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HELSINKI
11-13 June
2018



European
Sustainable
Phosphorus
Conference

Consultations open for input

STRUBIAS market report open for consultation



The European Commission Joint Research Centre (JRC) circulated on 20th December 2017, for comment, a [DRAFT "market study"](#) (165 pages) for the 'STRUBIAS' recycled nutrient products (precipitated phosphate salts, ashes and processed ash products, biochars and pyrolysis products). This document provides the economic and market assessment necessary for future addition of these products to the (revised) EU Fertilisers Regulation annexes (as additional CMCs). This is the second part of JRC's



'STRUBIAS' draft report, in complement to a first technical [report](#) ("draft recovery rules", circulated May 2017). This new draft "market study" assesses the possible sources of raw materials for nutrient recycling, STRUBIAS technologies and economic aspects (fertiliser prices, market for STRUBIAS products, economic externalities). Draft conclusions are that STRUBIAS recycled nutrient products could potentially substitute 25-40% of EU mineral phosphate fertiliser use. Meta-analyses conclude that struvite offers very good fertiliser effectiveness (as good as or better than mineral fertiliser) but that calcium phosphates are less effective (total 26 studies for phosphate salts), that most ashes/ash based products are reasonable effective fertilisers (17 studies) except for steel slag based materials and non-processed sewage sludge incineration ash, and that data on biochars is inadequate. **JRC is requesting comments on the report text:** (1) corrections to the text or additional information (line by line) and (2) answers to the following [questions](#): sale prices for STRUBIAS materials, costs of regulatory procedures (REACH registration, national fertiliser regulation dossier, industry site authorisation to take in waste materials ...), laboratory analysis costs (for the different product criteria, contaminants, etc. proposed in the draft "recovery rules" report), economic impacts of nutrient recovery to STRUBIAS products (environmental benefits, job creation, soil carbon restoration, information on metal industry slags (contaminants, fertiliser value ...), STRUBIAS nutrient recover routes or raw material sources which are not included in the report but are economically feasible (LRL at least 6), market potential of STRUBIAS products other than as P-fertilisers (e.g. as liming materials, soil improvers).

Comments to the draft "market study" are requested by JRC for 15th March 2018. However, comments are not accepted directly by JRC and must be transmitted via a member of the STRUBIAS working group (which includes: ESPP, DPP and several ESPP members). Please therefore transmit your comments to info@phosphorusplatform.eu by 28th February latest. For all comments please specify either page number plus line number of document, or the question addressed (1-6 in the document), and please provide justification (references, documents). The JRC draft STRUBIAS "market study" open for comment and the detail of JRC's questions are available on ESPP's website: www.phosphorusplatform.eu/regulatory (also the May 2017 JRC "draft recovery rules" report and ESPP's detailed submitted comments 14/9/17).

Standards needs for the circular economy



Input is invited to two processes currently underway to define European standards needs to enable development of the circular economy and markets for recycled products. (1) The European Commission (DG GROW) is preparing the list of European Standards which need to be created or modified (draft mandate to CEN) to accompany implementation of the revised EU Fertilisers Regulation (which is currently being finalised, see above). (2) CEN, the official EU standards organisation, is working on identification of new standards needs and obstacles posed by existing standards, relevant to sustainable chemicals, for the circular economy and product recycling (non-fertiliser chemicals, fertilisers are covered by (1)).

(1) Draft standards mandate to accompany the EU Fertilisers Regulation available on request from info@phosphorusplatform.eu Comments can be sent to us (ESPP) and we will transmit to DG GROW.

(2) CEN JWG (Joint Working Group) on standards needs for sustainable chemicals for the circular economy and recycling. **Stakeholders meeting 24th May 2018, Brussels.** Further information from ESPP info@phosphorusplatform.eu

EU public consultation on pharmaceuticals



The European Commission [public consultation](#) on the risks from pharmaceuticals in the environment is open to **21st February 2018**. ESPP will respond underlining the need for more information to ensure safety and develop public confidence in recycling of organic products, underlining the need to develop monitoring pharmaceuticals and their metabolites in sewage biosolids and manures as used on farmland, research into impacts on soil and ecosystems, possible crop uptake, environment and health risk assessments. R&D is also needed to better understand and improve the breakdown of pharmaceuticals in biosolids processing, such as anaerobic digestion and composting.

