

Fertilizers, soil conditioners and crop management tools

Basic admission criteria for the European Input List

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I. Introduction

This document describes the criteria that need to be fulfilled in order for fertilizers, soil conditioners and crop management tools¹ to be included in the European Input List. Additional criteria may apply for products to be included in a national list or a list of a private association. This document will be updated whenever necessary. The most recent version, which is available on the project website (www.inputs.eu), is the only valid version.

The European Input List – a private standard

The European Input List is a private standard. It is based on the relevant EU legislation (in particular Reg. 889/2008). However, it also comprises additional criteria and interpretations, which were set by FiBL, in order to ensure compliance with the objectives and principles of organic production.

Scope of products included

Annex I of Reg. 889/2008 covers only ‘fertilizers, soil conditioners and nutrients’. By contrast, the European Input List covers a broader scope of products and includes also products such as potting soils, adjuvants, biodegradable mulching materials etc.

2. Requirements for different product types

2.1 Requirements for fertilizers and soil conditioners

Background

Fertilizers and soil conditioners are explicitly mentioned and regulated in Annex I of Reg. 889/2008.

Requirements

Fertilizers and soil conditioners may only contain

- materials listed in Annex I of Reg. 889/2008,
- co-formulants (see separate section below).

¹ In this document, the term ‘crop management tool’ refers to inputs used in crop production which cannot be categorized as fertilizers, plant protection products or another legally defined category.

2.2 Requirements for crop management tools

Background

For ‘crop management tools’ (products used in crop production, other than fertilizers / soil conditioners and other than plant protection products), Reg. 889/2008 gives no detailed guidance. To ensure consistency with the objectives and principles of organic production, the European Input List has developed admission criteria for the major product groups. In specific cases, these criteria may be adapted. In all cases, the raw materials may not be derived from GMOs.

2.2.1 Potting soils

Potting soils may contain all materials listed in Annex I of Reg. 889/2008, in particular

- materials of plant origin such as compost, peat, wood fibre, coconut fibre, cocoa shells, bark,
- inert mineral components such as clay, sand, pumice, lava, perlite, vermiculite, expanded clay and soil, and
- fertilizers complying with the present admission criteria.
- Synthetic wetting agents are not allowed.

Requirements for coconut fibre and wooden products

Coconut fibre and wooden materials (incl. bark) are only allowed, if they have not been treated with synthetic substances such as nitrogen compounds (e.g. calcium nitrate).

2.2.2 Products which influence crop growth or performance

Background

Products claiming to influence crop growth or performance have traditionally been used in organic production and are widely used today. Their classification under national legislation varies greatly between countries. As a result, they are referred to by different names, such as ‘biostimulants’ and ‘plant strengtheners’. To ensure consistency and harmonization between countries, the European Input List applies the same admission criteria regardless of national classification, as far as legally possible in the concerned countries.

Requirements

- The main ingredient(s) must be listed in Annex I of Reg. 889/2008.
- Exceptionally, other natural materials may be accepted. Materials from Annex II are only acceptable, if they do not have an effect as plant protection product.
- Co-formulants: see separate section below.

2.2.3 Adjuvants

Background

In this document, the term ‘adjuvant’ summarizes products which may be used in combination with other authorised products, for example spreaders/stickers. Adjuvants have traditionally been used in combination with plant protection products. In the current organic legislation, they are not mentioned. Under the new organic legislation, they will be generally allowed, if used in combination with plant protection products. To ensure consistency with the objectives and principles of organic production, the European Input List has developed admission criteria for adjuvants.

Adjuvants may also be used in combination with fertilizers or biostimulants. To ensure consistency, the European Input List applies the same criteria as for products used in combination with plant protection products. The admission criteria for adjuvants are placed in the chapter on plant protection products.

Requirements

For adjuvants which are used in combination with fertilizers or biostimulants, the same admission criteria apply as for adjuvants which are used in combination with plant protection products.

2.2.4 Wound sealings and trunc paints

Requirements

- The main ingredient(s) must be listed in Annex I of Reg. 889/2008.
- Exceptionally, other natural materials may be accepted. Materials from Annex II are only acceptable, if they do not have an effect as plant protection product.
- Co-formulants: see separate section below.

