LEGATO Newsletter

LEGumes for the Agriculture of TOmorrow

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What is LEGATO?

LEGATO (LEGumes for the Agriculture of Tomorrow) is a 4-year 7 million € project funded by the European Union*, aimed at increasing grain legume cultivation in Europe.

Grain legumes (pea, faba bean, lentils, lupins, grass pea, chickpea) are a valuable source of protein for food, animal feed, industrial chemicals and materials. As legumes are capable of fixing atmospheric nitrogen, they don't need nitrogen fertilizer application. Introducing a legume into a crop rotation offers several further benefits for the agro-ecosystem: reduced pest and pathogen transmission between cereals, requirement for pesticides, need for N fertilizer in the subsequent crops and fossil energy, increased biodiversity to support pollinating insects and reduced greenhouse gas emissions.

Despite all these advantages, and steadily increasing plant protein prices on the world market, grain legume cultivation is at an all-time low in Europe. LEGATO is aimed at increasing grain legume production in the EU by addressing key issues such as breeding for improved disease and pest resistance, adaptation to abiotic stresses, optimization for foodstuffs, and development of cropping systems that exploit fully the ecosystem services afforded by grain legumes. To achieve this, the project integrates research and expertise of 29 partners from 12 European member and associated states.

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Web site: http://www.legato-fp7.eu/

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Who are the LEGATO partners?

INRA
CIHEAM IAM ZARAGOZA
PRIFYSGOL ABERYSTWYTH UNIVERSITY
Decollogne
agri tec
AGRO VEGETAL
NPZ LEMBKE
PATRIMVS INDUSTRIA SA
CRA AGRICULTURAL RESEARCH COUNCIL
PGRO
CSIC
SZG SAATZUCHT GLEISDORF
JÜLICH FORSCHUNGSZENTRUM
AMBIS Biotechnology
GenXPro genes never seen before
Instituto de Investigación y Formación Agraria y Pesquera CONSEJERÍA DE AGRICULTURA, PESCA Y DESARROLLO RURAL
SLU
UNIP Interprofession des protéagineux
iniav
UNIVERSIDAD D CÓRDOBA
INRA Transfert
ITQB INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA ANTÓNIO XAVIER/UNL Knowledge Creation
IGR PAN
John Innes Centre
UNIVERSITY of York

Impressum

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LEGATO Kick-off meeting

The LEGATO Kick-off Meeting took place in Dijon, France, on 4-5 March 2014 at the INRA Dijon Centre. More than 70 participants attended the event and a total of 36 organizations, including research and other public institutions and private companies, of 17 countries (Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Serbia, Spain, Sweden and UK) were represented. The meeting was also attended by the EU Scientific Officer in charge of LEGATO, Gaëtan Dubois*.

The objective of the meeting was to officially launch the project, to remind the partners of their involvement in the different tasks, and to review in detail the LEGATO work programme, especially the experiments to be carried out. LEGATO is aimed at increasing grain legume production in the EC by addressing key issues such as breeding for improved disease and pest resistance, adaptation to abiotic stresses, and optimization for foodstuffs, and development of cropping systems that exploit fully the ecosystem services afforded by grain legumes.

After a welcome and overview of the project by Richard Thompson, the LEGATO Coordinator (INRA), Françoise Simon-Plas, President of Dijon INRA Centre and Gaëtan Dubois, LEGATO EU Scientific officer, also welcomed the participants. Advisory Board member Thomas D. Warkentin, University of Saskatchewan, Canada, then gave an excellent overview on pulse breeding and research, with special attention to Canada. This was followed by presentations of individual work packages by the workpackage (WP) leaders.

During the Second day of the meeting, parallel workshops for WPs were organized with detailed presentations and discussions on the WP objectives, main tasks, deliverables and milestones and partners, in order for each WP to have a clear roadmap until the end of the project. After these parallel sessions, a wrap-up session was organized so that all partners were aware of the decisions taken for each WP.

At the end of the first day, a LEGATO Executive Committee Meeting took place, where decisions were made on several issues such as the deliverable validation process, the Intellectual Property Use and Dissemination Committee, the Advisory Board membership, the stakeholder meetings and the interaction with the EUROLEGUME project, which has been funded in parallel by the EC.

*Since May 2014, LEGATO has a new EU scientific officer, Dieter Brigitta.

Press releases on LEGATO

Several Press Releases have been published in several languages before and after the LEGATO Kick-off meeting.

A LEGATO team member notes, 'Despite previous advances, the impact [of previous projects] has been limited due to a lack of technology and expertise transfer since the expiry of GLIP and its attendant technology transfer platform (GL-TTP). We intend to take the opportunity to communicate and exploit better the breadth of knowledge obtained.' The LEGATO team will also be taking on new challenges. 'We have decided to tackle emerging pests and diseases that pose a threat to legume cultivation in low-input agriculture, some of which have been little studied in the past.'