EU public consultation on "pharmaceuticals in the environment" open to individuals and organisations to 21st February 2018

https://ec.europa.eu/info/consultations/public-consultation-pharmaceuticals-environment_en

Draft ESPP input available on request info@phosphorusplatform.eu

Livestock nutrient flows and impact assessments consultation



The Food and Agriculture Organization of the United Nations (UN FAO) has published a [draft for public review](#) of the Guidelines for environmental quantification of nutrient flows and impact assessment in livestock supply chains. This guideline has been prepared by the Technical Advisory Group (TAG) on nutrient cycles and impact assessment as a response to the call by the Livestock Environmental Assessment and Performance (LEAP) Partnership members for recommendations on nutrient accounting and impact assessment for inclusion into the LEAP guidelines. The objectives of the TAG were to develop guidelines to quantify nutrient flows in livestock supply chains; develop guidelines and environmental impacts (eutrophication and acidification) and for selection of relevant indicators for livestock supply chains. ESPP joined the first advisory group meeting in 2016 and provided a [presentation](#) about the need for better Data on Nutrients to Support Stewardship based on conclusions of [DONUTSS](#). The FAO

draft is open for public review to **February 28th 2018**, use [this template](#) and submit to Livestock-Partnership@fao.org including justifications for comments.

*Draft for public review Guidelines for environmental quantification of nutrient flows and impact assessment in livestock supply chains. Livestock Environmental Assessment and Performance (LEAP) Partnership, 2017, FAO, Rome, Italy www.fao.org/3/a-bu312e.pdf
ESPP presentation 1st Technical Advisory Group (TAG) on nutrient cycles and impact assessment www.slideshare.net/NutrientPlatform/need-for-better-data-on-nutrients-to-support-stewardship-donutss-1st-meeting-of-fao-livestock-environmental-assessment-and-performance-partnership-leap-technical-advisory-group-tag-on-nutrient-cycles-accounting-and-impact-assessment
Data on Nutrients to Support Stewardship workshop www.phosphorusplatform.eu/DONUTSS*

Call for data on manure processing

To prepare input to the proposed European Commission study on application limits for recycled nutrients from manure ("processed manure" under the Nitrates Directive, see [eNews n°18](#)), the Netherlands Government is requesting input of studies or data: (1) reports or data from scientific studies into environmental or agronomic impacts of manures after processing, or of nutrients recovered from manures, (2) research projects currently ongoing in this area, (3) new data requirements, methods or sample collection, and (4) scientific support justifying definition of possible "Safe Manure Criteria".

Input should be sent to Harm Smit, Netherlands government, h.j.smit@minez.nl by end February latest

Apply for the Baltic Sea nutrients and carbon reuse challenge



Do you have an innovation with the potential to reuse nutrients and carbon in the Baltic Sea? Are you eager to improve your innovation, adapt it to local markets in the Baltic Sea Region, and meet with potential investors and clients? The [BONUS RETURN project](#) is

hosting the [Baltic Sea nutrients and carbon reuse challenge](#): a competition for eco-technologies with the potential to reuse nutrients and carbon in the Baltic Sea. Up to 3 innovations will be chosen to be part of the project's pre-commercialization process, and present their innovations to a group of investors, researchers and public sector actors at the [Baltic Sea Future Conference](#) in Stockholm on 8 -9 March, 2018. BONUS RETURN offers to the winning innovation(s) the opportunity to perform tests, match their product to local needs, obtain tailor-made procurement and business plans, link with private sector and investors, and introduce the product to potential markets. Submit your application before **12 February 2018** via the [challenge webpage](#).

