Nota - Este ficheiro tem 8 páginas que incluem: Comunicado, breve introdução ao tema e descrição do projecto.

Comunicado à Comunicação Social

HOJE - LISBOA

Investigadores de todo o Mundo discutem Plantas Amigas do Ambiente que Renovam o Azoto

12 a 16 de Novembro 2007
Conferência Internacional de Leguminosas de Grão
Centro de Congressos de Lisboa

A partir de hoje,12 de Novembro, cerca de 400 investigadores provenientes de mais de 43 países reúnem-se no Centro de Congressos de Lisboa para discutir os últimos avanços no conhecimento científico das leguminosas de grão, plantas fundamentais na alimentação humana e amigas do ambiente.

"A sustentabilidade da agricultura requer a utilização de leguminosas, mas estas culturas estão a ser pouco produzidas na União Europeia. As nossas descobertas na genética e na biologia das leguminosas permitem-nos recolocar as leguminosas na linha da frente na agricultura moderna", diz o consórcio da união Europeia que lidera a investigação científica sobre as plantas fixadoras de azoto. A importância das leguminosas numa agricultura sustentável e amiga do ambiente foi, aliás, realçada durante a sessão de abertura da Conferência, quer pelo Secretário de Estado da Agricultura, Luis Medeiros Ferreira, quer pelo Director em exercício da Direcção Geral de Investigação em Biotecnologia, Agricultura e Alimentação da Comissão Europeia, Timothy Hall.

Realizada durante a Presidência Portuguesa da União Europeia, esta reunião conta com o patrocínio do Presidente da Comissão Europeia, José Manuel Durão Barroso, e marca a etapa final do GLIP, um grande Projecto Europeu de Investigação dedicado às leguminosas de grão que nos últimos quatro anos envolveu 67 laboratórios de 25 países.

A ervilha, a fava, o tremoço, o feijão, a lentilha, o trevo e a luzerna, entre outros, não necessitam de fertilizantes azotados para se desenvolverem. As leguminosas produzem sementes ou matérias-primas para a alimentação animal, humana ou para fins não alimentares. Graças a uma simbiose natural, estas plantas utilizam o azoto renovável do ar para adquirirem minerais necessários para a sua sobrevivência. Por isso, estas culturas podem minimizar o impacto negativo da agricultura no ambiente e contribuem para a sustentabilidade da agricultura.

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Anne Schneider – +33.1.40.60.49.15/09 – a.schneider-aep@prolea.com

Link para a Comunicação Social:
http://www.grainlegumes.com/aep/events/lisbon_2007/press_area_for_lisbon_event

– Integrating legume biology for sustainable agriculture –
Monday 12 to Friday 16 November 2007
Lisbon Congress Centre, Portugal
e.mail. lisbon2007@gmail.com – http://www.grainlegumes.com/events/lisbon_2007

Leguminosas - Breve Introdução

As espécies de plantas leguminosas são importantes fontes de proteínas e energia para uma alimentação humana e animal saudável, sendo produzidas com o mínimo de dispêndio de energia e com o mínimo de impacto para o ambiente.

Sementes para uma alimentação saudável contribuindo também para a prevenção de doenças humanas crónicas

As leguminosas de grão são componentes da dieta alimentar humana, quer quando consumidas directamente, ou quando consumidas como ingredientes utilizados no processamento de outros alimentos. O consumo de leguminosas de grão reduz o risco de doenças cardiovasculares, ajuda a controlar a diabetes e providência outros benefícios à saúde. Existem oportunidades de mercado para estes produtos de valor acrescentado com base em leguminosas de grão, produzidas na Europa.

As Leguminosas podem ser :
leguminosas de grão (ervilha, fava, tremoço, grão de bico, feijão, lentilhas), ou leguminosas herbáceas perenes (trevo, luzerna) ou leguminosas arbustivas (Robinia).

Matéria-prima rica em proteínas para a indústria

As sementes das leguminosas são ricas em proteínas, mas também contêm uma quantidade considerável de hidratos de carbono, uma fonte de energia. Quer as proteínas, quer a energia são componentes chave nas formulações das **dietas animais** (suínos, aves, ruminantes, peixes). O perfil de aminoácidos das proteínas das leguminosas complementa eficientemente o perfil de aminoácidos das rações feitas à base de cereais e beterraba. Contudo, a procura de materiais ricos em proteínas na União Europeia ultrapassa enormemente a oferta actual interna. **O deficit (74%)** é coberto maioritariamente por importações de soja (cujos resíduos da extracção de óleos são considerados ricos em proteínas). Produzir leguminosas de grão na União Europeia ajuda a reduzir o deficit comunitário em fontes proteicas. Esta produção será também fonte de matéria-prima para uso não alimentar (bioplásticos, etc.).

