

## 4th European Sustainable Phosphorus Conference (ESPC4)

with Nutrient Recovery Technology Fair  
and 5th European Phosphorus Research Meeting (PERM5)  
20 – 22 June 2022, Vienna Austria - and online (hybrid)

Andaz Vienna Am Belvedere (Hyatt), Arsenalstrasse 10, Vienna, Austria.

v05/05/2022 Programme updates and registration <https://phosphorusplatform.eu/esp4>



### ESPC4 – Day 1 - Monday 20<sup>th</sup> June 2022

#### 9h00 – 10h15 – Plenary - Opening and keynotes – Climate, nutrients and eutrophication

- P Conference opening by  
*Jürgen Czernohorszky, Councillor for Climate and Environment, Vienna City Council*  
*Ludwig Hermann, ESPP President*
- P Climate, energy, agriculture: What has to be done about phosphorus and nutrients?  
*Franz Josef Radermacher, Research Institute for Applied Knowledge Processing (FAWn), Germany*
- P Interactions between climate change, phosphorus losses and eutrophication:  
*Wenfeng Liu, China Agricultural University.*

10h15 – 11h00 – break – posters – stands - Tech Fair - networking

#### 11h00 – 12h45– Plenary – EU, regional, national and city phosphorus policies

- P What the Green Deal means for EU policies on nutrients  
*Virginijus Sinkevičius European Commissioner for Environment*
- P Perspectives for nutrient policy and action for the Baltic, *Lotta Ruokanen, HELCOM*
- P Implementation of Switzerland's 2016 P-recycling regulation: *Sibylla Hardmeier, Swiss Federal Office for the Environment (BAFU)*
- P Implementation of Germany's 2017 P-recycling regulation:  
*Andrea Roskosch, German Federal Environment Agency (UBA)*
- P Towards national phosphorus recycling policy in Austria: *Arabel Amann, Wien Energie*
- P Phosphorus recycling from sewage sludge - Strategy of the Canton of Zurich", *Leo Morf, AWEL Canton Zürich*

- P Vision for implementation of the German P-recovery obligation by a regional water operator:  
*Uli Paetzel, Emschergenossenschaft and Lippeverband*
- P Case study: Vienna City, *Florian Huber, Vienna City and Arabel Amann, Wien Energie*

12h45 – 14h15 – lunch - posters – stands - Tech Fair - networking

### 14h15 – 15h45 – Parallel sessions

*List of speakers for parallel session below*

- ← **Nutrient recovery operating experience technology showcase**  
(companies in ESPP-DPP-NNP Nutrient Recovery [Technology Catalogue](#))  
*Moderator/rapporteur: Karyn Georges, Isle Utilities & Bertrand Vallet, EurEau*
- ← **Phosphorus recovery from ashes**  
*Moderator/rapporteur: Paulo Pavinato, University of São Paulo & TBD*
- ← **Biochars and hydrothermal carbonisation**  
*Moderator/rapporteur: Céline Vaneekhaute, Université Laval, Québec, Canada & TBD*

15h45 -16h30 - break– posters – stands - Tech Fair – networking

### 16h30 – 17h45 – Business perspectives for nutrient sustainability

- P Reports from parallel sessions, questions and discussion  
Business vision statements from nutrient sustainability leading companies  
*Jean-Christophe Ades, Kemira*  
*Matt Kuzma, Ostara*  
*Wim Moerman, NuReSy*  
*José María Gómez Palacios, Biomasa Peninsular*  
*Henk Aarts, N2 Applied*  
*Hubert Halleux, Prayon*  
*Matthias Staub, Veolia*  
*Christian Guillaume, Sulzer Pumps*  
*Leoni Boller, Ductor*  
*Hanane Murchid, OCP*  
*Andreas Orth, MO Group*  
*Anne Marie Henihan, Ireland Dairy Processing Technology Centre*
- P The fertilisers industry, phosphorus sustainability and the Green Deal  
*Jacob Hansen, Fertilizers Europe*
- P Market perspectives for phosphate fertilisers and other uses of phosphorus, and place of recycling:  
*Alberto Persona, Principal Analyst Fertecon/HIS*

### 19h00 Evening networking event:

#### **Vienna City Town Hall festivities hall (Rathaus Festsaal)**

30'' by metro, 50'' by foot from Andaz hotel.

