PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
8-Hydroxyquinoline incl. oxyquinoleine	toxic for reproduction 1A / 1B	FU	01/01/2012	12/31/2022	2021/1449/EU	0.05 mg/kg bw/day	0.05 mg/kg bw	0.05 mg/kg bw/day
Aclonifen	two PBT criteria	HB	01/08/2009	31/07/2022		0.07 mg/kg bw/day	Not appl.	0.07 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Benzovindiflupyr	two PBT criteria	FU	3/2/2016	3/3/2023		0.05 mg/kg bw/day	0.1 mg/kg bw	0.04 mg/kg bw/day
Bordeaux mixture	two PBT criteria	FU	01/01/2019	31/12/2025				

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Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Bromuconazole	two PBT criteria	FU	01/02/2011	31/01/2024		0.01 mg/kg bw/day	0.1 mg/kg bw	0.025 mg/kg bw/day
Chlorotoluron	two PBT criteria	HB	01/03/2006	31/10/2022.	6 extensions.	0.04 mg/kg bw/day	Not appl.	0.215 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Copper compounds	two PBT criteria	FU	01/01/2019	31/12/2025		0.15 mg/kg bw/day	Not appl.	0.08 mg/kg bw/day
Copper hydroxide	two PBT criteria	FU	01/01/2019	31/12/2025				
Copper oxide	two PBT criteria	FU	01/01/2019	31/12/2025				
Copper oxychloride	two PBT criteria	FU	01/01/2019	31/12/2025				

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Cypermethrin	non active isomers	IN	3/1/2006	1/31/2029		0,05 mg/kg bw/day	0,2 mg/kg	0,06 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Cyprodinil	two PBT criteria	FU	01/05/2007	4/30/2023	2022/378/EU	0.03 mg/kg bw/day	Not appl.	0.03 mg/kg bw/day
Diclofop	low ADI / ARfD / AOEL	HB	01/06/2011	31/05/2023		0.001 mg/kg bw/day	0.03 mg/kg bw	0.003 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Difenoconazole	two PBT criteria	FU	01/01/2009	31/12/222	yes	0.01 mg/kg bw/day	0.16 mg/kg bw	0.16 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Diflufenican	two PBT criteria	HB	01/01/2009	12/31/2022	2021/1449/EU	0.2 mg/kg bw/day	Not appl.	0.11 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Dimoxystrobin	low ADI / ARfD / AOEL, two PBT criteria	FU	01/10/2006	1/31/2023	6	0.004 mg/kg bw/day	0.004 mg/kg bw	0.02 mg/kg bw/day
Emamectin	low ADI / ARfD / AOEL	IN	01/05/2014	30/11/2024		0.0005 mg/kg bw/day	0.01 mg/kg bw	0.0003 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Esfenvalerate	two PBT criteria	IN	01/01/2016	31/12/2022 (AIR V)+E22		0.0175 mg/kg bw/day	0.0175 mg/kg bw	0.011 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Etofenprox	two PBT criteria	IN	01/01/2010	31/12/2021 (AIR V)		0.03 mg/kg bw/day	1.0 mg/kg bw	0.06 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Etoxazole	two PBT criteria	IN	01/02/2021	31/01/2028		0.04 mg/kg bw/day	Not appl.	0.03 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Fludioxonil	two PBT criteria	FU	01/11/2008	31/10/2022	4 extensions, incl. 2021/1449/EU	0.37 mg/kg bw/day	Not appl.	0.59 mg/kg bw/day
Flufenacet (formerly fluthiamide)	two PBT criteria	HB	01/01/2004	10/31/2022	6 extensions	0.005 mg/kg bw/day	0.017 mg/kg bw	0.017 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Flumetralin	two PBT criteria	PG	11/12/2015	11/12/2022		0.015	0.1 mg/kg	0.03
Fluometuron	low ADI / ARfD /	HB	01/06/2011	31/08/2024		0.0005	0.008	0.008
Fluopicolide	two PBT criteria	FU	01/06/2010	31/05/2023		0.08 mg/kg bw/day	0.18 mg/kg bw	0.05 mg/kg bw/day
Flurochloridone	toxic for reproduction	HB	01/06/2011	5/31/2022	2 extensions	0.04 mg/kg	0.04 mg/kg	0.04

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Gamma-cyhalothrin	low ADI / ARfD / AOEL	IN	01/04/2015	31/03/2025		0.0012 mg/kg bw/day	0.0025 mg/kg bw	0.0003 mg/kg bw/day
Halosulfuron -	toxic for reproduction	HB	01/10/2013	30/09/2023		0.063	0.5 mg/kg	0.063
Imazamox	two PBT criteria	HB	01/11/2017	31/01/2025		3.0 mg/kg bw/day	3.0 mg/kg bw	2.25 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Ipconazole	toxic for reproduction 1A / 1B	FU	01/09/2014	30/11/2024		0.015 mg/kg bw/day	0.015 mg/kg bw	0.015 mg/kg bw/day
lambda-Cyhalothrin (includes gamma-cyhalothrin)	low ADI / ARfD / AOEL, two PBT criteria	IN	01/04/2016	31/03/2023		0.0025 mg/kg bw/day	0.005 mg/kg bw	0.00063 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Lenacil	two PBT criteria	HB	01/01/2009	31/12/2022	5 extensions, incl. 2021/1449/EU	0.12 mg/kg bw/day	Not appl.	0.4 mg/kg bw/day
Metalaxyl	non-active isomers	FU	01/07/2010	30/06/2023		0.08 mg/kg bw/day	0.5 mg/kg bw	0.08 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Metam (incl. - potassium and - sodium)	low ADI / ARfD / AOEL	FU, HB, IN, NE	01/07/2012	6/30/2022		0.001 mg/kg bw/day	0.1 mg/kg bw	0.001 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Metconazole	two PBT criteria	FU, PG	01/06/2007	4/30/2023	6 extensions.	0.01 mg/kg bw/day	0.01 mg/kg bw	0.01 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Methoxyfenozide	two PBT criteria	IN	01/04/2019	31/03/2026		0.1 mg/kg bw/day	0.1 mg/kg bw	0.06 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Metribuzin	two PBT criteria	HB	01/10/2007	7/31/2022	5/6 extensions	0.013 mg/kg bw/day	0.02 mg/kg bw	0.02 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Metsulfuron-methyl	two PBT criteria	HB	01/04/2016	31/03/2023		0.22 mg/kg bw/day	0.25 mg/kg bw	0.25 mg/kg bw/day
Nicosulfuron	two PBT criteria	HB	01/01/2009	31/12/2022	2021/1449/EU	2.0 mg/kg bw/day	Not appl.	0.8 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Oxamyl	low ADI / ARfD / AOEL	IN, NE	01/08/2006	1/31/2023	5 Extensions	0.001 mg/kg bw/day	0.001 mg/kg bw	0.001 mg/kg bw/day
Oxyfluorfen	two PBT criteria	HB	01/01/2012	31/12/2024		0.003 mg/kg bw/day	0.3 mg/kg bw	0.013 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Paclobutrazol	two PBT criteria	PG	01/06/2011	31/05/2023		0.022 mg/kg bw/day	0.1 mg/kg bw	0.1 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Pendimethalin	two PBT criteria	HB	01/09/2017	30/11/2024		0.125 mg/kg bw/day	0.3 mg/kg bw	0.17 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Pirimicarb	two PBT criteria	IN	01/02/2007	4/30/2023	6 extensions, incl. 2022/378/EU	0.035 mg/kg bw/day	0.1 mg/kg bw	0.035 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Propyzamide	two PBT criteria	HB	01/07/2018	30/06/2025		0.05 mg/kg bw/day	0.13 mg/kg bw	0.05 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Prosulfuron	two PBT criteria	HB	01/05/2017	31/07/2024		0.02 mg/kg bw/day	0.1 mg/kg bw	0.06 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Sulcotrione	low ADI / ARfD / AOEL	HB	d	31/08/2022 (AIR IV)		0.0004 mg/kg bw/day	Not appl.	0.0006 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Tebuconazole	two PBT criteria	FU	01/09/2009	8/31/2022	3 extensions	0.03 mg/kg bw/day	0.03 mg/kg bw	0.03 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Tebufenpyrad	two PBT criteria	AC	01/11/2009	31/10/2022 (AIR IV)		0.01 mg/kg bw/day	0.02 mg/kg bw	0.01 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Tembotrione	low ADI / ARfD / AOEL	HB	01/05/2014	31/07/2024		0.0004 mg/kg bw/day	0.1 mg/kg bw	0.0007 mg/kg bw/day
Tri-allate	two PBT criteria	HB	01/01/2010	12/31/2022	1 extension,	0.025	0.6 mg/kg	0.032