(from the press release at the EU Cordis web site)

Participants of the LEGATO Kick-off meeting, Dijon, France, 4-5 March 2014

How LEGATO is structured?

WP1: Genetics and new breeding tools and material

Leader:
Paolo Annicchiarico (CRA)

It focuses on the identification, distribution and exploitation of allelic variation. T1.1: We will identify, characterize and map genes associated with regulation of pea flower/pod production and faba bean autofertility. T1.2: We will develop and apply genetic markers to select for various traits studied in other WPs and against antinutritional metabolites of faba bean and grass pea, and validate a marker-assisted selection approach for pea in drought-prone environments. T1.3: We will broaden the pea genomic resources by developing Chromosome Segment Substitution lines from crosses between wild and cultivated material, and a high-density genetic map supporting genome sequencing. T1.4: We will investigate the genetic structure and construct a genetic map for white lupin.

WP2: Biotic stress resistance

Leader:
Diego Rubiales (CSIC)

We will thus build on pre-existing knowledge and address currently limited resistance to weevils, aphids and ascochyta blights in pea, faba bean and grasspea, identifying novel resistance sources based on unspecific mechanisms which are more likely to be durable. The availability of NGS sequence data will be exploited to refine markers for resistances. Knowledge on potyvirus resistance available for pea will be extended and applied to other related Fabeae tribe legume crops. Where resistance is mapped as a QTL, candidate gene mapping within the QTL interval will be tested for their suitability as markers.

WP3: Optimizing plant adaptation to abiotic stress

Leader:
Christophe Salon (INRA)

We will analyse the plant's response to abiotic stress, primarily the interaction between drought and heat stresses. We will focus on the effect of abiotic stresses on the legume-Rhizobium symbiosis. Root properties will be studied using innovative non-destructive imaging techniques. The outcome of these studies will be twofold: prediction of ideotypes adapted to withstand drought, and identification of candidate genes and bacterial strains involved in the symbiotic plants' adaptation to abiotic stress that can be used for selection.

WP4: Defining traits adapted to consumers' expectations

Leader:
Carlota Vaz Patto (ITQB)

WP4 will define grain legume quality characteristics that can be translated into consumer demand and develop the necessary tools to exploit these traits in breeding. It will also quantify a series of compounds affecting nutritional quality, health-beneficial properties, and organoleptic and processing qualities in the major European culinary grain legumes. Consumers' quality preferences, with a focus on perception of legume sustainability, will be assessed using a range of grain legumes based food products. Efficient screening tools will be developed for the most important traits. The collected data and developed methods will serve to improve screens for the most relevant consumers' quality traits in future breeding programs.

WP5: Grain legume cropping system management

Leader:
Erik Steen Jensen (SLU)

We will design and do *ex-ante* assessment of new cropping systems (CS) with intercrops (GL and cereals) and GL variety mixtures potentially adapted to local pedoclimatic zones. The productivity, yield and stability of selected systems will be evaluated in field trials. In parallel, the effect of CS on biotic and environmental stresses will be determined. In a subset of these trials, endogenous rhizobium populations for pea and fababean will be quantified and analysed for N_2-fixing efficiency. Highly efficient strains will be selected. The requirement for rhizobial inoculation by elite strains will be measured by comparing yields of inoculated and non-inoculated plots at partner sites.

WP6: Stakeholder interface for targets orientation and practical evaluation

Leader:
Steve Belcher (PGRO-RL)

The project will evaluate the potential impact of the new breeding material and cropping systems that are developed. One task in WP6 will embrace a stakeholder forum of plant breeders that identify priorities for trait selection and evaluate new data and material emerging from the project. A second major task will be trials by a Europe-wide network of plant breeders, both public and commercial, of genetic material and crop management regimes, and of marker-assisted selection protocols, all arising from the project.

WP7: Outreach

Leader:
Dunixi Gabiña
(IAMZ-CIHEAM)

This WP will complement the stakeholder interface of WP6 in disseminating LEGATO results to a broad audience including end-users, consumers, policy makers, and selected educational instances such as agronomy schools and nutritionist bodies. In coordination with other interested bodies such as the International Legume Society (ILS) and the inter-professional associations (UNIP, PGRO), this WP will utilize a wide range of communication media from a dedicated website through brochures, newsletter, press releases, a training course and an international conference.

WP8: Management

Leader:
Caroline Sautot (IT)

The work package is responsible for coordinating the execution of the project including reporting, and addressing administrative issues on a day-to-day basis. To facilitate this, project monitoring tools have been set up including a secure collaborative platform and mechanisms for IPR management. In addition to the progress within the project, wide scientific and socio-economic developments are followed to ensure maximum relevance and benefit from the work undertaken and permit adjustments where necessary.

