee, Gdansk, Poland, September 7-12, 2003]

There are seven goals of Standardization of Cotton (this is Commercial Standardization of Instrument Testing of Cotton – CSIRC):

1. define specifications for cotton trading
2. define international test rules
3. implement test rules

4. certify test centres
5. define calibration standards
6. specify commercial control limits for trading
7. establish uniform arbitration procedures

[Textiles 2007 No 2]

Following these rules - growers, spinners and merchants have got a useful instrument for qualification of cotton. The spinner as the final consumer of cotton can concentrate on spinning quality products with the confidence that the raw material will comply with the requirements.

3. Cotton research and future

Cotton is the largest natural fibre delivered to global textile market. The consumption of cotton has increased annual growth rate by 2%. Cotton growers (especially in USA) are radically changing agricultural practices (especially during last 10 years) in important direction like: reduction of the chemicals like fertilizers or plant production chemicals. As urgent need is development of the new strain of cotton, introduction of genetically modified cotton. In USA 75% GM cotton is grown (BT cotton) and the positive results are that farmers obtain greater yield and more efficient farming methods are applied. The debate around cotton farming is also concentrated on organic cotton, and on genetically modified cotton seeds which are bioengineered for larger yield of cotton and less water consumption. The modern technology providing precision measuring tools with significant reduction of fertilizers and insecticides, more precision in watering. Computer programmes are being used. For signalizing where water and fertilizers are needed. Biotechnology reduced pesticide spraying employing natural alternatives. In prototype form are smart sensors which will monitor water content of soil through wireless technology. The new is also in area of bleaching and dyeing (example- new exhaust bleaching developed by Clariant). Non impact dyes can reduce water use need lower temperatures for fixing dyes. In case of denim dyeing there is a new project connected with sulphur dyes to replace indigo.

The enzymes also are and will be used in processing of cotton- for replacing the chemicals and obtaining smoother and glossier surface of cotton.

The R&D work on cotton concentrates on:

- improving knowledge on cotton plants on the base of international wide cooperation
- developing cotton breeding and agrotechnology in direction the higher quantity and quality of produced cotton and environmental area
- better meeting the demand of cotton processing industry
- looking for the new area of applying cotton and by products (e.g. cotton seeds) for diversified products
- improving the method of fibre and yarn quality evaluation
- developing new more offensive marketing for cotton product on the base of latest research especially on healthy influence of natural fibres including cotton - on humans.

4. Cotton raw material characteristic - evaluation of the physico-mechanical properties and quality parameters of cotton as a raw material for the specific final products.

Cotton as a natural fibre produced in numerous world regions, is present in diversified varieties. Additionally, each variety is characterized by several quality classes depended on concrete physical parameters of the derived fibre. The basic parameters of the cotton fibre, on which the technological suitability and the price of the particular cotton lot are depended are: staple length, colour grade, strength of fibre, thickness & maturity represented by index Micronaire, and the leaf grade.

One of the most important criterion which influence the suitability of the cotton fibre for the specific cotton products is the length of fibre.

The most precious, noble, refined, dignified cotton varieties have the longest fibre, which is simultaneously thin and very resistant to tearing (breaking).

Such fibres are characterized by appropriate resilience, elasticity and perfect spinability.

Such type of cotton is used for the production of thin, strong cotton yarns suitable for the production of high quality, exclusive cotton goods (garments).

The cheapest cotton varieties with short, rigid fibre are applied for the production of thick yarns, designated for the production of products of lower quality.

As we mentioned before, the cotton produced in the world could be divided in 3 groups – taking into consideration the fibre length:

- short staple cotton with fibre length from 13/16" to 1"
- medium staple cotton with fibre length from 1-1/32" to 1-3/16"

- long staple cotton & extra long staple cotton with fibre length from 1-7/32" to 1-5/8"

Short staple cotton is designated especially for the production thick fabrics with specific weight > 250 gram/m^2 - e.g. denim, drill, flannel and the goods made of them e.g. low quality jeans cloth, protective and working clothes, upholstery, carpets etc. For such type of products appropriate and sufficient are cotton varieties with the following parameters (*):

Colour grade: from Strict Low Middling to Good Ordinary and from the group Spotted, Tinged
Staple length: 15/16" – 1-1/32"
Micronaire: 4,5 – 6
Strength: 14 – 18 gram/tex (PSI)

From this group of cotton, in Europe are processed low quality varieties from the Central Asia (Uzbekistan, Tajikistan, Kazakhstan, Turkmenistan), from USA (Memhis/Orlean/Texas) and others such like e.g. Bengal Deshi from India.

