

Legume-supported cropping systems for Europe

Project Newsletter 1

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Legume Futures goals

Europe uses about 9 million tonnes of fertiliser N per year and is the world's largest importer of plant protein, consuming the equivalent of 50 million tonnes of soybean per year. Reducing these inputs lies at the heart of improving our farming systems. Legumes fix nitrogen and are rich in protein giving them a special role in improving farming systems.

The project brings together data and expertise from 18 partner organisations in 12 countries to design new cropping systems. Economic and environmental assessments will examine wider effects, such as agricultural greenhouse gas emission reductions. Contact: Dr Bob Rees. (bob.rees@sac.ac.uk).

Systems research for our time

Recent political debate shows that the time is right for Legume Futures. Policy-makers are now focused on the further reform of the CAP against the background of demands for climate change mitigation, food security, and wider environmental protection. Few aspects of our food system are more relevant than how we source and use plant protein and nitrogen. Germany's Federal Agriculture [Minister Ilse Aigner](#) has announced the development of a protein strategy. The [European Parliament](#) is also addressing the low production of legumes in the EU. The European Commission is looking to [crop rotations](#) to address wider environmental problems. There is an increasing awareness Europe's legume deficit has effects well beyond the economic consequences of trade. This debate will be followed in Legume Futures to identify opportunities for increasing the impact of our research.

Legume Futures has a strong policy dimension and we aim to actively contribute to policy development. We have already contributed to EU research policy through submissions to the EU's Standing Committee on Agricultural Research ([SCAR](#)) and the Technology Platforms' development of a White Paper for research policy for the bioeconomy (BECOTEPS). We are also active in the [Task Force for Reactive Nitrogen](#) and will be active at the [Conference on Nitrogen and Global Change](#) in Edinburgh in April.

Researcher profile – Dr Valentini Pappa

There are over 40 active researchers in Legume Futures. The long term effect of their work is not just from delivering and exploiting results – it depends too on people and the collaboration. In this Newsletter we feature Dr Valentini Pappa who works in the Scottish Agricultural College in Edinburgh.



Dr. Valentini Pappa taking gas samples from barley plots at the SAC.

Valentini is an environmental scientist with degrees from Universities in Greece and Scotland. She is particularly interested gas emissions from agricultural systems. Coincidentally, her work in Edinburgh in Legume Futures now involves collaboration with her former supervisor from her student days at the Technological Educational Institute of Epirus, Prof. Dimitrios Savvas. Her past research was focused on hydroponics and salination.

Valentini is using existing experiments to provide data on N₂O emissions, crop yield and crop residue management. Reflecting on the collaboration that would have been unthinkable just 20 years ago she remarks "It is fascinating to see the breadth of Legume Futures, especially having worked myself in both northern and southern Europe. Last year, I travelled to Romania and Greece to work with Dr Ion Toncea at Fundulea and to visit the site provided by Dimitrios in Greece. We discussed methods in detail to make sure that they will meet the needs of Legume Futures".

It's just one small example of how European funding enables research collaborations that benefit everyone contributing to a European research community that will last long after Legume Futures has ended.

Legume Futures progress

Legume Futures started on 1 March 2010 and formally got underway at a two-day kick-off meeting in Edinburgh in mid-March which all partners attended. The meeting revealed the commitment of all Legume Futures participants and especially the wide range of expertise and commitment of partners from the Mediterranean region and eastern Europe.

The kick-off meeting was followed by the first meeting of the Scientific Steering Committee (SSC) in June where research plans were subject to the scrutiny of the independent SSC experts. The SSC endorsed the Legume Futures approach and provided advice on a wide range of scientific and technical details. In particular, the SSC emphasised the importance of ensuring effective nodulation at all sites. The measurements of biological nitrogen fixation and nitrous oxide emissions were discussed in detail.

Research on the ground is progressing as planned with plans and protocols for the first year's field work now in place. Critical methodologies have been clarified, subjected to external scrutiny, and agreed. The Legume Futures Delivery and Communications Strategy has been fully developed. We now look ahead to Legume Future's first growing season.

Partner profile - National Agricultural Research and Development Institute at Fundulea in Romania (NARDI)

A large range of legume species was widely used by Romanian farmers until recently. The [NARDI](#) at Fundulea has a long history of breeding and developing legume crop species.



NARDI at Fundulea in Romania – a key partner in Legume Futures

This collaboration in Legume Futures grew out of contacts in the early 90s. The Institute brings unique experience gathered over contrasting political conditions. In the past peas, bean, soy and many other legumes were common on Romanian farms. In 1989, 500,000 ha of soy were grown. This declined to about 50,000 ha by 2008. Common beans, which extended over 1.4 million ha in 1961, have practically disappeared. The NARDI research in Legume Futures will provide data from field trials and examine nitrogen fluxes in soils. Most importantly, the team at Fundulea bring their knowledge and experience to Legume Futures.



Sampling for measurements of N₂O from soils used for soybean cultivation at Fundulea in Romania

Dr Ion Toncea leads the Legume Futures work at Fundulea. He reflects on many years working with legumes and looks to the future "Unfortunately, as in the whole of the EU, the future of legume crops in Romania is uncertain because a policy to support these crops for their wider benefits has not been developed. Policies to address the EU protein deficit, reduce greenhouse gas emissions and to diversify European cropping could unlock the potential of the expertise we have at Fundulea".

First annual meeting in Cordoba (Spain)

The first annual meeting of the Legume Futures consortium takes place in Cordoba on 22-23 March followed by a visit to the University of Cordoba field site on March 24. More than 40 scientists from the consortium have registered. The programme provides some initial overviews by WP leaders, followed by contributions from individual research partners. Detailed discussions on methodological issues and sampling protocols, modelling data analysis etc. are planned. All members of the external Scientific Steering Committee will attend. They will report to the Project Steering Committee at the end of day two.



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