



This is the first newsletter of 1999 and we wish a very Happy New Year to all our readers. The coming year will be a busy one for the IENICA project, with the realisation of three conferences for Industry and submission to DGXII of a substantial report on the status of Industrial Crops in 14 states of the EU.

A New Member for the IENICA project

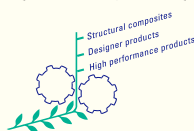
We are pleased to announce that the state of Hungary has joined the IENICA project. Hungary is in the accession phase to the European Union and is funding their contribution to the IENICA project themselves. The Hungarian representative in the IENICA project will be Dr Kornel L. Kovacs from Attila Joseph University of Szeged. For more information, look at the IENICA website. *Melvyn Askew*

Framework Programme V

The call for FPV is expected to be announced in March of this year. Please do not hesitate to contact us if you are searching for partners - we may be able to help you. Contact us by email: s.hugo@csl.gov.uk

In association with The Danish Ministry of Food, Agriculture and Fisheries and the Centre for Plant Fibre Technology, Denmark, IENICA is pleased to announce:

Natural Fibres Performance Forum CONFERENCE



Plant Fibre Products - essential for the future
The Royal Veterinary and Agricultural University
Copenhagen, Denmark
27 - 28 May 1999

The Natural Fibres Performance Forum will address key issues crucial to the increased future use of high performance plant fibres. This conference is a response to the mounting interest in industrial uses of plant fibres for a wide range of products. The conference Chairman is Dr Roger Rowell of the USDA Forest Products Laboratory, Madison, USA. A number of acknowledged experts have been invited to speak on the following topic areas:

Current/future uses and limitations of plant fibres in industrial products - to review progress to date on natural fibre applications particularly focusing on the car industry and other high technology areas. (Chaired by *Professor Rudolf Kessler* - Director, Institut für Angewandte Forschung, Reutlingen, Germany.)

New design opportunities for plant fibre products - to look at the design potential of plant fibres in value-added mouldable products based on the input of designers and potential manufacturers. (Chaired by *Mr Lars Thøgersen*, Director of CPH Industriel Design, Copenhagen, Denmark.)

Realising the full performance potential of plant fibres - to focus primarily on methods to improve the preparation of good-quality plant fibres and to increase the compatibility between hydrophilic fibres and mainly hydrophobic binders. (Chaired by *Dr Laurence Mott* - Research Manager, Perstorp A/B, Perstorp, Sweden.)

The future/next steps - to clearly define the work that is required to address the problems raised in the previous three topic sessions. (Chaired by *Dr David Plackett*, Visiting Professor at The Royal Veterinary and Agricultural University, Taastrup, Denmark.)

The **target groups** for the conference are industries and designers using or intending to use plant fibres, fibre suppliers, and scientists in materials and/or plant fibre research. A **conference exhibition** will highlight state-of-the-art technologies and products including a display of EU-funded plant fibre projects during the last 10 years.

The sessions will address the **barriers** to plant fibre use in Europe and elsewhere and investigate **trends** promoting plant fibre uses. In addition, the need for developing a **strategy for Europe** to ensure consistent production of good-quality fibres for industrial applications will be assessed.

An **optional tour** displaying state-of-the-art facilities within the Centre for Plant Fibre Technology is available for participants, this will include a visit to pilot-scale composite production facilities for very high-performance engineering applications

Product manufacturers and researchers are invited to

display relevant products, services and/or research results at the **Conference exhibition** - indicate your interest on the Conference Registration Form and you will be contacted by Van Hauen Conferences to discuss your specific requirements. Research posters may also be exhibited - please e-mail an abstract to cel@kvl.dk before 15 March 1999.

The registration fee is 1000 DKK (approx 135 EUR) until 31 March 1999. After that date the fee will be 1500 DKK (approx 202 EUR) and registration will be managed on a "first come, first served" basis. The registration fee includes access to all conference sessions and the conference exhibition, conference documentation, lunch and mid-session refreshments on 27 and 28 May.

For further details on conference registration and hotel accommodation please contact: Van Hauen Conferences, Tel: + 45 3314 0050, Fax: + 45 3314 5750, E-mail ss@vanhauen.dk.
Internet: <http://www.vanhauen.dk/9910ienica.htm>.

For further information on the conference technical presentations please contact: Centre for Plant Fibre Technology, Head of Secretariat: Christina Elmetofte
Tel: + 45 3528 2219, Fax: + 45 3528 2216,
E-mail: cel@kvl.dk

For the complete conference programme visit the IENICA website Events pages.

Forthcoming Industrial Crops Events

23 - 25 March 1999

4th European Symposium on Industrial Crops and Products

Bonn, Germany
Contact: Sarah Wilkinson
Fax: + 44 1865 843958
Email: sm.wilkinson@elsevier.co.uk
Internet: <http://www.elsevier.nl/locate/icp99>

25 - 26 March 1999

European Lactose Symposium

Organised by the Carbohydrate Research Foundation
Netherlands Congress Centre
Contact: Mrs Ellen Jansen
Tel: + 31 70 354 09 82
Fax: + 31 70 351 53 18
Email: lactose@zestec.com
Internet: <http://www.zestec.com/crf/lactose>

27 - 28 May 1999

**Natural Fibres Performance Forum:
An IENICA seminar**
Copenhagen, Denmark

A two-day conference addressing issues crucial to the increased future use of high performance plant fibres in industrial products.

