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Directorate B. Multilateral relations, quality policy
B.4. Organics

Expert Group for Technical Advice on Organic Production

EGTOP

Final Report on Organic Fertilizers And Soil Conditioners (II)

The EGTOP adopted this technical advice at the 12th plenary meeting of 14 - 15 December 2015 and submitted the final version on 2 February 2016.

About the setting up of an independent expert panel for technical advice

With the Communication from the Commission to the Council and to the European Parliament on a European action plan for organic food and farming adopted in June 2004, the Commission intended to assess the situation and to lay down the basis for policy development, thereby providing an overall strategic vision for the contribution of organic farming to the common agricultural policy. In particular, the European action plan for organic food and farming recommends, in action 11, establishing an independent expert panel for technical advice. The Commission may need technical advice to decide on the authorisation of the use of products, substances and techniques in organic farming and processing, to develop or improve organic production rules and, more in general, for any other matter relating to the area of organic production. By Commission Decision 2009/427/EC of 3 June 2009, the Commission set up the Expert Group for Technical Advice on Organic Production.

EGTOP

The Group shall provide technical advice on any matter relating to the area of organic production and in particular it must assist the Commission in evaluating products, substances and techniques which can be used in organic production, improving existing rules and developing new production rules and in bringing about an exchange of experience and good practices in the field of organic production.

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The report of the Expert Group presents the views of the independent experts who are members of the Group. They do not necessarily reflect the views of the European Commission. The reports are published by the European Commission in their original language only.

http://ec.europa.eu/agriculture/organic/home_en

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- **Roger Hitchings** (Struvite).

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All declarations of interest of Permanent Group members are available at the following webpage:
http://ec.europa.eu/agriculture/organic/home_en

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1. EXECUTIVE SUMMARY

The Expert Group for Technical advice on Organic Production (EGTOP), hereinafter called “the Group”, has considered whether the use of the substances in the second EGTOP fertilizers and soil conditioners mandate is in line with the objectives, criteria and principles as well as the general rules laid down in Council Regulation (EC) No 834/2007¹ and, hence, can be authorised to be used in organic production under the EU organic farming legislation. The Group concludes, on the basis of the knowledge available in the Group, the information gathered, the information provided in the dossiers from the Member states and by the Commission that:

The use of **iodine** as a fertilizer is NOT in line with the objectives, criteria and principles of organic farming and should not be included in Annex I to Commission Regulation (EC) No 889/2008².

Struvite cannot be included in Annex I to Regulation (EC) No 889/2008 because it is not authorised under Regulation (EC) No 2003/2003 at the present time. The Group concluded that the use of Struvite as a fertilizer should be considered to be in line with the objectives, criteria and principles of organic farming, although this is not specifically covered by the current Regulation. If Struvite were authorized under Reg (EC) 2003/2003, the Group recommends that it should be included in Annex I provided that the method of production ensures hygienic and pollutant safety.

Renewable calcined phosphate cannot be included in Annex I to Regulation (EC) No 889/2008 because it is not authorised in Regulation (EC) No 2003/2003, at the present time. The Group concluded that the use of renewable calcined phosphate as a fertilizer should be considered to be in line with the objectives, criteria and principles of organic farming, although this is not specifically covered by the current Regulation. If renewable calcined phosphate were authorized under Reg (EC) 2003/2003, the Group recommends that it should be included in Annex I with the following restrictions: (i) produced from municipal waste water sludge; (ii) Cr (VI) not detectable and (iii) other heavy metal contamination is minimised.

The Group considers that, while Articles 4 and 5(c) of Regulation (EC) No 834/2007 do not include human wastes, they do not specifically exclude them either. Products from human wastes have not previously been included in Annex I to Regulation (EC) No 889/2008. The Group believes there is no conflict in theory with the recycling of human wastes in organic farming but that their exclusion is due to concerns about potential pathogens and other contaminants. If necessary, the EU organic regulation should include specific mention of the principle of recycling human wastes subject to meeting hygiene and pollutant standards, for example by amending Article 5(c) of 834/2007 to include reference to human wastes.

Xylite is in line with the objectives, criteria and principles of organic production and should be added in Annex I to Regulation (EC) No 889/2008 with the following restriction: Only if obtained as by-product of mining activities (e.g. by-product of brown coal mining).

¹ Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91 (OJ L 189, 20.7.2007, p. 1)

² Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control (OJ L 250, 18.9.2008, p.1)

Hydrolysed proteins of plant origin are in line with the objectives of organic farming and should be included in Annex I to Regulation (EC) No 889/2008. The restriction imposed to hydrolysed proteins of animal origin (not to be applied to edible parts of the crop) should not be imposed to this material.

Industrial lime from sugar cane production is in line with the objectives of organic farming and should be included in Annex I to Regulation (EC) No 889/2008. The Group proposes to amend the specific conditions for industrial lime from sugar production in Annex I to Regulation (EC) No 889/2008. Therefore it should now read “By-product of sugar production from sugar beet and sugar cane”.

The Group was further asked by the Commission to give advice on:

- i) production and processing methods commonly applied to fertilizers;
- ii) additives and preservatives in commercial fertilizers;
- iii) specification of use categories in Annex I to Regulation (EC) No 889/2008;
- iv) specification of limits of heavy metals in categories in Annex I to Regulation (EC) No 889/2008;
- v) plant extract as fertilizers;
- vi) a fast-track reviewed procedure for non-problematic fertilizers such as soil conditioners.

Re i): In the Group’s opinion, composting, fermentation and other forms of biological degradation of organic matter, including the use of GMO-free microorganisms and fauna, are natural processes and should be allowed for all substances mentioned in Annex I to Regulation (EC) No 889/2008.

In the Group’s opinion, mechanical and physical processing methods, except those producing nanoparticles and other methods of micronization, should be allowed for all raw materials mentioned in Annex I to Regulation (EC) No 889/2008. Methodologies producing nanoparticles and other techniques of micronization should not be automatically allowed, but should be evaluated on a case by case basis with a dossier provided by a Member State. In the Group’s opinion, dehydration should be allowed for all raw materials mentioned in Annex I to Regulation (EC) No 889/2008. As regards pyrolysis, the Group agrees with the use of this method, but is concerned about the potential negative side effects as a consequence of the mismanagement of the process. For this reason, products obtained from pyrolysis should not automatically be approved but a dossier should be submitted for evaluation. Combustion should remain allowed but any additional products obtained from combustion should be evaluated according to the established procedures. The Group has no objections to the use of water and enzymes (provided that they are not produced by GMO). As regards acids, alkalis or organic solvents, the Group considers that these should not be generally authorised. The use of such substances should be authorised only after case by case evaluation. To ensure a smooth transition to the principles outlined here, the Group suggests that processing methods not mentioned in this chapter should remain authorised for a transitional period of 2 – 3 years. During this period, the sector may evaluate alternative production methods from the list mentioned here. If these are unsuccessful, a dossier for the authorization of additional production methods will have to be submitted.