LEGATO and farmers

The LEGATO project poster was presented by PGRO (Processors and Growers Research Organisation) at a major UK farmer event, Cereals 2014, on 11th and 12th June 2014 (photo right). In the context of CAP reforms and how these will be implemented in England, it could have positive implications for growing pulses in the UK. PGRO is a LEGATO project participant and will coordinate multisite trials evaluating new varieties and management practices. It will also participate in the forum of experts.

Stakeholder participation in LEGATO

The results obtained during the LEGATO project will be communicated regularly to potentially interested stakeholders* in the form of a website (http://www.legato-fp7.eu/), a newsletter, and by a series of stakeholder meetings. If you would like to to receive further information, please send a n e-mail to Dunixi Gabina (gabina@iamz.ciheam.org), with 'LEGATO stakeholder' in the subject line.

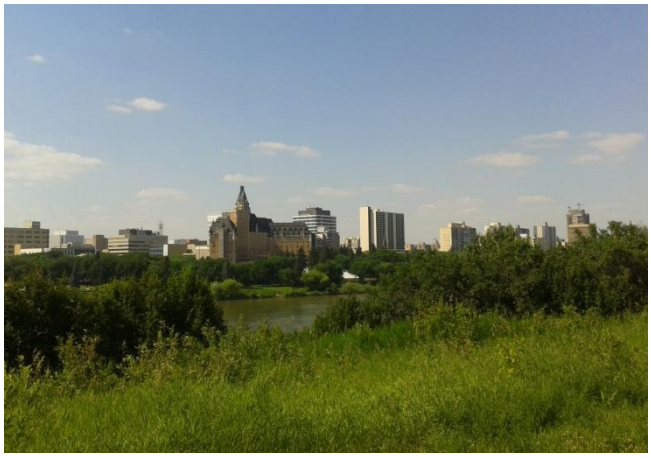
Past events

17 researchers from LEGATO partner organisations attended the 7th International Conference on Legume Genomics and Genetics, held jointly with the 6th International Food Legume Research Conference, in Saskatoon, Canada, from 7th to 11th July 2014. With over 400 participants, it was a valuable opportunity to network with the world's leaders in our field.

The programme reflected the strong LEGATO representation, with 3 of the keynote speakers, and a further 3 oral presentations and numerous posters coming from LEGATO teams.

Saskatchewan being the leading pulse-producing Canadian province, the congress attracted much local interest and was sponsored by several commercial and governmental bodies. Murad Al-Katib (CEO, Alliance Grain Traders) gave an inspiring talk tracing the role played by his company in the rapid development of lentil production in Canada, from modest beginnings to being now a world leader in exports.

The event was rounded off by visits to a 1910 Boomtown museum and a First Nation heritage reserve and unsurprisingly, the participants were nourished extensively with legume-based dishes.



Forthcoming events relevant to LEGATO

Innovations in
ORGANIC FOOD SYSTEMS
for Sustainable Production and Enhanced Ecosystem Services
International Conference, 1-2 November 2014, Hyatt Regency Long Beach Hotel
Long Beach, California

https://www.agronomy.org/membership/communities/organic-management-systems

CVT AllEnvi
PLANT PROTEINS & FOOD
What are the key innovation drivers?
CVT AllEnvi collective strategic analysis
25 NOV. 2014 PARIS

https://colloque.inra.fr/seminaire_proteines_vegetales_eng

Ag-Bio Congress
Informa's Innagural
Plant Breeding
03.12.14 - 04.12.14 Berlin| Germany

http://www.informa-ls.com/event/plantbreeding

LEGATO First Annual Meeting
SLU, Alnarp, Sweden, 23-26 February 2015

http://www.legato-fp7.eu/

EUCARPIA
European Association for Research on Plant Breeding
Europäische Gesellschaft für Züchtungsforschung
Association Européenne pour l'Amélioration des Plantes
EUCARPIA INTERNATIONAL SYMPOSIUM ON PROTEIN CROPS
V Meeting AEL [V JORNADAS DE LA AEL]
Pontevedra, Spain, 4-7 May 2015

http://www.symposiumproteincrops.org/

Related projects

EUROLEGUME 2014-2017

http://www.eurolegume.eu/

Legume Futures

http://www.legumefutures.de/

International Year of Pulses - 2016

The UN declared 2016 to be an International Year of Pulses (IYOP). The goal of the year is to raise the profile of pulses and to celebrate the role of beans, chickpeas, lentils and other pulses in feeding the world. It is a galvanizing moment to draw together key actors to further the contributions pulses make to health, nutrition and sustainability.

The goal of the 2016 IYOP is to position pulses as a primary source of protein and other essential nutrients. The 2016 IYOP will promote broad discussion and cooperation at the national, regional and global levels to increase awareness and understanding of the challenges faced by pulse farmers, be they large scale farms or small land holders.

http://www.iyop.net/en/