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Tribasic copper sulfate	two PBT criteria	FU	01/01/2019	31/12/2025				

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Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)
Ziram	two PBT criteria	FU, RE	01/08/2004	4/30/2023	7 extensions inc. 2022/378/EU	0.006 mg/kg bw/day	0.08 mg/kg bw	0.015 mg/kg bw/day

PAN EUROPE HAZARD SCREENING OF THE CANDIDATES FOR SUBSTITUTION (CfS)

Active substance	Reason for being a CfS (*)	Type of pesticide	Approved (date) (*)	Expires (date) (*)	Extentions of approval (''')	ADI mg/kg bw/d. (*)	ARfD mg/kg bw. (*)	AOEL mg/kg bw/d. (*)

(*) Data taken from DG SANTE's website, https://ec.europa.eu/food/plants/pesticides/eu-pesticides-database_en ; PAN will only do a screening if > 10 M

(**) Data taken from EFSA peer reviews, https://www.efsa.europa.eu/en and ECHA's RAC committee, https://echa.europa.eu/nl/about-us/who-we-are/c

(***) Data taken from EFSA peer reviews, https://www.efsa.europa.eu/en and JRC screening for endocrines, https://publications.jrc.ec.europa.eu/reposit

(****) Data taken from EFSA peer reviews, https://www.efsa.europa.eu/en and the assessment reports of the RMS, https://www.efsa.europa.eu/en/calls

(*****) Data taken from national residu monitoring, see https://www.efsa.europa.eu/en/efsajournal/pub/6491

(******) Data taken from PubMed, https://pubmed.ncbi.nlm.nih.gov/

(''') Data from EUR Lex https://eur-lex.europa.eu/homepage.html

(*******) EFSA slang for cases where the risk for the environment and biodiversuity arre thus high that a peasticide cannot be approved.

(##) Food Authority EFSA provides the basis for decisions on pesticide approvals; however, research shows that EFSA standardly disregards the precautior

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, DE, EL, ES, FR, HU, MT, PT, SI	R1B, toxic for reproduction; Increased abortions; Impaired fetal development (external malformations, head soft tissue variations, decreased ossification, skeletal retardations, sternebra) - rabbit; Impaired fetal development in rat (decreased ossification, skeletal retardations, visceral and skeletal variations); Decreased pup weight (not rel. acc. to EFSA##, maternal toxicity);	Considered to be endocrine (EFSA); Full endocrine acc. to JRC;	No information	MRL>LOD, 1, 0,10-0,10
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK,	Thyroid tumours and the bladder tumours observed (EFSA## assumes no relevance for humans) while brain tumours are observed as well; C2 classification; Decreased fetal weight and litter/pup weight (EFSA## not relevant due to maternal toxicity);	Not assessed	No data	MRL>LOD, 35, 0,02-0,80

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK,	Effects on reproductive system such as reduced sperm counts (ED potential); thyroid tumors (unlikely relevance to humans as assumed by EFSA##); effects on off spring (indirect as assumed by EFSA##); SDHI group	Potential endocrine, effects endocrine organs	Transient signs neurotoxicity acc. to EFSa	HIGH, top 20 MRL>LOD, 78, min: 0,02 - max: 1,50.
BE, CY, EL, HU, IT, MT, PT, RO				Not found in the EU-LRL database.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, FR, HU, IE, IT, LU, RO, SK,	Liver tumours in different test animals (EFSA## assumes not relevant for humans and safe level suggested); foetal toxicity, EFSA: 'may cause harm to unborn child'); Increased thyroid weight (EFSA## assumes indirect due to liver toxicity), Increased adrenaloid weight (EFSA## assumes due to general toxicity); Triazole group (sterole synthesis inhibitor);	belongs to the group of triazole fungicides that are suspected to have potential endocrine disrupting properties (industry didn't provide information)	No data	MRL>LOD, 2, 0,03-0,20
AT, BE, BG, CZ, DE, EE, EL, ES, FR, HR, HU, IE, IT, LV, PL, PT, RO, SI, SK,	No EFSA peer review (Spain 2004); Kidney adenomas and adenocarcinomas (mice); R2, C2 classification; fetotoxicity: skeletal variations and malformations; decreased number of implantation sites; Increased resorptions; Decreased fetal weight	No data, not assessed	No data	HIGH, top 20 MRL>LOD, 45, 001-0,10