19h00 Pre-dinner drinks. 20h00 Conference dinner,  
Viennese music interlude.

22h00 Big John Whitfield & The Vienna Soul Society



## **ESPC4 – Day 2 - Tuesday 21<sup>st</sup> June 2022**

### 9h00 – 10h30 – Plenary - EU Policies

- P Implementation of the nutrient loss reduction target set by the Green Deal Farm-to-Fork and Biodiversity Strategies: European Commission, DG Agriculture (tbc)
- P Phosphorus and Organic Farming productivity, Green Deal targets for Organic Farming and perspectives for recycled nutrients

- P Business vision statements from nutrient sustainability leading companies
- P Update on EU water policies, **Michel Sponar, Deputy Head of Unit, Marine Water and Water Industry, European Commission DG Environment**
- P Industry innovation in phosphorus chemistry and sustainability perspectives: **Clariant**
- P Towards an integrated EU approach, the proposed INMAP (EU Integrated Nutrient Management Action Plan). **European Commission DG Environment**

10h30 – 11h15 – break – posters – stands - Tech Fair - networking

### 11h15 – 12h45 – Parallel sessions

*List of speakers for parallel session below*

- ← **New fertilisers for nutrient sustainability**  
*Moderator/rapporteur: Alzbeta Klein, International Fertilizer Association & Hans Ingels, Head of Unit Bioeconomy – Chemicals – Cosmetics, European Commission DG GROW*
- ← **Emerging nutrient recovery technologies**  
*Moderator/rapporteur: Erik Meers, University of Gent and Biorefine Cluster Europe & Ana Soares, Cranfield University, UK*
- ← **Policies and regional actions for phosphorus sustainability**  
*Moderator/rapporteur: Lukas Egle, European Commission JRC (Joint Research Centre) & Geneviève Metson, Linköping University, Sweden*

12h45 – 14h15 – lunch - posters – stands - Tech Fair - networking

### 14h15 – 15h30 – Plenary – Visions and Actions

- P Reports from parallel sessions, questions and discussion
  - P Vision statements from ESPC4 sponsors  
**Pär Larshans, Chief Sustainability Officer, Ragn-Sells Group / EasyMining**  
**Wolfgang Hofmair, Borealis Group**
- Experience and future objectives of the nutrient platforms in Europe and worldwide
- **Chris Thornton, European Sustainable Phosphorus Platform (ESPP)**
  - **Matt Scholz, Arizona State University US Sustainable Phosphorus Alliance**
  - **Jacob Jones, North Carolina State University, for STEPS (US National Science Foundation's new Convergence Research Center for Phosphorus Sustainability)**
  - **Eiji Yamasue, Ritsumeikan University, Japan Phosphorus Industry Development Organisation (PIDO)**
  - **Tabea Knickel, German Phosphorus Platform (DPP)**
  - **Nathalie Tijdink, Netherlands Nutrient Platform**

15h30 – 16h15 – break – posters – stands – Tech Fair - networking

### 16h00 – 17h00 – Plenary – Perspectives and Conclusions

- Perspectives for global nutrient management and 'Our Phosphorus Future'  
**Mahesh Pradhan, United Nations Environment.**
- Horizon Europe Mission "Soil Health and Food"
- Panel discussion on perspectives for phosphorus sustainability policies

17h00 – ESPC4 Conference Closure

### Tuesday evening social event:

TBC 19h00 – 22h00 The Third Woman – An immersive city adventure in Vienna's underground sewer system inspired by the classic movie "The Third Man", 21.06.2022, 19:00, only for registered attendees.

## **Wednesday 22<sup>nd</sup> June 2022**

- P **Optional excursion:** Vienna municipal sewage treatment works, sewage sludge incinerator, urban vegetable farmers using waste heat from sludge incinerator. Max. 80 participants. **Same time as PERM5 morning sessions – you can attend either the sewage works excursion or PERM5 morning sessions.** Free.

- P** 5<sup>th</sup> Phosphorus in Europe Research Meeting (PERM5): 9h00 – 16h30, Andaz Vienna Am Belvedere (Hyatt). Programme <https://phosphorusplatform.eu/espc4> NOTE: additional registration fee required.
- P** Young scientists and R&D networks event: 17h – 18h30 and Wednesday evening social.

