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Newsletter #8 - May 2024

Optimising bio-based fertilisers in agriculture – Providing a knowledge basis for new policies

Get to know us!

LEX4BIO aims to identify and quantify nutrient-rich side-streams and evaluates technologies for producing safe, efficient and regionally targeted bio-based fertilisers in the EU. LEX4BIO will provide policy recommendations for achieving a higher use efficiency of bio-based fertilisers and socioeconomic improvements for the rural population.

Click here to discover our project objectives

Word from Kari Ylivainio, LEX4BIO coordinator

LEX4BIO project started in June 2019 and soon draws to a close, in May 2024. During these five years, we have evaluated various bio-based fertilisers considering their agronomic efficiency, potential environmental losses and effect on food and feed safety while ensuring human health.

The last six month were focused on dissemination and communication activities while at the same time preparing almost half of all project deliverables. LEX4BIO arranged two final events in March and April 2024. During the ManuResource conference in Antwerp, LEX4BIO presented main outcomes during the two parallel sessions. Audience included participants from scientific community and policy makers from both national and EU level. Also, round-table discussions took place during the conference and one of the discussion points was the challenges for evaluating agronomic performance of bio-based fertilisers. Second event was organized in Brussels, together with all five sister projects and ESPP and Biorefine Cluster Europe, compiling recent knowledge about nutrient recycling from various nutrient-rich side-streams. This event was more oriented towards policy makers but scientific community was presented as well.

Last review process of LEX4BIO will be finalized in early autumn after which all the public deliverables will be available on our website (**www.lex4bio.eu**). All publications will be also publicly available in Zenodo under **LEX4BIO community**. I hope you find these publications interesting to further enhance the utilization of bio-based fertilizers.

LEX4BIO Final Events

Our results dissemination effort focused on two prominent events in the field of agronomy and soil science where project partners presented to the scientific community, stakeholders involved in nutrient recycling and soil management, and policy makers, the key outputs and conclusions derived from a five-year research work dedicated to optimising biobased fertilisers in agriculture.

ManuREsource International Conference on Manure Management and Valorisation 2024

The sixth edition of the ManuREsource conference was held in Antwerp, Belgium, 20 - 21 March and LEX4BIO participation was organized in cooperation with four other sister projects (RUR-08).

LEX4BIO ran two parallel sessions, each featuring four presentations, as follows:

Session 1: Agronomic performance of bio-based fertilizers and their potential to replace mineral fertilizers in the EU

- Availability of nutrient-rich side streams and potential of biobased fertilisers for crop growth and soil health in Europe
- Potential of bio-based phosphorus fertilizers to replace conventional fertiliser in Europe
- Agronomic performance of nitrogen-rich, bio-based fertilizers across European field trial sites
- Compliance methods to determine the agronomic performance of bio-based fertilisers

Session 2: Stakeholders acceptance and potential effects of bio-based fertilizers on the environment, food safety and health

- Survey on opinions and attitudes of selected stakeholders about bio-based fertilisers
- Contaminants and antibiotic resistance genes in bio-based fertilizers (BBFs): low risk for soils and crops
- Quantifying nitrogen and phosphorus losses from bio-based fertilisers in European agriculture through experimentation and modelling
- Life cycle assessment of BBF production – applying the Lex4Bio LCA-Convention

The talks of all speakers on the various outcomes of LEX4BIO gained interesting questions by different stakeholders in the audience, leading to engaging discussions ranging from broad perspectives on the possibility to replace all artificial fertiliser use in the EU with bio-based fertilisers, to a detailed exchange of ideas about the intricacies of performing life cycle assessments.

ManuREsource is an international conference hosted by the Flemisch Coordination Centre for Manure Processing, Ghent University and Inagro. The sixth edition is organized in collaboration with NCM, the Dutch Center of Expertise for Valorization of Manure, a partnership between the national and regional governments, the agriculture and the agribusiness in the Netherlands.

Nutrients in Europe Research Meeting (NERM) 2024

Nutrients in Europe Research Meeting (NERM) was LEX4BIO´s final conference and pinnacle closing event for the project. It was co-organized by ESPP and FERTIMANURE, LEX4BIO, RUSTICA, SEA2LAND and WALNUT projects funded under Horizon 2020 Programme (RUR-08) and was conducted in Brussels on April 16 and 17, 2024 with the ambition to **outline the path towards closing nutrient cycles for a sustainable future under the tagline "From R&D to implementation**". An engaging and enriching two-day experience, disseminating key outcomes of latest research on nutrient recovery technologies and recycled fertiliser production, but also deliberating on the quality, application and stakeholder acceptance of secondary fertilisers as well as sketching a roadmap for future nutrient and fertiliser recycling R&D needs.