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BG, CY, FR, HR, HU, IT, LU, PL, PT, RO				VERY HIGH top 10 MRL> LOD, 353 MRL, min 2,00 - max 1.000,00
AT, BE, BG, CY, CZ, DE, EL, ES, HR, HU, IT, LT, LU, LV, MT, NL, PL, PT, RO, SI, SK	Equivocal results in chromosome aberration test; some effects on offspring; Decreased litter mass at weaning and increased pup mortality (not rel acc. to EFSA##, maternal toxicity); Skeletal variatons (not rel EFSA##);	No evidence	No data	Not found in the EU-LRL database.
BG, CY, EL, ES, HR, HU, IT, NL, PL, PT, SI				Not found in the EU-LRL database.
AT, BE, BG, CY, CZ, DE, EL, ES, HR, HU, IE, IT, LU, MT, PL, PT, RO, SI, SK,	See copper hydroxide			Not found in the EU-LRL database.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK	Increased thyroid and adrenal weights and disturbed estrus cyclicity in rats were observed in the presence of systemic toxictiy (including mortality) (disregarded, EFSA##). Decreased male fertility (rat 12 weeks; Decreased litter size (rat 3 generation); Decreased pup weight and growth (rat & mouse); Pup development: significant delay in pinna detachment, down appearance, and eye opening; increased pup mortality (mouse); Significantly reduced sexual behaviour parameters and reproduction in males (mouse); Decreased males/females ratio (mouse); Testis histopathology mostly degenerational effects; Reduced sperm numbers; Decreased sperm motility; Altered steroidogenesis (gene expression); Decreased serum testosterone levels; Increased estradiol levels; Changes in LH and FSH levels; Data gap on genotoxic potential of 3-PBA	Full endocrine according to JRC (2016): there is clear evidence for in-vitro mechanistic endocrine effects (sexual hormones, thyroid gland, estradiol synthesis, mRNA expression), for adversity in an intact organisms (fertility, development offspring, reproduction), and for a plausible link between those two (altered hormone levels and expression linked to adverse effects on reproduction).	Only a lowest observable adverse effect level (LOAEL) was identified for parental animals based on DNT study: NOAEL of 15 mg/kg bw per day was based on functional observation battery (FOB) changes and testes/epididymis alterations. No robust animal or epidemiological studies exist indicating a causal relationship between Parkinson Disease (EFSA##).	Residues in lettuce, peaches, spinach, tomatoes

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	Liver toxicity; Some effects on reproduction; Effects on thyroid and pituitary (not rel. acc. to EFSA##, only short term studies); developmental and reproductive adverse effects (not rel. acc. to EFSA##, maternal toxicity);	Transactivation induction; androgen receptor binding; lack of data	No data	VERY HIGH top 10 MRL> LOD, 135, min: 0,02 - max: 40,00. NVWA: number 4 (MRL 190% exceeded)
EL, ES, IT, PT				HIGH, top 20 MRL>LOD, 59,0,02-0,10

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	Developmental effects (resorptions, malformations offspring) - not rel. acc. to EFSA##, maternal toxicity; cataract formation in chronic studies; effects on adrenals and ovaries (not rel. acc. to EFSA##, only in 90-day studies; Androgen and estrogen receptor: (Trans)activation induction (high potency); Aromatase inhibition induction; substance causes AMR due to overuse in agriculture; part of the (large) group of 'triazoles' that have common metabolites	Transactivation induction (high potency); co-factor recruitment induction; aromatase inhibition induction; lack of data	No data	VERY HIGH top 10 MRL>LOD, 264 MRL, min: 2,00 - max 20,00. NVWA residue data: number 1 (840% of the MRL)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	Industry studies with equivocal results on reproduction (still adopted by EFSA##); Increased relative pituitary weight; Increased adrenal weight; Uterus histopathology (increased incidence of uterine dilation); decreased seminal vesicle secretion; fetal development (increased incidence of extra ribs, visceral anomalies, decreased litter size, decreased litter viability, and decreased litter/pup weight) disregarded by EFSA## due to maternal toxicity	Indications for endocrine disruption	No data	MRL>LOD, 5, 0,02-0,60

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, EE, FR, HR, HU, LT, LU, LV, PL, RO, SK,	C2, R2; adenoma and adenomacarcinoma in the duodenum; reduced gravid uterus weight, increased resorption rate, increased post implantation loss and increased no of foetuses with variations (fused sternebrae); Developmental toxicity and Increased incidence of skeletal variation not rel. acc. to EFSA## (maternal toxicity); Thyroid tumours (not rel. acc. to EFSA##, not accompanied by developmental	No data, not assessed (interim criteria)	No indications in studies	MRL>LOD, 3, 0,08-0,30
AT, BE, BG, CY, EL, ES, FR, HR, HU, IT, NL, PL, PT, RO, SI, SK	Reduced fecundity; development: incomplete ossification; decreased fertility (disregardede by EFSA## for maternal toxicity)	Delayed sexual maturation : age of vaginal opening; age of preputial separation; lack of data	Neurotoxicity mice/rats/dogs: (tremors and neuronal degeneration in brain and spinal cord) - not human relevant acc. to EFSA (##)	HIGH,top 20 MRL>LOD, 73, 0,02,--1,00

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, EL, ES, FI, FR, HR, HU, IE, IT, LU, NL, PL, PT, RO, SE, SK,	Decreased litter size, decreased litter/pup weight and pup mortality (not rel. acc. to EFSA##, maternal toxicity); Testes tumors (Leydig cells tumors); Increased age at vaginal opening; Decreased estradiol level & Decreased LH level; neurotoxicity (ADI based on it)	Based on US data (EDSP battery), no concern acc. to EFSA (##); Suspected ED (EC list)	Very neurotoxic (pyrethroid)	? Fenvelerate data ?