## ***Selected speakers for ESPC4 parallel sessions June 2022***

### **Day 1: Monday, June 20<sup>th</sup> 2022, 14:15 – 15:45 CEST**

#### **Parallel Session #1:**

#### **Nutrient recovery operating experience technology showcase**

*Limited to technologies presented in the ESPP-DPP-NNP Nutrient Recovery Technology Catalogue  
Confirmed to date*

**Marc Sonveaux, Prayon, Belgium**

**Leon Korving, Vivimag – WETSUS, The Netherlands & Bengt Hansen, Kemira – Sweden**

**Christian Kabbe, EasyMining (Ragn-Sells) – N, P, and K recovery technologies**

**ICL Fertilisers**

**Henk Aarts, N2 Applied:** Plasma treatment of slurry and digestate, sustainable fertiliser from air and electricity

**Arttu Laasonen, ENDEV nutrient recycling technologies**

#### **Parallel Session #2: P-recovery from ashes**

**Werner Preisig, ERZO, Switzerland & Anders Nattorp, University of Applied Sciences and Arts Northwestern Switzerland School of Life Sciences Institute for Ecopreneurship (FHNW):** Close the P-cycle: A solution in cooperation with cement industry

**Beatrice Decker, MFPA Weimar, Germany:** Resin-in-Pulp technology, an adapted holistic approach for nutrient and P-recycling from sewage sludge ashes (Abonocare)

**Florian Benedikt, Technische Universität Wien, Austria:** P-recycling from sewage sludge with fluidized bed incineration applying in-situ heavy metal removal

**Theresa Sichler, BAM, Germany:** European sewage sludge ash monitoring

**Lasse Fabian Köhl, Fraunhofer IKTS, Germany:** Decentralised phosphorus recycling from sewage sludge using dust firing and in-situ heavy metal separation (DreiSATS)

**Laura Fiameni, University of Brescia and INSTM, Italy:** Heavy metal stabilization in sewage sludge ash with poultry litter ash to enhance phosphorus recovery

#### **Parallel Session #3: Biochars and hydrothermal carbonisation**

**Marc Buttman, TerraNova Energy, Germany:** TerraNova@ultra - hydrochar from sludge, P-recovery and carbon sequestration

**Helmut Gerber, Pyreg, Germany:** Biochar from biosolids: the climate-positive alternative to conventional phosphorus fertilizer

**Lisa Röver, Deutsches Biomasseforschungszentrum gGmbH, Germany:** P-recycling via hydrothermal carbonization and the use of complexing agents and acids (Abonocare)

**Raquel Zambrano Varela, TreaTech, Switzerland:** Phosphorus recovery from hydrothermally treated sewage sludge. Closing the P cycle.

**Clara Kopp, University of Copenhagen, Denmark:** Activation of P-rich biochars and ashes to increase plant P availability

## **Day 2: Tuesday, June 21<sup>st</sup> 2022, 11:15 – 12:45 CEST**

### **Parallel Session #4: Emerging nutrient recovery technologies**

**Pim De Jager, Aquacare, Netherlands:** BioPhree: next generation solution to remove and re-use phosphate in surface & effluent waters to ppb-level.

**Adriana Romero Lestido, Cetaqua, Spain:** Turning wastewater treatment plants into biorefineries: global value chain from bioresources to valuable products (LIFE Enrich)

**Anders Øfsti, Hias How2O AS, Norway:** Sustainable Phosphorus Removal with the Hias Process

**Rubén Rodríguez-Alegre, LEITAT Technological Center & Universitat Politècnica de Catalunya, Spain:** Innovative integration of membrane technologies for nutrient recovery from high organic load streams (FERTIMANURE)

**Sabolc Pap, University of the Highlands and Islands, UK:** New technology to recover phosphorus from wastewater within the Circular Economy: a Scottish case study (Phos4You)

**Lidia Paredes, BETA Technological Centre (UVIC-UCC), Spain:** Recovering nutrients from aquaculture industry by-products for the production of bio-based fertilizers (Sea2Land)

**Sergio Lloret Salinas, EGEVESA, Spain:** New urban wastewater treatment based on natural coagulants to avoid phosphorus pollution (LIFE Newest)

### **Parallel Session #5: Policies and regions for phosphorus sustainability**

**Katharine Heyl, Research Unit Sustainability and Climate Policy, University of Rostock, Germany:** Sustainable phosphorus management under the future Common Agricultural Policy?