Re ii): There are no specific references for additives and preservatives in the EU organic regulations. Therefore, the Group has no legal basis for producing a list of permitted preservatives for fertilizers. The Group considers that substances in Annex I to Regulation (EC) No 889/2008 can be used as agronomic additives either as single substances or combination of

substances. This is an issue that should be discussed in the future and the Group recommends that the Commission discusses it in the event that Regulation (EC) No 2003/2003 is revised. However, as a general rule, in the Group's opinion a technological additive should not normally be present in organic fertilizers and should only be used when there is a clearly demonstrated need. For example, technological additives may be necessary in some liquid fertilizers. As far as Leonardite – Potassium humate is concerned, the Group considers this as a specially processed form of leonardite (which is already authorized). Since the production and processing methods and the additives and preservatives utilized were not reported in the [provided dossier](#), the Group could not evaluate the product.

Re iii): In the Group's opinion, the three categories "Composted or fermented mixture of household waste", "Composted or fermented mixture of vegetable matter" and "Biogas digestate containing animal by-products co-digested with material of plant or animal origin", should be kept as they are in the last revision of Annex I to Regulation (EC) No 889/2008.

Re iv): The Group considers that no additional limits of heavy metals in existing categories of Annex I to Regulation (EC) No 889/2008 are needed, but strongly affirms the need that at European level, any limit on heavy metal is determined as a result of the application of a rigorous scientific methodology. In the Group's opinion, a holistic and comprehensive approach which takes into account the contributions of all the steps of the production chain can be successful in the reduction of the total load of heavy metals applied to agricultural soils.

Re v): In the Group's opinion, plant extracts as fertilizers are considered to be covered under the category of *Products and by-products of plant origin for fertilizers* of Annex I to Regulation (EC) No 889/2008. Regarding plant extracts, the Group has no objections to the use of water and enzymes (provided that they are not produced by GMO). In order to achieve the desired effect as plant strengthener/biostimulant, it may sometimes be necessary to carry out the extraction with acids, alkalis or organic solvents. In these cases, the Group recommends that acids, alkalis or organic solvents may be used, because of the potential positive effects of plant strengthening on organic production.

Re vi): In the Group's opinion the term 'non-problematic' (uncomplicated or "less problematic") is too subjective and potentially misleading. In the Group's opinion it is crucial that the approval of substances authorized as organic fertilizers and soil conditioners remains fully under the control of the current procedure. Thus, the disadvantages of the proposed fast-track review of approval are considered to carry more weight than the advantages. In the group's opinion all proposed inputs should be equally evaluated but the overall process should be speeded up.

2. BACKGROUND

In recent years, several Member States have submitted dossiers under the second subparagraph of Article 21(2) of Regulation (EC) No 834/2007 concerning the possible inclusion, deletion or change of conditions of use of a number of substances in Annex I to Regulation (EC) No 889/2008, or more generally, on their compliance with the abovementioned legislation. Furthermore, several Member States have also requested an evaluation of some techniques used in fertilizer production in terms of their usefulness to and compliance with the EU organic

farming legislation. Therefore, the Group is requested to prepare a report with technical advice on the matters included in the terms of reference.

3. TERMS OF REFERENCE

In the light of the most recent technical and scientific information available to the experts, the Group is requested:

1. To answer if the use of the substances listed below are in line with the objectives, criteria and principles as well as the general rules laid down in Regulation (EC) No 834/2007 and, hence, can be authorised for use in organic production under the EU organic farming legislation:

- LT dossier (2009): Iodine as a fertilizer.
- AT dossier (2011): Renewable calcined phosphate as a fertilizer.
- AT dossier (2011): Xylite as a soil enhancer.
- EL dossier (2012): Amino 16, mixture of amino acids as a soil conditioner.
- UK dossier (2014): Struvite (Magnesium ammonium phosphate hexahydrate) as a fertilizer.
- PT dossier (2014): Industrial lime from sugar cane production as a soil enhancer.

2. To assess which of the production and processing methods commonly applied to fertilizers, like simple processes and treatments (e.g. drying, chopping, composting and fermentation) or more sophisticated techniques (e.g. micronization in High-Tech-Nano mills), used in EU organic farming, in particular the processing of by-products of plant and animal origin, are in line with the organic farming principles and which ones should be rejected. In addition, The Group is asked to evaluate to which degree additives and preservatives in commercial fertilizers for organic production may be accepted. In relation to this question, Czech Republic submitted a dossier regarding Leonardite – Potassium humate (which is already authorised) to be used in liquid as well as in raw form.

3. Also it is proposed that the group assesses whether it would make sense to group in a single category the currently separated categories "Composted or fermented mixture of household waste", "Composted or fermented mixture of vegetable matter" and "Biogas digestate containing animal by-products co-digested with material of plant or animal origin as listed in Annex I".

Lastly, the group is asked whether it would be appropriate to propose limits of heavy metals for relevant categories of fertilisers in Annex I to Regulation (EC) No 889/2008 in a similar way to "composted or fermented mixture of household waste" and "sapropel".

4. DK question about plant extracts: To which degree are these covered by annex I to Regulation (EC) 889/2008? If accepted as fertilisers, should specific extraction methods be required or prohibited?

5. The Group is also asked to give its opinion about having a fast-track reviewed procedure for the less problematic substances such as soil conditioners.

4. CONSIDERATIONS AND CONCLUSIONS

4.1 Iodine

Introduction, scope of this chapter

The dossier of the Member State asks for the inclusion of iodine as a microelement in Annex I to Regulation (EC) No 889/2008 for organic production although the dossier proposes its use as an integral part of a commercial product. In the group's opinion the dossier focused on the description of the commercial product rather than on iodine. According to the request, biologically active iodine acts in the commercial product as a sterilizer. Sterilizers are biocides, and are not listed in Annex I to Regulation (EC) No 889/2008. This evaluation is concerned with iodine as fertilizer.

Iodine is an element found in nature in several valence states and in a range of inorganic and organic forms including iodide (I^-), iodate (IO_3^-), element iodine (I_2) and organic iodine (Shetaya et al., 2012), and its forms depend partly on pH and the redox status of the surrounding environment (Shetaya et al., 2012).

Iodine is an essential trace element for human and animal health, which is used by the thyroid gland in the production of hormones which control a range of physiological processes, but it is not an essential plant nutrient.

Authorization in general production and in organic production

Iodine is not listed as a fertilizer in Regulation (EC) No 2003/2003. In organic Regulation (EC) No 889/2008, iodine is mentioned in Annex VI (Feed additives used in animal nutrition 3b E2 Iodine: — calcium iodate, anhydrous.

Agronomic use, technological or physiological functionality for the intended use

Plants take up iodine even though it is not a plant nutrient. Crop species show variable efficiency in plant iodine uptake (Landini et al., 2012). Increasing iodine applications to the soils can result in an enhanced iodine accumulation in crops (Landini et al., 2012). The request for the inclusion of iodine in Annex I to Regulation (EC) No 889/2008 is intended as a sterilizing component of the commercial product consisting of a mix of biohumus (liquid water soluble material obtained by separating dry and liquid parts of vermicompost), saccharose and biologically active iodine. According to the annex of the dossier, the annual application rate of iodine within the commercial products in experiments for different crops ranged from 0.2 to 1.5 mg I ha⁻¹.