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BG, CY, CZ, DE, EL, ES, FR, HU, IT, MT, PL, RO, SK,	liver and thyroid gland target organs; liver dysfunctioning; reduced levels of circulating thyroxine; increased incidence of thyroid follicular cell adenomas (not relevant acc. to EFSA##); renal lesions and renal cortical tumours (not rel. acc. to EFSA##); maternal deaths and abortions (not rel.)	weak endocrine effects (more data needed)	Dev. Neurotox study (pyrethroid): Impaired pre-weaning survival and subcutaneous haemorrhagic lesions (EFSA: May cause harm to breastfed babies)	VERY HIGH top 10 MRL >LOD: 89, min: 0,02 - max: 4,00.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, EL, ES, FR, HR, HU, IE, IT, NL, PL, PT, SI,	Non-finalised risk assessment with regards genotoxicity of etoxazole (only approved for non-edible products); abnormal amelogenesis (incisors) and hyperplasia of bone tissue; liver and prostrate toxicity; increased incidence of pup mortality; fetal development, i.e. incidence of 27 presacral vertebrae with 13th rib not rel. acc. to EFSA## (low evidence also cons. parental toxicity);	unlikely (EFSA##) despite prostrate effects, but more data needed	not neurotoxic on short term studies	MRL > LOD, 34, 0,02-15,00.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	Liver (increased weight, hepatocyte hypertrophy, bile duct proliferation) and kidney damage;	agonistic effects on ER transactivation (high potency); ERa-ERb and ERb-ERb dimmerization (high potency at 24 hours); antagonistic effects on ERa transactivation (medium to high potency); estrogenic and anti-estrogenic activity via endogenous ERa in MCF-7; estrogenic activity on hERa transfected in yeast; lack of data on endocrine activity	No data	VERY HIGH top 10 MRL > LOD, 176, min: 0,02 - max: 40,00. NVWA: number 2 (270% of the MRL)
AT, BE, BG, CY, CZ, DE, EE, EL, ES, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SI, SK,	Target: Liver, thyroid, kidney; eye and nervous system; increased incidence of renal pelvic mineralisation; Reduced fetal weight and skeletal variations at maternal toxic doses; hypertrophy of thyroid follicular cells	Thyroid? No data.	Neurotoxic effects in rats after acute and subchronic exposure;	MRL>LOD, 3, 0,10-0,15

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
EL, ES				
AT, BE, BG, CY, CZ, DE, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	effects on liver and kidneys; increased incidence of hepatocellular adenomas (not rel acc. to EFSA); Impaired fetal development (decreased crown rump length), decreased foetal weight and premature delivery (not rel acc. to EFSA);	Induction of Cytochrome P450 and liver enzymes was considered not relevant; lack of data	No neurotoxic effects in chronic studies	HIGH, top 20 MRL>LOD, 89, min: 0,01 - max: 10,00
CZ, EL, FR, HR, HU,	R1B (ECHA Risk Assessment committee,			MRL>LOD, 4,

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, DK, FI, FR, HR, HU, IE, LT, LV, PL, RO, SE, SK	increased incidence of mammary adenocarcinoma (but 'no evidence' acc. to EFSA##); Decreased litter/pup weight; acutely toxic after ingestion, highly toxic after inhalation; PBA-metabolite: potential genotoxic profile either regarding mutagenicity or clastogenicity; insufficient toxicological data for metabolite CPCA	No data	Neurotoxicity: salivation, incoordination, postural abnormalities, hyperexcitability, tremors;	MRL>LOD - See Lambda-cyhalothrin (top 10)
BG, EL, ES, FR, HU,	R1B, toxic for reproduction			
AT, BE, BG, CY, CZ, DE, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LV, MT, NL, PL, PT, RO, SE, SI, SK,	R2; Development: agenesis of the intermediate lobe of lung and cervical hemivertebra (rabbit), R2 proposed; unlikely to be genotoxic, but more data needed (EFSA); unknown genotox potential metabolite;	No information	No data	MRL>LOD, 8, 0,01-0,30

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, EL, FR, HU, IE, IT, LT, LV, PL, PT, RO, SE, SK,	R1B, toxic for reproduction; reduced thymus weight; cataracts in dogs; liver histopathological effects and forestomach lesions; offspring: reduced bw gain, delayed vaginal opening; malformations in offspring (Suspected of damaging the unborn child); triazole group	Data needed for endocrine effects on birds and fish	No data	
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SI, SK,	Short term exposure: poisoning by type II pyrethroids (such as salivation, incoordination, postural abnormalities, hyperexcitability, tremors);	No data submitted by industry, but some in vitro studies from the open literature describe interactions of lambda-cyhalothrin with receptors of the endocrine and immune systems	Very neurotoxic (bystanders advised to keep 10 meter distance to spraying)	VERY HIGH top 10 MRL>LOD, 195, min 0,002 - max: 10,00. NVWA data: number 3 (1400% of the MRL)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, CY, CZ, DE, EL, ES, FR, HU, IE, IT, NL, PL, PT, RO, SK,	C2; Significant increase in gravid uterus weight; Thyroid effects, Increased TSH levels and Thyroid histopathology; Pituitary weight increase; Mammary gland malignant adenocarcinoma;	Yes, endocrine : Plausible link between increased in pituitary weight & elevated TSH levels and thyroid effects	No data	MRL>LOD, 6, 0,50-0,50
AT, BE, BG, CY, CZ, DE, EL, ES, FR, HR, HU, IT, MT, NI, PL, PT, RO, SI, SK	Delayed ossification; Uterus histopathology findings	thyroid effects observed in an animal study could be attributed to liver mediated mechanism (EFSA##); lack of data	No data	HIGH, top 20 MRL>LOD, 75, 0,03-15,00. NVWA: number 6 (1900% exceeded)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BE, BG, CY, EL, HU, IE, IT, MT, NL, PL, PT, RO	Angiosarcomas in mice; Skeletal variations; decreased fetal weight; decreased number of live fetuses; increased post implantation loss all in the presence of maternal toxicity; causes severe skin burns and eye damage	No data	Neurotoxic at repeated exposure; no data on chronic exposure	Not found in the EU-LRL database.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, DK, EE, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK,	R2; Increased adrenals weight; Adrenals histopathology (corticomedullary pigmentation); Changes in fetal development: hydrocephaly, cebocephaly, forelimb flexures / malrotated hindlimb and increased lumbar/cervical ribs, bilateral hydroureter and hydrocephaly; Fetal mortality (rabbit); Resorptions; Post implantation loss; Decreased fetal weight, litter/pup weight, litter size; triazole group	No data	No data	MRL>LOD, 24, 0,05-0,70

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BE, BG, CY, CZ, EL, HR, HU, IT, MT, NL, PL, PT, RO, SK,	Adrenal histopathology findings; Increased adrenal weight; Decreased number of live fetuses; Increased testis weight; Thyroid histopathology findings;	Estrogen receptor: trans-activation induction (medium potency) - EFSA (##) feels outweigted by other studies; thyroid effects observed in these studies could be attributed to liver mediated mechanism (EFSA##); still 'updated assessment' needed from industry on thyroid toxicity	Not neurotoxic in acute studies; no data on chronic exposure	VERY HIGH top 10 MRL>LOD, 119, min: 0,02 - max: 7,00.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	Altered thyroid histopathology; Increased T4 levels; Decreased T4 and increased TSH levels; Decreased T3 and increased T4 levels; Increased T4 levels in different animal studies; All these thyroid effects were interpreted (by EFSA##) in terms of a rodent-specific response due to liver enzyme induction; Skeletal retardations and ureter/kidney alterations; Pituitary histopathology; Increased ovary weight; Reduced pup weight and increased pup mortality; Skeletal retardations and reduced foetal weight, reduced placental weight (indirect and irrelevant acc. to EFSA##);	No data	Effects observed in acute neurotoxicity study: decreased motor and locomotor activity, ptosis, oral staining, related to " the general toxicity of this compound" (EFSA##).	MRL>LOD, 4, 0,20-0,50