Culturas naturalmente auto-fertilizadas em azoto:
As plantas das espécies leguminosas são únicas no reino vegetal por conseguirem através de uma simbiose com certas bactérias do solo converter o azoto atmosférico (N_2) em azoto mineral (NH_3) que pode desta forma ser assimilado pela planta.
Por este motivo as leguminosas não necessitam de fertelização azotada para o seu correcto desenvolvimento.

Culturas energeticamente eficientes que reduzem o impacto ambiental negativo da agricultura

Na agricultura convencional, a produção de espécies não leguminosas, como os cereais, requer a aplicação de grandes quantidades de fertilização azotada, cuja produção é baseada na energia fóssil. A fertilização azotada constitui o principal custo energético para a produção agrícola de plantas e também provoca a emissão de gases que contribuem para o efeito de estufa (*green house gas emissions GHG*) e a acidificação dos solos e águas. Os custos energéticos do fornecimento de azoto na produção de espécies não leguminosas varia entre 40 a 70 % do custo energético total, enquanto que para a produção de leguminosas como a ervilha este custo será 25 a 50 % menor.

A **eficiência energética** da produção de leguminosas e da sua utilização em rotações de culturas, juntamente com a sua significativamente mais **baixa emissão de GHG**, são factores chave a ter em conta no contexto do desejo da União Europeia de desenvolver o papel da agricultura na produção de energia.

Os benefícios ambientais das leguminosas de grão:
-Redução nas necessidades de energia fóssil: a poupança de cerca de 50 giga joules, i.e., cerca de 1,2 toneladas de combustível por tonelada de azoto mineral
-Redução do potencial de aquecimento global (i.e., diminuição da emissão de gases com efeito de estufa): uma poupança de cerca de 10 toneladas de equivalentes de CO_2 por tonelada de azoto
-Redução da acidificação dos solos e das águas
-Diversificação das culturas, com o efeito regulador dos ciclos biogeoquímicos e ciclos das pragas e doenças das plantas
-Diversificação da paisagem e conservação da biodiversidade

Considerações económicas e politicas

A produção de leguminosas contribui para uma produção agrícola com menor custo energético e menor impacto ambiental: estas culturas constituem uma **componente significativa de uma agricultura sustentável que fornece alimentação humana e animal, assim como bio-energia**.

A produção de leguminosas pode ser rentável, mas ainda não se conseguiu explorar na totalidade o seu mercado potencial. É por isso necessário direccionar a produção para um aumento estável do seu fornecimento. O agricultor aprecia o efeito positivo das leguminosas nas rotações de culturas, permitindo um aumento da produção no cereal cultivado de seguida e uma diminuição dos custos de produção agrícola. Contudo, as leguminosas devem competir favoravelmente com os resíduos das culturas oleaginosas em relação ao valor de mercado. Actualmente a contabilidade dos agricultores não tem ainda em conta as suas necessidades energéticas totais, nem os custos ambientais das produções altamente intensificadas.

A União Europeia comanda o campo científico na investigação das culturas fixadoras de azoto atmosférico

"Nós estamos a apetrechar a biologia das leguminosas com ferramentas genómicas para permitir um maior desenvolvimento destas culturas extremamente úteis na agricultura europeia" diz o GLIP, um consórcio europeu de investigação e desenvolvimento (2004-2008).

www.grainlegumes.com

GLIP Project

O Projecto GLIP é coordenado pelo JIC - John Innes Centre, UK – e financiado pelo Sexto Programa Quadro da Comissão Europeia. Esta conferência é organizada pelo GLIP, ITQB – Instituto de Tecnologia Química e Biológica, JIC - John Innes Centre (UK), INRA - Institut National de Recherche Agronomique (France) e AEP – Associação Europeia para a Investigação de Leguminosas de Grão.