Necessity for intended use, known alternatives

The Group considers that there is no specific necessity for the use of iodine as an essential plant nutrient. The request for the inclusion of iodine as a microelement in Annex I to Regulation (EC) No 889/2008 is not consistent with Article 16(2)(a) and (d) of Regulation (EC) No 834/2007, since iodine is not a required external input.

Manures and composts are already authorized in Annex I to Regulation (EC) No 889/2008 and these can contain significant amount of the different species of iodine. For instance, it has been reported that dried poultry manure contains about 0.5 mg kg⁻¹ of iodine (Ghaly and MacDonald,

2012). Seaweed and seaweed products (Annex I to Regulation (EC) No 889/2008) are also important sources of iodine.

Origin of raw materials, methods of manufacture

The dossier does not provide any useful information on the origin of raw material and nor any details of the methods of manufacture of the iodine. However, the Group has identified brine as the main raw material for iodine production.

Environmental issues, use of resources, recycling

No specific environmental issues identified.

Animal welfare issues

Iodine is noted for its effectiveness as a general biocide in water sanitation as well as in the health care, livestock, dairy, and poultry industries. No specific animal welfare issues have been identified for the hypothetical use as a fertilizer.

Human health issues

There are no identified risks to human health associated with the intended use of iodine beyond the usual precautions. Usage should follow the usual safety protocols. Plant uptake of iodine can be increased by applications of iodine with potential impacts (positive or negative) on animal and human nutrition and health. Despite this, where dietary uptake of iodine is deficient, it may be better to supplement iodine in animal and human diets directly rather than by making iodine applications to plants, given the risks identified.

Food quality and authenticity

Food quality may be affected by iodine application because of plant uptake.

Traditional use and precedents in organic production

No traditional use as a fertilizer is known.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Iodine is not listed among synthetic substances allowed for use in US organic crop production (USDA Organic).

Other relevant issues

None identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

Iodine is not an essential plant nutrient. The Group is not convinced that there is a need for including this element in organic production, especially as it appears to be proposed for use as a

biocide. Iodine is not a common element but there are ways in which it can be supplied within the terms of the existing regulation. The Group would be concerned about the use as a biocide in fertilizers (see chapter on Additives and preservatives on commercial fertilizers below).

Conclusions

The Group concluded that iodine is not a fertilizer according to Regulation (EC) No 2003/2003 and that the use of iodine as a biocide in fertilizers is NOT in line with the objectives, criteria and principles of organic farming and should not be included in Annex I to Regulation (EC) No 889/2008.

4.2 Struvite (magnesium ammonium phosphate hexahydrate)

Introduction, scope of this chapter

The request of the Member State is for the inclusion in Annex I to Regulation (EC) No 889/2008 of Struvite as fertilizer, and this report is concerned with Struvite obtained from municipal waste water treatment plants. Struvite (magnesium ammonium phosphate hexahydrate) is a crystal which is formed with equal molar concentrations of magnesium, ammonium and phosphate combined with six water molecules ($\text{MgNH}_4\text{PO}_4 \cdot 6\text{H}_2\text{O}$), containing about 28 % P_2O_5 , 16.7 % MgO and 5 % N. Struvite is a naturally occurring mineral. However, this request does not deal with the mined mineral, but with Struvite which is artificially produced from wastes as a recycling product.

Authorization in general production and in organic production

Struvite is not listed as fertilizer in Regulation (EC) No 2003/2003, and it is not listed in any Annex to Regulation (EC) No 889/2008.

Agronomic use, technological or physiological functionality for the intended use

Struvite is proposed as a slow release P fertilizer with a higher solubility in the root zone than rock phosphate. This product can be used to satisfy plant needs for phosphorus. Recommended soil application rates are based on expected crop yields.

Necessity for intended use, known alternatives

Phosphorus application to soil is needed for optimal long term sustainable yields. Struvite obtained from waste water treatment plants is a way to reuse phosphorus and nitrogen and is in accordance with the principle of minimisation of the use of non-renewable resources (see Article 5(b) of Regulation (EC) No 834/2007). There are organic sources of phosphorus in Annex I to Regulation (EC) No 889/2008 (poultry manure, animal excrements, etc.) which not only supply the needed phosphorus but also maintain and enhance soil life, soil fertility and soil stability, but whose use is sometimes limited by the presence of other nutrients (e.g. nitrogen). Soft ground rock phosphate and aluminium-calcium phosphate are known inorganic alternatives already authorised although sources are not renewable for the former and the latter is not available in the market. Depending on the origin, the levels of heavy metals (e.g. cadmium) in soft ground rock phosphate can be high.

Origin of raw materials, methods of manufacture

Struvite is mainly obtained from precipitation at waste water treatment plants, and can also be recovered from animal waste processing. There are different processes for obtaining Struvite (Wollmann and Möller 2015). Depending on the origin of the waste water and of the processes, the quality and purity of the final product may be different.

Struvite forms naturally at waste water treatment works as a precipitate and forms crystals which can create restrictions in pipework carrying waste materials. Struvite can also be produced under controlled conditions. The pH of waste water from the separation of bio-solids at waste water treatment works is increased and a small quantity of magnesium salt is added to start crystal growth/nucleation.

Environmental issues, use of resources, recycling

The production of Struvite from waste water treatment plants through precipitation reduces the possibility of pollution from phosphate and nitrogen entering surface waters. Since Struvite is derived from a continuously produced waste, P, N and some Mg are recycled and reused. The risk of P, N and Mg leaching from Struvite after application to soil is low in neutral-to-basic soils when the application rate is matched to crop demands and soil analysis. The load of chemicals (HCl, H₂SO₄, CO₂, H₂O₂) consumed in some production processes can be high and can give rise to some concern (Wollmann and Möller, 2015).

The use of a recycled source of phosphorus such as Struvite could partially replace the application of soft rock phosphate which is considered to be a non-renewable source of P. Data on emissions during the production process of Struvite are very scarce.

Animal welfare issues

No issues identified.

Human health issues

Some organic contaminants, viruses and microorganisms of human origin might be trapped during the processes of precipitation and/or nucleation used to produce Struvite. There is a lack of data on the degree of transfer of these potential contaminants to precipitation products and the influences of the characteristics of the source materials. Few studies are available on the presence of persistent organic pollutants (POPs) in Struvite. There is a range of processes (for example, Pearl, Stuttgart, Gifhorn processes) for the production of Struvite and it has been reported (Wollmann and Möller, 2015) that in some of them (e.g. Pearl process) low levels of human pathogens and POPs were detected.

Food quality and authenticity

The presence of organic pollutants and pathogens might have an impact on product quality, but there are not enough data available to evaluate this aspect at the moment.

Traditional use and precedents in organic production

It is a new product and therefore no traditional use or precedents are known.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Struvite is not listed in the list of synthetic substances allowed for use in US organic crop production (USDA Organic).

