BIOREFINE

Recycling inorganic chemicals from agro- and bio-industrial waste streams

Project/Contract number: 320J - Biorefine

Document number: BIOREFINE – WP5 – A19 – P1 - D

Legal framework of recovered phosphorus (struvite) as fertiliser in North-Western Europe

Date: 30/08/2015

Start date of project: 1 May 2011 Duration: 56 months

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Project funded by the European Regional Development Fund through INTERREG IV B		
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PU	Public	x
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1. Introduction

Struvite or magnesium ammonium phosphate is considered as a slow-release phosphate fertiliser which can be produced from wastewater, sewage sludge, sewage sludge ashes and manure or digestate. Struvite is not included yet in the European Fertiliser Regulation of mineral fertilisers (EC 2003/2003), but this regulation is currently under revision and struvite and/or recovered phosphorus may be comprised. In the North-Western European (NWE) countries, national or regional fertiliser regulations also apply for the trade within the country or region. This report gives a summarised overview of the regulations applicable to the NWE countries and the European Union.

2. European legislations

2.1 EU Fertiliser Regulation 2003/2003

The regulation regarding mineral fertilizers is included in 1 document, the EC 2003/2003. Only those products fulfilling the specifications indicated in annex I are considered as EC fertiliser and can be traded liberally within Europe. Since there exists a broad range of fertilizer and soil amendment products, such as organic fertilizers and struvite, which are not included in this annexe, the European Commission started with the revision of this directive.

In April 2015, the European Sustainable Phosphorus Platform (ESPP) transmitted a list of proposed criteria to be included in the EU Fertiliser Regulation regarding recovered phosphorus to DG GROW. The list can be found as 'Proposed EU Fertiliser Regulation criteria for recovered struvite' under the Downloads section of the ESPP website [Link]. The main criteria are described below.

2.1.1 Purity requirements

The proposed purity requirements are related to the struvite content and the total organic carbon content (TOC). The acceptable purity range is 80% to 110% of the theoretical values of pure struvite, which are 12.6% total P, 16.4% MgO and 5.7% N. The total organic carbon content should not exceed the limit for 'inorganic' fertilisers as stated in the EU Fertiliser Regulation which is currently expected to be 2% TOC (of dry matter). However, struvite products with higher levels of organic matter can possibly be put on the market as organic or organo-mineral soil amendment.

2.1.2 Contaminants

The proposed contaminant criteria include the criteria for all categories of the Fertiliser Regulation products. All classified or hazardous impurities should be <0.1% (cfr. REACH). For inorganic contaminants only the limits fixed in the EU Fertilser Regulation revisions apply (Table 1). For Cu and Zn the proposed limits requiring labelling are 200 and 600 mg/kg DM respectively.

The proposal also postulates that only those organic contaminants, pathogens and seeds for which a limit is defined by the EU Fertiliser Regulation (as revised) for organic fertilisers, composts or digestates, should be also limited for struvite, taking the strictest limit (Table 2).

Table 1. Limits for inorganic substances as stated in the 02/06/2014 Fertiliser Regulation revision proposal

Contaminant	Limit
Cd	60 mg/kg P_2O_5
Cr (VI)	2 mg/kg DM
Hg	2 mg/kg DM
Ni	120 mg/kg DM
Pb	150 mg/kg DM
As	60 mg/kg DM

Table 2. Limits for organic contaminants, pathogens and seeds as stated in the 02/06/2014 Fertiliser Regulation revision proposal

Contaminant	Limit
Polyaromatic hydrocarbons	6 mg/kg DM
Salmonella spp	0 in 25 g
E. coli	1000 CFU/g
Viable weed seeds	2/kg

2.1.3 Physical quality and general safety criteria

Regarding the physical quality and general safety criteria, no specific requirements for recovered struvite other than those applicable for inorganic fertilisers in the revised EU Fertiliser Regulation apply.

2.1.4 Quality assurance

In addition, Meers postulates to include some additional quality assurance requirements in the revised EU Fertliser Regulation as stated in the Biorefine Cluster Europe position paper on the Fertiliser Regulation revision, which can be found as 'POLICY NOTE: Position paper EU Fertlizer Regulation 2003/2003 – Biorefine Cluster Europe' in the Downloads section of the Biorefine Cluster Europe website [Link].

