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Newsletter #5 - January 2023

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

Year 2022 has been an unprecedented time for Europe and especially devastating for Ukraine. War in Ukraine has affected all our lives and one of the consequences is the increased price of fertilizers. This has further increased interest towards bio-based fertilizers (BBFs) and results provided by the LEX4BIO projects has gained lots of interest. We have now started the last full year of the project and the main activities are now related to evaluating the data obtained from the field, greenhouse and laboratory trials. Results have shown that there exists great potential of BBFs for replacing mineral fertilizers and thus to reduce EU's dependency on imported mineral fertilizers.

Results will be disseminated through scientific articles and conferences. Relevant stakeholders at the EU and national level will be informed about the outcomes of the project. For more information about our activities, visit LEX4BIO's webpage ([www.lex4bio.eu](http://www.lex4bio.eu)) where you can find all the published scientific articles, conference presentations as well as accepted and submitted deliverables. By following us on social media, you will stay up to date with our on-going activities.

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## National Dissemination Forums



### LEX4BIO National Dissemination Forum, Finland

Second NDF-meeting in Finland was arranged in Jokioinen on 17th of August 2022. All those stakeholders that participated the first meeting were invited to join the second meeting as well. Although not that many participants joined as compared to first meeting, Ministry of Agriculture and Forestry (MMM), agriculture advisory services (ProAgria), farmers union (MTK), fertilisers industry (YARA, Biolan), Finnish Food Authorities and biggest provider of municipal water supply and waste manager in Finland (HSY) joined the meeting. During the meeting activities and preliminary results of WPs 1, 2, 3, 4 and 5 were presented and field visit to phosphorus (WP3) and nitrogen (WP4) field sites were conducted.

[Continue reading.](#)



## LEX4BIO National Dissemination Forum in Denmark

The 3rd *LEX4BIO* NDF in Denmark was set up and coordinated by the University of Copenhagen (UCPH) on July 7, 2022.

The EIP concept of local Operational Groups (OG) is not adopted in Denmark due to a political decision at the national level. Therefore the *LEX4BIO* national dissemination forum (NDF) in Denmark was organised differently, that is, in collaboration with the agricultural organisation SEGES (the Danish National Agricultural Advisory and R&D center). SEGES' national chief consultant in fertilisation, Torkild Birkmose, has in recent years organised a cross-sectoral *Fertilisers Network* for professionals with particular interest and responsibilities in fertilisers, fertilisation strategies and related technologies.

Read more about the event [here](#)

## LEX4BIO AT NATIONAL DISSEMINATION FORUM, SWITZERLAND

On November 16, Dr. Else K. Bünemann-König, Head of the Department of Soil Sciences at the Research Institute of Organic Agriculture (FiBL), Switzerland and work package leader in *LEX4BIO* made a presentation at the Autumn Conference on Soil, Fertilizers and Environment in Olten, Switzerland entitled "Availability of nitrogen and phosphorus in commercial and recycled fertilizers – results from the EU project *LEX4BIO*: EU fertilizer regulation with product function categories and component material categories; Efficiency of bio-based fertilizers and impact on soil quality".

[Continue reading](#)

## Presenting LEX4BIO to the Scientific Community

### Process factors affecting the contamination of struvite by selected antibiotics - *LEX4BIO* poster presentation at German Soil Science Society Annual Conference, Trier, 5 – 8 September