GLIP project to boost legume improvement

The GLIP project has gathered 67 laboratories from 25 countries, thanks to support from the European Union in the 6th Research and Technological Framework Programme. GLIP investigations aim to develop new strategies to enhance the use of grain legume crops in Europe and beyond, so that they contribute to a sustainable EU agriculture. This is being achieved by:

(i) providing a breakthrough in the genomic understanding and genetic improvement required to resist diseases and tolerate climate/soil constraints;

(ii) providing tools to improve seed quality and seed processing for the feed industry;

(iii) environmental analysis of the impact of legume crops and products and the development of innovative management of cropping systems;

(iv) facilitating the efficient and direct exploitation of the knowledge gained and resources created in the project by stakeholders such as plant breeders and feed industry organisations.

International genetic and genomic resources now available

The genome sequencing of *Medicago truncatula*, a wild lucerne which is one of the genetic models for legume species, is now being completed in a collaborative effort of laboratories from USA and Europe.

Genomic and post-genomic platforms have been developed to study the biologic pathways and genes involved in the key phases of the plant development such as seed setting-up or resistance to major pathogens or stresses.

Three levels of investigations have been developed: (i) automated annotation by IMGAG (International Medicago Genome Annotation Group) provides hypothetical gene function, (ii) genome-wide expression profiling provides correlative evidence for the involvement of specific genes in specific functions, (iii) functional genomics platforms provide stronger evidence for gene function by analysing the phenotypic consequences of mutations in specific genes.

Collaboration with international centres and less favoured countries

One third of the audience conference is from non EU countries. In Asia, Africa or South America, legumes are often a significant component of human diet and a key element for agricultural systems. The integration of the different scientific efforts have been also facilitated by GLIP which has incorporated 10 new contractors from Russia, Egypt, West Bank and Gaza Strip, Tunisia, Morocco, Brazil, China and South Africa, in the last year, especially in the topics of biotic and abiotic stresses (of importance especially in the Mediterranean regions) as well as comparative genetics (with expertise or legume species less developed in the previous consortium).

Vision for the future: legume community defines its priorities

The legume collaborations have now been well established both at trans-national level and at inter-disciplinary level and the Conference was timely to define the legume strategic vision. Since legumes could play a role for a stronger contribution to the EU agriculture for reinforcing its sustainability, the European Commission encourages the consortium and international network to continue to build upon current knowledge and outputs for contributing to develop the European Knowledge Based Bio-Economy.

More Information on the GLIP Project and the GLIP Governing Board see below.

GRAIN LEGUMES Integrated Project

To boost production & maintain quality

Grain legumes such as peas, chickpeas, beans and lupins have a significant role to play in European agriculture because of their value as an important source of vegetable protein for human and animal alike and their beneficial impact on the environment. However, the use of these crops in European farming systems is relatively limited compared with the rest of the world because of problems with nutrition, disease, drought and plant morphology. The principle objective of the project is to mobilise and integrate the European research effort on grain legumes to address these major agricultural constraints affecting the production of grain legume crops in Europe. Emphasis will be placed on using state-of-the-art methodologies including genomics and bioinformatics, together with transcriptomics and metabolomics.

GLIP
Grain Legumes Integrated Project
FOOD - CT - 2004 - 506223

Acronoym: GRAIN LEGUMES (or GLIP)

Full Title: New Strategies to Improve Grain Legumes for Food and Feed

Contract: FOOD-CT-2004-506223, Research project co-supported by the partners and the EU in the framework of the 6th RDT Framework Programme

Duration: From 10 February 2004 to 09 February 2008

Partnership: 67 participants of 25 countries

Coordinator: T.H. Noel Ellis, John Innes Centre, Norwich, United Kingdom, noel.ellis@bbsrc.ac.uk, Tel: +44 16 03 45 00 00

Communication contact: Anne Schneider, AEP, Paris, France, a.schneider-aep@prolea.com, Tel: +33 1 40 69 49 09

More information: http://www.eu.grainlegumes.org

IMPACTS & POTENTIAL OF IMPROVED GRAIN LEGUMES FOR FEED & FOOD

Grain legumes in feed

To identify optimal parameters for legumes in feed & food quality and safety

M1 leader: Alfons Jansman, IDL, The Netherlands

WP1.1 Grain legumes in feed (Intestinal microflora, gut health and nutritional value in animals)
Alfons Jansman, ID Lelystad, The Netherlands

WP1.2 Feed processing & nutritional value (Potential and behaviour of processed products of legume seeds)
Katrin Hasenkopf, Fraunhofer, IVV, Germany