**Francesco Avolio, HERA Spa, Italy:** Feasibility and sustainability assessment of struvite recovery solutions in Bologna, WWTP Italy

**Lisa Harseim, Albert-LudwigsUniversity of Freiburg, Germany:** Cities revisited: Out-of-the-box governance of phosphorus flows in food

**Fabian Kraus, Kompetenzzentrum Wasser Berlin, Germany:** Mandatory P-recovery from sewage sludge (ash) in Germany – a multiple-goal conflict?

**Esa Salminen, AFRY, Finland,** Nutrient balance and handprint of the Finnish forest industry

**Anna Muntwyler, European Commission JRC Ispra:** Modelling phosphorus dynamics in European agricultural soils and assessing phosphorus policy goals

**Sophia Schüller, FiW e.V. at RWTH Aachen University, Germany:** The funding measure RePhoR - Regional Phosphorus Recycling

### **Parallel Session #6: New fertilisers for nutrient sustainability**

**Else Bünemann, FiBL, Switzerland:** Bio-based fertilizers as efficient alternative phosphorus sources for closing nutrient cycles (Lex4Bio)

**Farida Dechmi, Agrifood Research and Technology Centre of Aragon, Spain:** Assessing phosphorus soil status and fertilisers management in the Ebro river intensive irrigated area (Spain)

**Alicia Hernandez Mora, University of Natural Resources and Life Sciences Vienna (BOKU), Austria:** Developing fertilizer compliance test methods for recycled P fertilizer products (Lex4Bio)

**Julia Santolin, University of Antwerp, Belgium:** Comparative consequential LCA: microbial fertilizers grown on potato wastewater, common organic fertilizers: and mineral fertilizers

**Berta Singla, BETA Technological Centre (UCC-UVIC), Spain:** Nutrient recovery from pig slurry – Production and agronomic quality assessment of added value bio-based fertilisers (Fertimanure)

**Pauline Welikhe, Phospholutions Inc. / State College PA, USA:** Corn Phosphorus Uptake and Yield Response to Reduced Phosphorus Rates Applied in Combination with RhizoSorb®

**Kari Ylivainio, Natural Resources Institute Finland (Luke):** Phosphorus losses from different soil types caused by bio-based fertilisers (Lex4Bio)

VIENNA  
22 June  
2022



Phosphorus  
in Europe  
Research  
Meeting

9h00 – 16h30 CEST | Hybrid

Wednesday June 22<sup>nd</sup>, 2022

9h00 – 10h30 : Phosphorus recycling research & technology update

Housekeeping and meeting networking tools  
*Lapo Braconi, ETA Florence Renewable Energies*

Welcome. Outcomes of PERMs 1-4. Meeting objectives and outputs  
*Ludwig Hermann, President, ESPP*

Introducing the Nutrient Recycling Community: a platform to exchange knowledge  
and good practices between research projects dealing with nutrient recycling in EU.  
*Ana Robles Aguilar, Ghent University*

Greenhouse gas emissions from digestate composting  
*Bente Foereid, NIBIO, Norway*

Contributing to sustainable rural development and transition to a circular bioeconomy  
with a special focus on nutrient sustainability  
*Laila Llenas Argelaguet, BETA Technological Center (UVIC-UCC), Spain*

Questions and discussion I

Phosphorus recovery technologies  
*Erik Meers, Ghent University and Biorefine Cluster Europe*

LIFE projects: from R&D to pilot testing and implementation  
*Federico de Filippi, CINEA*

Questions and discussion II

Vision Statements from ESPP R&D Members:  
*Simone Maccaferri, Alma Mater Studiorum – Università di Bologna, Italy*

## 10h45 – 12h15 : Parallel breakout sessions I

### ➤ **New and recycled phosphorus fertilisers**

*Moderator: Leonardus Vergutz, Mohammed VI Polytechnic University, Morocco*

*Rapporteur: Bernard Wern, IZES, Germany*

*Assessment of P availability and efficiency of recycled P fertilizers - Recommendations for pot trial standardisation*

*Aleksandra Bogdan, Ghent University, Belgium*

*Efficacy of Actinobacteria-based biofertilizer to improve cereal plant growth under phosphate/potassium rocks fertilization*

