DOSSIER CONCERNING THE REQUEST TO AMEND ANNEX II TO COMMISSION IMPLEMENTING REGULATION 1165/2021[1]

Fertilisers, soil conditioners and nutrients referred to in Article 24 (1)(b) of Regulation (EU) No 848/2018[2] to be evaluated for use in EU organic production

Article 24 (7) of Regulation (EU) No 848/2018:

"Where a Member State considers that a product or substance should be added to or withdrawn from the lists of authorised products and substances referred to in paragraphs 1 and 2, or that the specifications of use referred to in the production rules should be amended, it shall ensure that a dossier giving the reasons for the inclusion, withdrawal or other amendments is officially sent to the Commission and to the other Member States and is made publicly available, subject to Union and national legislation on data protection. The Commission shall publish any requests referred to in this paragraph."

1. General information on the request

Nature of the request	☒ Inclusion ☐ Deletion ☐ Change of disposition
Request introduced by	[Member State] Contact e-mail:
Date	

Please indicate if the material provided is confidential

2. Requested inclusion/deletion/amendment

Name of additive / substance	Primary use/conditions
BIOCHAR FROM MANURE – CATTLE DUNG	Carbon and phosphorus rich stable product used as soil amendment

3. Status

Authorization in general agriculture or food processing

Historic use
Regulatory status (EU, national, others) (including expiry dates of authorisation if applicable) Category of fertilising product under EU reg. 2019/1009: FPC 3.A – organic soil conditioner composed of CMC 14 – Pyrolysis and gasification materials.

[1] EUR-Lex - 32021R1165 - EN - EUR-Lex (europa.eu)
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0848&from=EN

4. Identification[3]

Identification of substance, terminology, synonyms

Chemical name(s): biochar
Other names: charcoal, carbon, organic amendment, stable organic matter
Trade name: biochar
CAS code (Chemical Abstracts Systematic Names) CAS 16291-96-6
Other code(s): potential product registration as REACH regulation: EC# 240-383-3 Charcoal

5. Aspects related to the relevance and priority of the request

Geographical relevance (Member States, regions, …): high stability with a controlled release of present or added nutrients. Carbon content with potential to increase carbon stock in soils and ultimately soils' health
Socio-economic relevance (acreage, turnover, number of stakeholders affected, …): diversification of potential revenues for livestock farmers and new and recycled nutrient sources for agricultural and fertilising industry sector. Potential of creating a carbon sink and decarbonize sectors of agriculture
Sectors affected: livestock sector, agricultural sector and industrial sector (fertilizing industry)
Stakeholder engagement/consultation in dossier preparation: stakeholder consultation on specific workshops within FERTIMANURE project to the broader farming sector
Market presence: availability (quantity / quality) and origin (local / imported). currently biochar from vegetal origin is available in the market. The Europe Biochar Market was worth USD 0.59 billion in 2021 and is estimated to be growing at a CAGR of 13.6%, to reach USD 0.72 billion by 2026 (market data forecast, 2023)
Aspects of international harmonization / market distortion The Crops Subcommittee of the National Organic Standards Board of United States evaluated in 2021the inclusion of cow manure derived biochar on the national list of authorised products. In this case the product would be categorised as Organic Food Production Act (OFPA) category for Crop and Livestock Materials and is characterized as a fertilizer and carbon storage soil amendment/soil conditioner to aid in organic crop production. Biochar is defined in NOP guidance document 5034 "Materials for Organic Crop Production" as: "[…] biomass that has been carbonized or charred. Sources must be untreated plant or animal material. Pyrolysis process must not use prohibited additives." And refers to the practice standard 205.203 on Soil fertility and crop nutrient management. The biochar in evaluation falls under this description. In the case of Japan, the Japanese Agricultural Standard for Organic Products of Plant Origin lists a number of authorised fertilising products in its Appended Table 1 "Fertilizers and soil improvement substances". In the list of authorised substances, Charcoal Natural substances or substances derived from natural sources which have not undergone any chemical treatment are mentioned. This mention, does not mention manure as an unauthorised feedstock

[3] To be filled in only when applicable

A (possible) authorization leads to amendment(s) in the respective Annex[4] Yes. Inclusion of manure-derived biochar in the already existing category of the biochar authorised from organic materials of plant origin. Specification of coupling a N recovery from off gas could be required
Other aspects justifying high priority, such as • highly stable carbon can be integrated into agricultural soils which is expected to significantly increase the soils' health and ultimately increase carbon stocks significantly contributing to the climate action • biochar from cattle manure contains available and slow-release phosphorus (demonstrated by mineralisation tests) which can achieve significantly replacing other non-renewable phosphorus sources • biochar can help to inhibit the leaching of nutrients such as N, P and K, thus reducing the amount of additional fertilizer required