Other relevant issues

None identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

The Group considers the recovery of phosphorus from waste water treatment plants as a valuable contribution to the closing of nutrient cycles and to the reduction of the use of non-renewable sources of phosphorus (see Section 4.4). Because Struvite is not currently listed as a fertiliser in Regulation (EC) 2003/2003, it cannot be included in Annex I to Regulation (EC) No 889/2008 at this time. If Struvite is listed in the revision of Reg (EC) 2003/2003, the Group suggests that it should be included in Annex I without further consultation of the Group and without the submission of another dossier. Waste water often contains organic pollutants and pathogens, and the Group underlines that only Struvite which poses no hygienic risks should be used. The Group assumes that only such forms of Struvite will be authorized under Regulation 2003/2003. The request mentions several production methods. For Pearl process, it was shown that there is no hygienic risk, but the dossier does not prove this for the other production methods.

As far as the waste water sources are concerned, the Group agrees that wastes coming from animal husbandry should be preferably re-used directly rather than used for Struvite production because this is a more efficient way of re-using organic matter and nutrients.

The Group therefore suggests that, if Struvite is to be included in Annex I the production process should preferably be based on the use of municipal waste water.

Conclusions

Struvite cannot be included in Annex I to Regulation (EC) No 889/2008 because it is not authorised under Regulation (EC) No 2003/2003 at the present time. The Group concluded that the use of Struvite as a fertilizer should be considered to be in line with the objectives, criteria and principles of organic farming, although this is not specifically covered by the current Regulation.

If Struvite were authorized under Reg (EC) 2003/2003, the Group recommends that it should be included in Annex I provided that the method of production ensures hygienic and pollutant safety.

4.3 Renewable calcined phosphate

Introduction, scope of this chapter

The dossier requests that calcined phosphate is included as a fertiliser in Annex I to Regulation (EC) No 889/2008. The particular type of calcined phosphate in this case is produced by thermal treatment of ash produced during the combustion/incineration of a diversity of organic matter rich materials of different origin.

Authorization in general production and in organic production

Calcined phosphate is included in Regulation (EC) No 2003/2003, but the listing only applies to thermally treated phosphate rock. Calcined phosphate derived from waste is being approved by the German Fertilizer Regulation for application on soils for crop production and forestry. Aluminium-calcium phosphate, as specified in point 6 of Annex IA.2. to Regulation (EC) No 2003/2003, is already in Annex I to Regulation (EC) No 889/2008. It should be noted that

calcined phosphate derived from the heat treatment of rock phosphate is specified in point 5 of Annex IA.2. to Regulation (EC) No 2003/2003 but not in Annex I to Regulation (EC) No 889/2008.

Agronomic use, technological or physiological functionality for the intended use

According to the dossier the total phosphorus concentration of renewable calcined phosphate is about 20 % P₂O₅. This product can be used to satisfy plant needs for phosphorus. Soil application rates according to expected crop yield are recommended.

Necessity for intended use, known alternatives

Phosphorus application to soil is needed for an optimal long term sustainable yield. Calcined phosphate obtained from ash from the burning of phosphorus rich organic matter is a way to reuse phosphorus and is in accordance with Article 5(b) of Council Regulation (EC) No 834/2007. There are organic sources of phosphorus in Annex I to Regulation (EC) No 889/2008 (poultry manure, animal excrements, etc.) which not only supply the needed phosphorus but also maintain and enhance soil life, soil fertility and soil stability, but whose use is sometimes limited by the presence of other nutrients (e.g. nitrogen). Soft ground rock phosphate and aluminium-calcium phosphate are known inorganic alternatives already authorised although sources are not renewable for the former and the latter is not available in the market. Depending on the origin, levels of heavy metals (e.g. cadmium) in the soft ground rock phosphate can be high.

Origin of raw materials, methods of manufacture

According to the dossier, the main raw material for renewable calcined phosphate is ash produced during the combustion/incineration of organic waste of different origins such as wastewater treatment sludge, meat and bone meal, animal manure, harvest plant residues and residues from anaerobic digestion. Ash is mixed with magnesium salts and magnesite and is thermally decontaminated (1000°C) to obtain calcined phosphate.

The group is concerned about the incineration of organic materials such as meat and bone meal, animal manure, harvest plant residues, and agriculture waste residues from anaerobic digestion. These can be applied directly to soils (subject to appropriate treatment) and can provide nutrients such as nitrogen in addition to phosphorus.

Environmental issues, use of resources, recycling

Natural rock phosphate is a limited non-renewable source of phosphorus. The re-utilization and re-use of phosphorus is desirable and highly recommended. A relatively high amount of energy is used during calcination although the dossier claims that the energy use is broadly similar to the extraction and transport of soft rock phosphate. According to the Member State's request, some potential inorganic contaminants are removed during the 1000°C thermal step and collected in filters which are disposed of safely. More detail on the filters and their disposal would have been useful. According to the dossier, the levels of heavy metals such as lead, chromium, copper, nickel, zinc, cadmium and uranium are similar to or lower than in sedimentary rock phosphate which is presently used as the source of soft ground rock phosphate. The group is however concerned about the potential presence of chromium in its hexavalent form (Cr VI).

The Group considers recovery of phosphorus from the incineration of waste water sludge to be desirable, provided that filters are used to capture pollutants, though the Group is concerned about the high consumption of energy.

Animal welfare issues

No specific issue.

Human health issues

No special concern. There are no identified risks to human health associated with the intended use of renewable calcined phosphate beyond the usual precautions. Usage should follow the usual safety protocols.

Food quality and authenticity

No specific issue.

Traditional use and precedents in organic production

In the first version of the EU organic legislation, ‘calcinated aluminium phosphate rock’ was explicitly authorized. The Group could not verify to what extent this substance was identical to the ‘renewable calcined phosphate’ discussed here.

‘Redzlaag’ (calcined aluminium phosphate) has been used in organic production in the past. There is a specific reference to calcined aluminium phosphate in the UK Soil Association Symbol Standards (Lampkin, 1990) prior to the introduction of Council Regulation (EEC) No 2092/91³. This reference may have been carried forward into the earliest version of Regulation (EEC) No 2092/91 but removed in 1994 when the entire annex (Annex II) was replaced under an amending regulation (Commission Regulation (EC) 2381/94⁴). There is no reference to this material in any subsequent organic legislation.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Renewable calcined phosphate is not included in the list of permitted substances in US (USDA Organic) and ash from manure burning is listed as “non-synthetic substances prohibited for use in organic crop production” (USDA Organic).