*Kenza Boubekri, Mohammed VI Polytechnic University, Morocco*

*Microbial phosphate solubilization: A potential alternative for increasing soil phosphorus sustainability*

*Wissal Elhassoufi, Mohammed VI Polytechnic University, Morocco*

*Assessment and comparative analysis of willingness-to-pay for bio-based fertilisers in the European Union*

*Egor Moshkin, Ghent University, Belgium*

*Reduced nitrous oxide emissions in a pot trial with novel organic NP(K)-char fertilizers*

*Carolyn-Monika Görres, Hochschule Geisenheim University, Germany*

*Phenotypic and genotypic screening of potato cultivars for phosphorus efficiency*

*Mousumi Hazarika, University Rostock, Germany*

### ➤ **Iron – phosphorus interactions in phosphorus recycling (coordinated by WETSUS)**

*Moderator: Leon Korving, Wetsus, Netherlands*

*Rapporteur: Bengt Hansen, Kemira, Finland*

*Biological and chemical drivers over P availability from different P forms: an incubation experiment*

*Ángel Velasco Sánchez, UniLaSalle Rouen, France*

*Insight into direct phosphorus release from simulated wastewater ferric sludge: influence of physiochemical factors*

*Aseel Al Nimer, Wilfrid Laurier University, Canada*

*The impact of P on Fe(II) catalyzed ferrihydrite transformation under oscillating redox condition*

*Xingyu Liu, University of Bayreuth, Germany*

*Potential of recycled vivianite as P and Fe fertilizer – from a mechanistic point of view*

*Rouven Metz, University of Vienna, Austria*

*Research on Fe-P interactions at Wetsus for P recovery*

*Thomas Prot, TU Delft, Netherlands*

*How phosphorus removal technologies in WWTP can impact the phosphorus recovery from sludge?*

*Marie-Line Daumer, INRAE, France*

*Summary of P-Trap results: concepts to reduce diffuse P input to surface waters*

*Sylvia Walter, Utrecht University, Netherlands*

### ➤ **Nutrient recovery from dairy industry processing wastewaters (coordinated by REFLOW)**

*Moderator: Jan-Philip Uhlemann, Wageningen University and Research, Netherlands*

*Rapporteur: Ipan Hidayat, BETA Technological Centre (UCC-UVIC), Spain*

*Multiple resource recovery from dairy processing waste. A circular economy approach for downstream valorization*

*Pablo Martin Binder, BETA Technological Centre (UCC-UVIC), Spain*

*Hydrothermal carbonization of surplus sludge from effluent treatment in various milk processing factories*

*Marzena Kwapińska, University of Limerick, Ireland*

*Safe Use of Dairy Processing Sludge and STRUBIAS Food System Fertilising Products in Agriculture*

*Wenxuan Shi, Teagasc, Ireland*

*Effects of dairy-processing-sludge (DPS) and derived hydrochar on greenhouse gas (GHG) emissions from maize field*

*Yihuai Hu, Aarhus University, Denmark*

*Hydrochar – a cheap efficient P-biofertilizer with low climate footprint*

*Sven Gjedde Sommer, Aarhus University, Denmark*

*LCA of multiple scenarios for dairy wastewater treatment and P-recovery processes*

*Marta Behjat, Chalmers University of Technology, Sweden*

## 12h15 – 13h30: Lunch Break

## 13h30 – 15h00 : Parallel breakout sessions II

### ➤ Phosphorus interactions in soils

*Moderator: Victoria Barcala, Deltares, Netherlands*

*Rapporteur: Jakob Santner, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria*

[Simulating long-term phosphorus, nitrogen, and carbon dynamics to advance nutrient assessment in dryland cropping](#)

*Bianca Das, University of Queensland, Australia*

[Soil phosphorus mining in agriculture – Impacts on P availability, crop yields and soil organic carbon stocks](#)

*Stefaan De Neve, Ghent University, Belgium*

[DOC Addition Increases Phosphate Adsorption in Mediterranean Soils](#)

*Yaniv Freiberg, Volcani Center, Israel*

[Soil phosphorus turnover in soils under long term P management](#)

*Olha Khomenko, Teagasc / University of Limerick, Ireland*

[Changes of phosphorus forms in soil as a function of different fertilizing strategies](#)

