

## Summary of ESPP stakeholder workshop outcomes

ESPP organised a workshop in Brussels, 5<sup>th</sup> September, with over 100 participants from a wide range of industries, farming organisations, environmental NGOs, national and EU regulators, including the European Commission (JRC, DG GROW, DG ENVI, DG SANTE).

This workshop included breakout sessions addressing the three STRUBIAS materials (phosphate salts, ashes, biochars) which were reported to and discussed in the workshop plenary. The conclusions of this workshop for these three materials are presented here:

### Ash

*rapporteur & moderator = Kristy Blakeborough-Wesson, Secanim/SARIA & Kees Langeveld, ICL Fertilisers*

#### General approach

- As a general principle, quality criteria (nutrient content/solubility, contaminants ...) should not be “duplicated” in CMCs when already fixed in PFCs
- The modified JRC wording of “post-processing” to cover chemical reaction of ash to produce different chemicals requires further assessment, both as regards workability and the wording currently proposed

#### Contaminants:

- Molybdenum, manganese and cobalt are micro-nutrients. They can have added value. Therefore they should not be subject to an exclusion limit, but to a labelling obligation above the specified threshold.
- OK for the proposed limits on PAH, PCB and dioxins. It is appropriate to specify limits for all three (as proposed) because levels can be independent in ash
- Macroscopic impurities should not be limited (they are not in the JRC proposal for ashes) because the market will take care of this: farmers will not accept products containing e.g. lumps of glass
- Mixing / dilution of contaminants should be subject to the same rules as are applicable to virgin materials

#### Category 1 animal by-products (ABPs)

- Cat. 1 ABPs which are appropriately incinerated reach an ABP end-point, and the use of this ash as fertiliser is therefore legal. Indeed, this is practised in the UK and Portugal, at least. Cat. 1 ABPs also include materials such as Netherlands eggs, chicken manure or carcasses contaminated with Fipronil, where there is no safety question after incineration. Dialogue with DG SANTE would be useful to confirm the legality of use of Cat. 1 ash as fertiliser. Cat 1 ABP ash is rich in K and P, and is safe once incinerated under appropriately controlled conditions (as required by the ABP Regulations) and should not be excluded from use in ash based products.

#### Other comments

- Input material additives (additives added in the combustion process): the limit of 25% is appropriate, but the definition of accepted additives is too restrictive. In particular, additives may not be REACH registered, e.g. wastes or natural materials (such as silica, clay). Why should such limitations be applied for production of ash when not in processing of virgin materials (CMC1). At the same time, confusion between “feedstocks” and “additives” must be avoided.

#### Nutrient content

- The proposed limit of  $>0.3$  for the ratio (phosphate + potassium + sulphate)/(total minerals) is too high, and would exclude both ashes which are today sold and recognised as fertilisers, and also standard manufactured fertiliser chemicals. ESP suggests  $> 0.2$  as a limit.

## **Biochars / pyrolysis products**

*rapporteur & moderator = Mike Parr, Hitachi Zosen & Jürgen Kern, Leibnitz Inst. & Biochar COST*

Sewage sludge should not be excluded as an input material for biochar production:

- Sewage sludge has the potential to be an important input material for biochar, recycling nutrients and organic carbon. There should be no exclusion of sewage sludge.
- If sewage sludge biochar can meet contaminant limits then there is no reason to exclude it.

Ensuring elimination of organic contaminants

- The best and safest way to identify the presence and levels of organic micro-pollutants in biochar is to measure the H to organic carbon ratio ( $H/C_{-org}$ ). Page 112 of the JRC report places an upper limit of 0.7 on this ratio which is acceptable.
- It is not appropriate to set minimum process temperatures/times as proposed: the JRC report recommends a process temperature of 500°C and a duration of 20 minutes as process limits that will eliminate organic micro-pollutants which could range from antibiotics through to prions. The problem with this approach is that 500°C will reduce biochar yield. Furthermore, this temperature is not required to ensure that, for example, biochar derived from pig slurry feedstock has minimal micro-pollutants. The JRC report cites the paper by Ross et al. (2016) as justification for its 500C/20 minute process parameters. However, Ross et al. (2016) showed that there is no change in the amount of micro-pollutants above a process temperature of 300°C. The justification for 500°C is thus absent. In addition, Ross et al. (2016) clearly showed that 5 minutes residence time at 300 °C (or presumably even shorter at higher process temperature) is enough to eliminate organic pollutants.
- Furthermore, if the process parameter route is chosen as the way to ensure minimal micro-pollutants in biochar, for the reasons given above, different feedstock would need different process parameters. For example, animal bone may well need a 500°C/20 minutes process parameters to eliminate prions. However, since there are no prions present in pig slurry and since Ross et al (2016) showed that 300°C is adequate to eliminate residues such as antibiotics then a set of different process parameters could be specified for pig slurry or indeed a wide range of animal slurries. This raises issues of MRV (monitoring, verification and reporting).
- By contrast, using the  $H/C_{-org}$  ratio applied to any and all biochar, regardless of feedstock, focuses on results (does the end product meet contamination limits) and not processes. It also simplifies MRV - which can be implemented by a simple and regular test.
- The  $H/C_{-org}$  ratio must be tested on dry and ash-free biochar, in particular for the materials termed "Pyrogenic Carbonaceous Materials" (<50% carbon) in the report. If the biochar sample that is being measured is not ash-free, this will bias the resulting ratio i.e. it will give a false result.