Eligibility criteria and additional information can be found at the webpage. For questions email info@bonusreturn.com
Baltic Sea Nutrient Reuse challenge webpage with application form www.bonusreturn.com/innovation
Baltic Sea Nutrient Reuse challenge Fact Sheet https://docs.wixstatic.com/ugd/62766f_78f4c55769aa488381b2f1f06fcd5454.pdf

Survey on sustainable development in the livestock sector



A public online [survey](#) is open within the EU funded Horizon 2020 project [TRANSrisk](#) to explore priorities for low-emission development strategies in the livestock sector. Climate action is one of the relevant Sustainable Development Goals (SDGs), alongside SDGs #2 zero hunger, #3 good health and well-being, #6 clean water and sanitation, #12 responsible production and consumption, and #15 life on land. This survey aims identify which development goals are perceived as more important, and to explore what potential risks and opportunities can occur when pursuing an ambitious low greenhouse gas emission strategy in the livestock sector.

Please participate via www.surveymonkey.com/r/sustainable-livestock

ESPC3 call for presentations and success stories

Third European Sustainable Phosphorus Conference, Helsinki, 11-12 June 2018



Deadline for proposing presentations on sustainable phosphorus policy or management actions, or of business or action success stories, for ESPC3 (the 3rd European Sustainable Phosphorus Conference, Helsinki, 11-12 June) is **28th February**. Presentation and success story proposals can address innovation, policy, nutrient recycling, science needs, links to nitrogen and carbon, agriculture, nutrients in the food chain. Full details of themes and required format submission can be found on the [ESPC3 webpage](#). ESPC3 will bring together some 300 companies, stakeholders, regional and national authorities, innovation and researchers, to discuss phosphorus sustainability actions and policies. This conference follows from the first two European conferences in [2013](#) and [2015](#), see also SCOPE Newsletters [92](#) and [111](#). In particular, the conference will present and assess integration of phosphorus and other nutrients into EU policies since the publication of the EU Consultative

Communication on Sustainable Use of Phosphorus ([2013](#)), and enable dialogue with industry and stakeholders concerning future policies.

ESPC conference 3 website www.phosphorusplatform.eu/ESPC3

ESPC conference 1 and 2 see SCOPE Newsletters 92 www.phosphorusplatform.eu/scope92 and 111 www.phosphorusplatform.eu/scope111

Policy

EU Fertilisers Regulation moves to trilogue

The European Council (Member States) adopted its position on the Fertilisers Regulation proposal on [20th December](#). This is not yet published, but has been seen by some stakeholders. Media coverage indicates that Council's position is to delay the proposed 60 mg/kgPO₃ cadmium limit by eight years, then subject any possible reduction to evaluation. The position indirectly recognises the possibility of "Low carbon fertiliser" by specifying pathogen limits for inorganic fertilisers >1% organic carbon. Council proposals on animal by products however pose problems ("Whereas" n°s 10 and 12), as do proposals on digestates and composts (CMC3, CMC5) by requesting prior sanitation for input of animal by products (in particular manure): so effectively requiring 'double sanitation'. The proposed Regulation now goes to the trilogue process where Parliament and Council negotiate (with support of Commission) to hopefully find a jointly acceptable text, with discussion usually addressing only points included in the amendments of either Council or Parliament.

Initially proposed EU Fertilisers Regulation text: <http://ec.europa.eu/DocsRoom/documents/15949>

EU Parliament amendments: www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P8-TA-2017-0392

Council amendments (not yet published) see http://eur-lex.europa.eu/procedure/EN/2016_84

Council press release www.consilium.europa.eu/en/press/press-releases/2017/12/20/eu-fertilisers-council-agrees-terms-of-mandate

Cross-sector industry joint statement www.phosphorusplatform.eu/images/download/Joint-statement-industry-Fert-Regs-finalised-20_11_17.pdf

Agreement on tightening EU waste legislation

The European Parliament and Council are [reported](#) to have finally reached agreement on modifications to the EU Waste Framework Directive and related waste legislation updates (Packaging, Landfill, WEEE – electronics, End of Life Vehicle and Batteries directives). The compromise includes clarifying waste concept definitions, binding targets for waste reduction and recycling, stricter requirements for separative waste collection and producer responsibility.

