

**Table 1:** Human Safety testing parameters for pesticides approved for use in organic agriculture in EU according to Annex II of Commission Regulation (EC) No 889/2008, also approved under the general pesticide regulation (1107/2009). Microorganisms are taken from annex 2 of official Danish guidance on organic agriculture (Landbrugsstyrelsen 2018). Testing for genotoxicity (geno), carcinogenicity (carc), reproductive and developmental toxicity (repr) and neurotoxicity (neuro) was examined, as well as the availability of a completed risk assessment for humans. Data was obtained from peer reviews published by European Food Safety Authority (EFSA).

Pesticide	Indication	Tested for: <sup>1</sup>				Complete <sup>2</sup> Human Risk Assessment Possible?	Comment	Reference
		Geno <sup>1</sup>	Carc <sup>1</sup>	Repr <sup>1</sup>	Neur <sup>1</sup>			
Azadirachtin	IN	Yes	No	Yes	No	No	Nature of residues unknown, critical concern. Clastogenic in vitro.	EFSA Journal 2011;9(3):1858
Lecithin	FU	Yes	Yes	No	Yes	Yes	OECD TG 426 study (DNT, developmental neurotox) needed.	EFSA Journal 2017;15(4):4742, 74 pp
Pyrethrins	IN	Yes	Yes	Yes	Yes	No	Conclusion not possible on metabolites. Risk assessment for consumer not finalized.	EFSA Journal 2013;11(1):3032, EFSA Supporting publication 2017 33 pp
Spinosad	IN	Yes	Yes	Yes	Yes	Yes	Classification proposal H361f (reproductive toxicant category 2), carcinogen cat 2 classification considered. Concern for endocrine disruption. DNT study needed.	EFSA Journal 2018;16(5):5252, 33 pp
Spearmint Oil	IN, FU	No	No	No	No	No	Toxicological database incomplete, risk assessments could not be finalized.	EFSA Journal 2012;10(11):2541
Orange Oil	IN, FU	Yes	No	No	No	No	Toxicological database incomplete, risk assessments could not be finalized.	EFSA Journal 2013;11(2):3090
Paraffin Oil	IN	No	No	No	No	Yes	Concerns were raised over relevant impurities that may cause cancer (not with highly purified paraffin oils)	EFSA Scientific Report (2008) 216, 1-59
Citronella Oil	IN, FU	No	No	No	No	No	Components of citronella oil: methyl eugenol and methyl isoeugenol identified as toxicologically relevant impurities, being potential genotoxic carcinogens.	EFSA Journal 2012;10(2):2518
Clove oil	IN, FU	Yes	Yes	Yes	Yes	Yes	May contain methyl-eugenol which is a genotoxic carcinogen	EFSA Journal 2012;10(1):2506
Rapeseed oil	IN, FU	No	No	No	No	Yes	Testing was waived, food grade substance.	EFSA Journal 2013;11(1):3058
Sunflower oil	IN, FU	?	?	?	?	Yes	May form genotoxic and/or carcinogenic compounds upon degradation (photo oxidation, lipid peroxidation). No quantification of amounts available.	EFSA supp. publication 2016:EN-1023. 51 pp.
Adoxophyes orana	IN	Yes	Yes	Yes	Yes	Yes	Some tests done with other baculoviruses	EFSA Journal 2012;10(4):2654

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Ampelomyces quisqualis AQ10	FU	Yes	No	No	No	No	Data gap for identification and quantification of secondary metabolites & toxins, human risk assessments not finalized.	EFSA Journal 2017;15(12):5078, 17 pp
Bacillus firmus I-1582	NE	No	No	No	No	Yes	Testing waived, no secondary metabolites.	EFSA Journal 2012;10(10):2868
Bacillus Subtilis QST 713	FU	No	No	No	No	Yes	No concerns identified.	SANCO/10184/2003 - rev. final
Bacillus thuringiensis israelensis AM65-52	IN	No	No	No	No	No	Data gap for toxins, human risk assessment not finalized may need testing for genotoxicity	EFSA Journal 2013;11(4):3054
Bacillus thuringiensis subsp. aizawai	IN	Yes	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2013;11(1):3063
Bacillus thuringiensis subsp. kurstaki	IN	No	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2012;10(2):2540
Beauveria bassiana ATCC-74040, GHA	IN	Yes	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2013;11(1):3031
Con. minitans CON/M/91-08	FU	Yes	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2016;14(7):4517
Cydia pomonella Granulovirus	IN	Yes	Yes	Yes	Yes	Yes	Some tests done with other baculoviruses.	EFSA Journal 2012;10(4):2655
Gliocladium catenulatum J1446	FU	Yes	No	No	No	No	Concern for genotoxicity of secondary metabolite (gliotoxin), human risk assessments not finalized, approval not recommended.	EFSA Journal 2017;15(7):4905, 22 pp
Lecanicillium muscarium Ve6	IN	Yes	No	No	No	Yes	Does not produce toxins.	EFSA Journal 2010; 8(1):1446
Metarhizium anisopliae var. anisopliae F52	IN	Yes	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2012;10(1):2498
Phlebiopsis gigantea	FU	No	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2013;11(1):3033
Pseudomonas chlororaphis MA 342	FU	Yes	No	No	No	No	Proposed for category 2 mutagen classification (DDR metabolite). Human risk assessment not finalized due to risk identified with metabolites.	EFSA Journal 2017;15(1):4668, 21 pp
Streptomyces K61	FU	No	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2013;11(1):3061
Trichoderma harzianum T22	FU	Yes	No	No	No	No	Data gap on possible toxin formation, human risk assessments not finalized.	EFSA Journal 2013;11(10):3055
Verticillium albo-atrum WCS850	FU	No	No	No	No	Yes	Negligible human exposure	EFSA Journal 2013;11(1):3059
Copper	FU, BA	Yes	Yes	Yes	Yes	No	AOEL exceeded for workers in vineyards. Data gap on residue trials for all representative uses, consumer risk assessment not finalized.	EFSA Journal 2018;16(1):5152

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Fatty acids C7 to C18	IN, HE, PGR	N.A.	N.A.	N.A.	N.A.	No	Data gap, if fatty acid not of food grade quality, human risk assessment cannot be finalized.	EFSA Journal 2013;11(1):3023
Lime sulphur	IN, FU	Yes	No	No	No	Yes	Genotox: Positive in vitro tests, but not clastogenic in vivo. Eventual need for in vivo UDS assay. Data gap on nature of residues, in particular possible presence of polysulfides.	EFSA Journal 2010;8(11):1890
Sulphur	FU, IN, RE	Yes	N.A.	N.A.	N.A.	Yes	Sulfur is an essential element and it is needed at high dose levels. It is generally regarded as safe and is abundant in food.	EFSA Scientific Report (2008) 221, 1-70
Calcium hydroxide	FU	?	?	?	?	No	Operator, worker & bystander risk assessment could not be concluded.	EFSA supporting publication 2014:EN
Potassium hydrogen carbonate	FU	N.A.	N.A.	N.A.	N.A.	Yes		EFSA Journal 2012;10(1):2524

<sup>1</sup>Yes = Some level of relevant testing was done but not necessarily sufficient for a conclusive risk assessment.

<sup>2</sup> Complete human risk assessment possible: "No" in this column indicates that EFSA were not able to finalize the risk assessment for humans in the areas of operator, worker, bystander, resident or consumer, due to relevant concerns and/or lack of data. "Yes" indicates that risk assessments were finalized, however there may still have been data gaps of relevance for the human risk assessments.