2.2.5 Additives for biogas digestion

Background

Biogas digestate is listed in Annex I to Reg. 889/2008. However, there is no specification regarding the use of additives in digestion plants.

Requirements for additives for biogas digestion

- Calcium salts, magnesium salts and iron salts are allowed.
- Aluminium salts are not allowed.

- Nickel salts may be used as additives to support the production of methane. However, they must be dosed in such a way that the content of nickel in the final digestate does not exceed 25 mg/kg.
- Selenium salts may be used as additives to promote methane producing bacteria.
- Other biogas digestion additives will be evaluated case by case.

2.2.6 Biodegradable products (e.g. pots, mulching sheets)

Background

Mulching sheets are regularly used in practice, especially in vegetable production. They serve a number of purposes such as weed suppression, water conservation, regulation of soil temperature and keeping the harvest clean. Depending on the crop and situation, it may be preferable to use non-biodegradable or biodegradable mulching sheets. Since biodegradable mulching sheets are not mentioned in Annex I of Reg. 889/2008, the European Input List has developed its own admission criteria based on the objectives and principles of organic production. Although these criteria were developed for mulching sheets, they may be applied also to other types of biodegradable products, e.g. biodegradable pots.

In the opinion of the European Input List team, such products should be made entirely from bio-based materials. However, we recognize that to date this is not yet technically feasible. As an intermediate solution, we require that the proportion of bio-based materials is as high as technically feasible.

For the assessment of biodegradability, two methods are available: EN 17033 (biodegradability in the soil) and EN 13432 (biodegradability in compost). The European Input List bases its evaluation on EN 17033.

Requirements

- The proportion of bio-based raw materials should be as high as technically feasible. Currently, a minimum of 40 % bio-based raw materials is required.
- The raw materials may not be GMOs.
- For biodegradable pots, peat is not allowed as a raw material.
- 100% biodegradability in soil according to EN 17033*.
- The material must comply with limit values for contaminants and additives (e.g. heavy metals) according to EN 17033*.

*These criteria are usually covered by a certification system, and applicants are expected to present a valid certificate. If no certificate is available, the evaluation team may carry out an evaluation.

2.2.7 Seed treatments

Background

Seed treatments serve a wide array of functions. On one hand, they may serve as fertilizers or as plant protection products. In this case, the EU organic legislation applies and the European Input List applies the criteria for fertilizers or those for plant protection products (including basic substances, e.g. vinegar). For compulsory treatments required by EU phytosanitary legislation, the acceptability is evaluated case by case.

On the other hand, seed treatments serve a range of technological functions. Such applications are not covered by the EU organic legislation, but are also in the scope of the European Input List. In this document, the term 'auxiliaries' refers to products which are applied to seeds during seed treatment, but which are later removed from the seeds and leave no residues. The need for co-formulants and auxiliaries in seed treatments is recognised.

Requirements for seed treatments with a fertilizing or a plant protect effect and for micro-organisms

- Components with an effect as fertilisers must comply with the criteria for fertilizers.
- Components with an effect as pesticides must comply with the criteria for plant protection products.
- Micro-organisms such as rhizobia and mycorrhiza are allowed, provided that they are not GMOs.

Requirements for co-formulants and auxiliaries for seed treatment

- Preferably, co-formulants and auxiliaries in seed treatments should be listed in Annex I of Reg. 889/2008.
- Other natural materials are also acceptable.
- Synthetic components may be accepted under the following conditions:
 - (i) the applicant can demonstrate that they are necessary to achieve the desired function, and that they are used in the lowest possible amounts.
 - (ii) They comply with the principles for co-formulants (see separate section).

Requirements for auxiliaries used in seed priming

- Soluble nitrogen used as signalling compounds during the priming process are allowed.
- Synthetic substances acting as plant hormones are not allowed (with the exception of ethylene).

3. Requirements concerning individual components

Annex I of Reg. 889/2008 contains a list of ‘fertilizers, soil conditioners and nutrients’ which are allowed for use in organic farming. This chapter describes the interpretation by the European input List. These requirements are applied to each component of a product. Requirements are described separately for different materials.

3.1 Products and by-products of animal origin

3.1.1 Animal excrements

Background

Annex I of Reg. 889/2008 allows various types of manure with the limitation ‘factory farming origin forbidden’. However, there is no official definition of ‘factory farming’ and no general agreement across Europe how to implement this requirement. The European Input List considers that this requirement needs to be considered in a context of regional traditions and farming practises.