"Council and Parliament reach provisional agreement on new EU waste rules", EU Council press release 816/17 of 18/12/2017

https://europa.eu/newsroom/press-releases/today_en?page=2

Business call for further action on Circular Economy



The Aldersgate Group, an alliance of businesses for sustainable economy, has published a [call for action](#) towards the Circular Economy and resource efficiency, "beyond" the EU Circular Economy Package. The group includes Anglian and Thames Water companies, Aviva, IKEA, Siemens, Marks & Spencers). The call estimates that increased policy support for resource efficiency could add over €300 billion to EU business output by 2030. Beyond the current EU Circular Economy Package, the following

actions are proposed: include resource efficiency in product standards, support innovation in resource efficiency (including through EIB European Investment Bank funding), include circular economy criteria in public purchasing, develop pricing mechanisms and fiscal incentives to support recycling, circulation of information and coherent definitions of "waste".

Aldersgate Group 2017, position paper (24 pages) "Beyond the Circular Economy Package: maintaining momentum on resource efficiency"

https://gallery.mailchimp.com/c0baca4990b9062dd6688dd4f/files/f991a7c2-c915-475e-9f70-b59e4a01ea89/1712_Beyond_the_Circular_Economy_Package_FINAL_low_res.pdf and "Amplifying Action on Resource Efficiency"

www.aldersgategroup.org.uk/our-reports

Netherlands phosphorus emission trading approved

The European Commission has [approved](#) the Netherlands State scheme for tradable phosphorus rights for dairy farmers, entering into force on 1st January 2018. This Commission decision specifies that the phosphorus rights scheme will not be considered as an illegal state subsidy to farmers, despite the farmer receive the monetisable rights for free. However, the objective of the scheme is to obtain prolongation until 2021 of a 2014 derogation allowing spreading of up to 250 kgN/ha from manure, compared to the general limit of 170 kg fixed by the EU Nitrates Directive (in Nitrate Vulnerable Zones). The European Commission's decision on this derogation extension is not yet made and is expected in coming months.

European Commission press release 19th December 2018 www.europa.eu/rapid/press-release_IP-17-5362_en.htm

Sustainable phosphorus

Sustainability in the Food and Beverage Industry – ENG Conference

The ENG (European Networking Group) [conference on food industry sustainability](#) brought together around 100 sustainability managers from food and drink companies and distributors, agricultural organisations, sustainability certification experts and partners. Speakers and moderators were Danube Soya, Waitrose, Dalehead Pork, Thinkstep, DNV-GL certification, Danone / The Livelihoods Fund, FAO (Food and Agriculture Organisation), EOSTA (real cost accounting), PROVA, Kelloggs, Max Burgers, Südzucker, Nestlé, Carrefour, Illy Coffee, European Dairy Association. ESPP presented the importance of nutrients in food security, sustainability and human health. Several speakers noted nutrient resources amongst their sustainability assessment criteria. Nestlé (Hélène Lanctuit) indicated work ongoing to evaluate the nutrient value as well as tonnage of food losses. Key issues discussed included the need for traceability, trust and formal certification procedures with farmers (supply chain) because of the high financial value of reputation and risk; the need for data to understand sustainability impacts but also of clear messages to consumers, and the need for long-term strategies and partnerships. Inspiring case studies of actions with farmers, supply chains, in shops and with consumers were presented. Carrefour (Bertrand Swiderski, Matthew Mellin) presented innovative actions to reduce food waste in concertation with their supply chain, including extending expiry dates, in-store reprocessing of deteriorated food and methane production from non-avoidable food waste (fueling 300 delivery trucks in France). Major challenges for the future were identified as obesity and diet-related health issues (defining responsibilities of industry, regulators, consumers), food waste from farm to plate, the changes with new technologies in communication and information and the need to work together to address these challenges across industry and with stakeholders. Particular challenges face food and drink companies whose core product is unsustainable: the example of Max Burgers (Kaj Török) was presented. After identifying beef in burgers as responsible for 65% of its whole supply chain and operation climate change impact, the company successfully introduced in 2015 five new taste-quality non-meat burgers, which already today represent 1/3 of sales – as well as offering increased margins.

