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## Low-risk Substances, New Effective Category of Biocontrol Agents as Lever for Durable Crop Protection Products

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### Abstract

Under EU pesticide regulation, a new category of active substance, namely low-risk substances are defined by Article 22 of Regulation 1107/2009. Since 2015, during *de novo* approbation or renewal, 18 biopesticides were approved giving rise to corresponding authorized marketed biocontrol agents. These low-risk substances are granted with 15 years approval instead of 10 usually, they are all without Maximum Residue Limits and corresponding Market Authorizations should be delivered in 120 days.

### 1. Introduction

The opportunity of biocontrol agents (BCA) to be usable in agriculture for crop protection as low-risk phytochemical substances is now operative (Marchand, 2017) at EU Plant Protection Regulation. These plant protection named “low-risk substances” are from plant, animal or mineral origin, or occur as natural microorganisms in fields. Up to now they are all granted without MRL (Maximum Residue Limits) (Charon, 2018). These 18 substances are considered as biopesticides although most of them are not assorted with a biocidal mode of action (MOA).

Available and marketed in most EU countries they may be employed by farmers in a safer way compare to most chemicals. Most of them are also allowed in organic production (Marchand, 2018) or are candidates with good chance. Criteria for these low-risk substances were modified in 2017, in order to open more opportunities for microorganisms to be approved in this category (EU, 2107).

### 2. BCA from Plant Origin

Although the production process is at industrial level, laminarin is extracted and purified from *Laminaria digitate* (sea algae). Laminarin is the last approved low-risk substances (EU, 2018a) qualified as such during renewal. Agricultural plant protection Mode Of Action (MOA) is an elicitation or a triggering of the plant defense mechanisms (elicitor) in order to enhance resistance

to bioaggressors, mainly in cereals.

### 3. BCA from Animal Origin

COS-OGA (ChitoOligoSaccharides and OligoGAlacturonides), also produce by industrial process, is a natural substance, mixture of two entities with a plant strengthener and fungicide Mode Of Action for vineyards and vegetables.

### 4. BCA from Mineral Origin

Ferric or iron phosphate is approved as molluscicide against slugs.

### 5. Microorganisms

A large majority of low-risk substances are from microorganism origin (15 from the 18 low-risk substances). *Bacillus amyloliquefaciens* strain FZB24 (fungicide), *Isaria fumosorosea* Apopka strain 97 (insecticide), Mild Pepino Mosaic Virus isolate VC 1 (elicitor), Mild Pepino Mosaic Virus isolate VX 1 (elicitor), Pepino mosaic virus strain CH2 isolate 1906 (elicitor, virus inoculation), *Saccharomyces cerevisiae* strain LAS02 (fungicide), *Trichoderma atroviride* strain SC1 (fungicide), *Coniothyrium minitans* Strain CON/M/91-08 (DSM 9660) (fungicide) and microorganism derived Cerevisane (plant activator) are corresponding approved low-risk microorganism substances at EU level. Two more were voted in May 2018: an approval for *Pasteuria nishizawae* Pn1 as nematocide and a renewal for *Ampelomyces quisqualis* strain AQ10 as well as for *Clonostachys rosea* strain J1446 as fungicides. Later, in 2019, were renewed as low-risk fungicides *Bacillus subtilis* strain IAB/BS03 and *Verticillium albo-atrum* strain WCS850.

Some natural low-risk substances are not living microorganism but derived from microorganism. Cerevisane was the first member of this sub-section and the second approved one is ABE-IT 56 (lysate parts of *Saccharomyces cerevisiae* strain DDSF623). Both are also fungicides.

### 6. Results

All the core of the plant protection uses, the Good Agricultural Practices (GAP) tables are of public occurrence (EU, 2019). In this database, the list of the basic substance may be found in “Search active substances” and sub-selection “Advanced Search” then “type” and finally “Low-risk substance”. For each approved Low-risk substance, the “Review Report”,

available on each individual corresponding web page, contains the dedicated GAP table were Usages are detailed in the Appendix II.

### 5. Conclusion

16 Low-risk substances are already approved in EU as biocontrol agents (Robin, 2019a) in Part D (Robin, 2019b) of Implementing Regulation (EU) No 540/2011 (EU, 2011). Non-biocidal, thus non-toxic, mode of actions, including elicitor effect and special competition (for microorganisms), are privileged for these crop protection products. Clearly, more Low-risk substances will come into force in the next years, and four new (two approvals, two renewals) were already acknowledged in 2018 and 2019. Moreover, a global list of Low-risk substances is under consideration in order to transfer during renewals or validate at once upon decision in this category all substances meeting the requirement of criteria defined by recent regulation (EU, 2107). Slowly, renewals of the substances from this list add more official Low-risk substances and mechanically decrease the “pesticides” Harmonised Risk Indicator (Robin, 2019c).

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