With six parallel session presentations, LEX4BIO speakers walked conference participants through the whole lifecycle of the project, with talks on nitrogen (N) and phosphorus (P) bio-based fertilisers' (BBF) agronomic performance, findings on potential risks of BBF use posed to soils and crops, the availability of nutrient-rich side-streams and the effect of BBFs on crop growth, quantification of P and N losses through experimentation and modeling, and last but not least, the environmental and socio-economic impact of BBFs.

LEX4BIO participants in NERM enjoyed a social dinner at a cool Brussels' cafe, enjoying cozy conversations, delicious local dishes and good craft beer.

Read the Press Release dedicated to the final conference **here**

More dissemination and visibility

LEX4BIO presented at SOFIE3 Conference, Belgium

The 3rd Summit of the Organic and Organo-mineral Fertilisers Industry SOFIE3 held in Brussels in January 2024 was a tremendous success.

Lex4bio Project was represented by its coordinator Kari Ylivainio who spoke about the agronomic efficiency of organic fertilizers in various growing conditions in Europe, based on the research results achieved within the project.

All attendees greatly appreciated the organization of this excellent event, bringing together the scientific community, industry and policy makers to compare notes in their important mission of shaping the future of a balanced and sustainable organic-based crop nutrition.

Back-to-back with SOFIE3, on January 18, the European Sustainable Phosphorus Platform (ESPP) organized a meeting on Defining “Bio-Based Fertilisers” and FPR “solely biological origin” which brought together the European Commission, industry and fertiliser associations, research projects and stakeholders into a discussion of:

- relevance of bio-based definitions for markets and policy making
- existing official bio-based vocabulary (CEN, ISO, ASTM, plastics sector, industry labels)
- what comparable methodologies could be applied to recycled nutrients in fertilisers and in other applications?
- possible coherence with the EU Fertilising Products Regulation terminology “of solely biological origin”
- proposed joint position and discussion of next steps, possible input to policy makers, to CEN

LEX4BIO Project at Agricultural Science Days 2024, Helsinki

Our colleagues from Natural Resources Institute Finland / Luonnonvarakeskus presented interesting results from the field trials conducted in LEX4BIO.

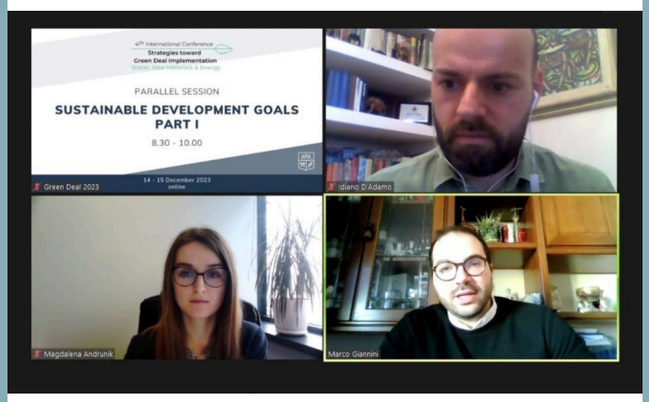
The Agricultural Science Days 2024 were held on January 10 -11, 2024. The program included the latest research results from various fields of the #AgriculturalSciences.
The event welcomed more than 600 participants - researchers, teachers, entrepreneurs and experts in administration, counseling and the business world.

More on the event

LEX4BIO Project at DeliSoil – EU Mission Soil project

LEX4BIO partners Lars Stoumann Jensen and Lærke Wester Larsen enjoyed the opportunity to present project's results at DeliSoil - EU Mission Soil Project first Living Lab workshop in Denmark. Lærke presented results on N fertiliser value and soil quality impacts of the range of bio-based fertilisers she had tested in LEX4BIO. It felt great to present and discuss LEX4BIO outcomes with Danish stakeholders from the organic waste recycling industry, farmers, advisors and authorities, and we hope our findings would prove useful to colleagues from the DeliSoil Living Lab.

LEX4BIO project results presented at the 4th International Conference “Strategies Toward Green Deal Implementation – Water, Raw Materials & Energy”



On December 14-15, 2023, LEX4BIO results were presented at the “4th International Conference “Strategies Toward Green Deal Implementation – Water, Raw Materials & Energy,” organised by the Mineral and Energy Economy Research Institute of the Polish Academy of Sciences. The conference was held virtually and gathered over 500 participants. The audience included students, PhD candidates, scientists and researchers from all over the world – Poland, Taiwan, India, Bangladesh, Georgia, Morocco, Spain, Italy, Lithuania, Greece, Egypt, Algeria, Thailand, and Pakistan, among others.

The aim of the conference was to address the issue of climate change and explore preventive measures, including innovative technological, environmental, economic and social solutions that align with the Green Deal Strategy.