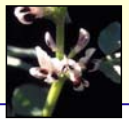
Economic & environmental impact

To use legumes to develop healthy and sustainable agriculture

M2 leader: ES Jensen, Risø, Denmark

WP2.1 Lower input farming (Agronomic considerations of grain legumes in agriculture)
Erik Jensen, Risø, Denmark

WP2.2 Economic & environmental analysis (Economic considerations of grain legumes in agriculture, including Life Cycle Analysis)
Thomas Nemecek, FAL, Switzerland



FACTORS AFFECTING SEED QUALITY & USE

Seed composition & quality

To investigate genetic variation in grain legume seed composition

M3 leader: Mark Stitt, MPG, Germany

WP3.1 Systems approaches to seed composition (High troughput approaches to characterise protein & metabolite amounts & composition)
Richard Thompson, INRA, Dijon, France

WP3.2 Novel approaches to alter seed composition (Gene and allele discovery, including QTL approaches)
Claire Domoney, JIC, United Kingdom

Crop functioning & seed quality

To indentify the factors affecting legume seed composition and supply

M4 leader: T. H.Noel Ellis, JIC, Norwich, United Kingdom

WP4.1 Abiotic stress (Saline & drought)
Martin Crespi, CNRS, Gif sur Yvette, France

WP4.2 Biotic stress (Fungal areal & root disease, parasitic plants, etc.)
Diego Rubiales, CSIC, Cordoba, Spain

WP4.3 Plant architecture (Shoot & root, leaf, inflorescence, stem stiffness, plant size)
Francisco Madueno, CSIC, Valencia, Spain - Catherine Rameau, INRA Versailles, France

WP4.4 Carbon/Nitrogen allocation & seed quality (Control of flux from primary assimilation to seed filing)
Christophe Salon, INRA Dijon, France

GENOMIC & POST GENOMIC TOOLS

Genetic & genomic tools

To develop new genetic & genomic tools

M5 leader: Jean Denarié, INRA, Toulouse, France

WP5.1 Sequencing (Two chromosomes sequenced in Europe)
Giles Oldroyd, JIC, Norwich, United Kingdom

WP5.2 Mutagenesis & reverse genetics (Gene tagging, fast neutron mutagenesis, TILLING platform)
Adam Kondorosi & Pascal Ratet, CNRS, Gif sur Yvette, France

WP5.3 Expression profiling (Microarrays, hybridisation)
Helge Kuester, Bielefeld, Germany

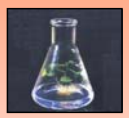
WP5.4 Crop & comparative Genomics (*Medicago truncatula*, pea, faba bean, *Lotus japonicus*, lupin, chickpea, lentil, clover, *Phaseolus* bean)
György Kiss, Inst. Genetics, BRC Szeged & Gödöllo, Hungary

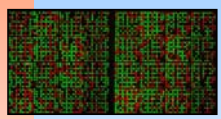
Bio-informatics

To integrate & exploit -omics data with bioinformatic tools

M6 leader: Klaus Mayer, MIPS, Munich, Germany

WP6.1 Bioinformatics (Sequence annotation, transcriptomic tool, comparative genomics, germplasm analysis)
Klaus Mayer, MIPS, Munich, Germany





COORDINATION, DISSEMINATION, TECHNOLOGY TRANSFER

Coordination & training

To provide coordination & training

M7 leader: Ton Bisseling, WAU, Wageningen, The Netherlands

WP7.1 Coordination
Noel Ellis, JIC, United Kingdom

WP7.2 Training (Short term fellowships & training workshops)
Ton Bisseling, WAU, Wageningen, The Netherlands

Dissemination & transfer

To disseminate knowledge & transfer technology

M8 leader: Frédéric Muel, AEP – GL-TTP, Paris, France

WP8.1 Dissemination of knowledge (Hard & web publication, workshops & dissemination events)
Anne Schneider, AEP

WP8.2 Transfer & exploitation of results (Progress survey & transfer programmes)
Catherine Golstein, GL-TTP

