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Organic farming and biocontrol: two concepts that do not overlap

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According to the European Commission, biocontrol products are intended to be a sustainable alternative to chemical pesticides. However, as we saw in a previous article, the Commission plans to group products that are genuinely low-risk together with products derived from biotechnologies - whose risks have not been assessed - under the single term "*biocontrol*". Yet, the term "*biocontrol*" creates confusion by fostering the illusion that it is a technique akin to organic farming. What is the reality?

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Inf'OGM *decided to focus on biocontrol once it became clear that the definition currently under discussion at the European level could facilitate the marketing of products derived from biotechnologies. Furthermore, this definition could lead to semantic confusion with products used in organic farming - a confusion we believe it is important to highlight.*

"*Biocontrol*" is a recent term that has gained prominence within the debate on alternatives to synthetic chemical pesticides. This term - which has already replaced "*biological control*" in French-language general and scientific literature - could also undermine organic farming, following the trend of so-called "*agricultural greening*" (integrated farming, high environmental quality standards, etc.). In this article, we will highlight a structural difference between biocontrol and organic farming, and then specify which products are authorized for biocontrol but not for organic farming, explaining the rationale behind this prohibition.

Will the biocontrol of tomorrow be biotechnological?

"*Omnibus X*" - a European Commission proposal to amend several regulatory texts related to food - introduces numerous products incompatible with organic farming, owing to its vague and very broad definition of biocontrol. The European Commission is opening the door to "*biological macromolecules or molecules composed of elements thereof, as well as substances - including those of unknown or variable composition - derived from living organisms or resulting from biological processes*" (such as plant extracts or metabolites produced by microorganisms). At the time, *Inf'OGM* wrote: "*With such a definition, Omnibus X paves the way for market access for a new generation of so-called '*biological*' molecules that can nonetheless be synthesized* via *'*genetic engineering*' (*e.g.*, interfering RNA, micro-peptides, macromolecules '*inspired*' by living organisms)* ".

Organic farming and biocontrol: different approaches

Before detailing the incompatibilities between biocontrol products and organic farming standards, the first point to note is that the two approaches are fundamentally different. Biocontrol is defined exclusively by its "*products*"; it operates on a logic of substitution. In theory, these new products replace synthetic chemical pesticides. Often, the same companies - such as Syngenta or BASF - sell both types. Indeed, they emphasize that chemical pesticides and biocontrol products work synergistically[i].

Organic farming, by contrast, is a holistic approach to agro-ecosystems based on obligations regarding methods rather than specific products. Its primary aim is to devise or reintroduce practices that reduce the reliance of crop and livestock farming on external inputs. In practical terms, crop protection in organic farming relies first on agronomic measures (crop rotation, stale seedbed techniques, sowing densities and dates, choice of varieties, etc.). Next come mechanical and physical interventions, supplemented where necessary by authorized inputs (organic fertilizers, certain biocontrol products, basic substances) - excluding synthetic chemicals and products derived from genetic engineering. Thus, whereas biocontrol involves a new range of products that are quite diverse and relatively ill-defined, organic farming emphasizes agronomic practices.

Not all biocontrol products are authorized in organic farming.

Let us now turn our attention to biocontrol products, starting with the proposal made by the European Commission in "*Omnibus X*", which aims to amend Regulation (EC) No 1107/2009 concerning pesticides. Omnibus X introduces - for the first time in European law - the categories of

biocontrol "*substances*" and "*products*", defining them quite broadly[ii] and proposing a streamlined regulatory framework for them[iii].

France already has a definition for biocontrol products that - more or less - aligns with the proposed European definition. This French definition establishes a list of products recognized as "*biocontrol*" agents. For each product on the list, the Ministry of Agriculture specifies whether it is authorized for use in organic farming. By the end of 2025, 807 products in France were designated as biocontrol agents, and over three-quarters of them were authorized for organic farming[iv].