Requirements

For the moment, the European Input List relies on national interpretations and policies. As a rule, the policy for the country of production is applied.

3.1.2 By-products of animal origin

Background

Annex I of Reg. 889/2008 contains a list of animal by-products which are allowed.

Requirements

- There are no requirements regarding the animal husbandry system.
- As specified by general legislation, the hygienic requirements relating to diseases such as BSE must be respected. Products must meet the requirements of EU Reg. 1069/2009 and EU Reg. 142/2011.

3.1.3 Nitrogen fertilizers produced by air scrubbers

Background

Various organic materials such as manure or sewage sludge emit ammonia. The ammonia can be captured with air scrubbers and transformed into highly soluble nitrogen fertilizers (also called nitrogen stripping). The EGTOP has recommended not to authorize such materials for organic production².

Requirements

- Highly soluble nitrogen fertilizers produced by air scrubbing / nitrogen stripping are not accepted by the European Input List.

3.1.4 Guano

Background

'Guano' in the true sense of the word is accumulated excrement of seabirds, seals, or cave-dwelling bats. This material is allowed. However, non-permitted materials such as Chilean nitrate are sometimes also traded under the denomination 'guano'.

Requirements

- To avoid misinterpretations and erroneous authorization, components declared as 'guano' will be subject to more in-depth investigations regarding their true nature.
- Where adequate, the evaluation teams may request proof that a given guano product is free from human pathogens.

3.2 Products and by-products of plant origin

Background

Annex I of Reg. 889/2008 allows 'products and by-products of plant origin for fertilisers', and gives the following examples: 'oilseed cake meal, cocoa husks, malt culms'. The use of such materials for fertilization purposes is clearly desirable, since the raw materials have little other uses, and since they undergo only minor processing steps. However, there are also fertilizers on the market that are made from food materials (e.g. soy meal) as well as products which undergo a complex series of processing steps. The team of the European Input List has some doubts whether the use of such materials is desirable from the perspective of organic farming principles and from a sustainability point of view. Considering the current legal background, such products are provisionally allowed for the moment.

² EGTOP (Expert Group for technical Advice on Organic Production): Report on Fertilizers (III), chapter 3.5.1.

Requirements

- Hydrolysed proteins from plant material are allowed.
- Products and by-products of GM plants are not allowed.
- Aqueous extracts are generally allowed, while extracts with chemicals are not allowed (exception for seaweed products: see below). Extraction with ammonia is not permitted.
- Seaweed products may be obtained by extraction with acids or alkaline aqueous solutions. Clarification: Acids/alkalines which increase the concentration of nutrients in the final product are restricted or prohibited. This means that nitric and phosphoric acids are not allowed, because they act as easily soluble mineral fertilisers. Extraction with KOH is only allowed, if the amount of K supplied with KOH is smaller than the amount of K contained in the seaweed. If KOH is used for extraction, the manufacturer has to provide the necessary data for this point to be verified.
- By-products of plant materials derived by physical processing are allowed. The material may not be contaminated with non-authorized substances (e.g. chemical solvents) during the process. In such cases, the applicant must explain the production process including all substances used in sufficient detail, and he must demonstrate the absence of contaminants with chemical analyses. If the absence of contaminations cannot be established beyond doubt, the evaluation team may reject the product.

3.2.1 Fermentation products

Background

Products and by-products of plant origin can be transformed into fertilizers through a range of microbial fermentation technologies. Fermented products such as vinasse have traditionally been allowed for organic production. They are not explicitly mentioned in Annex I of Reg. 889/2008, but the European Input List team considers that they are covered by the entry 'Products and by-products of plant origin'. The evaluation must make sure that the nitrogen content of fermentation products originates from the plant materials and not from synthetic nitrogen added during fermentation.

Requirements

- The micro-organisms used for fermentation must not be GMOs.
- Materials with a nitrogen content up to a maximum of 5 % are allowed.
- Materials with a nitrogen content >5 % are only allowed, if the manufacturer can clearly demonstrate that the nitrogen originates predominantly from the plant materials used as raw materials for fermentation. Detailed information on the nitrogen content of all intermediate steps in the production process is required.