Other relevant issues

None identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

³ Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs (OJ L 198, 22.7.1991, p. 1)

⁴ Commission Regulation (EC) No 2381/94 amending Annex II to Council Regulation (EEC) No. 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs (OJ L 255, 1.10.94, p. 84)

The Group considers the recovery of phosphorus from waste water treatment plants as a valuable contribution to the closing of nutrient cycles and to the reduction of the use of non-renewable sources of phosphorus (see also Section 4.4). Because renewable calcined phosphate is not currently listed as a fertiliser in Regulation (EC) 2003/2003, it cannot be included in Annex I to Regulation (EC) No 889/2008 at this time. If renewable calcined phosphate were listed in the revision of Reg (EC) 2003/2003, the Group recommends that it should be included in Annex I without further consultation of the Group and without the submission of another dossier.

The Group has some concerns about the high energy consumption, but accepts it because the extraction and transport of soft rock phosphate requires comparable amounts of energy, on the basis of evidence in the dossier provided.

The Group agrees that organic materials such as meat and bone meal, animal manure, plant residues and anaerobically digested agricultural waste residues should be used directly as fertilizers, and not processed to calcined phosphate, because this is a more efficient way of re-using organic matter and nutrients. Therefore, the Group proposes that only renewable calcined phosphate derived from municipal waste water sludge should be authorized.

The Group also suggests that only products where Cr VI is not detectable should be authorized.

Conclusions

Renewable calcined phosphate cannot be included in Annex I to Regulation (EC) No 889/2008 because it is not authorised in Regulation (EC) No 2003/2003, at the present time. The Group concluded that the use of renewable calcined phosphate as a fertilizer should be considered to be in line with the objectives, criteria and principles of organic farming, although this is not specifically covered by the current Regulation. If renewable calcined phosphate were authorized under Reg (EC) 2003/2003, the Group recommends that it should be included in Annex I with the following restrictions: (i) produced from municipal waste water sludge; (ii) Cr (VI) not detectable and (iii) other heavy metal contamination is minimised.

4.4 On the possibility of the use of products from human wastes

While discussing the requests for Struvite and renewable calcined phosphate, the Group raised the question whether the use of human wastes should be authorized in general, and under what conditions. The use of human wastes would help to close nutrient cycles, and in particular to return phosphorus from urban areas back to farmland. From a long-term perspective, this would greatly increase the sustainability of nutrient supplies (particularly for phosphorus).

There are two major concerns over the use of human wastes. Firstly, they contain various human pathogens, particularly those related to diseases of the digestive tract. Secondly, waste water contains a wide range of contaminants mainly originating from the use of cosmetics, drugs and household chemicals. The Group underlines that it is important to manage both these risks, if human wastes are to be used. As illustrated in the chapter on Struvite, there are methods to manage the risks related to pathogens and chemical contaminants.

In the Group's opinion, all human waste products could be authorized, if their production processes effectively eliminate human pathogens and minimize the presence of chemical

contaminants.

The Group considers that, while Articles 4 and 5(c) of Regulation (EC) No 834/2007 do not include human wastes, they do not specifically exclude them either. Products from human wastes have not previously been included in Annex I to Regulation (EC) No 889/2008. The Group believes there is no conflict in theory with their recycling in organic farming – in fact many authors (Oelofse et al. 2013; Løes et al. 2015; Wollmann and Möller 2015), have advocated their use – but that their exclusion is due to concerns about potential pathogens and other contaminants. Human excrements are permitted under the Codex Alimentarius (Guidelines for organically produced food, 2013) subject to certain conditions.

If necessary, the EU organic regulation should include specific mention of the principle of recycling human wastes subject to meeting hygiene and pollutant standards, for example by amending Article 5(c) of 834/2007 to include reference to human wastes.

4.5 Xylite

Introduction, scope of this chapter

Xylite occurs in deposits of lignite in which pieces of wood and some fibrous tissues with different degrees of mineralisation are fossilized and relatively well preserved. According to the dossier this evaluation concerns xylite as a soil conditioner. Xylite is rich in organic matter (about 60 %) with low levels of essential nutrients, trace levels of heavy metals, and a high structural stability.

Authorization in general production and in organic production.

In some Member States, xylite is already in use as a component of substrates. In the absence of specific guidance, the team publishing the inputs list for organic farming in Switzerland has provisionally considered xylite to be authorized, because of the similarity with leonardite.

Agronomic use, technological or physiological functionality for the intended use

Xylite can be used as a peat substitute in substrates which reduces the use of peat. Xylite might improve some physical (bulk density, water holding capacity, etc.) and chemical (increase cation exchange capacity) properties of substrates. According to the dossier, substrates based on xylite should contain between 20-40 % of xylite.

Necessity for intended use, known alternatives

Substrates based on peat (authorised in Annex I to Regulation (EC) No 889/2008 with a limitation to horticultural use only) that are rich in organic matter and with high structural stability, are of importance in horticulture. Xylite could be an alternative to peat. There are other alternatives in Annex I to Regulation (EC) No 889/2008 such as composts that can contribute to peat reduction.

Origin of raw materials, methods of manufacture

Xylite is obtained as a by-product of mining brown coal with minimal processing, mainly mechanical grinding and sieving.

Environmental issues, use of resources, recycling

Xylite is a non-renewable material and its extraction solely for the purpose of being used as soil conditioner could lead to an environmental impact in the medium to long term. Therefore if authorised, only xylite obtained as by-product of coal mining activities should be permitted. The partial replacement of peat by xylite might contribute to the alleviation of the environmental impact of peat extraction.

Animal welfare issues

No specific concern.

Human health issues

No special concern. There are no identified risks to human health associated with the intended use of xylite beyond the usual precautions. Usage should follow the usual safety protocols.

Food quality and authenticity

No specific concern.

Traditional use and precedents in organic production

No traditional use is recorded for xylite but it is used in organic production in Switzerland.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Not known.

Other relevant issues

None have been identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

In the Group's opinion there are no specific disadvantages arising from the use of xylite. Xylite is a non-renewable material and its extraction solely for the purpose of being used as soil conditioner could lead to an environmental impact in the medium to long term. The group is not in favour of coal mining because it is a non-renewable resource and its burning contributes to environmental pollution, affecting public health and climate change. On the other hand, recycling of the by-product of this activity is in line with the organic principles.

Conclusions

Xylite is in line with the objectives, criteria and principles of organic production and should be added in Annex I to Regulation (EC) No 889/2008 with the following restriction: Only if obtained as by-product of mining activities.

4.6 Hydrolysed proteins of plant origin

Introduction, scope of this chapter

Hydrolysed proteins of plant origin are mixtures of polypeptides and amino acids obtained by hydrolysis in acid solution of plant-based protein rich material.

Authorization in general production and in organic production

According to the dossier, products containing hydrolysed proteins are already authorised in Greece for organic production. Hydrolysed proteins of plant origin are also permitted in Germany as by-products of plant origin.

Agronomic use, technological or physiological functionality for the intended use

Hydrolysed proteins of plant origin are organic compounds that are easily mineralised in soil. Therefore, their main agronomic effect is as a source of nitrogen for plant utilisation. The dossier suggests that they can also be used as a foliar feed. The agronomic use is presumed to be similar to the use of hydrolysed proteins of animal origin, which are already listed in Annex I to Regulation (EC) No 889/2008.