Partnership

1 John Innes Centre (United Kingdom)
2 INRA, Institut National de la Recherche Agronomique (France)
2-A Angers, 2-D Dijon, 2-M Montpellier, 2-N Nantes, 2-T Poitou-Charentes, 2-R Rennes, 2-T Toulouse, 2-V Versailles-Grignon
3 CNRS (France)
3-G Gif-sur-Yvette, 3-T CNRS Castenet-Tolosan
4 LMB Wageningen University (The Netherlands)
5 UNIBI, Bielefeld University (Germany)
6 AEP, European Association for Grain Legume Research
7 MPI, Max Planck Institute of Molecular Plant Physiology (Germany)
8 CSIC, Consejo Superior de Investigaciones Cientificas (Spain)
8-C Instituto Agricultura Sostenible, Córdoba
8-V Instituto de Biologia Molecular y Celular de Plantas, Valencia
9 Génoscope, Consortium national de ressources en génomique (France)
10 KVL, Royal Veterinary and Agricultural University (Denmark)
11 The Wellcome Trust Sanger Institute (United Kingdom)
12 Johann Wolfgang Goethe University (Germany)
13 University of Dundee at SCRI (United Kingdom)
14 BRC, Biological Research Center of the Hungarian Academy of Sciences (Hungary)
15 Animal Sciences Group (The Netherlands)
16 University of Córdoba (Spain)
17 MIPS, Technische Universität München (Germany)
18 Schothorst Feed Research (The Netherlands)
19 UAAR, Dept Molecular Biology, University of Aarhus (Denmark)
20 Swiss Federal Research Station for Agroecology & Agriculture (Switzerland)
21 Flemish Institute for Biotechnology (Belgium)
23 IPK, Institut für Pflanzengenetik & kulturpflanzenforshung (Germany)
24 RISØ National Laboratory (Denmark)
25 IVV, Fraunhofer Institute (Germany)
26 Nutreco Aquaculture Research Center (Norway)
28 ESA, Ecole Supérieure d'Agriculture (France)
29 PRI, Plant Research International (The Netherlands)
30 University of Hannover, Department for Molecular Genetics (Germany)
31 Instituted foer Livsmedel och Bioteknik (Sweden)
32 Institute of Plant Genetics of Polish Academy of Sciences (Poland)
33 University of Leon, Instituto Technologico Agrario de Castilla y Leon (Spain)
34 CLS, Central Science Laboratory (United Kingdom)
35 University of Sevilla (Spain)
37 IBMC, Instituto de Biologia Molecular e Celular (Portugal)
38 CEREOPA, Centre d'Etudes et de Recherche sur l'Economie et l'Organisation des Productions Animales - INA P-G (France)
39 NIAB Cambridge (United Kingdom)
41 Universidad Pública de Navarra (Spain)
42 CESFAC, Confederation Espanola de Fabricantes de Alimentos Compuestos para animales (Spain)
43 CZU, Ceska Zemedelska Universita (Czech Republic)
44 UoR, The University of Reading (United Kingdom)
45 IGER, Institute of Grassland & Environmental Research (United Kingdom)
46 UNIP, Union Nationale Interprofessionelle des Plantes Riches en Protéines (FR)
47 Plant Breeding and Acclimatisation Institute (Poland)
50 ARO, Agricultural Research Organization (Israel)
51 ABI, AgroBioInstitute (Bulgaria)
52 AEL, Asociación Española de Leguminosas – Centro de Recursos Fitogeneticos del INIA (Spain)
55 University of York (United Kingdom)
57 Murdoch University (Australia)
58 IG-ABC, Institute of Genetics (Hungary)
59 Instituto di Ricerche per il Miglioramento (Italy)
60 University of Ghent (Belgium)
66 CSIRO Plant Industry (Australia)
67 GL-TTP, Grain Legume Technology Transfer Platform
68 GenXPro (Germany)
69 University of Essex (United Kingdom)
70 ADAS, Wolverhampton (United Kingdom)
70 ARRIAM, All Russia Research Institute for Agricultural Microbiology (Russia)
72 FAKS, Faculty of Agriculture of Tanta University (Egypt)
73 FAN Faculty of Agriculture of An-Najah National University (West Bank & Gaza)
74 IAV, Institut Agronomique et Vétérinaire Hassan II (Morocco)
75 INRAT, Institut National de la Recherche Agronomique de Tunisie (Tunisia)
76 EMBRAPA, National Brazilian Agricultural Research Institute (Brazil)
77 UCB, Universidade Católica de Brasília (Brazil)
78 SIPPE, Shanghai Institute of Plant Physiology and Ecology (China)
79 CBBC, Centre de Biotechnologie (Tunisia)
80 University of the Witwatersrand (South Africa)
81 ITQB, instituto Tecnologia, Quimica e Biologica (Portugal)