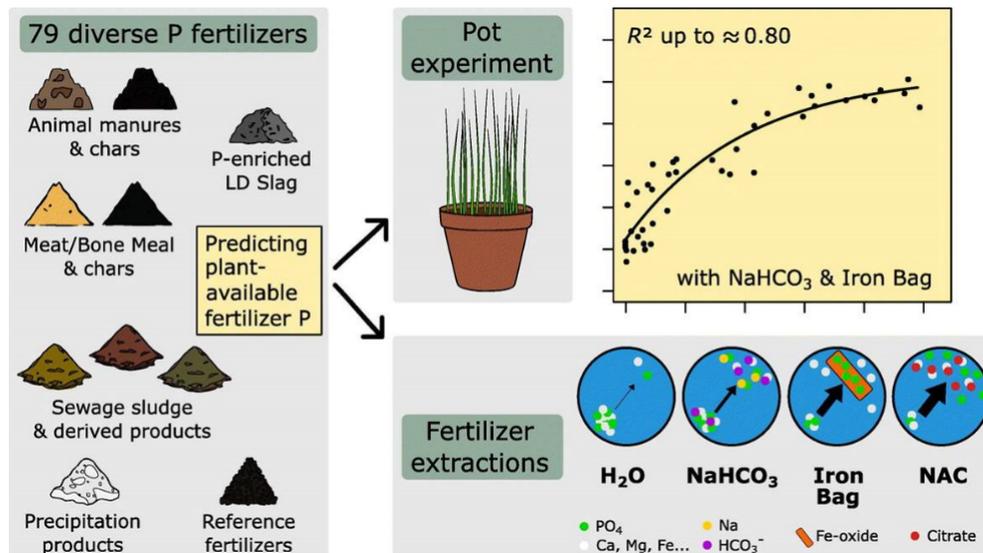
Dr. Elke Bloem of the Julius Kühn-Institut (JKI), the German Federal Research Centre for Cultivated Plants attended the German Soil Science Society's Annual Conference, held in Trier earlier this month. As leader of *LEX4BIO* WP1, she presented results of the research work performed within the work package with the poster "Process factors affecting the contamination of struvite by selected antibiotics". To assess struvite as a promising fertilizer, the team examines phosphorous (P)-recovery from wastewater and sludge using four different technical procedures for the precipitation of struvite.

Download the poster [here](#).

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## SCIENTIFIC PUBLICATIONS BY LEX4BIO

### Improving the prediction of fertilizer phosphorus availability to plants with simple, but non-standardized extraction techniques



In the framework of the [circular economy](#), new P [fertilizers](#) produced from diverse secondary raw materials are being developed using various technologies. Standard extraction methods (neutral ammonium citrate (NAC) and  $\text{H}_2\text{O}$ ) provide limited information about the agronomic efficiency of these often heterogenous new products.

Continue [reading](#)

## Potential ammonia volatilization from 39 different novel biobased fertilizers on the European market – A laboratory study using 5 European soils



A scientific paper by Lærke Wester Larsen, Dorette Sophie Müller-Stöver, Tapio Salo and Lars Stoumann Jensen about the risk of ammonia (NH<sub>3</sub>) volatilization from 39 biobased fertilizers (BBFs) was just published in the Journal of Environmental Management of Science Direct.

The key findings of the authors are that the potential NH<sub>3</sub> volatilization varies substantially among BBFs. The highest NH<sub>3</sub> volatilization potential was found from digestates and the lowest NH<sub>3</sub> volatilization potential from composts and struvites. The NH<sub>3</sub> volatilization potential from BBFs could effectively be reduced by incorporating the BBFs into soil, and the soil type had a great impact on the potential NH<sub>3</sub> volatilization from the BBFs.

[Follow the link to download the paper](#)

## More of LEX4BIO scientific publications featured below:

### Remediating Agricultural Legacy Nutrient Loads in the Baltic Sea Region

The Baltic Sea is considered the marine water body most severely affected by eutrophication within Europe. Due to its limited water exchange nutrients have a particularly long residence time in the sea. While several studies have analysed the costs of reducing current nutrient emissions, the costs for remediating legacy nutrient loads of past emissions remain unknown.

[Continue reading](#)

### Phosphorus recovery and recycling – closing the loop

There is a clear and pressing need to better manage our planet's resources. Phosphorus is a crucial element for life, but the natural phosphorus cycle has been perturbed to such an extent that humanity faces two dovetailing problems: the dwindling supply of phosphate rock as a resource, and the overabundance of phosphate in water systems leading to eutrophication.

