TECHNICAL REPORT

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Outcome of the consultation with Member States, the applicant and EFSA on the pesticide risk assessment for tebufenozide in light of confirmatory data

European Food Safety Authority (EFSA)

Abstract

The European Food Safety Authority (EFSA) was asked by the European Commission to provide scientific assistance with respect to the risk assessment for an active substance in light of confirmatory data requested following approval in accordance with Article 6(1) of Directive 91/414/EEC and Article 6(f) of Regulation (EC) No 1107/2009. In this context EFSA's scientific views on the specific points raised during the commenting phase conducted with Member States, the applicant and EFSA on the confirmatory data and their use in the risk assessment for tebufenozide are presented. The current report summarises the outcome of the consultation process organised by the rapporteur Member State Germany and presents EFSA's scientific views and conclusions on the individual comments received.

Keywords: tebufenozide, peer review, confirmatory data, risk assessment, pesticide, insecticide

Requestor: European Commission

Question number: EFSA-Q-2018-00414

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Summary

Tebufenozide was included in Annex I to Directive 91/414/EEC on 1 June 2011 by Commission Implementing Directive 2011/60/EU, and has been deemed to be approved under Regulation (EC) No 1107/2009, in accordance with Commission Implementing Regulation (EU) No 540/2011, as amended by Commission Implementing Regulation (EU) No 541/2011. It was a specific provision of the approval that the applicant was required to submit to the European Commission further studies on (1) the relevance of metabolites RH-6595, RH-2651, M2;

(2) the degradation of tebufenozide in anaerobic soils and soils of alkaline pH.

by 31 May 2013. On request of the applicant the deadline for submission of this data was extended by the Standing Committee in May 2013 to 31 December 2013.

In accordance with the specific provision, the applicant, Nisso Chemical Europe, submitted an updated dossier in December 2013, which was evaluated by the designated rapporteur Member State (RMS), Germany, in the form of an addendum to the draft assessment report. In compliance with guidance document SANCO 5634/2009-rev.6.1, the RMS distributed the addendum to Member States, the applicant and EFSA for comments on 27 April 2017. The RMS collated all comments in the format of a reporting table, which was submitted to EFSA on 16 May 2018. EFSA added its scientific views on the specific points raised during the commenting phase in column 4 of the reporting table.

The current report summarises the outcome of the consultation process organised by the RMS, Germany, and presents EFSA's scientific views and conclusions on the individual comments received.

Tebufenozide is the ISO common name for *N*-*tert*-butyl-*N*′-(4-ethylbenzoyl)-3,5-dimethylbenzohydrazide (IUPAC). The representative formulated product evaluated was a 240 g/l suspension concentrate (SC) formulation registered under different names in Europe. The representative uses evaluated comprised outdoor foliar spray applications against insect pests on grapes and pome fruit.

Considering the predicted concentrations in groundwater and the available toxicological data, the metabolites M2 and RH-6595 are considered not toxicologically relevant. Based on the submitted data, the metabolite RH-2651 has to be considered as a relevant groundwater metabolite since the absence of genotoxic potential in vivo has not been fully demonstrated.

Based on the available toxicology information RH-2651 has to be considered as a relevant groundwater metabolite, this is considered a critical area of concern as for all the representative uses assessed FOCUS groundwater modelling indicated that annual average recharge concentrations moving below 1 m depth of RH-2651, will be above the parametric drinking water limit of 0.1µg/L in all 9 FOCUS groundwater scenarios, using the results from FOCUS PEARL.

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

Tebufenozide was included in Annex I to Directive 91/414/EEC[1] on 1 June 2011 by Commission Implementing Directive 2011/60/EU[2], and has been deemed to be approved under Regulation (EC) No 1107/2009[3], in accordance with Commission Implementing Regulation (EU) No 540/2011[4], as amended by Commission Implementing Regulation (EU) No 541/2011[5]. EFSA previously finalised a Conclusion on this active substance on 18 October 2010 in the EFSA Conclusion (EFSA, 2010).

It was a specific provision of the approval that the applicant was required to submit to the European Commission further studies on

(1) the relevance of metabolites RH-6595, RH-2651, M2;

(2) the degradation of tebufenozide in anaerobic soils and soils of alkaline pH.

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In accordance with the specific provision, the applicant, Nisso Chemical Europe, submitted an updated dossier in December 2013, which was evaluated by the designated rapporteur Member State (RMS), Germany, in the form of an addendum to the draft assessment report (Germany, 2017). In compliance with guidance document SANCO 5634/2009-rev.6.1 (European Commission, 2013), the RMS distributed the addendum to Member States, the applicant and the EFSA for comments on 27 April 2017. The RMS collated all comments in the format of a reporting table, which was submitted to EFSA on 16 May 2018. EFSA added its scientific views on the specific points raised during the commenting phase in column 4 of the reporting table.

The current report summarises the outcome of the consultation process organised by the RMS, Germany, and presents EFSA's scientific views and conclusions on the individual comments received.

1.2. Interpretation of the Terms of Reference

On 22 December 2014 the European Commission requested EFSA to provide scientific assistance with respect to the risk assessment of confirmatory data following approval of an active substance in accordance with Article 6(1) of Directive 91/414/EEC and Article 6(f) of Regulation (EC) No 1107/2009. EFSA's scientific views on the specific points raised during the commenting phase conducted with Member States, the applicant and EFSA on the risk assessment of confirmatory data for tebufenozide are presented.