Medium staple cotton (about 85% of the world production and processing) is designated for the production of medium thick fabrics with specific weight 100 gram/m^2 - 250 gram/m^2 appropriate for the production of the majority of popular cotton garments such like bed linen, table and bath cloth, good quality denim (jeans cloth) as well the majority of underwear and cotton cloth available at the market.

For afore mentioned goods are sufficient cotton varieties of the following parameters (*):
Colour grade: from Good Middling to Low Middling as well as from group Light Spotted, Spotted
Staple length: 1-1/32" – 1-5/32"
Micronaire: 3,5 – 4,8
Strength: 25 – 33 gram/tex (PSI)

From this group of cotton, in Europe are processed medium and high quality cotton from the Central Asia (Uzbekistan, Tajikistan, Kazakhstan, Turkmenistan), West Africa (Chad, Mali, Ivory Coast, Burkina Faso), from Greece, Spain, Turkey (EGE, Antalya, Cukurova), from USA (Memhis/Orlean/Texas/California), from Brazil (Mato Grosso), from Syria (Aleppo) and from Pakistan (Punjab).

Long staple cotton (about 3-5% of the world production and processing) are designated for the production of the highest quality, the most thin and delicate fabrics and knitting with specific weight <100 gram/m^2 for the production of luxury textiles and cloth (e.g. exclusive shirts and blouses, the best quality bed linen and underwear etc.)

For such high quality garments are required the cotton varieties with the following parameters(*):
Staple length: 1-7/32" - 1-5/8"
Micronaire: 2,8 – 4,5
Strength: 33 – 45 gram/tex (PSI)

In scope of this group, in Europe is processed high quality long staple cotton from Egypt (Giza) and from the USA (Pima).

(*) – the quality of cotton is described according to the most largely applied standardization of cotton – Universal Cotton Standards – USDA.

[Gdynia Cotton Association, Poland]

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The Networks within ESCORENA (19). State-of–art in December 2010

- **Agromarketing Network** - *coordinated by Belarus*
- **Apricot Network** - *coordinated by Armenia*
- **Buffalo Network** - *coordinated by Italy*
- **CENTAUR-Biomedical Technology, Epidemiology and Food Safety Global Network** - *coordinated by Czech Republic*
- **Cotton Network** - *coordinated by Greece*
- **Farm Animal Welfare (FAW)** - *coordinated by Slovak Republic*
- **Flax and other Bast Plants Network** - *coordinated by Poland*
- **NACEE- Aquaculture Centers in Central-Eastern Europe** - *coordinated by Hungary*
- **NCDN-Capacity Development in Nutrition. Thematic Knowledge Network Central and Eastern Europe** - *coordinated by Croatia*
- **Network of Museums in Agriculture within International Association of Agricultural Museums (AIMA)**
- **Nut Network** - *coordinated by Spain*
- **Olives Network** - *coordinated by Spain*
- **Organic Edunet** - *coordinated by Greece*
- **Pastures & Fodders Network**- *coordinated by Belgium*
- **RAMIRAN (Recycling of Agricultural, Municipal and Industrial Residues in Agriculture)** - *coordinated by United Kingdom*
- **Rice Network** - *coordinated by Italy*
- **Sheep and Goat Network** - *coordinated by France*
- **SREN (Sustainable Rural Environment and Energy) Network** – *coordinated by Germany*
- **Sunflower Network** - *coordinated by Serbia*

In next edition of Scientific Bulletin of Escorena will deliver information about networks listed below:

- **Farm Animal Welfare (FAW)** - *coordinated by Slovak Republic;*
- **NACEE- Aquaculture Centers in Central-Eastern Europe** - *coordinated by Hungary;*
- **Network of Museums in Agriculture within International Association of Agricultural Museums (AIMA);**
- **Rice Network** - *coordinated by Italy;*
- **Sheep and Goat Network** - *coordinated by France;*
- **SREN (Sustainable Rural Environment and Energy) Network** – *coordinated by Germany;*
- **Sunflower Network**- *coordinated by Serbia.*

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Instrumente Structurale 2007-2013

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Sectoral Operational Programme "Increase of Economic Competitiveness"