GRAIN LEGUMES Integrated Project
EU scientific leadership on nitrogen-fixing crop research for the sustainability of agriculture

Coordinator: T.H. Noel ELLIS (John Innes Centre, UK)
Web site: http://www.eugrainlegumes.org

"Legume crops are essential for environmentally friendly and sustainable agriculture, but are under-used in the EU; we are harnessing genomics to legume biology to redress the balance" says GLIP consortium

The Grain Legumes Integrated Project (GLIP) aims to develop new strategies to enhance the use of grain legume crops for animal feed in Europe and also in a wider context. GLIP is combining the efforts of 67 contractors from 25 countries, due to an extension to non-EU countries in 2006. GLIP is a network of interacting sub-projects that aims to understand how grain legume products can be exploited to a greater extent and so contribute to a sustainable EU agriculture. This is being achieved by:

(i) assessing the potential and impact of improved grain legumes

The nutritional and functional values of grain legumes for feeding poultry and pigs are being investigated in **Module 1**, with an emphasis on their effects on enteric bacterial populations to assess pro-biotic potential, as well as on their digestibility as whole, processed or fractionated seed. The potential of protein-enriched materials is also being tested for feeding piglets and fish.

Module 2 considers the impact of grain legumes in cropping systems and for feed or food use. Intercropping grain legumes with cereals enables the incidence of diseases such as ascochyta blights or Aphanomyces, and infection by broomrape, to be reduced. Genetic variability in nutrient uptake and some aspects of N dynamics in crop rotations are also being investigated. Modelling by Life Cycle Assessment has demonstrated the benefits of grain legumes with respect to energy efficiency and to environmental criteria.

There is a need for plant proteins, especially for animal feed. There is a need for sustainable farming systems. Nitrogen fertilizer production is based on fossil energy and constitutes the main energy input and cause of greenhouse gas emission from agricultural plant production. The energy costs of nitrogen supply to most non-legume crops are very high ranging between 40 and 70% of the total energy requirement whereas for a legume such as pea it is 25 to 50% lower. Grain legumes can provide the EU with a source of protein with minimum environmental input.

(ii) investigating the factors affecting seed quality and use

Module 3 has undertaken a systematic analysis of legume seed components that determines their pattern of usage. Mutants in several relevant genes have been obtained and their effect on storage products and metabolite profiles is under investigation. Information from *Arabidopsis thaliana* is being exploited to develop comprehensive studies of the regulation of seed metabolism in the *Medicago truncatula* model, which has genetic and metabolic features closer to legume crops.

The traits that constrain crop productivity are being investigated in **Module 4**, both in model and crop systems, for biotic and abiotic stresses and for internal processes: regulation of plant architecture, assimilation and remobilisation of nutrients. Several target genes have been identified, large scale analyses of plant responses are undertaken. Genomic tools for *Aphanomyces euteiches*, a major concern for pea in Europe, are being developed.

(iii) providing the legume community with genomic and post-genomic tools

Through **Module 5** GLIP contributes to the international Medicago genome sequencing programme. Systematic mutagenesis has been very successful, providing mutants for studies of traits and characters. Array-based and qRT-PCR platforms have been developed, mostly for the model system *M. truncatula*, and arrays for transcriptome and other analyses in pea have been developed and used for studies of different traits. Substantial progress has been made in aligning the genetic maps of several crop species with sequence data from model systems. There is progress in informatics tools through **Modules 5 & 6**, most notably in genome sequence annotation and analysis, but with significant contributions to the analysis of array data.

(iv) integrating activities and facilitating exploitation of the knowledge and resources

GLIP sub-parts are exchanging materials and concepts and are open to interactions with non-GLIP parties (**Modules 7 & 8**). GLIP interacts with other scientific groups especially through thematic workshops, and with agricultural stakeholders or decision-makers through dissemination events and the web portal on grain legumes (www.grainlegumes.com). GLIP is unique in having set up a Grain Legumes Technology Transfer Platform (GL-TTP), open to any interested parties, to assist the transfer of results from different research investigations into commercial products with a focus on plant breeding.