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	fetal development (incomplete ossification of frontal bones)- indirect acc. to EFSA##;	No data (unlikely endocrine acc. to EFSA##)	No data	MRL>LOD, 1, 0,02-0,02
AT, BE, BG, CY, CZ, DE, EE, EL, ES, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SI, SK,	Increased variations at maternally toxic dose (mortality and clinical signs) in rabbit (irelevant acc. to EFSA##); Effects on foetus (secondary to maternal toxicity acc. to EFSA##); Impaired thyroid histopathology; slightly increased incidence of interstitial cell adenoma and thyroid follicular cell carcinoma in rat (within HCD and not treatment related acc. to EFSA##); increased incidences of hepatocellular adenoma and carcinoma (mouse); effects on skeletal development of foetuses at the top dose	No data, no assessment	No data	

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BE, BG, CY, CZ, EL, ES, FR, HR, HU, IE, IT, MT, NL, PL, PT, RO,	Decreased litter size, decreased pup weight, increased pup mortality (not relevant acc. to EFSA## because of maternel toxicity);	High potency anti-estrogenic activity; medium potency progesterone antagonist; low potency-binding to estrogen receptor; low potency-binding to Progesterone Receptor; no further data; Carbamate	Decreased plasma, erythrocyte and/or brain cholinesterase activity (not relevant acc. to EFSA##); no chronic neurotox study available	MRL>LOD, 3, 0,01-0,02
BG, CY, EL, ES, HR, IT, MT, PL, PT, RO	Decreased litter/size, decreased fetal weight, post-implantation loss, and changes in fetal development, all disregarded by EFSA (##) because of maternal toxicity; Elevated risk of hypospadias; increased incidence of liver cell adenocarcinoma;	Anti-androgenic activity; Very potent ERalpha agonist (HepG2); mPXR and hPXR agonistic activity; no further data, no assessment	No data	MRL>LODn 15, 0,10-1,00

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, IT, LT, LV, NL, PL, PT, RO, SE, SK,	R2; Fetal development: skeletal variants, cleft palate, defects in the urogenital system; Decreased Litter/pup weight gain; "Possible risk of harm to the unborn child"(EFSA); Triazole and plant growth inhibitor (hormone).	Induction of aromatase activity; Estrogen receptor alpha antagonist (medium to high potency); Estrogen receptor agonist (medium potency); further information needed;	HIGH: MRL>LOD+L45	MRL>LOD, 9, 0,05-0,15

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SI, SK,	R2; pituitary effects are non significant or toxicologically important (acc. to EFSA##); The thyroid effects observed disregarded (by EFSA##); Thyroid histopathology findings; Increased thyroid weight; increased incidence of thyroid follicular cell hyperplasia and follicular adenomas; positive chromosome aberration results (EFSA##: unlikely genotox in vivo); development: increased incidence of less than twelve pairs of ribs and missing/incomplete vertebrae;	Decreased T3, T4 and TSH levels; Increased uterus weight; Androgen receptor (AR) mRNA showed a marked down-regulation and ER-beta mRNA was up-regulated; Full endocrine acc. to JRC (only 'endocrine activity' acc. to EFSA## and no further data needed); ;	No data except acute	HIGH, top 20 MRL>LOD, 72, 0,02-4,00 (+NVWA residues)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, CZ, DE, DK, EL, ES, FR, HR, HU, IE, IT, LU, NL, PL, PT, SE, SI, SK,	C2; Impaired fetal development and decreased fetal weight; reduction in cholinesterase activity and haematological effects; inhibition of brain and erythrocyte cholinesterase activity and tremors; positive in the mouse lymphoma test; lung tumours and mammary gland fibroadenoma; development: Skeletal effects were seen in the foetuses; Carbamate group	antagonist of Estrogen Receptor β.	Only acute studies, no studies on delayed neurotoxicity are available nor chronic neurotox studies	VERY HIGH top 10 MRL>LOD, 211, min: 0,05 - max: 15,00 (NWVA residues)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, CY, CZ, DE, DK, EL, ES, FR, HU, IE, IT, LU, MT, NL, PL, PT, RO, SE, SK,	C2; Carcinogenicity studies: thyroid tumours in rats, liver adenomas and carcinomas in mice (human relevance "could not be excluded" acc. to EFSA##); Adrenal histopathology findings; Increased adrenal weight; decreased pup weight; Altered pituitary histopathology; Reproduction studies: Ovary histopathology findings; Testis histopathology alterations; Testis discoloration, size variation and enlargement; Increased testis weight; Increase Age at preputial separation; Decrease in Coagulating gland weight, LABC weight, prostate weight and Seminal vesicles weight; Altered thyroid histopathology; Increased thyroid weight;	Studies on endocrine organs: Increased estadiol levels; Increased FSH levels (reversible acc. to EFSA##); Increased LH levels (reversible acc. to EFSA##) ; Decreased T4 levels; Increased TSH levels; Increased estrone levels; (reversible EFSA##); decrease LABC weight , prostate weight and Seminal vesicles weight (Hershberger anti-androgneic); Full endocrine acc. to JRC; "unlikely that propyzamide is an endocrine disruptor in mammals" (EFSA##)'	reduced motor activity in acute study; no chronic studies available	HIGH, top 20 MRL>LOD, 56, 0,02-0,60 (NWVA: low evidence)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CZ, DE, EL, ES, FR, HR, HU, IT, LU, MT, NL, PL, PT, RO, SI, SK,	Fetal development: skeletal variations; Increased incidence of acinar atrophy of the male mammary gland, uterine endometrial hyperplasia and uterine horn dilation; the genotoxic potential cannot be concluded for the metabolite triazine amine;	Toxic effects on uterus, male mammary gland; still EFSA## concludes that "No recognised endocrine disrupting effects were observed in vivo" and further studies not needed;	No neurotox effects in short term studies; no chronic studies available	