- In the end product, not more than 15 % of the total nitrogen may be present in the form of ammonia.
- In all cases, the manufacturer must declare whether any nitrogen compounds are added as 'starters' for fermentation, and in what amounts.

3.2.2 Compost, digestate

- Annex I of Reg. 889/2008 contains some specifications.
- At the moment, the European Input List applies no additional criteria.
- Digestates are only acceptable if the digestion additives are acceptable (see separate section).

3.2.3 Potassium fertilizers from sugar production

Background

Potassium sulphate is produced in the manufacture of sugar. The potassium and sulfur both originate from the plant biomass. This material is therefore allowed.

Requirement

- Potassium from vinasse (called 'vinasse potassium' or 'vinasse kali') is allowed.

3.2.4 Other single nutrients isolated from plant materials

Background

Potassium sulphate is also produced in the manufacture of biofuels ('biodiesel'). This process involves an ester interchange with potassium hydroxide and a precipitation with sulphuric acid. The European Input List considers this as chemical processes.

Phosphates can be recovered from plant biomass with chemical processes that resemble the manufacture of superphosphate. The European Input List team considers this as a chemical process.

Requirements

- Potassium sulphate from the manufacture of biofuels is not allowed.
- Phosphates recovered from plant biomass are not allowed.

3.3 Micro-organisms

Background

Micro-organisms have traditionally been used in organic farming, and there is no objection to their use. Micro-organisms are mentioned in Art. 3(4) of Reg. 889/2008, but not in Annex I of that regulation.

Requirements concerning micro-organisms

- The micro-organisms must not be GMOs. A declaration of absence of GMOs is required for each microbial strain.
- The identity (species and strain) of the microorganism must be given.
- Strains which are known to have a pesticidal function are not allowed in fertilizers (see EU pesticides database).
- Upon request, the applicant must document that in normal use, they are harmless for humans, environment, crops and animals.

Requirements concerning growing media for micro-organisms

- The manufacturer must specify all ingredients which are used for the growing media (if possible, use standard chemical nomenclature).
- The manufacturer must declare whether remains of the growing media used to grow the micro-organisms, or microbial products (e.g. antibiotics) can be found in the final product, and approximately how much. If remains of the growing media are present in significant amounts, their acceptability is determined case by case. The acceptability of microbial products is determined case by case; the presence of antibiotics in the final product is not allowed.
- For the growing media for micro-organisms, there are no requirements regarding the GM status. However, if remains of the growing media can be found in the final product, no DNA of GMOs must be detectable. The evaluation teams may request analytical or other evidence to verify this point.
- If the growing media for the micro-organisms contain synthetic nitrogen compounds, these must not be added in excess. In case the final product contains more than 5 % N_{mineral}, the manufacturer is obliged to demonstrate that synthetic nitrogen compounds have not been added in excess (detailed description of the production process). If this cannot be demonstrated, such products will be rejected.

3.4 Inorganic plant nutrients

Annex I of Reg. 889/2008 contains a list of materials which may be used as sources of phosphorus, potassium, calcium, magnesium and sulphur.

3.4.1 Liming materials

Magnesium and calcium carbonate of natural origin are allowed. This includes also mollusc and egg shells.

3.4.2 Inorganic nitrogen

Mineral nitrogen fertilisers are *not permitted* (see Article 4(b)(iii) and Art. 12(1)(e) of Reg. 834/2007). This includes synthetic compounds such as ammonia, nitrate and urea, but also natural sources such as ‘Chilean nitrate’ (also known as ‘Chile salpeter’, ‘Peru salpeter’, ‘Caliche’).

3.5 Trace elements

Annex I of Reg. 889/2008 allows ‘all inorganic micronutrients listed in part E of Annex I to Reg. 2003/2003’. In the European Input List, this is implemented as follows:

- All micronutrients listed in part E.1 of Annex I to Regulation 2003/2003 are allowed (however, elements such as selenium which are not listed in Reg. 2003/2003 are not permitted).
- Consistent with the principles of organic production, mineral nitrogen salts (e.g. nitrate, ammonia) of micronutrients are not allowed.