6. Characterisation

Raw materials, methods of manufacture

Composition/ingredients cattle dung (3-8 samples from different batches): • Organic carbon: 393 g/kg fresh matter • Total nitrogen: 10.1 g/kg fresh matter • Total phosphorous: 30.4 g/kg fresh matter • Total potassium: 95 g/kg fresh matter • Dry matter: 996 g/kg fresh matter
Relevant nutrients and trace elements content: • S: 2.5 g/kg fresh matter • Ca: 22.9 g/kg fresh matter • Mg: 6.7 g/kg fresh matter • Na: 8.2 g/kg fresh matter • Mn: 0.4 g/kg fresh matter • Zn: 358.5 mg/ kg dry matter • Cu: 51.3 mg/kg dry matter
Other trace elements and pathogens: • Ni: 6.9 mg/kg dry matter • Pb: 1.9 mg/kg dry matter • Cr: 11.0 mg/kg dry matter

[4] It should be carefully analysed whether the specific use of a substance is already (implicitly) authorized or not. This is to avoid the following conclusion: "The Group considers that the use of … is in line with the objectives, criteria and principles of the organic regulation. There is no need for amendment of the specific conditions of Annex …"

- Cr VI: 0.05 mg/kg dry matter
- Hg: 0.02 mg/kg dry matter
- As: 0.47 mg/kg dry matter
- Cd: 0.06 mg/kg dry matter
- Fe: 3402 mg/kg dry matter
- PAH: 3.0 mg/kg dry matter
- Cl: 17 g/kg fresh matter
- Salmonella spp.: Not detected in 25 g of sample
- E.Coli: <10 CFU/g (colony forming units)

Basic physical properties: Solid porous material with basic pH 12.3 and 0.5 g/cm3 density

Solubility:

Low solubility of carbon (opportunity to increase carbon stock in soils), average solubility for nutrients in matrix

Origin of raw materials, production methods: Dried Cattle dung, where the exhaust gas is scrubbed with sulfuric acid to produce ammonium sulphate solution) is treated by thermo-catalytic Reforming (TCR). Process reactor temperatures between 450°C and 500°C and post-reforming temperatures between 600°C and 650°C.

The process gas from the TCR process contains up to 5 % ammonia. This ammonia is recovered in the MAP reactor. There a scrubbing process with phosphoric acid, followed by crystallization produces solid mono ammonium phosphate (MAP) which can be used as a fertilizer without further purification

7. Specification of use

Agronomic use

Fertiliser or soil conditioner: Soil conditioner

Application method: Integration into soil using a plow

Dosage: 90-500 kg/ha (extrapolated from pot trials)

Stage of plant development: Soil preparation before sowing

Physiological effect, mode of action:

Nutrient provision for crops and soils, but mainly structural effect for soil quality and fertility

8. Reasons for the inclusion, withdrawal or amendments

Explain the need for the proposed fertilizer or soil conditioner or nutrient

The main function of this product is the improvement of the physical structure and microbial soil functions together with its potential as carbon storage into agricultural soils. However, it can also be a relevant source of phosphorus and potassium. As a natural and renewable resource, it contributes significantly to close carbon and nutrient cycles, reducing the dependency upon non-renewable phosphorus and potassium sources
What alternative solutions are currently authorised or possible? • Biochar from plant origin is authorised to be used in organic farming, and biochars from other origins (EGTOP, 2018) or specifically from bone meal (EGTOP, 2022) were positively evaluated for their authorisation • Soft ground rock phosphate or basic slag (Thomas phosphates or Thomas slag) as source of phosphorus are authorised. As non-renewable source of phosphorus, finding new and renewable phosphorus sources such as the biochar obtained from the TCR cattle dung is critical • In pressure regions there is an excess of cattle manure which cannot be brought to fields directly. Transportation out of the regions is expensive and ineffective. By producing N-fertilizers within the process the nitrogen can be distributed specifically with regards to crop needs
Is there any traditional use or precedents in organic production? No

9. Consistency with objectives and principles of organic production

Please use the checklist in Annex A to this dossier to indicate consistency with objectives and principles of organic production, as well as criteria and general rules, laid down in Council Regulation (EC) 834/2007 Title II and Title III as applicable.