Conference website www.engevents.com/food-and-beverage/sustainable-food-2017

Climate change impacts on agricultural phosphorus losses

A [study](#) from 11 UK universities models expected impact of climate change on agricultural phosphorus losses, based on high-frequency phosphorus flow data from three UK sub-catchments, a climate model and uncertainty estimates and two phosphorus transfer models (HYPE Hydrological Predictions for the Environment and DBM Data-Based Mechanistic). The three sub-catchments (Newby Beck, Cumbria – Blackwater, Norfolk – Wyllye, Hampshire) have different agricultural contexts (livestock, arable). Results predict increased winter rainfall (+15 to +30%) and decreased summer rainfall. Because most phosphorus losses occur in winter, when soils are water saturated, this results in expected increases of +10 to +30% in annual phosphorus losses, despite a reduction in summer losses (-20%). These increases in phosphorus losses are greater than reductions estimated as possible by farm mitigation measures within current agricultural practice, and could only be countered by considerable agricultural changes (e.g. -20 to -80% reduction in phosphorus inputs).

“Major agricultural changes required to mitigate phosphorus losses under climate change”, M.C. Ockenden et al., Nature Communication, 8:161, 2017, <http://dx.doi.org/10.1038/s41467-017-00232-0>

Phosphorus recovery & recycling

Nordic waste and water phosphorus network

The Nordic phosphorus network announced in Malmö in October 2016 (see SCOPE Newsletter [n°123](#)) has defined its scope and objectives at a meeting in Copenhagen 25th August 2017, to which ESPP and BSAG contributed. The network will for now bring informally together the Nordic countries' EPAs (environment agencies), solid waste associations (Avfall Norge, Avfall Sverige, DAKOFA, KIVO/FSWA, Samband) and wastewater associations (DANVA, Norsk Vann, Samorka, Svenskt Vatten, VVY). The objectives are to promote recycling of phosphorus-rich waste – especially the reuse or recovery from wastewater and biodegradable solid wastes, by sharing information and joint projects between the Nordic countries. Possible actions proposed include: identifying phosphorus flows, defining a “phosphorus hierarchy” (based on the waste hierarchy and providing a basis for assessment of phosphorus recycling or reuse policies or technologies), integrating phosphorus into Nordic countries' national waste and circular economy strategies and risk-based assessment of use of sewage biosolids in agriculture. The network hopes to develop collaboration with the Nordic Council of Ministers. A next meeting is planned for Oslo, April 2018.

Contact: Morten Carlsbæk, DAKOFA, Denmark waste and resource industry federation mc@dakofa.dk

Pharmaceuticals not found in struvite-fertilised tomatoes

In a [study](#) struvite was precipitated from human urine spiked with five pharmaceuticals, then used to fertilise tomatoes. Also, wheat husk biochar and clinoptilolite zeolite, as potential materials for nitrogen recovery, were tested similarly. Uptake of the different pharmaceuticals into the precipitated struvite varied from (approx.) 0 – 50% of influent concentration, but this was



artificially high because a low Mg:P ratio was used (1.2:1) for struvite precipitation, resulting in high amorphous impurity levels in the struvite (16%). However, none of the five pharmaceuticals were detectable in tomatoes grown in 9-week pot trials using artificially high struvite doses (50g struvite per 0.5 litre pot). No pharmaceuticals were detected in the tomatoes produced with the struvite (detection limit 0.001 mg/kg), nor in tomatoes fertilised using the following products: struvite precipitation + zeolite N adsorption, struvite precipitation + biochar N adsorption, biochar N adsorption only. In the tomatoes fertilized with the zeolite (after N adsorption) only a small amount of carbamazepine (~0.003 mg per kg dry weight tomato) was detected. With an uptake of 0.003 mg carbamazepine/kg DW tomato biomass, an adult weighing 67 kg would need to consume 73 kg of dried tomatoes per day in order to reach the TRV limit (toxicological reference value). Thus there was no detectable transfer of pharmaceuticals to tomato crops by struvite, and the authors conclude that for the nitrogen adsorbent materials tested (wheat biochar, zeolite) the health risk is not significant.