Biocontrol products can serve various functions: "*cidal*" roles (herbicides, insecticides, fungicides, etc.), population regulation (such as pheromone trapping), or the regulation of plant growth and development.

Biocontrol product categories prohibited in organic farming

The primary distinction between biocontrol products and organic farming lies in the latter's strict prohibition of herbicides and growth regulators. Organic farming standards (defined by Regulation 2018/848, Article 9 and Annex II) explicitly exclude all herbicides, even those that are entirely natural. For instance, pelargonic acid - originally discovered in geraniums - is not a product of synthetic chemistry; rather, it is an herbicide produced by extracting fatty acids from rapeseed or sunflower oil. Consequently, this product is not authorized for use in organic farming.

As for growth regulators, they are prohibited under Article 5 of Regulation 2018/848, which stipulates that organic farming practices must respect natural systems and cycles. Gibberellic acid, for example, is a natural hormone that stimulates plant growth and development, controls stem elongation, triggers seed germination, and promotes both flowering and fruit enlargement. It is found in products such as Proliant or Perlan, which are authorized in France as biocontrol products but prohibited in organic farming.

Herbicides and plant growth regulators are therefore strictly prohibited in organic farming; these are categorical bans. Other categories of substances - whether naturally derived or synthetic ones "*recognized as identical*" to the natural version and classified as biocontrol agents - include insecticides and fungicides. For these, specific products approved as biocontrol agents may or may not be authorized for use in organic farming. There are several reasons for these prohibitions. Biocontrol products can have systemic effects: they circulate within the plant's sap, trigger defense mechanisms, and leave measurable residues for extended periods (a classic example being phosphonates, despite their mineral nature). They can also have non-specific effects. For instance, rotenone kills a wide range of insects - including beneficial ones - and is highly toxic to aquatic organisms. This type of ecotoxicological profile is deemed incompatible with the biodiversity preservation goals inherent to organic farming, even though the active substance - formerly permitted in organic farming and now classified as a biocontrol product - is of plant origin.

Omnibus X opens the door to new biocontrol products

Omnibus X paves the way for synthetic biocontrol substances that are "*functionally identical and structurally similar*" to natural substances. In organic farming, synthetic inputs that are "*identical*" to natural substances remain excluded in principle. Under European organic regulations, they may only be authorized on an exceptional basis: when no effective natural or agronomic alternative exists, and when using other available natural inputs would result in greater environmental impact (Articles 5g and 24 of Regulation 2018/848).

It is based on the principle of excluding synthetic inputs - even those "*identical*" to natural substances - that organic farming prohibits, for example, potassium phosphonates[v], which are considered biocontrol products. This mineral fungicide exists in trace amounts in the soil; however, virtually all products sold are manufactured synthetically. Demeter adds that "*the main metabolite of synthetic phosphonates is phosphonic acid, which is identical to the one derived from Fosetyl-Al, a product banned in organic farming. This renders any residue-based monitoring virtually ineffective, threatening the traceability and transparency of organic products*"[vi].

Chemical mediators: a staple of biological control

We just stated that synthetic versions "*identical*" to natural ones are, in principle, banned in organic farming. There is, however, an exception: chemical mediators (pheromones or kairomones). Although chemically synthesized, they are "*identical*" to natural pheromones; used for trapping or mating disruption and leaving no residues on fruit, they are permitted in organic farming. It should be noted, however, that some are not permitted because the dispenser or trap contains other substances banned under organic regulations (synthetic insecticides, problematic solvents, etc.). Furthermore, a synthetic chemical product is never entirely identical to the natural product it seeks to replicate.