Contact: <http://www.vanhauen.dk/ienica9910.htm>
Tel: + 45 3314 0050
Fax: + 45 3314 5750
E-mail: ss@vanhauen.dk

10 - 11 June 1999

Freisinger Tage 1999 - Prospects for Plant Proteins in Foods

Munich Airport Marriott Hotel, Freising, Germany.
Contact: Fraunhofer-Institut für Verfahrenstechnik und Verpackung IVV
Tel: + 49 (0) 81 61 4 91 1 24
Fax: + 49 (0) 81 61 4 91 2 22
Email: gabler@ivvv.fhg.de
Close of registration 21st May 1999.

For comprehensive details of events see the IENICA web site: www.csl.gov.uk/ienica
or contact Sarah Hugo at s.hugo@csl.gov.uk

Bio-Products and the Greenhouse Effect: Results from an ongoing research activity

BRED (Biomass for greenhouse gas emission *RED*uction) is a research project supported by the European Commission's Environment and Climate Programme. *BRED* is a joint project of 3 European Institutes: (1) ECN (Netherlands Energy Research Foundation) as coordinator; (2) BFH (Bundesforschungsanstalt fuer Holzwirtschaft), Germany; and (3) NTUA (National Technical University of Athens), Greece.

In accordance with the EU policy goal for greenhouse gas (GHG) emission reduction, the *BRED* project work (1/1/98 - 31/12/99) focuses on the optimal use of biomass in Western Europe (EU + EFTA). In particular, indigenous biomass uses for energy and materials are analysed "from cradle to grave," according to the MATTER 2.0 MARKAL model, from the point of view of achieving cost-effective GHG emission reduction in the long term (period 2000-2050). The goal of this analysis is to provide a consistent and scientifically well-founded set of recommendations to policy makers and industry with respect to R&D and investment options.

As the Western European reference energy and materials systems will be significantly affected by technological change and emission reduction policies, the identification of cost-effective biomass uses can only be based on an integrated energy and materials systems approach, such as the one of the MATTER 2.0

Visit the IENICA database at: <http://www.csl.gov.uk/ienica>

model. In this model, the final demand for products and energy services is exogenously defined by an extrapolation of the EU scenarios. Several specific biomass use strategies for GHG emission mitigation are considered in the analysis:

- substitution of fossil feedstocks for energy and materials;
- substitution of CO₂-intensive materials by biomass-derived ones;
- substitution of non-renewable timber by renewable timber;
- carbon storage in forests, products, and disposal sites;
- increased recycling/reuse of bio-materials; and
- increased energy recovery from waste biomass.

Although the *BRED* work is still in progress, a number of interim research findings are definitely interesting in an industrial crop-related context, and even appear to contradict some aspects of the “conventional wisdom” in the field. As shown in Figure 1, the estimated potential contribution of the whole materials sector for GHG emission reduction can be significant, even at rather limited policy support level. Moreover, as presented in Figure 2, the use of biomass feedstocks for industrial applications occupies a major position among the various options within the materials sector, especially with increasing level of policy support.

More information on the model and other aspects of this research is available at the following web address: http://www.ecn.nl/unit_bs/bred/main.html

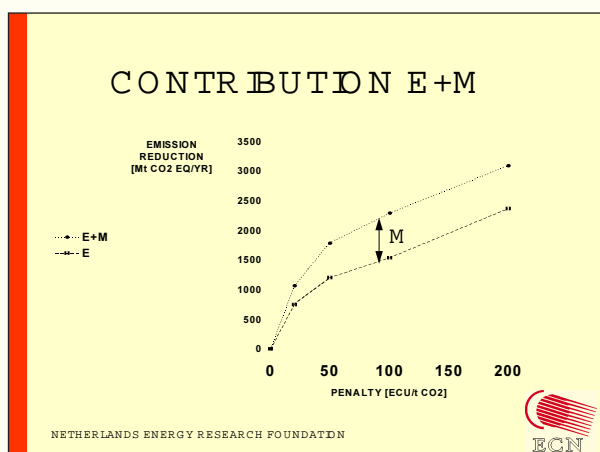


Figure 1: Estimated contributions of the energy (E) and materials (M) sectors for GHG emission reduction as affected by policy options (GHG penalty). SOURCE: ECN.

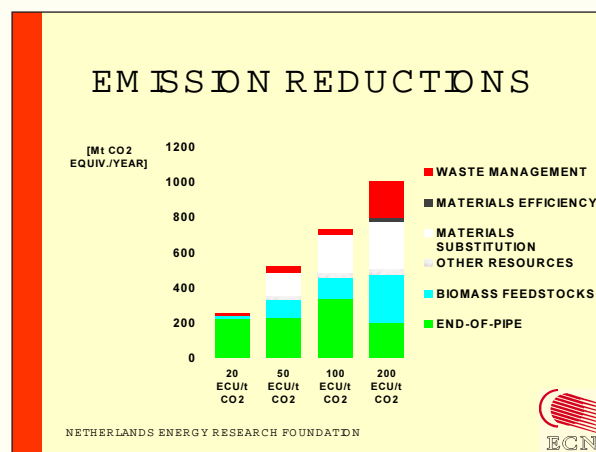


Figure 2: GHG reduction potential of various strategies within the materials sector. SOURCE: ECN.