3.5.1 Complexing agents for trace elements

Background

Annex I of Reg. 889/2008 allows trace elements and specifies ‘inorganic micronutrients listed in part E of Annex I to Regulation 2003/2003’. Part E of Reg. 2003/2003 has several sections: part E.1 lists inorganic micro-nutrient fertilizers and part E.3 lists authorized chelating and complexing agents for micro-nutrients. The general interpretation in the European organic sector is that all trace element fertilizers containing any of the authorized chelating and complexing agents is allowed for organic farming.

In addition, several materials which are authorized by Annex I (e.g. hydrolized proteins, humates, citric acid) also have a complexing effect in trace elements.

Requirements

- Materials which are authorized as fertilizers may also be used as complexing agents (e.g. hydrolized proteins, humates, citric acid)

- Lignosulfonic and heptagluconic acid as well as their salts (e.g. sodium or potassium, but not ammonium salt), are allowed.

3.5.2 Chelating agents for trace elements

Background

Annex I of Reg. 889/2008 allows trace elements and specifies ‘inorganic micronutrients listed in part E of Annex I to Regulation 2003/2003’. Part E of Reg. 2003/2003 has several sections: part E.1 lists inorganic micro-nutrient fertilizers and part E.3 lists authorized chelating and complexing agents for micro-nutrients. The general interpretation in the European organic sector is that all trace element fertilizers containing any of the authorized chelating and complexing agents is allowed for organic farming.

Chelating agents increase the mobility and bioavailability of heavy metals in the environment. This can lead to water pollution with toxic and/or radioactive metals and it may pose a risk for soil or water micro-organisms. The potential environmental impact of chelating agents varies greatly between substances.

- EDTA: EDTA is the most widely used and best studied chelating agent. It is of environmental concern because of its persistence and strong metal chelation.
- HEEDTA; DTPA; [o,o] EDDHA; [o,p] EDDHA; [o,o] EDDHMA; [o,p] EDDHMA; EDDCHA; EDDHSA; HBED: These chelating agents are less studied than EDTA, but the European Input List team assumes that they have similar environmental properties.
- IDHA; [S,S]-EDDS: These chelating agents are easily biodegradable and therefore not persistent in the environment.

Requirements

To ensure consistency with the objectives and principles of organic production, the European Input List excludes chelating agents which potentially have a negative impact on the environment.

- EDTA; HEEDTA; DTPA; [o,o] EDDHA; [o,p] EDDHA; [o,o] EDDHMA; [o,p] EDDHMA; EDDCHA; EDDHSA; HBED: These chelating agents are not allowed.
- IDHA; [S,S]-EDDS: These chelating agents are allowed.

3.5.3 Copper

Copper is a trace element listed in part E.1.3 of Annex I to Reg. 2003/2003 and is therefore authorized for use in organic farming. The European Input List has no specific rules applying to copper. Because the use of copper is discussed controversially, some national Input Lists restrict its use.

3.6 Other materials

Several other materials are also authorized according to Reg. 889/2008, Annex I. The following sections provide guidance for selected materials.

3.6.1 Sodium chloride (salt)

Background

Reg. 889/2008, Annex I lists sodium chloride with the description 'only mined salt'.

Requirements

- Rock salt and sea salt are allowed.
- Sodium chloride obtained by chemical synthesis is not allowed.

3.6.2 Humic and fulvic acids

Background

Humic and fulvic acids are not yet explicitly mentioned in Annex I or Reg. 889/2008, but they can be seen as acceptable (leonardite processed in an allowed way). The EGTOP has recommended authorizing humic and fulvic acids for organic production, with certain restrictions³.

Humic and fulvic acids are often manufactured by treatment with potassium hydroxide. Because this is a synthetic form of potassium, the levels should be kept low.

Requirements

- Humic and fulvic acids obtained from leonardite are allowed.
- Extraction with potassium hydroxide (KOH) or potassium chloride (KCl) is only allowed, if the amount of K supplied with the extracting agent is smaller than the amount of K supplied with the leonardite. Manufacturers have to provide the necessary data for this point to be verified.
- Humic and fulvic acids obtained from the purification of drinking water are allowed, while humic and fulvic acids obtained from the purification of *waste* water are *not allowed*.

³ EGTOP Report on Fertilizers (III), chapter 3.3.

3.6.3 Biochar

Background

Biochar is not yet explicitly mentioned in Annex I of Reg. 889/2008, but it can be seen as acceptable (plant products processed in an allowed way). The EGTOP has recommended authorizing biochar for organic production, with restrictions on the feedstock material and on contaminants (PAHs)⁴. Some countries have national regulations.