However, another type of chemical mediator is now entering the market. Already field-tested in Brazil, it consists of oil extracts from camelina plants genetically modified to produce precursors for the sex pheromones of lepidopteran pests[vii]. This process was developed by ISCA (Innovative Solutions for Insect Control in Agriculture), a subsidiary of De Sangosse, a leader in the biocontrol market. Because it is derived from a GMO, this oil is effectively banned in organic farming.
Restrictions on Microorganisms in Organic Farming

Microorganisms are frequently used in organic farming, whether in powder form or in preparations based on plant fermentation. Indeed, nettle slurry and *Bacillus thuringiensis* (Bt) are two iconic examples of organic crop protection. Microorganisms also spearhead the field of biocontrol.

Nettle slurry cannot be classified as a biocontrol product in the legal sense; instead, it is regulated as a "*basic substance*" (Regulation 1107/2009, Article 23), provided the specified production process is followed. Like any product resulting from fermentation, these slurries are preparations rich in microorganisms.

As for Bt, any product containing it must meet specific criteria to be authorized for organic use. The Bt product must consist exclusively of co-formulants that are themselves authorized for organic farming. Similarly, formulations containing only isolated Cry toxins - without the Bt bacterium itself - are prohibited in organic farming, even though they might qualify as "*biocontrol*" products. Crucially, the *Bacillus thuringiensis* strain must not be genetically modified. Regulations governing organic farming are explicit: authorized microorganisms must "*not be obtained from or derived from GMOs*" (Regulation 2018/848). This criterion immediately rules out Bt GMO crops in organic farming, as the Cry toxins are produced by the genetically modified plant itself. In contrast, in the United States, transgenic Bt crops are recognized as "*biocontrol products*" because they utilize biological mechanisms. This country has also authorized the marketing of genetically modified microorganisms (GMMs) as "*biocontrol products*", such as Crymax, marketed by Certis Biologicals [viii], or Nogall, marketed by Bio-Care[ix].

In Europe, under the definition proposed in the "*Omnibus X*" initiative, the European Commission refers to metabolites produced by microorganisms. It is important to note that these microorganisms can be genetically modified - such as those used to produce ledprona, the active

substance (RNAi) in Calantha, an RNAi spray designed to combat Colorado potato beetles. These new genetic pesticides are incompatible with the standards and fundamental principles of organic farming. However, within the European Union, the Omnibus X proposal - when read alongside the Commission's proposal to deregulate the commercial release of GMMs[x] - would allow authorized GMMs to be labeled as "*biocontrol products*" after having been approved as GMOs, doing so much more easily and without post-market oversight.

What do organic sector stakeholders think of biocontrol and the Omnibus X proposal?

To date, few stakeholders in the organic sector have criticized the European Commission's proposal regarding biocontrol products (Omnibus X). Historically, they have often championed the first biocontrol products to reach the market, while remaining wary - as the FNAB was in 2014 - of potential co-optation by the agribusiness industry and the introduction of products with questionable ecotoxicological profiles. At the time, the FNAB president stated: "*If biocontrol relies on products requiring marketing authorization or patents - and thus on private companies - it will be of far less benefit to farmers. Organic farmers value their autonomy; we do not want to trade one form of dependency for another*". When asked by *Inf'OGM*, the FNAB clarified that "*the proposals regarding biocontrol are also a cause for concern. It is primarily the definition that raises questions*". They added: "*The concept of '*similar*' is vague and creates a grey area between '*natural*' and '* synthetic*' substances. Yet, this distinction is fundamental to organic farming. That said, organic regulations remain in place to ensure that synthetic substances are excluded from the organic label. So, while it creates an issue regarding clarity, it does not necessarily pose a direct threat to the organic sector*".