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BE, BG, CZ, DE, EL, ES, FR, HU, IT, LU, NL, PL, PT, RO, SK	R2; Fetal development: Delayed eye opening, corneal opacity, white material in the urinary tract, dilated renal pelvis and kidney abnormalities, decreased pup survival and decreased index number of live foetuses, decreased litter/pup weight; Decreased fetal bw , incompletely ossified or unossified skeletal elements (sternum, hyoid), short extra ribs, decreased fetal weight; Increased fetal mortality; Inconsistent results on genotoxicity;	No data, no assessment	neurological signs of toxicity in 90-day study, but dismissed by EFSA; no neurotox studies performed;	MRL >LOD, 10, 0,02-0,02

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK,	R2; Carcinogenicity studies: liver tumours in mice (not relevant acc. to EFSA##); Adrenals histopathology; Fetal development (skeletal and/or external malformations); Decreased fetal weight; Post-implantation losses; Resorptions; Increased placental weight; Increased gestation length; Reproduction studies: Increase Ano-genital distance; Increase number of nipples in males; Increase age at vaginal opening; Decrease coagulating gland weight; Increase epididymis histopathology; Decrease epididymis weight; Decrease LABC weight; increase prostate histopathology; Decrease prostate weight; Increase seminal vesicle histopathology; Decrease seminal vesicle weight; Increase testis histopathology; Decrease testis weight; Triazole group	Studies endocrine organs: Decreased testosterone levels in male foetuses testis; Altered steroid hormone levels in dams; androgen receptor binding; Full endocrine acc. to JRC; "no further concerns on endocrine disrupting properties can be raised" (EFSA##);	No data (only remarks on effects in other chronic studies)	VERY HIGH top 10 MRL> LOD, 172, min: 0,05-max: 40,00. NVWA: number 5 (MRl 900% exceeded)

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
BE, BG, CY, CZ, EL, ES, FR, HR, HU, IT, LU, PT, SI,	The developmental and reproductive adverse effects diasregarded (EFSA##, maternal toxicity); weak clastogenic potential in vitro (EFSA##: not genotoxic); liver tumours (EFSA##: benign, not relevant); suspected carcinoigen (EPA);	Estrogen receptor transactivation induction (low potency); no receptor binding;	No data (EFSA##: not suspected to affect the nervous system); Charli 2015: Loss of dopaminergic cells (possible relation to Parkinson);	

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, BG, CY, CZ, DE, EL, ES, FR, HR, HU, IT, LU, NL, PL, PT, RO, SI, SK,	R2; changes in thyroid histopathology disregarded (by EFSA## considered as liver toxicity); Carcinogenicity studies: Increased number of corpora lutea; Impaired fetal development (delayed ossification, variations and anomalies, runts); Reproduction studies: Delayed age of preputial separation; increased testis weight; Decreased uterus weight and altered vaginal histopathology; Altered epididymis histopathology, decreased sperm numbers, altered testis histopathology; Corneal squamous cell carcinoma (not rel acc. to EFSA##);	No data, no assessment	Acute, 90-days and developmental neurotox studies: corneal opacities (dams and offspring), reduced absolute body weight (dams), reduced body weight gain (dams and offspring) and lower absolute brain weight with no functional or histological impairment (EFSA## concludes "no direct neurotoxic effect of Tembotrione);	MRL>LOD, 10, 0,02-0,05
BE, FR, IE, IT,				

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, CY, CZ, DE, EL, ES, HR, HU, IT, LU, MT, PT, RO, SI, SK	Equivocal results in chromosome aberration test; some effects on offspring;	No evidence	No data	Not found in the EU-LRL database.

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)
AT, BE, CY, CZ, EL, FR, HR, HU, IT, MT, PL, PT, RO, SI, SK	The developmental and reproductive adverse effects diasregarded (EFSA##, maternal toxicity); increased T3 levels disregarded; Carcinogenicity studies: Adrenal histopathology; Increased adrenal weight; Fetal development deregulation; Decreased fetal weight; Increased post-implantation loss; Tumour induction: Haemangiomata; Reproduction studies: Increased epididymis weight; Increased ovary weight; Increased testis weight; Thyroid histopathology findings; Increased thyroid weight; Decreased uterus weight; Positive Ames test; one of the last from the Dithiocarbamate group	Cellullar proliferation induction; androgen Receptor binding induction; decreased thyroid peroxidase activity; lack of data, no assessment; Full endocrine acc. to JRC;	Neuropathological lesions after repeated dose; EFSA##: No developmental neurotoxicity	MRL>LOD, 3, 1,00-5,00

MS authorisation (*)	Human health - chronic - CMR (**)	Human health - chronic - endocrine (***)	Human health - chronic - neurotoxicity (****)	Exposure through food - residues (*****)

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ıary principle, see: https://www.pan-europe.info/sites/pan-europe.info/files/css/EFSA%20Science%20or%20Ideology%20-%20Report.pd

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Only one on aquatic toxicity (metal chelator).	5	Not found in the EU-LRL database.P8	Low risk due to low persistance	2
Lee. 2021, oxidative strees and mitochondrial damage; developmental abnormalities	4	long-term risk to birds and mammals (CAoC); risk to aquatic organisms (CAoC); risk to non-target plants in the off-field area (CAoC)	moderate to high persistent in soil under aerobic conditions at 20 °C (DT50 = 32.2 – 134 d).	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Only one on the toxicity for earthworms	4	High risk aquatic (Critical area of concern, CAoC);	Very high persistance (DT50 = 596 – 1216 days)	5
	P8			

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Three articles on hepatoxicity (triazole family, systemic, blocking steroles synthesis); 259 genes changed by exposure	5	Bromuconazole is very toxic to aquatic organisms; A high long-term risk was identified for herbivorous mammals (CAoC); Endocrine effects on birds and fish	high to very high persistent (DT50 = 329-1028 day at 20-22ºC).	5
Several articles on genotoxicity in test animals and testicular toxicity.	5	some data avialable but risks not asssesed	persistant but no good data available (like on bioaccumulation)	2