Reported by **Emmanuel G. Koukios**, national coordinator for the IENICA programme in Greece. National Technical University, Zografou Campus, GR-15700 Athens, Greece.
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Oil Crops – Five Years of Research

Oil crops are of considerable interest in Italy. They adapt well to the different pedoclimatic conditions in the country; they can be included in traditional rotations, improving their efficiency; current EU regulations make them remunerative for farmers; the Italian crushing industry is sufficiently developed that internal production satisfies only a part of the raw material requirements.

At the beginning of the 80’s oil seed crops were more or less absent from Italy. The Ministry of Agriculture Oil-seed Project provided the technical know-how to allow for an increase in surface area: for sunflower from circa 30,000 hectares to the current 295,000; for rape from 20,000 to circa 100,000; and most especially for soybean, that was introduced after an initial experimental stage and spread until it extended to over 521,000 hectares in 1991, to then consolidate at around 300,000.

PRisCA, the new national project on non-food crops of the Ministry of Agricultural Policy (ex Ministry of Agriculture), set up in 1993, has dedicated a line of research to oil crops. Fourteen O.U., distributed from the north to the south of the country, have been committed to detailed research on sunflower, rape, flax, castor-oil plants and safflower, and new species have begun to be studied.

The main research subjects can be summarised as follows:

- evaluation of the adaptability, yield, content and

accumulation over time of oleic acid and stability of the new sunflower hybrids, high oleic sunflower oil (HOSO);

- study of environmental effects on varieties of flax, castor-oil plants and safflower;
- study of the energy balance of biodiesel oil crops;
- characterisation of the methyl ester deriving from different vegetable oils obtained under different environmental and agronomic conditions;
- bioagronomic evaluation of species (and within these, of genotypes) with different fatty acid chains (long, medium and short chain);
- bioagronomic evaluation of Brassicas (and within these, of genotypes) with a high erucic acid content (*B. napus* var *oleifera*, *B. carinata*, *B. juncea*, *B. nigra*, *B. rapa*, *Crambe abyssinica*, *Sinapis alba*).

Summary of results:

- In the sunflower HOSO hybrids the oleic acid content is on average around 85% with peaks of almost 90%, against the 30% of the standard cultivars. Oleic acid accumulation is intense for a week in mid-July, when it increases from about 30% to over 80%. The stearic acid content reduces contemporarily. Oleic acid varies according to achene size. The tested low input management techniques highlight the efficiency and effectiveness of different cropping methods that benefit agriculture and the environment.
- The genotypes of rape, flax, castor-oil plants and safflower have been identified that are best adapted to specific pedoclimatic conditions. The environments have then been identified that are most suited to each species and for every one of these, the optimal combination between variety and cropping methods.
- The compared theoretical energy balances between the major oil crops have been verified in practice at farm level. For sunflower it was found that lower input did not modify output: an input of 10-20 GJ ha⁻¹ giving the maximum energy gain. However, inputs lower than 15 GJ ha⁻¹ can be risky. The advantage of a more extensive management compared to the traditional one was thus demonstrated.
- The comparison between different Brassica species leads to different conclusions depending on the parameter considered. For erucic acid content, *C. abyssinica*, with more than 55%, exceeds the other species whose contents vary between 28 and 43%. Some industries have appraised *C. abyssinica* oil and expressed their interest in its utilisation. Relating to oil content, none of the new Brassicas, excluding *B. rapa*, come close to rape. For seed production, *B. carinata* and *C. abyssinica* have resulted as interesting. The possibility of autumn sowing has

been evaluated from the north to the south of the country. *C. abyssinica* and *B. juncea* are not tolerant to low winter temperatures, *B. carinata* is fairly tolerant, while rape adapts well to these conditions. The characteristics that differentiate the species are resistance to lodging, dehiscence and cycle length.

- Amongst the minor oil plants, of the more than 12 considered interesting for the fatty acid composition of the oil (long or short chain), a very marked diversity was found between genotypes and a different response to the environment. Some can be considered still at the domestication stage and, if, on the one hand, this is an advantage in terms of the possibility of great improvement, on the other, it currently excludes them from cultivation. The list of species considered possible for inclusion in crop rotations in the medium-short term includes *Coriandrum*, *Eruca*, *Sinapis* and *Euphorbia*. For these species, cropping techniques have begun to be tested under different environmental conditions to evaluate their qualitative and quantitative agronomic response.

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The next issue will contain **Guidelines for Good Agricultural Practice (G.A.P.) of Medicinal and Aromatic Plants** prepared for IENICA by James Lambe, President of EUROPAM.

The IENICA project is funded by DGXII of the European Commission under the FAIR programme. IENICA currently involves 14 states in the EU.



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