Necessity for intended use, known alternatives

Hydrolysed proteins may be used on crops where there is a high nitrogen demand at specific, short phases of their life cycle, in order to achieve desired quality. For organic crops, such as short-cycled vegetables, there are few materials available which may be used for liquid fertilization/fertigation (see Annex I to Regulation (EC) No 889/2008). Hydrolysed proteins of animal origin have a similar function. In Germany, hydrolysed proteins from plant origin are available and are used as an alternative.

Origin of raw materials, methods of manufacture

According to the dossier, the raw materials for the production of hydrolysed proteins include corn, wheat and soy flour. The raw materials and enzymes are stated as GMO free. Methods of manufacture are mainly based on the use of enzymes and acid treatments at high temperatures and pressures.

Environmental issues, use of resources, recycling

Nitrogen losses should not occur if good agricultural practices are followed. Chemical hydrolysis processes have potential, negative environmental implications such as energy and chemical use. On the other hand, materials which are already present in Annex I to Regulation (EC) No 889/2008 such as hydrolysed proteins of animal origin, seaweed products or industrial lime from sugar beet production are also obtained with treatments in acidic and alkaline environments. If the raw materials are by-products from other processes then resource use efficiency is increased.

Animal welfare issues

No issues identified.

Human health issues

No special issue. There are no identified risks to human health associated with the intended use of hydrolysed proteins of plant origin beyond the usual precautions.

Food quality and authenticity

Hydrolysed proteins of plant origin may contribute to the achievement of desired qualities (e.g. protein content) of the commercial product.

Traditional use and precedents in organic production

Hydrolysed proteins of plant origin have been registered as plant strengtheners in Germany, and could thus be used in German organic farming. In addition, hydrolysed proteins can be used in Italy as biostimulants (Decreto Lgs. 75/2010).

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Natural amino acids derived from plants, animals and microorganisms that have not been genetically modified are permitted by USDA Organic (NOP). Chemical hydrolysis is not allowed.

Other relevant issues

No other relevant issues have been identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

Hydrolysed proteins of plant origin can be obtained using similar methods of production as for hydrolysed proteins of animal origin which are already approved. The product does not raise any ethical concerns among vegetarians. Only raw material from by-products of plant material which cannot be used for food and feed should be allowed. Fertilisers based on hydrolysed plant or animal origin should only be used as a supplementary N source and not as a substitute for basic fertility maintenance as set out in Article 12(1)(b) of Regulation (EC) No 834/2007.

Conclusions

The group considers hydrolysed proteins of plant origin to be in line with the objectives of organic farming and should be included in Annex I to Regulation (EC) No 889/2008. The restriction imposed to hydrolysed proteins of animal origin (not to be applied to edible parts of the crop) should not be imposed on this material.

4.7 Industrial lime from sugar cane production

Introduction, scope of this chapter

The Group was asked whether industrial lime from sugar cane production can be authorized as a soil pH adjustment for acid soils and as a calcium fertilizer. Industrial lime from sugar production is authorized in organic production, but it has the restriction ‘By-product of sugar production from sugar beet’ (Regulation (EC) No 889/2008). Industrial lime from sugar cane production is produced from residues of sugar cane (*Saccharum spp.*) obtained during the transformation of sugar cane into sugar. Organic matter levels are relatively high, levels of calcium are very high, and pH is strongly alkaline.

Authorization in general production and in organic production

Industrial lime from sugar production is authorized in organic production, but it has the restriction ‘By-product of sugar production from sugar beet’ (Regulation (EC) No 889/2008).

Agronomic use, technological or physiological functionality for the intended use

Calcium is relatively abundant in soils and rarely limits crop production. Calcium is a component of cell walls and is also important for cell division, permeability of cell membranes and nitrogen metabolism. In the soil, calcium helps to maintain chemical balance, reduce soil salinity, and might improve water penetration and soil structure, especially in clay soils. Industrial lime from sugar cane might have similar agronomic properties as industrial lime from sugar beet.

Necessity for intended use, known alternatives

Because of the high content of calcium and high pH, application of industrial lime from sugar cane could improve the level of calcium and pH in low calcium and low pH soils. Other alternatives already authorized in organic production include calcium carbonate, magnesium and calcium carbonate, gypsum of natural origin and industrial lime from sugar beet production (Annex I to Regulation (EC) No 889/2008).

Origin of raw materials, methods of manufacture

Industrial lime from sugar cane is produced from *Saccharum spp* residues. During the production and refining of sugar from sugar cane, calcium hydroxide (Ca(OH)_2) and CO_2 are added to the sugar cane molasses. A calcium carbonate precipitate is obtained which retains some of the compounds of the raw material of the suspension such as organic matter. Calcium hydroxide is made by mixing quicklime and hot water in a drum and CO_2 is taken from the steam-raising boiler’s exhaust. The production process for industrial lime from sugar cane is similar to that for producing industrial lime from sugar beet which is already authorized for organic farming (Annex I to Regulation (EC) No 889/2008).

Environmental issues, use of resources, recycling

Industrial lime from sugar cane has similar environmental properties to industrial lime from sugar beet. The use of industrial lime from sugar cane production provides a use for the main by-product of the sugar production industry and could contribute to the reduction of other natural non-renewable sources of calcium already authorized in organic production.

Animal welfare issues

No specific concerns.

Human health issues

No special issue. There are no identified risks to human health associated with the intended use of industrial lime from sugar cane production for the application on soils.

Food quality and authenticity

No specific concerns.

Traditional use and precedents in organic production

Residues of sugar cane and sugar beet have long been applied to soil in areas of sugar cane/beet production. There is a strong precedent in the fact that industrial lime from sugar beet is already approved for use in organic farming.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

The lime is produced through a synthetic reaction. For this reason, it would not be allowed by USDA Organic (NOP).

Other relevant issues

No relevant issues identified.

Reflections of the Group / Balancing of arguments in the light of organic production principles

The group considers that the use of industrial lime from sugar cane (which is similar to that of sugar beet already authorised) provides a means of utilising the main by-product of the sugar production industry, and could contribute to the reduction of other natural non-renewable sources of calcium already authorized in organic production.

Conclusions

The group considers industrial lime from sugar cane production to be in line with the objectives of organic farming and should be included in Annex I to Regulation (EC) No 889/2008. The Group proposes to amend the specific conditions for industrial lime from sugar production in Annex I to Regulation (EC) No 889/2008. Therefore it should now read “By-product of sugar production from sugar beet and sugar cane”.

4.8 Production and processing methods for fertilisers

Production and processing methods applied to fertilizers have always been the subject of controversial debates. This is partially due to the fact that Annex I to Regulation (EC) No 889/2008 lists both fertilisers specified by Regulation (EC) No 2003/2003 and other items such as, for example, soil conditioners, organic fertilisers and other organic materials which are not encompassed by the European fertilizer legislation. In many cases, some of these items are regulated by national legislation which is not always acknowledged by other Member States.