*Martin Kulhanek, Czech University of Life Sciences Prague, Czech Republic*

[The Effect of soil pH on phosphate solubility in soils](#)

*Klara Mrak, BOKU Vienna, Austria*

### ➤ Regional policies for nutrient stewardship

*Moderator: Robin Harder, Swedish University of Agricultural Sciences, Sweden*

*Rapporteur: Kimon Van Dijk, Wageningen Environmental Research, Netherlands*

[A material flow model for the implementation of phosphorus recovery in a model region](#)

*Hiep Le, RWTH Aachen, Germany*

[Nutrient Content of Manures and Potential for Valorisation: Case Study of Monaghan and Tipperary, Ireland](#)

*Rosanna Kleeman, University College Dublin, Ireland*

[Impact and opportunities for the urban water cycle of the 'fully circular in 2050' target of the Netherlands - Circular Water 2050](#)

*Kees Roest, KWR Water Research Institute, Netherlands*

[Closing the loop of Phosphorus cycle in the Visegrad Group \(V4\) countries](#)

*Marzena Smol, Polish Academy of Sciences, Poland*

[Sustainable agriculture as a vehicle of corporate reputation: sustainability within the value chain of food and agricultural production as a core element of business strategy](#)

*Michael Stopford, Ca' Foscari University Venice, Italy*

[Mapping the availability of nutrient-rich side-streams – mission impossible?](#)

*Elina Tampio, Natural Resources Institute Finland (Luke), Finland*

[Technical and Economical Appraisal of Regional Concepts for Sewage Sludge Utilization and Phosphorus Recovery](#)

*Harald Weigand, THM Uni Giessen, Germany*

### ➤ New technologies for nutrient recovery

*Moderator: Matthias Zessner, TU-Wien, Austria*

*Rapporteur: Francesco Fatone, Università Politecnica delle Marche, Italy*

[Vacuum degasification/acidic-neutral absorption for nitrogen recovery from agricultural digestate](#)

*Johannes Koslowski, KWB, Germany*

[Technical comparison of phosphorus recovery technologies from wastewater](#)

*Hanna Kyllonen, VTT, Finland*

[A novel process for an efficient phosphorus utilization from cereal by-products in feed industry](#)

*Natalie Mayer, Hamburg University of Technology, Germany*

[Flashphos - Thermal behaviour of sewage sludge aiming at white phosphorus recovery](#)

*Sander Arnout, InsPyro, Belgium*

[Yellow phosphorus production from secondary phosphorus resources by carbothermic reduction](#)

*Huafang Yu, Tohoku University, Japan*

[Acid-induced phosphorus release from hydrothermally carbonized sewage sludge](#)

*Carla Perez, Umeå University, Sweden*

[NPHarvest – Calcium based P recovery process as a pre-treatment for N recovery](#)

*Raed Al-Juboori, Aalto University, Finland*



## **15h00 – 16h30 : Perspectives for research and market uptake**

Nutrient R&D objectives under Horizon Europe.

*Katja Klasinc, European Commission DG RTD.*

INTERREG R&D initiatives on nutrients

*TBD*

Market uptake activities for nutrient recovery innovation in EISMEA

*TBD*

Summaries of outcomes of each breakout sessions (research needs)

*Sessions Rapporteurs*

Questions and Discussion

Key take-aways from the day identified by experts:

*TBD*

Close

# Poster Presentations on display during ESPC4 & PERM5

Phosphorus availability in long-term cultivated arid soil treated with diverse biochars

*Khaled Alotaibi, King Saud University, Saudi Arabia*

Perspectives and limitations of the inverted biological P-elimination for P-fertilizer production from sewage sludge

*Annika Anders, THM Uni Giessen, Germany*

Phosphorus balance, release rates and mechanisms in a eutrophic coupled - reservoir system

*Karel As, Bayreuth University, Germany*

Use of vivianite obtained from water purification as phosphorus fertilizer

*Tolulope Ayeyemi, University of Seville, Spain*

Degree of phosphorus saturation and Olsen extraction in Alentejo region soils

*Rui Bajoucio, University of Trás-os-Montes and Alto Douro, Portugal*

Effect of rain variability and water retention measures on phosphorus loads at the farm scale