Requirements

- For the moment, biochar is evaluated according to the national criteria applying in different countries.

3.6.4 Materials which may have a use in filtering beds

Background

Materials such as sand, zeolite, perlite, vermiculite and clinoptilolith may be used in filtering beds, which can result in their contamination. Companies should be aware that different legal requirements may apply to unused ('virgin') materials and to used materials ('wastes').

Declaration policy

Whenever a material has been previously used as filtering material, this fact must be clearly stated by the applicant during application. If there is no mentioning of such an earlier use, the evaluation team will assume that the declared materials are virgin materials previously unused.

3.6.5 Synthetic nanoparticles / picoparticles

Background

Synthetic nano- and picoparticles are not mentioned in Reg. 889/2008. Consistent with the policy of EGTOP (see EGTOP report on fertilisers II⁵), the European Input List considers that they are not implicitly authorized, but would require a separate listing in order to be authorized. For picoparticles, the same argument applies.

Requirements

- Synthetic nano- and picoparticles are not allowed at the moment.

⁴ EGTOP (Expert Group for technical Advice on Organic Production): Report on Fertilizers (III), chapter 3.5.1.

⁵ EGTOP Report on Fertilizers (II), chapter 4.8.2.

- The size limit below which a particle is considered as a nanoparticle follows national guidelines and interpretations at the moment.
- Agglomerates of nanoparticles will be evaluated case by case.

3.7 Co-formulants

Background

In this document, materials other than nutrients and soil conditioners are referred to as 'co-formulants'. Examples include emulsifiers, carriers, antifoaming agents, dyes and preservatives. Co-formulants are not regulated by the EU organic legislation. To ensure compliance with the objectives and principles of organic production, FiBL has certain requirements for co-formulants, which take into account effects on human health and/or the environment as well as the risk of causing residues.

The European Input List does not want to restrict the use of co-formulants to certain substances, as this would limit the potential for innovations in this field. Instead, it applies a flexible scheme based on the following principles:

- Materials listed in Annex I of Reg. 889/2008 are allowed.
- If the materials listed in Annex I of Reg. 889/2008 are not sufficient to achieve these effects, other materials may be used, provided that the applicant can demonstrate their need and that they are not harmful to the user or the environment.
- Natural substances should be used in preference.

Requirements

- Where a synthetic co-formulant is used, the applicant must demonstrate that the desired effect cannot be achieved with a natural substance.
- If synthetic co-formulants are necessary, the lowest possible amounts must be added.
- Co-formulants must not be harmful to the user or the environment. Endocrine disruptors (including potential endocrine disruptors) are not accepted. This applies to all alkylphenols and their ethoxylates, including nonylphenol and dodecylphenol. EDTA is not allowed as co-formulant (exceptions may be granted for the addition of FeEDTA to potting soils with a pH <5). FiBL reserves the right to request additional information, particularly on environmental fate and on residues in soil and/or crops. If the applicant fails to prove the need to use a co-formulant, or if he fails to demonstrate that the co-formulant does not cause residues in crops and has no unacceptable effects on human health and the environment, the product will be rejected.

- Manufacturers are free to choose those co-formulants which they consider to be most appropriate. The EPA's old list 4, and the 'Safer Choice' database may be consulted for orientation purposes.
- Co-formulants must not act as plant nutrients (e.g. ammonium compounds) and must not have a plant protection effect (e.g. preservatives).

4. Compliance with general legislation

The European Input List includes only products that comply with the relevant EU and national legislation. In the context of fertilizers, soil conditioners and crop management tools, the following aspects are particularly relevant:

- In countries/product types which must be registered, this is a requirement for admission into the input lists.
- Products with an effect on pests or diseases effect must be registered in compliance with pesticide legislation.
- For products which are not registered as plant protection products, no claims of a plant protection effect may be made.

Because such products are regulated / registered at a national level, compliance with general legislation is checked during evaluation for inclusion of products into the national lists associated with the European Input List. Compliance with general legislation is primarily in the responsibility of the applicant companies. However, if national evaluation teams suspect that a product does not comply with the relevant legislation, they may postpone inclusion into the list until the applicant has demonstrated legal compliance.