Moreover, many of the organic materials listed in Annex I to Regulation (EC) No 889/2008 cannot be directly applied to soil without some degree of physical, chemical or biological processing. Since processing methods can significantly change the physico-chemical characteristics of the fertilisers and the availability of nutrients, the methods themselves are often under critical evaluation. In the following sections, the Group reports its position on the more diffused methods of processing for fertilisers. This evaluation was made without the support of specific dossiers submitted by Member States, consequently the Group only provides a general overview of the issue.

In the following chapter, the production processes have been evaluated on their own merits. However it must be stated that in the evaluation of a product, the process should be evaluated in combination with the product. Moreover, there may be a range of different processes for the production of a certain product which might lead to different recommendations of the appropriate processing methods to be used.

4.8.1 Biological methods

Composting and fermentation are mentioned several times in Annex I to Regulation (EC) No 889/2008, in the context of animal excrements and plant materials.

Conclusions

In the Group's opinion, composting, fermentation and other forms of biological degradation of organic matter, including the use of GMO free microorganisms and fauna, are natural processes and should be allowed for all substances mentioned in Annex I to Regulation (EC) No 889/2008.

4.8.2 Mechanical and physical methods (except thermal methods)

Mechanical and physical processing methods do not change the chemical composition of the raw materials. They influence mainly particle size and also purity. They include methods such as:

- Grinding (up to micrometers particles sizes, larger than 100 nanometers).
- Grading, sieving.
- Centrifugation.
- Crystallization.
- Granulation, pelletization.

Specific aspects of particle size

A Member State inquired about micronization of fertilizers and soil conditioners. Micronization is a process of reducing the average diameter of a particle. Usually the term micronization is used when the particles that are produced are only a few micrometers in diameter (Joshi, 2011). In the Group's opinion traditional methods of micronization (milling, bashing and grinding) are acceptable. However, methods involving other techniques (such as supercritical fluids) may need to be reviewed.

In contrast, the Group is concerned about methods producing nanoparticles (particles smaller than 100 nm). Nanoparticles sometimes have unique properties or behavior attributable to that particle size, which deviates from larger particles of the same material. Thus, nanoparticles have to be considered as new materials, and a separate evaluation is necessary.

Conclusions

In the Group's opinion, mechanical and physical processing methods, except those producing nanoparticles and other methods of micronization, should be allowed for all raw materials mentioned in Annex I to Regulation (EC) No 889/2008.

Methodologies producing nanoparticles and other techniques of micronization should not be automatically allowed, but should be evaluated on a case by case basis with a dossier provided by a Member State.

4.8.3 Thermal methods

Thermal methods can be grouped into dehydration, pyrolysis and combustion according to their influence on the chemical composition of the raw materials.

Dehydration

Dehydration is a physical method that removes water from the raw material without changing its chemical composition. It takes place at temperatures below or slightly above 100 °C. Dehydration is mentioned in Annex I to Regulation (EC) No 889/2008 for farmyard and poultry manure.

Dehydration is an important method to stabilize organic materials, and helps to avoid hygienic risks. The Group assumes that dehydration is applied to a wide range of fertilizers used in organic production.

Pyrolysis

Pyrolysis is a thermochemical decomposition of organic material at elevated temperatures in the absence of oxygen or at low levels of oxygen. It involves the simultaneous change of chemical composition and physical phase, and is irreversible. It takes place at temperatures between 200 and 900 °C. The best-known example of pyrolysis is the production of charcoal from wood. No products produced by pyrolysis are mentioned in Annex I to Regulation (EC) No 889/2008, and it is therefore considered by the authorities of some member states not to be authorized. Some authorities, however, consider pyrolysis to be implicitly allowed by the listing of 'wood ash' in Annex I to Regulation (EC) No 889/2008. The group is not concerned about properly managed pyrolysis processes, but is concerned about potential mismanagement that leads to the production of contaminants such as PACs (polycyclic aromatic carbonates).

Combustion

Combustion (burning) is an exothermic process which takes place in the presence of oxygen, at temperatures above 700 °C. Wood ash which is produced by combustion is already mentioned in Annex I to Regulation (EC) No 889/2008.

Conclusions

In the Group's opinion, dehydration should be allowed for all raw materials mentioned in Annex I to Regulation (EC) No 889/2008. As regards pyrolysis, the Group agrees with the use of this

method, but is concerned about the potential negative side effects (e.g. emission of pollutants, Conesa et al., 2009) as a consequence of the mismanagement of the process. For this reason, products obtained from pyrolysis should not automatically be approved but a dossier should be submitted for evaluation. Combustion should remain allowed but any additional products obtained from combustion should be evaluated according to the established procedures.

4.8.4 Extraction and hydrolysis

Extraction is a separation process, where the desired substance is dissolved and separated from a solid or liquid matrix. Various extractants (solvents) can be used, and the process can be done at various temperatures and pressures.

Water is the most widely used extractant. Weak acid and alkaline solutions are other important extractants.

Hydrolysis is a process, where complex molecules are cleaved by addition of water molecules. Hydrolysis can be performed with water, with various acid and alkaline solutions, or with enzymes. Heat and increased pressure can be used in some cases.

Conclusions

The Group has no objections to the use of water and enzymes (provided that they are not produced by GMO). As regards acids, alkalis or organic solvents, the Group considers that these should not be generally authorized. The use of such substances should be authorised only after case by case evaluation.

General consideration

The majority of processing and production methods known to the Group have been considered and listed above, but this does not exclude the possibility that additional methods of production could already be in use or may be utilised in the future. The production methods for some mineral fertilisers (e.g. trace elements) were not considered here as the main focus was on the products and by-products of plant and animal origin.

Transitional measures

Currently, there are no restrictions on processing methods for producing fertilisers. If authorized processing methods should be specified by the organic regulation in the future, the Group suggests that processing methods not mentioned in this chapter should remain authorized for a transitional period of 2–3 years, to ensure a smooth transition to the principles outlined here. During this period, the sector may evaluate alternative production methods from the list mentioned here. If these are unsuccessful, a dossier for the authorization of additional production methods will have to be submitted and should preferably be evaluated before the transitional period terminates.

4.9 Additives and preservatives in commercial fertilizers

There are no specific references for fertilizer additives and preservatives in the EU organic regulations.

There are two kinds of fertilizer additives: agronomic and technological additives (Traon *et al.*, 2014). An **agronomic additive** is *any substance or microorganism, in the form in which it is supplied to the user, added to a fertiliser, soil improver, growing medium with the intention to improve the agronomic efficacy of the final product and/or to modify the environmental fate of the nutrients released by the fertiliser, the soil improver or the growing medium, or any combination of such substances and/or microorganisms intended for this use.* On the other hand, a **technological additive** is used to improve the manufacturing, processing, preparation, treatment, packaging, transport or storage of fertilizers without any direct agronomic effects. In the Group's opinion, preservatives are a form of technological additive.

The Group considers that all substances in Annex I to Regulation (EC) No 889/2008 can be used as agronomic additives either as single substances or combination of substances.