In 2025, prior to the publication of Omnibus X, IFOAM Organics Europe - the European federation for the organic sector - emphasized organic farming practices, stating that "*in organic systems, biocontrol is just one of several tools used to manage pests, diseases, and weeds. In most cases, preventive and agronomic measures - such as crop rotation, variety selection, and the use of natural enemies - are sufficient*. *In fact, only 10% of organic farmland requires the use of natural substances in addition to preventive measures - with some crops, such as fruit and grapes, requiring them more than others*"[xi]. According to IFOAM, biocontrol substances can be "*natural substances or substances identical to them - such as extracts of natural origin (notably from plants or algae) or animal origin, substances produced by microorganisms or constituting biological organisms, and natural inorganic substances (of mineral origin)*". IFOAM Organics Europe sets two conditions. First, "*organic farming requires substances for niche uses and with selective action, so as not to destabilize the ecosystem's self-regulating balances and its naturally present beneficial organisms*". Second, "*biocontrol agents used in organic farming must meet the requirement of being GMO-free*", covering both products derived from GMOs and products manufactured by GMOs.

Thus, logically, in its response to the European consultation on the Omnibus X Regulation[xii], IFOAM Organics Europe states: "*While the definition of biocontrol products at the European level represents a positive step forward, the proposed definition is too broad. By including '*substances of biological origin or produced *via* synthesis that are functionally identical and structurally similar to them*', it creates a grey area that fails to adequately distinguish natural substances from artificial synthetic ones. This wording allows certain new substances - such as RNAi or peptides - and future biotechnologies to fall under the biocontrol category […]. We therefore believe that a clear regulatory distinction must be maintained between natural substances (and those identical to substances found in nature) on the one hand, and artificial synthetic substances on the other*". The definition needs to be refocused on the concept of identity, with other substances continuing to

follow standard regulatory procedures.

Ultimately, IFOAM Organics Europe does not question the principle of biocontrol; indeed, it calls for a harmonized European definition and a rigorous assessment of these substances that takes their natural occurrence into account. The organization points out that "*European assessment and authorization procedures were designed for synthetic substances and are ill-suited to natural substances, which struggle to gain approval despite offering crop protection alternatives that are less harmful than synthetic pesticides*".

Summary of products classified as "*biocontrol*" (or not) and products authorized for organic farming (or not)

Product	Biocontrol	Organic farming
Herbicide	Yes	No
Growth regulator	Yes	No
Systemic insecticide or fungicide	Yes	No
Non-selective insecticide or fungicide	Yes	No
Chemical mediator	Yes	Yes, if and only if the trap or dispenser does not contain other prohibited substances.
Non-GMO microorganism	Yes	Yes, subject to two conditions: – composed exclusively of co-formulants that are themselves authorized, – and the bacterium is "*complete*" (isolated toxin is prohibited).
GMO plant or microorganism, or molecule produced from a GMO	Under discussion	No
RNAi spray	Under discussion	No

i « Biocontrôle, le renouveau des pesticides ? », *Inf'OGM*, 28 novembre 2025.

ii Christophe Noisette, « The European Commission is proposing legislation on biocontrol », *Inf'OGM*, 8 July 2026.

iii Christophe Noisette, « Biocontrol: European Commission seeks lighter regulation », *Inf'OGM*, 2 July 2026.

iv French Ministry of Agriculture, « Liste des produits phytopharmaceutiques de biocontrôle, au titre des articles L.253-5 et L.253-7 du code rural et de la pêche maritime », 24 July 2026.

v "*Pygmalion*" by De Sangosse, "*LBG-01F34"* by De Sangosse, or "*Boing*" by HELM.

vi Demeter France, « Phosphonates en agriculture Biologique : la position de Demeter France », 5 June 2025.

vii https://hortimedia.ma/une-plante-genetiquement-modifiee-produit-des-pheromones-sexuelles-dinsectes-comme-alternative-aux-pesticides/

viii CERTIS Biologicals, « Crymax ».

ix « Bio-Care given permission to sell NoGall, and the world's first genetically engineered microbe designed for outdoor use », *LifeScienceHistory.com*.

x COM(2025) 1031.

xi « Accelerating access to biocontrol in the EU: IFOAM Organics Europe issues recommendations », *Bio Eco Actual*, 20 May 2025.

xii European Commission, « Feedback F33479098 from: IFOAM Organics Europe », 11 June 2026.

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