"Investing for your future"

PRIORITY AXIS 2 - Research, Technological Development and Innovation for Competitiveness
Operation 2.1.2: "Complex research projects fostering the participation of high-level international experts"
"Bast Plants - Renewable Strategic Resources for European Economy"

Project beneficiary: "AUREL VLAICU" UNIVERSITY - Arad, Romania
TECHNICAL AND NATURAL SCIENCES RESEARCH-DEVELOPMENT-INNOVATION INSTITUTE of UAV

BASTEURES

The project objectives

The main objective of the project is the complete capitalization of the bast plants (flax, hemp, Spanish junceum) in order to obtain advanced materials, auxiliary raw materials and energetic products by developing and applying new and competitive processing/ extraction technologies for both, primary and secondary products of these plants, in a sustainable economical development context.

These renewable raw materials resources are studied by researchers for their huge potential to offer valuable economical solutions in
many sectors.

For transforming the bast plants (flax, hemp, Spanish junceum) – in advanced materials (advanced textiles fabrics, paper, biocomposites), auxiliary raw materials for food industry and pharmacy (oils for functional food, agro-fine-chemical are natural sources for extracts with anticancer, antibacterial, immunoglobulin level controlling, nutritive, etc. properties included in production of drugs, cosmetics, etc., bioremediation agents, etc.) and energetic products (bio-fuel), performed technologies based on the novel achievements from different fields (chemistry, biotechnology, applied physics, materials, textiles, textiles chemistry, wood chemistry, paper industry, etc.) will be developed in this project for the complete capitalization of these resources in a closed circle.

In order to attend the major objective of the programme – „to enhance the Romanian enterprises'productivity and to reduce the gaps to the average productivity at the EU level" as well as increasing and diversifying the Romanian products and innovative services, the team will solve through this project, a broad and complex range of economical problems (new sources of raw materials for sensitive sectors, paper from non-wood pulp, biodegradable composites for civil constructions, auxiliary raw materials for functional food, pharmaceutics,
cosmetics, and energetic products as bio-fuels, etc.) by offering different solutions with direct economical applicability.

The technological solutions proposed in this project will be developed for each plant (according with the usage potential and the physical-chemical and structural characteristics of these plants) and in the end of the project, based on a feasibility study, a selection of the most promising and suitable technology for practical application (from economical efficiency point of view) will be done for each according with their maximal capitalization potential.

Through this project, new applications of the existing patents (relevant for the theme) will be developed and new patents applications for the proposed technologies will be applied. For all 6 proposed technologies, which includes certificates about the performances of newly products/auxiliary raw materials, the documentation for obtaining industrial property rights will be processed. Through project publicity the following aspects are envisaged:

Informing the large public about the project benefits upon the economy development:

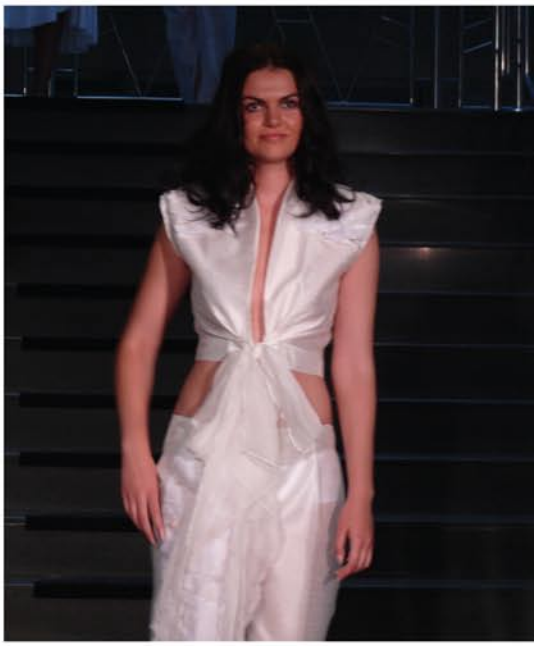
Informing the large public about the obtained project results:

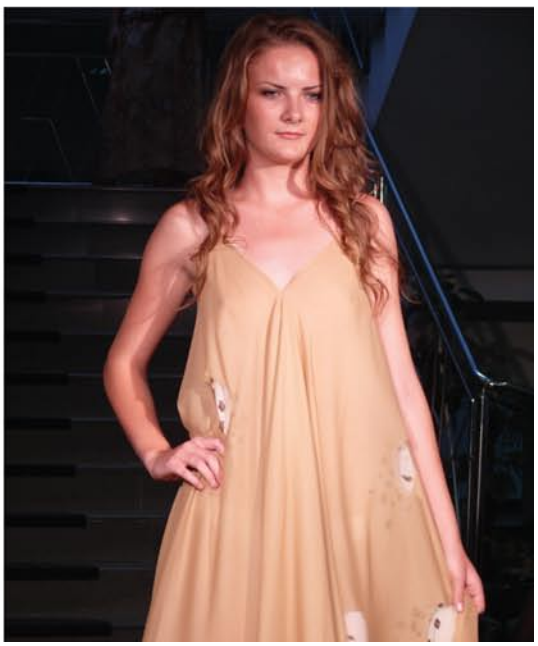
Informing the public about the project aimed to attract new services for new applications from economic sector with relevance on the proposed theme:

The proposed research theme contributes to achieving the competition objectives through: solving a series of economic problems offering competitive technologies for obtaining raw/auxiliary materials for innovative and energetic products from renewable resources. The project through its objectives contributes to achieving the specific objectives of the competition because it's able to generate applicable results in economy and leads to increasing the quality/diversifying the innovative services offers.


WEEK OF THE NATURAL FIBRES
SCIENTIFIC WORKSHOP AND EXHIBITION ON
TEXTILES AND NON - TEXTILES APPLICATIONS
21-24 JUNE 2009 UNIVERSITY „AUREL - VLAICU" ARAD - ROMANIA
„Fashion Show"
2009 THE INTERNATIONAL YEAR OF NATURAL FIBRES





• Eli Laslean - ELLIS Fashion House Arad - Romania









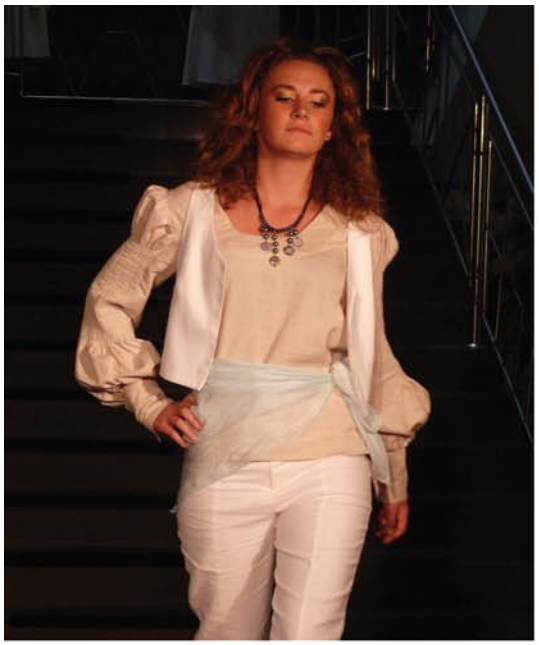


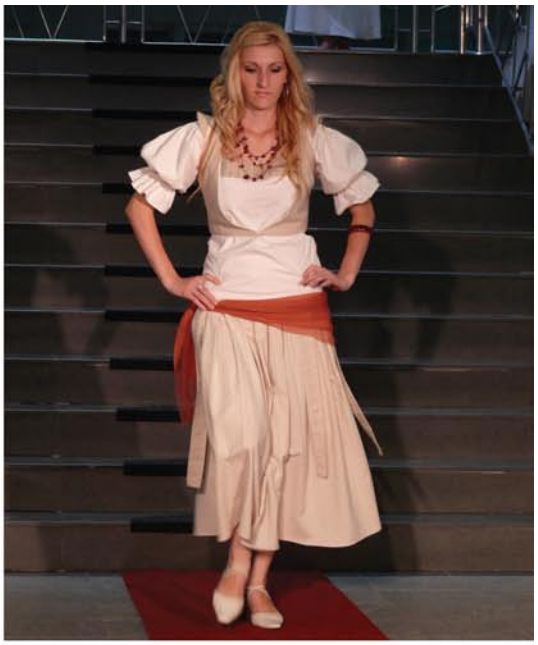
• Leontina Prodan - ENA Design - Timisoara - Romania