The Group did not have the specific expertise to carry out a full evaluation of all agronomic and technological fertilizer additives. This is an issue that should be discussed in the future and the Group recommends that this should be done in the event that Regulation (EC) No 2003/2003 is revised. However, as a general rule, in the Group's opinion a technological additive should not normally be present in organic fertilizers and should only be used when there is a clearly demonstrated need. For example, preservatives may be necessary in some liquid fertilizers to prevent decay by microbial growth. In relation to this question, as far as the dossier regarding Leonardite – Potassium humate is concerned as submitted by the Czech Republic, the Group noted that the forms and the document attached to support the request refer partially to the use of the product as a feed additive and partially to the use as a fertilizer. The use as feed additive cannot be evaluated in the framework of the present report. The Group considers leonardite – potassium humate as a specially processed form of leonardite (which is already authorized). Since the production and processing methods and the additives and preservatives utilized were not reported in the [provided dossier](#), the Group could not evaluate the product.

4.10 Specifications of use categories in Annex I to Regulation (EC) No 889/2008

In the Group's opinion, the three categories "Composted or fermented mixture of household waste", "Composted or fermented mixture of vegetable matter" and "Biogas digestate containing animal by-products co-digested with material of plant or animal origin", should be kept as they are in the last revision of Annex I to Regulation (EC) No 889/2008. This is due to the fact that the origins, types of raw materials, production processes, chemical composition, properties of the final products and the agronomic utilization are different. For instance, biogas digestate (which can in fact be obtained from both plant, and animal sources used either separately or mixed) is characterised by nutrient rich organic matter that is more easily mineralised in soil compared to composts. Composted or fermented mixture of household waste is also a nutrient rich organic matter but it is less easily mineralised when compared to biogas digestate and it has a relatively higher risk of contamination compared to composted or fermented mixture of vegetable matter. For this reason, in the Group's opinion, the heavy metal limits imposed by Regulation (EC) No 889/2008 for this category of compost are not needed for the compost made from mixtures of vegetable matter.

4.11 Specifications of limits of heavy metals in categories in Annex I to Regulation (EC) No 889/2008

The issue of heavy metals limits for relevant categories of fertilisers has been raised more than once in recent years. Fertilisers and soil conditioners listed in Annex I to Regulation (EC) No 889/2008 belong to categories of products whose agronomic utilization is extremely wide and diverse. Moreover, the risk of toxicity of heavy metals applied to soil through fertilization and amendments depends on the amount of heavy metals applied and on many other factors like soil physico-chemical and biological processes. This makes the specification of maximum limits of heavy metals for each category of Annex I extremely difficult. For animal excrement based fertilizers, the heavy metal content (especially Cu and Zn) is often due to the high concentration of trace elements added to feed as nutritional additives (Annex VI to Regulation (EC) No 889/2008). The Feed Report II (EGTOP, 2015) has already pointed out that the levels of some specific trace elements in organic husbandry feed might exceed by far the need of the animals. These excesses of nutritional additives in livestock diets lead to their high concentrations in animal excrements. In the Group's opinion the reduction of levels of heavy metals such as Zn and Cu in animal feed is a more useful approach than placing restrictive limits on the animal manure.

However, the Group is aware of the fact that some materials of Annex I to Regulation (EC) No 889/2008 have a higher risk of heavy metal contamination than others. This is the case for Sapropel and composted household wastes (see discussion above). Authorization of new products should include an evaluation of the need for heavy metals limits.

In the group's opinion no additional limits of heavy metals in existing categories of Annex I to Regulation (EC) No 889/2008 are needed. Some organic associations (e.g. Bioland, KRAV or UK Soil Association organic standards) have specified maximum permitted levels of application of heavy metals within the fertilizer, soil conditioner, pest control agents and other products. For instance, according to standards for KRAV certified production, annual application of lead, cadmium, copper, chromium, mercury, nickel and zinc applied with the organic fertilizers, soil conditioners and plant protection products should not exceed 50, 0.75, 500, 50, 1, 50 and 700 g per hectare, respectively. The Group does not comment on limits on heavy metals provided by private organisations, but strongly affirms the need that at European level, any limit on heavy metal is determined as a result of the application of a rigorous scientific methodology. In the Group's opinion, a holistic and comprehensive approach which takes into account the contribution of all the steps of the production chain can be successful in the reduction of the total load of heavy metals applied to agricultural soils.

4.12 Plant extracts as fertilizers

Regarding plant extracts used as fertilisers, the Group was asked whether specific extraction methods should be required or prohibited. As explained in section 4.7, the Group has no objections to the use of water and enzymes (provided that they are not produced by GMO), while acids, alkalis or organic solvents should only be authorised if their use is essential.

In the Group's opinion, plant extracts are considered to be covered under the category of *Products and by-products of plant origin for fertilizers* of Annex I to Regulation (EC) No 889/2008. Some plant extracts have not only a fertilizing effect, but also other effects on crops, which is why they are sometimes described as 'plant strengtheners' or 'plant biostimulants'.

However, it is extremely difficult to differentiate one effect from the other. In order to achieve the desired effect as plant strengthener/biostimulant, it may sometimes be necessary to carry out the extraction with alcohol, plant oil, acids, alkalis or organic solvents. In these cases, the Group recommends that acids, alkalis or organic solvents may be used, because of the possible positive effects of plant strengthening on organic production.

The issue of plant extracts might have to be reconsidered/adapted, if the fertilizer regulation (Regulation (EC) No 2003/2003) should be revised.

4.13 On having a fast-track review procedure for non-problematic (uncomplicated) fertilizers such as soil conditioners

As proposed by a Member State “Our suggestion is that a dossier can be prepared by a Member State on an uncomplicated substance and sent to COM and the other Member States suggesting this substance. If no objections are received within a certain period (1-2 months), the substance will be adopted in the annexes of the organic regulation. If any objection is received, the substance should be evaluated by the usual procedure by the EGTOP”.

In the Group’s opinion the term ‘non-problematic’ is too subjective and potentially misleading. A major problem is how to decide whether a proposed substance is ‘less problematic’ or ‘more problematic’. Nevertheless, the Group is sensitive to a fast tracked approach to approval and has assessed the advantages and disadvantages below.

The main advantage of a fast-track review of ‘less problematic’ substances under Annex I to Regulation (EC) No 889/2008 is that it saves time, effort and costs. In the past, the inclusion of new substances has often taken several years. In the case of fast-track review, substances would be quickly made available to organic farmers after their approval and this could encourage innovation in organic production. A disadvantage of fast-track review is that substances might appear to be uncomplicated when they are proposed, but may later turn out to be problematic when they are in use. Such situations should be avoided as much as possible, because they could compromise stakeholder trust. Although this possibility theoretically exists also in the normal inclusion process, full evaluation by EGTOP greatly reduces the likelihood of such an event.

In the Group’s opinion it is crucial that the approval of substances authorized as organic fertilizers and soil conditioners remains fully under the control of the current procedure. Thus, the disadvantages of the proposed fast-track review of approval are considered to carry more weight than the advantages. In the group’s opinion all proposed inputs should be equally evaluated but the overall process should be speeded up.

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