One of the main arguments is the lack of process or product origin information in the current regulation. Since the fertilizer products can originate from different types of waste (such as quite pure industrial wastewater or municipal wastewater sludge), chain information might be required in the regulations either in additional safety criteria, in the monitoring by accrediting bodies or in the classification itself.

2.2 REACH registration

The REACH (Registration, Evaluation, Authorization and restrictions of CHemical compounds) registration (1907/2006) entered into force since the 1st of June 2007 in all EEA (European Economic Area) countries, this means all 28 EU countries, Iceland, Liechtenstein and Norway. REACH applies to the processing, import, trading and use of chemical compounds as such, in mixtures or tools. The European Chemical Agency (ECHA) manages the REACH system.

REACH registration is generally obligatory for any company producing a recovered phosphate chemical product. Action is legally required before or immediately on starting a production > 1

ton/year. This may include immediate registration (if the substance is already pre-registered), submission of an inquiry dossier followed by registration or late pre-registration.

The REACH dossier for struvite was successfully submitted by Berlin Wasserbetriebe (BWB) for the 2013 REACH registration deadline (EINECS n° 232-075-2 and CAS n° 7785-21-9). The dossier concludes that struvite is 'Not Classified'. Therefore, organisations and companies producing struvite must contact Berlin Wasserbetriebe (Alexander.Schitkowsky@bwb.de) to purchase a 'Letter of Access' to the struvite joint registration dossier before submitting their REACH registration (REACH legislation requires "one substance – one dossier"), and will have to pay a contribution to dossier costs (studies, preparation) (Thornton, 2013).

More information: Chris Thornton, European Sustainable Phosphorus Platform (ESPP), info@phosphorusplatform.eu; Erik Meers, Ghent University and Biorefine Cluster Europe, erik.meers@ugent.be.

3. Dutch legislation: Dutch Fertiliser Law

From the 1st of January 2015, the category 'recovered phosphates' has been added to the Dutch Fertiliser Law as officially published in the Dutch Statute book. This means that struvite, magnesiumphopshate and dicalciumphosphate (from wastewater and agricultural waste amongst others) have been approved for use as fertilisers in the Netherlands, on the condition that the products meet the requirements for heavy metals and organic micro-pollutants applicable for regular fertilisers (Dutch Nutrient Platform, 2015).

The Ministry of Economic Affairs has realized this improvement in the fertiliser law in cooperation with the Ministry of Infrastructure and Environment to support the establishment of a market for recycled phosphorus. This is a successful result of the Dutch Nutrient Platform's actions since 2011, in particular the Dutch Phosphate Value Chain Agreement signed by more than 20 companies, knowledge institutes, NGO's and the Dutch Government (European Sustainable Phosphorus Platform, 2015).

More information: Dutch Nutrient Platform, info@nutrientplatform.org.

4. Belgian legislation: FPS exemption

In Belgium, (inorganic) fertilisers are required to comply with the Belgian legal requirements as mentioned in the Royal Decree of 28 January 2013 on the marketing and the use of fertilizers, soil improvers and growing media. Annex I to this Decree provides an overview of products which may be marketed, in the same way as in EU Regulation 2003/2003 (designation, description, requirements and markings) (DG Animals Plants and Food & Service Pesticides and Fertilisers, 2013). Struvite is an endproduct not included in the Annex. Therefore, the Federal Public Service (FPS) Health, Food Chain Safety and Environment can grant exemptions for the trade of struvite products as fertilizers when the producer applies for mutual recognition (or derogation). In this case, not only the purity of the product, but also the agronomic properties are evaluated. Relevant parameters are: ammonia nitrogen (minimum 4–5%), phosphoric anhydride (P_2O_5) soluble in neutral ammonium citrate (minimum 8%), phosphoric anhydride soluble in mineral acid (minimum 20%), phosphoric anhydride soluble in 2% citric acid, magnesium oxide soluble in mineral acid (Vanhoof and Tirez, 2014). The mutual recognition procedure only starts when a complete dossier is submitted. The time limit for processing the application is four months starting from receipt of the complete dossier (and payment of €1500) (DG Animals Plants and Food & Service Pesticides and Fertilisers, 2013). The Federal Agency for the Safety of the Food chain (FAVV) acknowledges the companies that meet the requirements of the Royal Decree and controls the compliance of the product norms.