Governing Board of
GRAIN LEGUMES Integrated Project

The Governing Board:

Ton Bisseling	WU Wageningen University, Netherlands
Jean Denarie	INRA-T Toulouse, France
Noel Ellis	JIC John Innes Centre, Norwich, U.K
Alfons Jansman	ID Lelystad, Lelystad, Netherlands
Erik Steen Jensen	Risø National Laboratory, Roskilde, DK
Klaus Mayer	MIPS, GSF, Neuherberg, Germany
Frédéric Muel	UNIP, Paris, France
Mark Stitt	MPG Max Planck Institut, Golm, Germany

Biographies of the leaders of the 6 scientific modules:

GLIP coordinator
Leader of Module 4 Crop functioning & seed quality

T. H. Noel Ellis (PhD Dr.) has a expertise in pea genetics and diversity and is the Associate Head of the Crop Genetics Department at the John Innes Centre (Norwich, UK) which has contributed to legume genetics since 1911. Noel has contributed to the establishment of the DEFRA network for Pulse Crop Genetic Improvement (PCGIN www.pcgin.org), and is the JIC director of an MSc course 'Plant Genetics and Crop Improvement'. Noel has been involved in several EU and international projects and coordinates the GLIP project and contributes to the genetics of plant architecture the crop and comparative genomics."

Leader of Module 1 Grain legumes in feed
Alfons Jansman (ID Lelystad, Lelystad, Netherlands)

Senior scientist and cluster manager at the Animal Sciences Group in Lelystad, The Netherlands. After graduating from the Wageningen University in Animal Production, he obtained his degree of Doctor in Agricultural Sciences at the same university in 1993 on a thesis entitled “Tannins in faba beans – antinutritional effects in mongastric animals”. He was employed from 1993 till 2003 by TNO (Netherlands Organisation for Applied Scientific Research). Since 2003 he is working for the Animal Sciences Group of Wageningen University and Research Center in Lelystad, The Netherlands.
His main areas of expertise are the nutritional value of feed ingredients, digestive physiology in pigs, amino acid requirements and metabolism and nutrition and health in pigs and poultry. In GLIP, he is leader of the Module “Grain Legumes in Feed” and member of the Governing Board.

Leader of Module 2 Economic and environmental impact

Erik Steen Jensen (Professor Dr, and of WP2.1 on Lower input farming) has a deep expertise in N2 fixation in legumes, plant biomass for energy, intercropping, sustainable/organic agriculture, cycling of N and C. The Biosystems Department at Risø National Laboratory, DTU (Roskilde, Denmark) is engaged in basic and applied research to improve the scientific basis for developing new methods and technology for the future, environmentally benign industrial and agricultural production, thus exerting less stress and strain on the environment. The Unit Prof. Jensen leads has main focus on sustainable biomass productin systems incuding legumes, conversion technologies for 2. generation bioethanol and sustainability analysis of crop and conversion technologies.

Leader of Module 3 Seed composition & quality

Prof. Mark Stitt is Director of the Metabolic Networks Department of the Max Planck Institute of Molecular Plant Physiology (Golm, Germany). His research interests are in the systematic and comprehensive analysis of the control of plant metabolism mainly using the model system Arabidopsis thaliana. Mark has coordinated the area "Seed composition and quality" within the EU Grain Legumes Integrated Project (GLIP).

Leader of Module 5 Genetic & genomic tools

Jean Dénarié is Emeritus director of research at the CNRS-INRA Laboratory of Plant-Microbe Interactions in Toulouse. He is studying the legume-rhizobium symbiosis and has contributed to the discovery of nodulation signals that are used on a large scale for legume seed inoculants. He has contributed to the development of Medicago truncatula as a model legume, was coordinator of the FP5 Medicago genomics project, and is leader of the GLIP module 5, Genetic and genomic tools. He has been elected as a member of the European Molecular Biology Organisation (EMBO) and of the Academia Europaea (section Biochemistry and molecular biology).

Leader of Module 6 Bioinformatics

Klaus Mayer is heading the bioinformatic research group at MIPS at the German National Research Center for Environment and Health. He has been involved in the bioinformatic analysis of plant genomes since 1997. Beside development of bioinformatic means to establish a grain legume comparative platform and to efficiently analyse, store and display functional genomic and reverse genetic information a main deliverable is the thorough and comprehensive sequencing and analysis of the genome of *Medicago truncatula*. A main focus of his work is to ensure high quality analysis of the genome sequence and to embed the Medicago sequence into a legume and plant comparative platform. A second important task to fulfill is to establish data resources and web accessible data bases which ensure a maximum profit for the wider legume community.