[Continue reading](#)

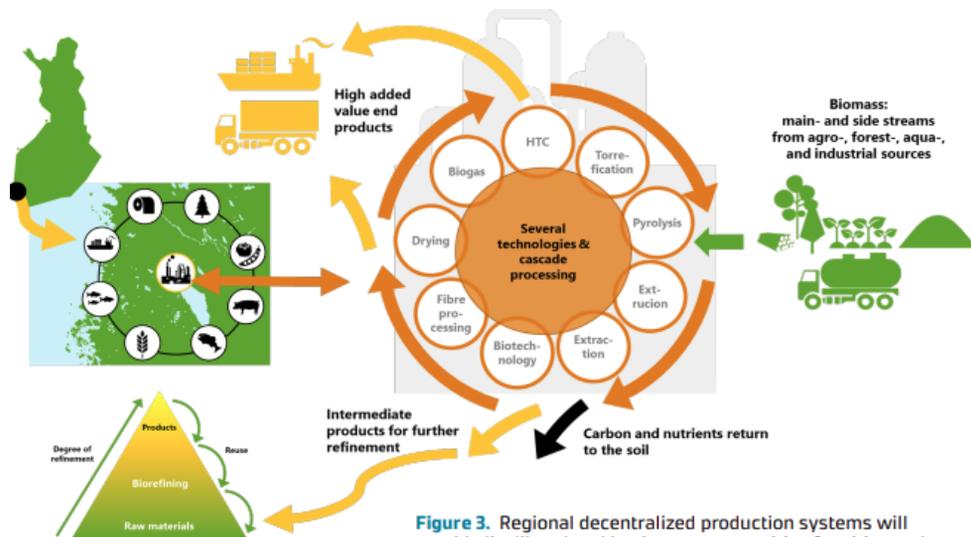
### Predicting relative agronomic efficiency of phosphorus-rich organic residues

Relative agronomic efficiency (RAE) of phosphorus (P) in nutrient-rich residues with different chemical characteristics must be known in order to optimize their use as [fertilizers](#), to avoid underfertilization of crops or [eutrophication](#) of surface waters due to [overfertilization](#).

[Continue reading](#)

## POSITION PAPER

### Circular bioeconomy: tools for resilient primary production and security of supply with added value



**Figure 3.** Regional decentralized production systems will provide livelihood and business opportunities for cities and rural communities. Comprehensive use of biomass can be achieved by cascade processing concepts.

The COVID-pandemic and the recent changes in the global geopolitics have drastically increased the importance of security of supply to ensure the functionality of our societies in Europe. Improving the security of supply, especially in terms of rawmaterials and inputs for energy and food, needs both immediate actions and longer-term planning.

Read the [paper](#)

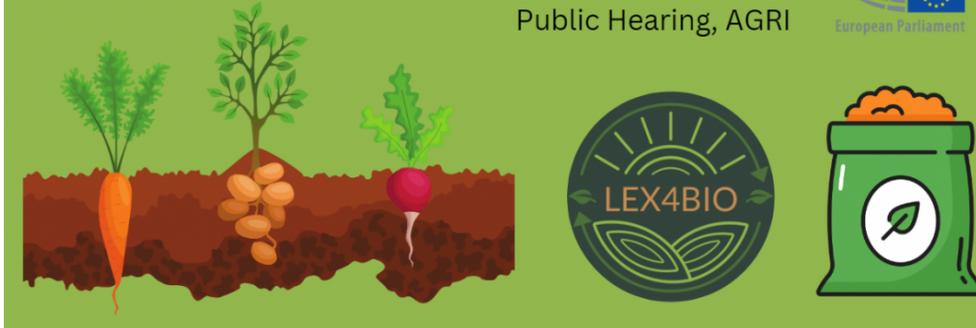
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## PUBLIC HEARING, DG-AGRI