LEX4BIO presentation, entitled “Analysing the drivers and barriers to bio-based fertiliser (BBFs) adoption in farming practices – Polish case study”, was produced by partners Magdalena Andrunik, Dominika Szołdrowska, Paulina Marcinek, and Marzena Smol, all members of the Mineral and Energy Economy Research Institute, Polish Academy of Sciences.

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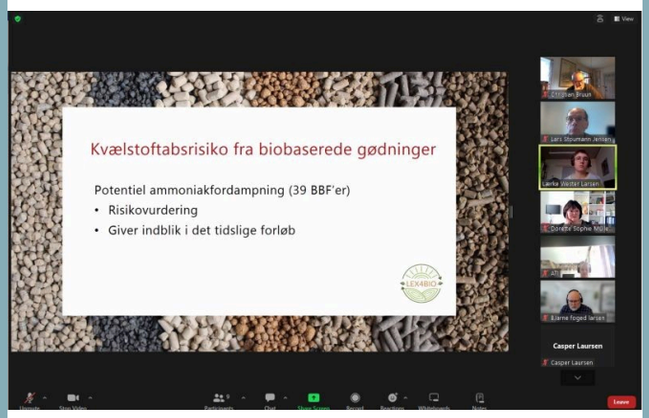
UCPH WEBINAR



LEX4BIO colleagues from the University of Copenhagen held a webinar for Danish stakeholders in the biobased fertiliser sector. The participants represented companies that supplied LEX4BIO Project with N-BBFs for five main field trial sites across Europe, for two growing seasons in accordance with a common protocol.

Everyone was interested to hear the results and conclusions from the team's work on assessing the agronomic efficiency of BBFs as N source for crops.

To learn more about the potential ammonia volatilisation from 39 different novel biobased fertilizers on the European market – A laboratory study using 5 European soils, follow the link.

LEX4BIO project presented at the Phosphates Conference 2024, Poland

LEX4BIO partner Marzena Smol, Professor and Head of the Division of Biogenic Raw Materials, Mineral and Energy Economy Research Institute of the Polish Academy of Sciences, participated at the Phosphates Conference 2024 in Warsaw, Poland, from 26 to 28 February 2024.

Her presentation focused on the results of LEX4BIO project regarding producers and farmers' attitudes to production and usage of bio-based fertilisers. She was also a speaker on the panel discussion "Towards sustainable fertilizers" during the second day of the event, which was facilitated by our friends from the European Sustainable Phosphorus Platform (ESPP).

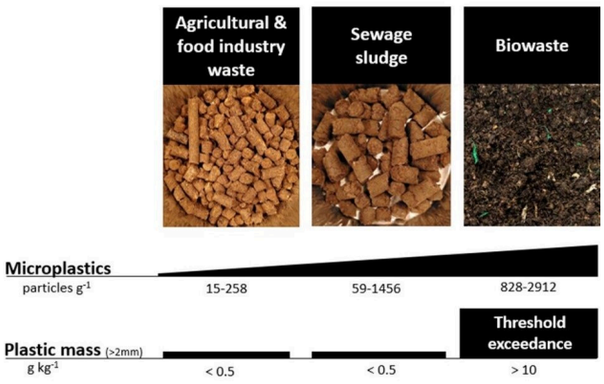
Continue reading

The final LEX4BIO poster was presented at NERM conference in a poster session with the rest of the participating sister RUR-08 projects.

Download the poster with the conclusions from the project **here**.

SCIENTIFIC PUBLICATIONS BY LEX4BIO

Exposure assessment of plastics, phthalate plasticizers and their transformation products in diverse bio-based fertilizers



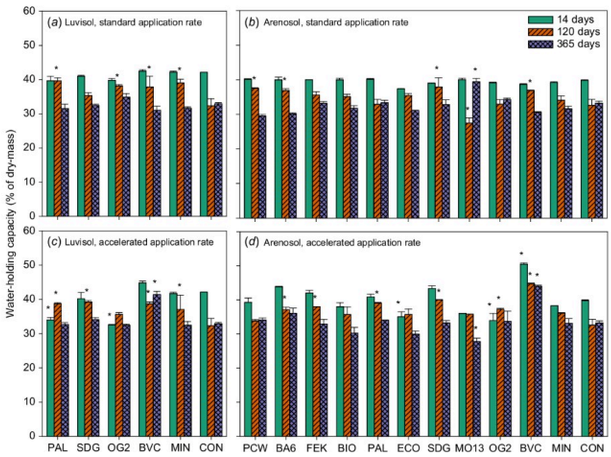
Authors: Nicolas Estoppey, Gabriela Castro, Gøril Aasen Slinde, Caroline Berge Hansen, Mari Engvig Løseth, Katinka Muri Krahn, Viona Demmer, Jørgen Svenni, Teresa-Van-Anh Thi Tran, Alexandros G. Asimakopoulos, Hans Peter H. Arp, Gerard Cornelissen

HIGHLIGHTS

- Fertilizers from biowaste, sewage sludge and agro/food industry waste were assessed.
- Packaging plastic concentrations in biowaste fertilizers exceeded the EU limit.
- Small amounts of non-packaging plastics were found in other fertilizers.
- Low concentrations of DEHP and phthalate metabolites were measured in all fertilizers.
- Phthalate metabolites bioaccumulated in earthworms.