More information: Federal Agency for the Safety of the Food chain (FAVV), info@favv.be; Erik Meers, Ghent University and Biorefine Cluster Europe, erik.meers@ugent.be.

5. Flemish legislation: VLAREMA

In Flanders, the Public Waste Agency of Flanders (OVAM), grants resource declarations to use struvite as a fertilizer or soil amendment. To obtain a resource declaration, the environmental quality standards (heavy metals, dry and organic matter and pH) for the use as struvite are evaluated. The product needs to meet the composition requirements regarding the maximum content of pollutants as described in annex 2.3.1 of VLAREMA (Flemish Regulation on Sustainable Management of Material Cycles and Waste Materials). Up to now, the recovered struvite products that received a resource declaration originate from industrial wastewater from potato processing companies (Vanhoof and Tirez, 2014).

More information: Flemish Nutrient Platform/ Public Waste Agency of Flanders (OVAM), info@ovam.be.

6. French legislation: Les Matières Fertilisantes sont définies en France par une loi (n° 79-595 du 13 juillet 1979)

In France fertilizing products, including struvite, that are not covered by the French standard NFU for organic fertilizers (NFU 42001) and organic amendments (NFU 44051), are defined by the law n° 79-595 from 13 July 1979. The producer must have a marketing approval before selling the products.

The approval is linked to 1 production site and 1 product or 1 family of products. The application for authorization requires a technical folder with analysis.

More information: Adeline Haumont, Association d'Initiatives Locales AILE, adeline.haumont@aile.asso.fr.

7. German legislation: Fertiliser Act (DüG) and Fertiliser Ordinance (DüV) and Ordinance on Fertiliser Quality (Düngemittelverordnung, DüMV)

In Germany, the manufacturing, marketing and use of fertilizers, soil improvers, culture media and plant aids are governed by the Fertilizer Act (DüG) and its regulations. The Düngemittelverordnung (DüMV) (fertilizer regulation) implemented in 2008 and revised in 2012 specifies the requirements for putting fertilisers on the market. Compliance with these requirements is monitored by official fertilizer transport controls known as Düngemittelverkehrskontrolle (DVK). The Düngeverordnung (DüV) regulation describes the usage criteria in accordance with good agricultural practice for fertiliser use. These criteria are amongst others determining fertilizer needs, the timing of fertilizer application, buffer strips for surface waterbodies, and rules concerning ammonia emission abatement. The Düngeverordnung regulation also transposes the Nitrates Directive 91/676/EEC into German law (Umwelt Bundesamt, 2014; Christian Kabbe, personal communication).

Recovered phosphorus (including struvite) is categorized in Annex II of the Ordinance on Fertiliser Quality (DüMV) as type 6.2.4 Phosphate precipitates (Christian Kabbe, personal communication; German Federal Ministry of Justice and Consumer Protection, 2012). In May 2008 struvite from the wastewater treatment plant (WWTP) of Waßmannsdorf was registered as mineral P fertiliser according to the German Fertiliser Ordinance (DüMV) by Berlin Water Utilities (BWB) after 2 years of discussion and optimisation of the precipitated struvite together with the local authorities in order to get the certification by the Federal Ministry of Food, Agricultlure and Consumer Production (Kern, 2009). Struvite products from other companies need to meet the same requirements (Fabian Kraus, personal communication).

More information: German Phosphorus Platform (DPP), info@deutsche-phosphor-plattform.de.

8. United Kingdom

In the United Kingdom, there is no legal requirement for an export certificate for fertilisers. Fertilisers scan be sold to all Member States of the European Union without having to comply with the domestic requirements and legislation of those countries. However, in order to do so, the fertiliser must be an "EC fertiliser" or "EEC fertiliser" which are listed in the EU Fertiliser Regulation (EC 2003/2003) (see above). In case the fertilisers are exported to non-EU countries, the authorities in the destination country should be contacted about their import requirements.

More information: UK Department for Environment, Food & Rural Affairs (Defra), fertilisers@defra.gsi.gov.uk.

9. Acknowledgements

The authors wish to thank Christian Kabbe and Fabian Kraus from the Kompetenzzentrum Wasser Berlin and the P-REX consortium for delivering clear information on the German fertilizer regulation.

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