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Several articles on toxicity for soil organims; animal studies on developmental toxicity with malformations in embryos/larvae and alter the gene expression (nano copper);	3	high risk to birds and mammals (CAoC); high risk to aquatic organisms including sediment (CAoC); high risk to soil macro-organisms (CAoC)		5
	2			5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Dozens of articles. Singh 2020 demonstrates adverse effects in female rats on reproduction and developmental anomalies, that even were passed on to the F2 generation. Transgenerational! Hormone levels and receptors were altered during exposure. Wang 2021 discusses the mechanism of male reproductive toxicology of Cypermethrin. The substance induces Sertoli cell apoptosis (a cell in the testis that helps producing sperm). JIn 2011 reports on Cypermethrin-induced endocrine disruption in male mice. The review of Marettova 2017 points at the wider group of pyrethroids with neurodevelopmental, reproductive, and immunological effects that may result following exposure to some pyrethroids at levels below those that induce overt signs of neurotoxicity. Pyrethroids are endocrine	5	High risk to aquatic organisms (no sufficient mitigation measures available that could lead to a safe level in water); High risk to bees; High off-field risk to non-target arthropods	Metabolites are present up to 90 days and 'unextractable residues'up to 120 days. Data gap on toxicity soil mite.	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Tang 2020: development toxicity in zebrafish larvae, especially on cardiac; Fang 2012: AHR activator (a potential endocrine disrupter); Wang 2021: corruption of neurogenesis (mix of 3 low dose fungicides);	3	Buffer zones (10-40m) needed to protect aquatic life; high long-term risks for birds and mammals	persistent metabolite	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Range of independent studies showing endocrine activity; also one demonstrating cardiovascular toxicity, Deng 2017, 2018, Dong 2017, 2018;	5	No concerns according to EFSA	Data lacking on soil organisms; difenoconazole and metabolites (very) persistent	3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
No studies available	3	Very toxic for aquatic life (large buffer zones needed); high risk for non-target arthropods; no good data for birds and mammals	Diflufeniccan and metabolites persistent	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Only study (ANSES) on recovery of earthworms after application fungicide mix	5	High chronic risk to birds and mammals; A high risk to aquatic invertebrates, algae and in particular a very high chronic risk to fish	Risk groundwater pollution by persistent metabolites	5
Several articles on neurotoxicity and aquatoxicity.	3	High risks for arthropods, for aquatic life and for honey bees	Persistent metabolite	3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Zhu 2020: triggers Parkinson-like symptom during zebrafish development; studies on neurotoxicity and endocrine disruption; Pine, 2008: hormonal changes were observed in prepubertal female rats.	4	Risk for aquatic life incl. bioaccumulation; high risks arthropods and honey bees	Bioaccumulative; No data on metabolite and groundwater pollution	4