Pharmaceuticals tested: carbamazepine, propranolol-HCl, diclofenac sodium, sulfamethoxazole, ibuprofen. "Uptake of pharmaceuticals by sorbent-amended struvite fertilisers recovered from human urine and their bioaccumulation in tomato fruit", M.A. de Boer, M. Hammerton, J.C. Slotweg, University of Amsterdam, in print, Water Research <http://dx.doi.org/10.1016/j.watres.2018.01.017>

Market report on nutrient recovery systems

A [market report](#) from TechSci Research (market intelligence consultation) looks at forecasts for nutrient recovery systems worldwide, 2012-2022. The report covers market outlook, size, shares and forecasts, by world region and by technology/application: chemical, biological, municipal/industrial. The following technology suppliers are presented and/or interviewed: Ostara, Trident, Airprex/CNP, DVO, CLEARAS, NuReSys, Royal Haskoning DHV, Unitika, Alfa Laval and Multifarm Harvest.

"Global Nutrient Recovery System Market Forecast & Opportunities, 2012 – 2022" TechSci Research 2017 (110 pages), € 3 400
www.asdreports.com/market-research-report-433044/global-nutrient-recovery-system-market-forecast-opportunities

Biogas success stories recycling nutrients



The EU [Biogas Action](#) project (Horizon 2020) [presents](#) ten innovative biogas plants, producing renewable energy from biowastes, seaweed and/or manures. In all cases, nutrients are recycled by use in agriculture. In some cases, digestate is used directly on fields, in others it is treated by solid-liquid separation, pasteurisation or composting; The ten examples include Terragr'Eau (Féternes, Haute Savoie, France), where the key objective is to ensure collection of biowastes to avoid pollution of the Evian water catchment (Danone, see ESPP eNews [n°16](#)). In Denmark, Solrod Biogas [produces](#) methane from around 200 000 t/y of seaweed, dairy and brewery byproducts

and manure and the digestate is used a fertiliser by farmers. In The Netherlands, Greendal Vergisting [produces](#) methane from 52 000 t/y of mainly pig and chicken manure, and the digestate is used either to produce algae or is pasteurised and exported as fertiliser.

Biogas Action "Regional integrated biogas plants" <http://biogasaction.eu/best-regional-integrated-biogas-plants> and brochure on "Best Regional Integrated Biogas Plants. Biogas Action: Promotion of sustainable biogas production in EU" <http://biogasaction.eu/wp-content/uploads/2017/07/Biogas-Action-Brochure.pdf>

What is widdle?

EcoSec, the French dry toilet company (see ESPP eNews [n°15](#)) is developing direct use of separately collected urine as fertiliser in wine grape and vegetable production. [Drip by drip](#) application has been tested on spinach, showing improved crop production, and on grape vines at the Domaine de la Jasse [vineyard](#), Combaillaux, Hérault, France. The urine is treated using the volcanic rock [Chabasite](#), which traps ammonia nitrogen in a form which is accessible for nitrification by plant bacteria and so release for plant uptake.

EcoSec www.ecosec.fr and Valurine www.ecosec.fr/wp-content/uploads/2017/09/Projet-Valurine_flyer-1.pdf

Biochars show rich and varied phosphorus forms

A [study](#) of nine different biochars showed very different phosphorus contents, depending on the input materials used to produce them. Animal bone biochars showed phosphorus levels up to 13% P, mainly as hydroxyapatite (calcium phosphate as found in bones). Other biochars showed 0.06% P (in reed biomass biochar) up to 5% P in pig manure biochar. X-ray analysis (K-edge XANES spectrometry) showed that the biochars contain a variety of different phosphorus forms (compounds of calcium, iron, magnesium and sodium). The authors conclude that this variety of phosphorus forms will mean a diversity of phosphorus solubility rates, considered to be an environmentally positive property for fertilisers.

"Phosphorus transformations in plant-based and bio-waste materials induced by pyrolysis", J.S. Robinson et al., Ambio 2018, 47(Suppl. 1):S73-S82, Special Issue "Special Issue: Handling the phosphorus paradox in agriculture and natural ecosystems: Scarcity, necessity, and burden of P" <http://dx.doi.org/10.1007/s13280-017-0990-y>