*Victoria Barcala, Deltares, Netherlands*

Granular iron-based materials for phosphate removal from waters

*Oleksandr Bolielyi, GEOS, Ukraine*

Stimulating anaerobic phosphorus release from marine sediment by addition of volatile fatty acids

*Ece Cakmak, Hacettepe University, Turkey*

Recovery of phosphorus from real pulp mills effluents using magnetic nanomaterials

*Celso Cardoso, University of Aveiro, Portugal*

Iron coated sand filters for efficient P removal from agricultural drainage waters

*Stefaan De Neve, Ghent University, Belgium*

Sugarcane bagasse ash and its blends with triple-superphosphate reduce the dependency on rock phosphate

*Vitalij Dombinov, Forschungszentrum Jülich GmbH, Germany*

Sugarcane bagasse-based ashes as fertiliser for soybeans and the relevance of ash mineral composition on plant phosphorus availability

*Vitalij Dombinov, Forschungszentrum Jülich GmbH, Germany*

Slow-Release Fertilizers Based on Dispersed Struvite in Thermoplastic Starch Matrix

*Stella Do Valle, Uni Sao Carlos, Brazil*

Microbiological and practical aspects of removal phosphorus from waste water

*Andrzej Dziuba, KREVOX Europejskie Centrum Ekologiczne, Poland*

Quinoa agricultural waste recycling: Evaluation of agronomic and physicochemical quality of quinoa compost

*Khadija El Hazzam, Mohammed VI Polytechnic University, Morocco*

Structural Study on The Chemical Environment Surrounding Phosphorus in Ash Fractions Suitable for Nutrient Recovery

*Sana Elbashir, Umeå University, Sweden*

Assessing the bioavailability of several recycled phosphorus forms in alkaline soils

*Ran Erel, Volcani Institute, Israel*

Strategies for optimizing the scalable microbial synthesis of vivianite

*Lordina Eshun, Manchester University, United Kingdom*

Nutrient recycling with dry toilets as sustainable solution for communal waste management and regional economies

*Albrecht Fritze, Technische Universität Berlin, Germany*

Biological phosphorus removal from potato processing industrial wastewater – High phosphorus load  
*Dorothee Goettert, University of Antwerpen, Belgium*

Assessment of heavy metals from the mixture of phosphate industry by-products and sewage sludge  
*Yao Kohou Donatien Gueable, Mohammed VI Polytechnic University, Morocco*

Egestabase – Navigating technologies for recovery and reuse of plant nutrients from human excreta and wastewater.  
*Robin Harder, Swedish University of Agricultural Sciences, Sweden*

Novel hybrid membrane process coupled with freeze concentration for phosphorus recovery from cheese whey  
*Ipan Hidayat, BETA Technology Centre, Spain*

Phosphorus Recovery Methods from Secondary Sources, Assessment of Overall Benefits and Barriers with Focus on the Nordic Countries  
*Aida Hosseinian, University of Oulu, Finland*

Development and evaluation of innovative technologies for the phosphate removal and recovery  
*Jia-Qian Jiang, Glasgow Caledonian University, United Kingdom*

Phosphorus leaching following a long-term cattle manure application  
*Bijesh Maharjan, University of Nebraska – Lincoln, USA*

Exploration of low energy flotation process to selectively separate purple phototrophic bacterial biomass from anaerobic digestate  
*Bailee Maija Johnson, McGill University, Canada*

Hydrothermal Carbonization (HTC) of Dairy Waste: Effect of Temperature and Initial Acidity on the composition and quality of solid and liquid products  
*Nidal Khalaf, University of Limerick, Ireland*

Production of a safe and nutrient-rich material from a mixture of human waste via pyrolysis  
*Malte Kraus & Kevin Friedrich, Björnсен Beratende Ingenieure GmbH, Germany*

High added value protein and minerals recovery and recycling from animal processing by-products  
*Maya Lacruz-Asaro, INESCOP, Spain*

Nanofertilizer obtained by colloidal self-assembly of amphiphilic molecules for controlled release of phosphorus in soil  
*Luis Lightbourn, Lightbourn Research Institute, Mexico*

Reduction kinetics of iron-rich by-products from drinking water treatment  
*Mingkai Ma, Utrecht University, Netherlands*

Extraction Effects on Polyphosphate Ion Diffusion as Detected with Gel Electrophoresis and <sup>31</sup>P-DOSY-NMR  
*Lori Manoukian, McGill University, Canada*