Independent literature (******)	**PAN Europe assessment of human health hazard level (1 - 5)**	**High risks for biodiversity (****) - CAoC (*******)**	**Soil pollution (*****)**	**PAN Europe assessment of environmental hazard level**
Some studies on effects on insects, aquatic, etc.	3	High risk to earthworm-eating birds and mammals; to aquatic organisms; to sediment dwellers from metabolites; to non-target arthropods and bees (CAoC)	Substance and metabolite persistent	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Park 2019: effects of etoxazole on embryogenesis and cardiovascular development; Ham 2020: induces testicular malfunction; Rencuzogullari 2004: potential genotoxic effects;	3	High risk of etoxazole for aquatic invertebrates; for non-target arthropod, for soil mites	Etoxazole might be considered a persistent (P) bioaccumulative (B) and toxic (T) or PBT substance (Commission)	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Teng 2013: antiestrogenic activity; consultants studies to claim that effects on soil organisms are acceptable; Li 2016: lethal and teratogenic toxicity for amphibians;	3	High risks for fish and aquatic invertebrates (10 meter buffer needed);	Moderate persistant metabolites, exceeding groundwater standard	4
No studies on toxicity	3	High risks for algae and aquatic plants (buffer needed);	Risk for groundwater contamination	3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Very few studies (new pesticide)	4	long-term risk for mammals; high risk was identified for the aquatic organism	Persistent substance and groundwater contamination risk; also air pollution (risk long range transport through the atmosphere)	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Moser 2016: behavioral effects, locomotor activity changes; several articles on aquatic toxicity, bee and arthropod toxicity	5	High risk to wild non target terrestrial vertebrates; High risk to aquatic organisms (CAoC);	potential for biomagnification in terrestrial and aquatic food chains.	5
Sevin 2018: hepatic and pancreatic toxic effects; Shen 2020: disrupted corticosteroid homeostasis; Fragiorge 2008: genotoxic risk for IMZX (in vitro);	4	High risk for aquatic organisms (RAC: Very toxic to aquatic life with long lasting effects); data gaps for bees;	Exceedance drinking water standard, incl. metabolites	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
No studies on toxicity	5	High risk to wild non target terrestrial vertebrates; High risk to wild non target terrestrial organisms other than vertebrates; High risk to aquatic organisms; The long-term risk to small granivorous birds (CAoC)	Ipconazole exhibited high to very high persistence in soil as well as metabolite 1,2,4 triazole	5
At least 10 articles on endocrine disruption, thyroid, sperm effects, reproduction; Shen 2020: Lethal toxicity and gene expression changes; Ansari 2012: neurobehavioral changes; Al-Sarar 2012: reproductive toxicity, hepatotoxicity, nephrotoxicity, and splenotoxicity	5	Data gap: biomagnification in aquatic and terrestrial food chains; A high acute and chronic risk to aquatic organisms		3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
No studies on toxicity	5	risk to algae and aquatic plants not finalised (higher sensitivity in the outdoor microcosm study);	potential groundwater contamination by unknown major soil metabolites; high potential for leaching to groundwater metabolites M1, M2 and M3;	4
Lerro 2021: associated with increased risk of thyroid cancer; Wu 2020: Disturbs the Skeletal Development of Zebrafish Embryos; Wu 2019: harms cardiac development and function of zebrafish embryos;	3	The risk assessment for birds and mammals from bioaccumulation in earthworms and from major plant metabolites is not finalised;	groundwater metabolite NOA409045 has a high potential to exceed the parametric drinking water limit of 0.1µg/L in groundwater	3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Pruett 2001: potential for immunological, developmental, carcinogenic, and atherogenic effects; Kaikai 2020: induces sensorimotor and neurobehavioral abnormalities in mice offspring; air pollution	5	very toxic to aquatic life with long lasting effects; risk for earthworms; long-distance air pollution	Groundwater contamination metabolite MITC	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
No studies on toxicity	5	High risk for aquatic organisms (15 meter buffer zone needed); high long-term risk to insectivorous birds;	medium to high persistence; groundwater contamination 'unlikely'	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Meikle 2019: disrupts honey bee colony activity and thermoregulation; no further studies on toxicity	3	The risk assessment for honeybees (chronic adult and larvae), for non-target arthropods, for sediment dwellers could not be finalised; risks for aquatic organisms in several crops	Potential ground water contamination above the parametric drinking water limit of 0.1 lg/L by methoxyfenozide and toxicological relevant metabolite RH131154; risk of accumulation in soil;	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Studies on toxicity for fish and amphibians; cancer risk (AHS); Porter 1993: increased thyroxine;	4	High risk algae and aquatic plants (15 meter buffer zone needed); high risk non-target plants (5 meter buffer zone needed);	Potential groundwater contamination by metabolites diketo-metribuzin, desamino-diketometribuzin and desmethylthio-metribuzin	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Few articles on soil organisms (persistence)	3	High risks for non-target terrestrial plants (20 meter buffer zone needed);	Substance and metabolites up to high persistance; exceedance groundwater standard for some crops	4
Bretaud 2020: Significant inhibitions (9-12%) of brain AChE activity; articles on aquatic toxicity and groundwater pollution.	4	High risk to aquatic macrophytes (5 meter buffer required); High risks non-target plants in the off-field area (5 meter buffer required);	Nicosulfuron risk of groundwater contamination; range of metabolites also violate the groundwater standard, but are declared 'irrelevant' by EFSA (##);	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Sorensen 2005: concentration-dependent increase in genomic DNA damage; some articles on acute neurotoxicity	3	earthworm field study missing; high risk to birds and mammals (granules); high long term risk to aquatic organisms; High toxicity to non-target arthropods (data lacking);	metabolites exceeding the groundwater standard classified by EFSA (##) as non-relevant;	4
Powe 2018: deregulation of zinc-finger type transcription regulators; Hassanein 2005: inhibition of acetylcholinesterase; some article on soil biodiversity	3	A high risk to aquatic organisms was identified for the active substance and for the metabolite MW 347; the risk assessment to aquatic organisms for the metabolite Deg 27 could not be finalised;	Very persistent substance, DT50 up to 553 days; bioaccumulative	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Mengmeng 2020: decrease of neurotransmitters; Yekti 2014: disrupts the development of heart and craniofacial cartilage in zebrafish embryos, and decreases their survival and hatching rates.	4	A high risk to aquatic organisms was identified from paclobutrazol and CGA149907; risk assessment for aquatic organisms was not finalised;	High risk groundwater contamination	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Neuro-disrupting pesticide. Campillo et al., Biomarkers indicative of neurotoxicity and physiological stress in caged clams exposed to a contaminated water containing the product; Pan et al.: thyroglobulin decreased in rats thyroid cells after exposure Andreotti 2009: higher incidence of pancreatic cancer; Meng 2021: reduce the heart rate, survival rate, and body length of zebrafish embryos; Demir 2017: induce DNA damage; range of studies on genotoxicity, endorine disruption, and other toxicity.	5	A high risk was identified for aquatic organisms (particularly algae) - CAoC	potential for groundwater exposure by the toxicologically relevant groundwater metabolite M455M001; The available evidence cannot exclude that pendimethalin might be considered a persistent (P) bioaccumulative (B) and toxic (T) or PBT substance	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Xiao 2015: sublethal and transgenerational effects of pirimicarb; Natale 2018: DNA damage at the chromosomal level; studies on neurotoxicity and aquatoxicity; Soloneski 2015: demonstrate the genotoxic and cytotoxic effects of carbamates;	4	High risk for aquatic organisms (buffer zone of 5 metres to address the acute risk required and a buffer zone of 40 metres to address the chronic risk); long term risk to birds is observed	Pirimicarb is medium to high persistent in soil; medium persistent metabolites;	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
No studies on toxicity	4	High risks for soil organisms; lack of data for risks for birds; High risk to aquatic organisms living in surface waters; lack of data for honey bees, earthworms, soil organisms, non-target terrestrial plants…..	groundwater contamination by soil metabolites of Propyzamide; substance persistent, DT50 up to 120 days; Volatilisation	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Few studies on toxicity soil organisms	3	High risk for aquatic organisms	moderate to high persistence in soil; range of metabolites up to very high persistance and exceeding 0.1 µg/L; exceeding standards in groundwater, even if used once in 3 years; unknown genotoxic potential of plant and groundwater metabolite CGA150829;	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Goujon 2014: photolyzed sulcotrione cocktail have a greater cytotoxicity and genotoxicity than parent molecule; few studies on toxicity substance and transformation products on soil;	4	High risk for non-target arthropods (spiders) in the off-field area (buffer zone 5 meter required); high risk for non-target plants in the off-field area (10 m buffer required); high risks aquatic higher plants; high long-term risk to insectivorous birds	Medium persistence, DT50 up to 90 days; metabolite exceeds groundwater standard	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Birkhoj 2007: Effects of azole fungicides on the function of sex and thyroid hormones; Taxvig 2007: Endocrine disrupting activities in vivo of the fungicides tebuconazole and epoxiconazole; Lu 2020: transgenerational defects in both reproduction and development; Othmene 2020: cardiac cell toxicity; Li 2019: thyroid endocrine disruption; Lopes-Antia 2021: reduced breeding output (birds); Othmene 2020: oxidative stress and histopathological alterations;	5	long-term risk to insectivorous birds; long-term risk to granivorous birds; long-term risk to herbivorous mammals; long-term risk to granivorous mammals; high risk for aquatic organisms (5 meter buffer required);	Lack of data on metabolite 1,2,4-triazole reg. Groundwater pollution;	5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Charli 2015 again and no further studies on toxicity	3	High risk aquatic organisms (20 meter buffer required); long-term risk to insectivorous birds	bioaccumulative; moderate to medium persistence; risk groundwater contamination low	4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Lovacovic 2020: primary DNA damage in both peripheral blood leocytes and brain (low dose exposure); Kasuba 2019: DNA instability in kidney and liver cells; some soil studies;	4	risk for aquatic organisms (drift reduction needed); risk for terrestrial non-target plants (mitigation needed);	Low to moderate persistance (incl. the metabolites); two metabolites pollute groundwater but are qualified as 'not relevant'by EFSA##;	3

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Several studies on the advantages of feeding it to pigs and chicken	2	high risk to birds and mammals (CAoC); high risk to aquatic organisms including sediment (CAoC); high risk to soil macro-organisms (CAoC)		5

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level
Cao 2019: egatively impacts embryonic development (i.e. mortality, hatching, heartbeat and notochord development) of zebrafish, decreases basal respiration of embryos, and alters behavioral responses in larvae.; Su 2018: interfering with neurosteroid production; Guo 2017: Delays Pubertal Development; Lulla 2016: Neurotoxicity of the Parkinson Disease-Associated Pesticide Ziram; Chou 2008: dopaminergic cell damage; Xie 2018: decreased serum testosterone and follicle-stimulating hormone levels; Ema 1994: Developmental toxicity;	5	High risk for aquatic organisms and non-target arthropods;		4

Independent literature (******)	PAN Europe assessment of human health hazard level (1 - 5)	High risks for biodiversity (****) - CAoC (*******)	Soil pollution (*****)	PAN Europe assessment of environmental hazard level

If ; ## indicates all cases where EFSA assumes that the effects is not relevant (based on speculation) and disregards the observed effect.