Fertiliser effectiveness depends on soil chemistry and fertiliser placement

Two [studies](#) examine soil behavior and fertiliser effectiveness of two recovered phosphate materials: granulated and powdered LDH (magnesium/aluminium Layered Double Hydroxides, with phosphate anions on the exchange complex) and struvite (Ostara Crystal Green), compared to commercial MAP (mono ammonium phosphate) fertiliser. Soil incubation techniques and 6-week wheat pot trials (plant biomass, P uptake, reverse isotope labeling) were used. An acid soil (Kingaroy, pH 5.1) and an alkaline soil (Black Point, pH 7.6) were used. Powdered struvite and powdered LDH showed results not significantly different from powdered MAP in both soils (with a slightly lower P uptake for struvite compared to MAP in the alkaline soil). However, in both soils, granular MAP showed better results than powdered or granulated MAP or LDH. The reason for the better results of granular MAP compared powdered MAP, especially in the acidic soil, cannot be identified with certainty, but is likely related to the “banding effect” in the granular treatments: the granules create spots with relatively high soluble P concentrations from which plant roots can readily tap P. Also, all yields are much higher (c. 10x higher) in the Black Point soil than in the Kingaroy soil, and the results may be related to the high iron and aluminium contents of both soils used: 2 – 5x higher in the Kingaroy soil at 2.6 and 2.4 g/kg of iron and aluminium oxide.

“Agronomic Effectiveness of Granulated and Powdered P-Exchanged Mg–Al LDH Relative to Struvite and MAP”, M. Everaert et al., *J. Agric. Food Chem.*, 2017, 65 (32), pp 6736–6744 <http://dx.doi.org/10.1021/acs.jafc.7b01031>

Recovered phosphates show good fertiliser performance

Sewage-recovered struvite and two products thermochemically recovered from iron salt P-removal sewage sludge incineration ash (with sodium and magnesium) were [tested](#) in maize pot trials at soil pH 4.9 and 7.1. Fertiliser performance of the struvite and sodium-recovered product were comparable to triple super phosphate (TSP) in both acid and neutral soils, whereas the magnesium-recovered was effective only in the acidic soil. Using K-edge XANES X-ray analysis of phosphorus forms in the pot soils, the authors conclude that the effectiveness of the recovered phosphate products may be related to reactions with nitrogen and to formation of plant-available compounds such as ammonium phosphates.

“Performance of secondary P-fertilizers in pot experiments analyzed by phosphorus X-ray absorption near-edge structure (XANES) spectroscopy”, C. Vogel et al., *Ambio* 2018, 47(Suppl. 1):S62–S72, Special Issue “Special Issue: Handling the phosphorus paradox in agriculture and natural ecosystems: Scarcity, necessity, and burden of P” <http://dx.doi.org/10.1007/s13280-017-0973-z>

Agenda

- **SPA Phosphorus Forum 2018**
27 February 2018, Tempe, Arizona, USA - [Website](#)
Annual forum of the North America Sustainable Phosphorus Alliance
 - **Conference Symbiosis and Circular Economy in fertilizers Are by-products a thing of the past? Unlocking the new fertilizer Regulation**
7 March 2018, Brussels, Belgium - [Flyer](#) - [Email](#) - [Registration](#)
Organized by Fertilizers Europe
 - **Phosphates 2018 conference**
12 - 14 March 2018, Marrakesh, Morocco - [Website](#)
Gathering for decision-makers representing the fertilizer, feed and industrial phosphates industries.
- 
- **IFAT trade fair for sewage - waste – resources**
14 - 18 May 2018, Munchen, Germany - [Website](#)

- **3rd European Sustainable Phosphorus Conference (ESPC3)**
11 - 12 June 2018, Helsinki, Finland - [Website](#) - [Email](#)



- **6th Sustainable Phosphorus Summit (SPS2018)**
20 - 22 August 2018, Brasilia, Brazil - [Website](#)
For the first time, the Summit will be held in Latin America, enabling a spotlight on the Tropics, where phosphorus sustainability is a big concern
- **6th Symposium of Phosphorus in Soils and Plants (PSP6)**
10 - 13 September 2018, Leuven, Belgium - [Website](#)
This symposium will address the challenges of phosphorus scarcity in many terrestrial and agroecosystems as well as the challenges of managing excess phosphorus where such has occurred

See more events at www.phosphorusplatform.eu/upcoming-events

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