The  $O/C_{-org}$  ratio should be deleted

- The  $O/C_{-org}$  ratio is proposed in the nutrient recovery rules and mentioned on page 112 of the JRC report. However, this fulfils a similar criteria to that of  $H/C_{-org}$ . There is no need to measure two such ratios given that a single ratio ( $H/C_{-org}$ ) is sufficient to identify (or not) micro pollutants.

PAH limit for biochar should be raised from <4 to <6

- This would enable harmonize limit values with similar compounds (struvite, ash). There is no reason why biochar should be regarded more strictly than other fertilizer products.

## **Phosphate salts**

*rapporteur & moderator = Christian Kabbe, KWB Berlin & Pierre Jaouen, TIMAC*

- Positive welcome to the widening of the definition to “phosphate salts” as proposed (not only struvite). However, this is contradictory to the proposed  $(Ca+Mg)/P > 0.8$
- Need for more precise definition of post-processing ( “normal industry practice” is not a useful description)
- Quality criteria are defined by PFCs and so should not be specified additionally for CMCs: organic carbon content, phosphate content, phosphate solubility, Mg/P ratio.
- CMCs should only define safety criteria
- However, a limit on organic carbon may be justified if it is demonstrated that this is a meaningful indicator of safety (organic contaminants, pathogens)
- Drying of struvite must not be at a temperature above that at which the molecule is modified (for determination of dry matter)
- More generally, analytical methods for testing all defined parameters should be specified, along with tolerances
- Add to authorised input streams:
  - fertiliser industry discharge
  - some streams from sites handling animal by-products (to be defined in CMC11 ?)
- It would be preferable that the Fertiliser Regulation ensure End-of-Waste status for phosphate salts at the material stage (CMC before post-processing) and not only for the finished fertiliser product (after post-processing at PFC stage. This would merit clarification.
- Alternative methods of assessing plant availability should be accepted (in addition to the P solubility criteria), e.g. e.g. Hedley method<sup>i</sup>

## **Other recovered materials to be potentially included in the EU Fertilisers Regulation in the future**

*rapporteur & moderator = Emilie Snauwaert, Flemish Coordination Centre for Manure Processing & José Maria Gomez, Biomasa Peninsular*

The objective of this session was to see which other materials (not yet included in the EU Fertiliser Regulation) would be potentially interesting for use in fertilisers.

Conditions for adding a new CMC to Annex II are defined in Art. 42.1 of the Fertiliser Regulation: in short evidence is needed that the materials are likely to be subject of significant trade on the internal market, that they do not present an unacceptable risk and that they are sufficiently effective.

Potential materials could include:

- “Mineral” nitrogen products derived by ammonia stripping/scrubbing from digestate/manure treatment or air treatment in farms/industry ... Such production of ammonium salts has already an important potential today, for use as mineral N fertiliser. These products should not be subject to a STRUBIAS process, but treated like virgin material, or where the substrate is manure or other animal by-products, the ABP question could be addressed.
- ABP including processed animal manure: the IMCO amendment 280 (CMC11) provides an initially satisfactory list of animal by product derived materials, to be completed later (ABP regulation procedure)
- Pulp and paper mill sludges
- Calcium carbonate from Drinking water treatment
- Microalgae cultivated on residual streams (non waste)

Next to these materials, there is a strong demand and need for high C content materials that can add organic matter to the soils.

Before application for addition of a new CMC, it is first needed to verify status of the material as regards other existing Regulations (End of Waste, REACH, Animal By Products, Nitrates Directive).

It is not possible for all materials to be added to the Fertiliser Regulation CMC list: in some cases, ‘local’ use under national regulations (with optional mutual recognition by nearby Member States) may be more appropriate. The aim of the Fertiliser Regulation is to have harmonised rules for the most important materials. Therefore this is an optional harmonisation (Member States may allow other fertilisers on their national markets without the CE marking). So it is not the aim to add all different kinds of materials into the EU Fertiliser Regulation, which could make it very complex.

If Council and Parliament maintain the possibility for the European Commission to modify the annexes of the Fertiliser Regulation (“delegated acts”) then new recycled materials can be added as CMCs, according to the rules of Art. 42.1. For materials for which there is not scientific consensus on safety, effectiveness, etc. then a JRC assessment process will be required before a modification to the CMC’s of Annex II can be carried out.

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<sup>i</sup> See “Changes in Inorganic and Organic Soil Phosphorus Fractions Induced by Cultivation Practices and by Laboratory Incubations”, J. Hedley et al., 1982, SSSAJ Vol. 46 No. 5, p. 970-976 <http://dx.doi.org/10.2136/sssaj1982.03615995004600050017x>