Annex A

CHECKLIST FOR CONSISTENCY
with objectives and principles of organic production with reference to specific articles in the organic regulation

Criteria	**Specific articles in Regulation (EU) 848/2018**	**Fulfilled? Yes / no / not applicable**	**Brief qualification**
Exclude the use of GMOs and products produced from or by GMOs	Art. 3(58)(59)(60); Art. 5(f)(3); Art. 11; Art. 30(4)		Not applicable

Criteria	Specific articles in Regulation (EU) 848/2018	Fulfilled? Yes / no / not applicable	Brief qualification
Enhances the health of soil, water, plants and animals	Art. 4(b)	Y	Presumably from the agronomic tests performed. Improves soil health especially for loamy or sandy soils by providing better ventilation and, due to the large surface area of the material, good conditions for the colonization of soil-typical microbial communities (Blanco-Canqui, 2017; Razzaghi et al., 2020)
High level of biodiversity	Art. 4(c) and (i); Art 6(a)		Not tested
Makes responsible use of energy and the natural resources, such as water, soil, organic matter and air	Art. 3(a)(iii)	Y	Able to partially substitute non-renewable P sources
Aim at producing products of high quality	Art. 5(d)	Y	Agricultural performance equivalent to other conventional fertilizing products. Improvement of soil structure. (Supporting material D2.5 Final - Report on agronomic performance of the obtained BBFs and TMFs in laboratory setting and D2.6 Final - Report on agronomic and Environmental performance in field trial Experiences will be available online in the webpage of FERTIMANURE)

Criteria	Specific articles in Regulation (EU) 848/2018	Fulfilled? Yes / no / not applicable	Brief qualification
Aim at producing a wide variety of foods and other agricultural products……goods produced by the uses of processes that do not harm the environment, human health, plant health or animal health and welfare	Art. 5 (d)	Y	Non-hazardous product, process ensures the breakdown of substances present in cattle manure, such as antibiotics, In addition, no germs or bacteria can be detected due to the high process temperature. PAH were measured and were always below the threshold values established in the Fertilising product Regulation (Reg. (UE). 2019/1009) Crops tested: ryegrass, potatoes, maize
Use living organisms and mechanical production methods	Art. 5(f)(i)	No	Use of thermo-chemical processes
Limited to natural or naturally-derived substances	Art. 5(g)(ii)	Y	Cattle dung is a recycled raw material
For chemically synthesized inputs: appropriate management practices do not exist	Art. 4(c)(i)	Not applicable	
For chemically synthesized inputs: organic, natural or naturally-derived alternative substances are not available on the market	Art. 24(5)	Not applicable	
For chemically synthesized inputs: use of organic, natural or naturally-derived alternative substances contributes to unacceptable environmental impacts	Art. 24(5)	Not applicable	

Criteria	Specific articles in Regulation (EU) 848/2018	Fulfilled? Yes / no / not applicable	Brief qualification
Maintenance of plant health primarily by preventative measures, such as resistant species/varieties, appropriate crop rotations, cultivation techniques, mechanical and physical methods, thermal processes and the protection of natural enemies of pests	Art. 3(4)	Not applicable	Not tested
All plant production techniques used shall prevent or minimise any contribution to the contamination of the environment	Art. 3(5)	Not applicable	
The corresponding use is authorised in general agriculture […]	Art. 9 (3)	Y	Under CMC14 and as FPC 3.A – organic soil conditioner
Their use is necessary for sustained production and essential for its intended use	Art. 24(3)(a)		Not tested
All products and substances shall be of plant, animal, microbial or mineral origin …	Art. 24(3)(b)	Y	Animal manure origin
… except where products or substances from such sources are not available in sufficient quantities or qualities or if alternatives are not available	Art. 24(3)(b)	Not applicable	
Their use is essential for the control of a harmful organism or a particular disease for which other biological, physical or breeding alternatives or cultivation practices or other effective management practices are not available	Art. 24(3)(c)(i)	Not applicable	
If products are not of plant, animal, microbial or mineral origin and are not identical to their natural form, they may be authorised only if their conditions for use preclude any direct contact with the edible parts of the crop	Art. 24(3)(c)(ii)	Y	Product used in soil preparation. It will not be in contact with any edible part of the crop

Criteria	Specific articles in Regulation (EU) 848/2018	Fulfilled? Yes / no / not applicable	Brief qualification
Products and substances to be withdrawn or their use amended/ limited	Art. 24(7)	Y	Use of non-renewable P-sources such as Soft ground rock phosphate can be partially substituted
Others: please specify			

References:

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