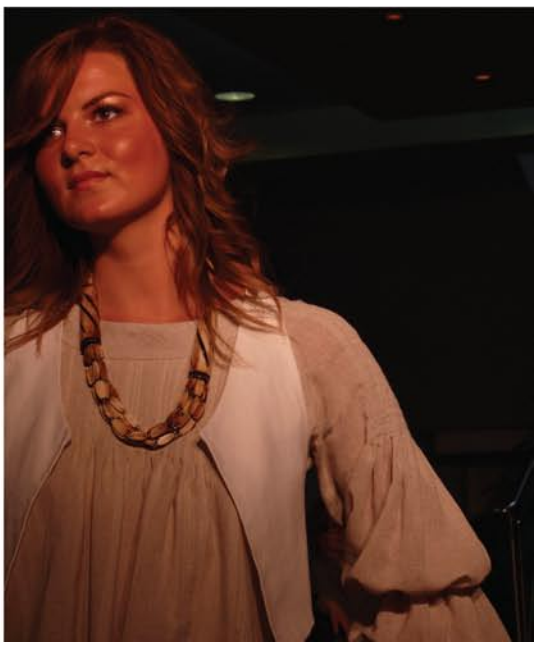




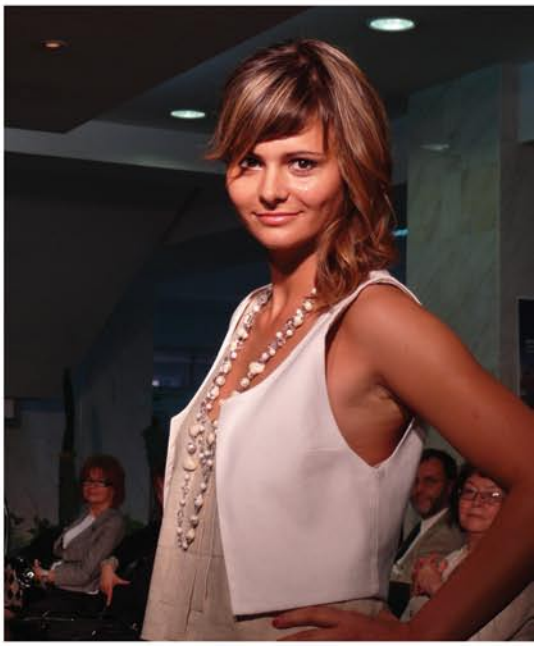

• Yolanda Zalecka - Poland







• Lacrimioara Ionescu - Universitatea "Aurel Vlaicu" din Arad - Romania



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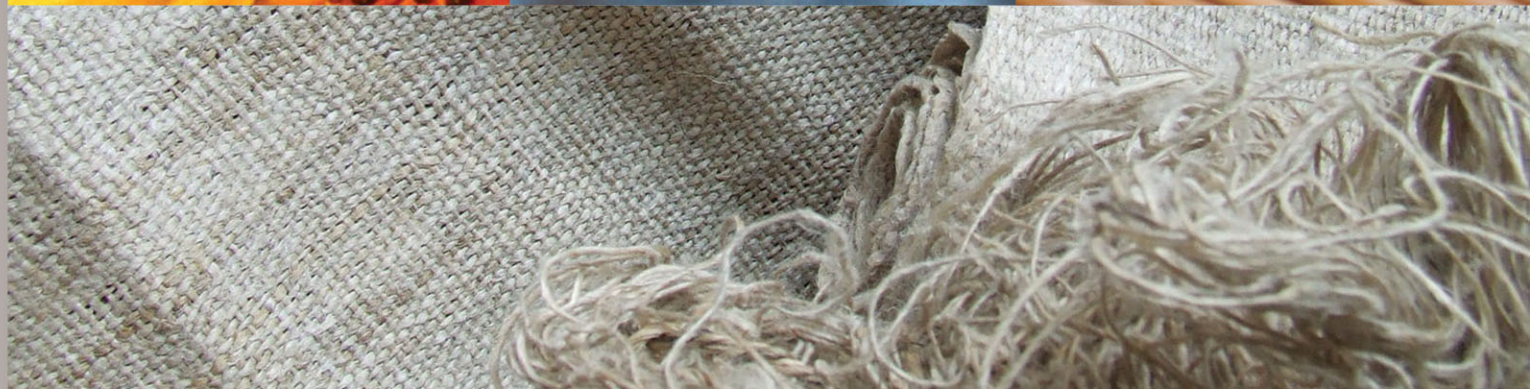

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