LEX4BIO partner Lars Jensen, UCPH invited by AGRI as expert speaker at European Parliament's public hearing on fertilizers and circularity in agriculture

# REDUCING THE IMPACT OF FERTILIZERS FROM PRODUCTION TO END USE - IMPROVING THE CIRCULAR ECONOMY IN AGRICULTURE

Public Hearing, AGRI



A recognized expert in soil fertility and organic waste recycling, and partner and work package leader in LEX4BIO and Nutri2Cycle EU H2020 projects, Lars Jensen, UCPH was invited by the Committee on Agriculture and Rural Development of the European Parliament to speak at the public hearing on "Reducing impacts of fertilisers from production to end-use – increasing circularity in agriculture", held on 29 November 2022.

[Read more](#)

## Interested to learn more?

**More to check out:**

[Report of the Selenium Working Group 2022](#)

[Report on the legal framework governing the use of nutrient-rich side streams \(NRSS\) as biobased fertilisers \(BBFs\) – EU legislation](#)

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## Networking as key to maximising LEX4BIO impacts

Since the beginning of the LEX4BIO project, networking activities have been undertaken to ensure cross-cooperation with relevant projects and clusters at EU scale. We are glad to have had the chance to participate in December 2022 in a second cross-seminar with FERTIMANURE, discussing the bio-based fertilizers of the future. Another initiative LEX4BIO joined as a sub-group leader was the Nutrient Recycling Community established by Biorefine Cluster Europe and Fertiamnure project.

**Cross-H2020-seminar LEX4BIO & FERTIMANURE 2022 « Bio-based fertilizers of the Future »**



## CROSS-H2020-SEMINAR LEX4BIO & FERTIMANURE

### “Bio-based fertilisers of the Future”



FERTIMANURE



**Marzena Smol**

Head of Division of Biogenic Raw Materials, Mineral and Energy Economy Research Institute, Polish Academy of Sciences, Poland



**Kari Ylivainio**

Natural Resources Institute Finland (Luke)



**Laia Llenas Argelaguet**

BETA Technological Center



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Norwegian Geotechnical Institute Norway

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3<sup>rd</sup> International Conference

Strategies toward  
Green Deal Implementation  
Water, Raw Materials & Energy



A second cross-seminar of H2020 projects LEX4BIO and FERTIMANURE was conducted as special parallel session during the 3<sup>rd</sup> International Conference “Strategies toward Green Deal Implementation: Water, Raw Materials and Energy” organized by the Mineral and Energy Economy Research Institute of the Polish Academy of Sciences.

The seminar entitled “Bio-based Fertilizers of the Future” took place online on 7 December 2022, and enjoyed a great interest.

During the seminar, the speakers presented the scope and results of the **Lex4Bio** project: Optimizing bio-based fertilizers in agriculture – Providing a knowledge basis for new policies and **Fertimanure** – a project dedicated to the innovative nutrient recovery from secondary sources for the high-added-value fertilizers from animal manure.



## LEX4BIO in Nutrient Recycling Community

In September LEX4BIO, along with Biorefine Cluster and Fertimanure project organized the first webinar of the sub-group it leads within the community - Agronomic performance of fertilising products. 12 projects dealing with BBFs had confirmed participation and provided short presentations, followed by discussion.

### Who is the Nutrient Recycling Community and what do they do?

A joint initiative launched by Biorefine Cluster Europe and Fertimanure-project aiming to foster collaboration with relevant initiatives and projects in Europe related to nutrient recycling and serve as a platform to exchange knowledge and good practices:

- Clustering of Projects working on nutrient recycling.
- Identification of common challenges and needs in the field of nutrient recycling.
- Knowledge sharing and exchange to move towards common methodologies and approaches.
- Promote joint experiments and joint publications.
- Promote the preparation of new projects.
- Staff exchange through secondments or others.

Learn more [here](#).

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**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.**



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