Pilot scale Recovery of Calcium Phosphate from UASB effluent after elimination of Dissolved Inorganic Carbon  
*Boudewijn Meesschaert, KU Leuven, Belgium*

Synthesis of struvite with compost slurry: analysis of the fertilizer potential for the circular economy  
*Rose Meira, Uni Federal do Oeste do Para, Brazil*

Balancing multiple priorities for a circular phosphorus economy: spatial tools to help select processing locations  
*Geneviève Metson, Linköping University, Sweden*

Nutrient pollution in Stockholm's water catchments: Systemically assessing its social, ecological, and technological determinants  
*Harrie Mort, Leeds University, United Kingdom*

Effect of Fe addition on P retention in peaty freshwater sediment  
*Melanie Munch & Karel As, Utrecht University, Netherlands*

Phosphate retention by Fe(III)- and Ca-phases formed upon oxygenation of anoxic groundwaters  
*Ville Nenonen, Eawag, Switzerland*

Phosphorus recovery as struvite from hydrothermal carbonization liquor of chemically produced dairy sludge  
*Claver Numviyima, Politechnika Wroclawska, Poland*

Phosphorus recovery from sewage treatment plant in Brazil through sorption and coagulation-flocculation  
*Camille Nunes Leite, University of São Paulo, Brazil*

Transformation of Soluble Phosphate within Manure to a Less Soluble Calcium Phosphate Solid  
*Sidney Omelon, McGill University, Canada*

Effect of phosphogypsum on faba bean and its nutrients and heavy metals uptake  
*M'Barka Outbakat, Mohammed VI Polytechnic University, Morocco*

Sewage sludge compost and wastewater nutrient sources in forage production of *Urochloa brizantha*  
*Paulo Pavinato, University of São Paulo, Brazil*

Cover crops and phosphate sources influencing cash crops yield and soil P dynamics  
*Paulo Pavinato, University of São Paulo, Brazil*

Novel green nanotechnology approach to manufacture nano-rock phosphate fertilizer for sustained release of macronutrients  
*Piumi Peiris, University of Sri Jayawardenapura, Sri Lanka*

Purifying calcium phosphate fertilizers produced from human urine  
*Dyllon Randall, University of Cape Town, South Africa*

Potential of waste-derived phosphate fertilisers for sugarcane production in a tropical soil  
*Henriקה Raniro, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria*

Efficient nutrient recovery from urine: turning the entire waste stream into a product on-site  
*Frank Riechmann, Eawag, Switzerland*

Functional phosphorous-containing cellulosic materials: an outlook of its chemistry and applications  
*Mohamed Hamid Salim, Mohammed VI Polytechnic University, Morocco*

Removal of dissolved organic phosphorus from synthetic agro-industrial wastewater using ferric chloride  
*Ana Paula Nova, Universidad de la Republica, Uruguay*

Recycled iron phosphates are not effective phosphorus fertilizers in the short term on lowland rice  
*Rochelle Joie Saracanlao, KU Leuven, Belgium*

Calcium phosphate granulation from pig manure: Simultaneous phosphorus recovery and anaerobic digestion  
*Chris Schott, Wageningen University & Research, Netherlands*

Investing in Phosphorus Fertilizer Recovery from Dairy Processing Wastewater  
*Jan-Philip Uhlemann, Wageningen University & Research, Netherlands*

Phenotyping seedling vigor, root architecture, phosphorus uptake and use efficiency in rice genotypes contrasted in seed-P under low and high soil P  
*Hafeez Ur Rehman, University of Agriculture Faisalabad, Pakistan*

Thermochemical equilibrium calculations of char formation during co-pyrolysis of municipal sewage sludge with straw  
*Naeimeh Vali, University of Borås, Sweden*

Assessment framework for a sustainable use of P fertilizer from agronomic and environmental perspectives  
*Debby Van Rotterdam, Nutrient Management Institute, Netherlands*

Phosphorus and food security in India: opportunities and barriers to recycling phosphorus from human sewage  
*Diorbhail Wentworth, University of Edinburgh, United Kingdom*

FT-IR Based Inline Analysis of Phytic Acid During Enzymatic P-Adjustment in Monogastric Animal Feeding  
*Niklas Widderich, Hamburg University of Technology, Germany*