Follow the link to read the full publication **https://doi.org/10.1016/j.scitotenv.2024.170501**

Effects of biobased fertilisers on soil physical, chemical and biological indicators – a one-year incubation study



Authors: Lærke Wester-Larsen, Lars Stoumann Jensen, Johannes Lund Jensen and Dorette Sophie Müller-Stöver

HIGHLIGHTS

- A laboratory study investigating the effects of novel biobased fertilisers on soil quality indicators.
- Overall, the application of biobased fertilisers improved soil quality.
- Compost improved soil quality most, followed by a plant-based fertiliser and a biogas digestate.
- The amount of total and easily degradable carbon added was only related to some positive effects.
- Some but not all effects of long-term field application of compost could be predicted in the laboratory.

Follow the link to read the full publication in Soil Research:
https://doi.org/10.1071/SR23213

There are many more publications that are in a process of review currently. If interested in reading them, make sure you follow LEX4BIO community on **ZENODO!**

LEX4BIO BLOG – an expert voice

Phosphorus – a finite and strategic resource for agricultural production and food security

by admin_lex4bio **/** Apr 5, 2024 **/** ***Blog***

In March 2024 we started a blog section on the project's website, to talk about key aspects of LEX4BIO work in a popular language so that we can reach a broader and more diverse audience and have a greater impact. Our consortium experts contributed articles, offering insights and expert knowledge on bio-based fertilisers, nutrient recycling and agronomic efficiency.

Enjoy reading them all **here**.

LEX4BIO VIDEO

What is a more compelling way to tell a story about P and N than a video?

For broadening the reach and enhanicng the understanding of LEX4BIO key outputs, we developed a professional animated video featuring in a visually appealing way the need for the research within LEX4BIO, the solutions it offers through its achieved results, impact in the context of circular economy and Green Deal as well as considerations for the way ahead. The video targets policy makers, industry stakeholder groups and general public and was launched in March 2024.

It was played during the final events of LEX4BIO, NERM and ManuResource, and is uploaded to the website for all minds curious about soil and agriculture to watch it

Networking as key to an amplified impact

Since the beginning of LEX4BIO project, networking activities have been undertaken to ensure cross-cooperation with relevant projects and clusters at EU scale.

ESNI round table discussions at ManuREsource 2024

The ESNI Community was represented at the ManuREsource Conference through four dynamic round table discussions. These sessions focused on the pivotal role of manure in driving the transition towards a circular economy and sustainable resource management.

The insightful discussions were facilitated by the four dedicated ESNI Working Groups:

1. Technologies for nutrient recycling coordinated by FERTIMANURE

2. Agronomic performance of fertilising products coordinated by LEX4BIO

3. Sustainability assessment coordinated by NOVAFERT

4. Policy coordinated first by NUTRI2CYCLE and currently led by RENU2CYCLE

Each session provided invaluable insights and strategies to accelerate the adoption of sustainable practices in nutrient management, contributing to the broader goal of fostering a circular economy.

Workshops on Nutrient Recycling Policy by ESPP

LEX4BIO joined the European Sustainable Phosphorus Platform (ESPP)'s Workshops on Nutrient Recycling Policy held on 13 and 14 March in Brussels and online.

Over the two days the event comprised two sessions. The first, dedicated to policy tools to support market pull for recycled nutrients which could achieve consensus across industry and users. LEX4BIO project partner Ludwig Hermann, Proman Management GmbH presented a summary of the discussions of the market-pull policies at the ManuREsource Conference that took place the following week.

The second session elaborated on a proposition for the UWWT Directive targets for P and N recovery. It seeked ambitious, feasible and consensus proposals for regulatory targets for phosphorus and nitrogen reuse-recycling from municipal wastewater.

LEX4BIO

With this, LEX4BIO story ends.

Thank you for being our **loyal readers** and **supporters**. We hope our paths cross again on the journey of making our **planet greener!**

LEX4BIO is online: From its outset, LEX4BIO project has been benefiting from a large on-line visibility. The website dedicated to the project was launched in November 2019 to provide publicly accessible information on project's goals and objectives, work activities progress and results. Over the entire duration of LEX4BIO, you will be able to download directly from our web platform, **all public deliverables and outcomes LEX4BIO accomplished**.

Follow us on social media. Visit our website.

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You are receiving this e-mail as you are part of the LEX4BIO community!

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