To this end, a technical report containing the finalised reporting table is being prepared by EFSA. The deadline for providing the finalised report is 6 June 2018.

On the basis of the reporting table, the European Commission may decide to further consult EFSA to conduct a full or focused peer review and to provide its conclusions on certain specific points.

[1] Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market. OJ L 230, 19.08.1991, p.1-32.
[2] Commission Implementing Directive 2011/60/EU of 23 May 2011 amending Council Directive 91/414/EEC to include tebufenozide as active substance and amending Commission Decision 2008/934/EC. OJ L 136, 24.5.2011, p. 58-61
[3] Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC. OJ L 309, 24.11.2009, p. 1-50.
[4] Commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the list of approved active substances. OJ L 153, 11.6.2011, p.1-186.
[5] Commission Implementing Regulation (EU) No 541/2011 of 1 June 2011 amending Implementing Regulation (EU) No 540/2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the list of approved active substances. OJ L 153, 11.6.2011, p.187-188.

2. Assessment

The comments received on the pesticide risk assessment for the active substance tebufenozide in light of confirmatory data and the conclusions drawn by the EFSA are presented in the format of a reporting table.

The comments received are summarised in column 2 of the reporting table. The RMS' considerations of the comments are provided in column 3, while EFSA's scientific views and conclusions are outlined in column 4 of the table.

The finalised reporting table is provided in Appendix A of this report.

Documentation provided to EFSA

1. Germany, 2017. Addendum to the additional report on tebufenozide, confirmatory data, April 2017, updated in March 2018. Available online: www.efsa.europa.eu.

2. Germany, 2018. Reporting table, comments on the pesticide risk assessment for tebufenozide in light of confirmatory data, March 2018.

References

EFSA (European Food Safety Authority). Conclusion on the peer review of the pesticide risk assessment of the active substance tebufenozide. EFSA Journal 2010;8(12):1871, 120 pp. doi:10.2903/j.efsa.2010.1871

European Commission, 2003. Guidance Document on Assessment of the Relevance of Metabolites in Groundwater of Substances Regulated under Council Directive 91/414/EEC. SANCO/221/2000-rev. 10 final, 25 February 2003

European Commission, 2013. Guidance document on the procedures for submission and assessment of confirmatory information following approval of an active substance in accordance with Regulation (EC) No 1107/2009. SANCO 5634/2009-rev. 6.1

Abbreviations

CA	Comet assay
DAR	draft assessment report
DFOP	double first-order in parallel
DT50	period required for 50% dissipation (define method of estimation)
DT90	period required for 90% dissipation (define method of estimation)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FOCUS	Forum for the Co-ordination of Pesticide Fate Models and their Use
GAP	Good Agricultural Practice
GLP	Good Laboratory Practice
ISO	International Organization for Standardization
IUPAC	International Union of Pure and Applied Chemistry
Koc	organic carbon linear adsorption coefficient
LC50	lethal concentration, median
LD50	lethal dose, median; dosis letalis media
LoEP	list of endpoints
MN	micronucleus assay
NOEL	no observed effect level
OECD	Organisation for Economic Co-operation and Development
OC	organic carbon content
PEC	predicted environmental concentration
PECgw	predicted environmental concentration in groundwater
RMS	Rapporteur Member State
SC	suspension concentrate
SFO	single first-order
SMILES	simplified molecular-input line-entry system

Appendix A – Collation of comments from Member States, applicant and EFSA on the pesticide risk assessment for the active substance tebufenozide in light of confirmatory data and the conclusions drawn by EFSA on the specific points raised

Physical/Chemical Properties; Data on application and efficacy; Further Information; Methods of Analysis

Data on application and efficacy

No.	Column 1 Reference to addendum to assessment report	Column 2 Comments from Member States / applicant / EFSA	Column 3 Evaluation by rapporteur Member State	Column 4 EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data
1(1)	Addendum, PEC groundwater p. 103 and GAP table LoEP, p.3	EFSA: in the LoEP the interval between the 2 applications can be 15 days or 23 days, while in the PEC assessment only 15 days is considered.	RMS: For the calculation of PEC_{GW} an application interval of 15 days was considered as worst case scenario for the use in pome fruit.	Addressed: For the calculation of PECGW an application interval of 15 days was considered as worst case scenario for the use in pome fruit
1(2)	Addendum, B.9.9.1 Pesticidal activity of metabolites, p.112	EFSA agrees that none of the tebufenozide metabolites RH 6595, M2 and RH 2651 showed a comparable insecticidal or acaricidal activity to the active substance. However this conclusion has not been included in the relevant (missing efficacy) section of the list of endpoints.	RMS: The list of endpoints did not include the section efficacy in the EFSA conclusion. Therefore, it remained the same while working on the confirmatory information.	Addressed: The LoEP was updated by EFSA with the section on efficacy.

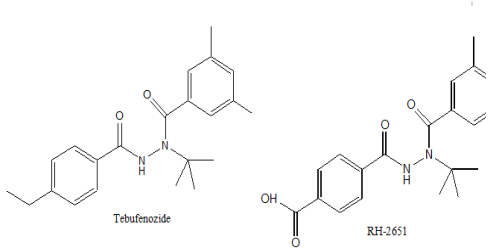
Effects on human and animal health

Further toxicological studies				
No.	**Column 1** **Reference to addendum to assessment report**	**Column 2** **Comments from Member States / applicant / EFSA**	**Column 3** **Evaluation by rapporteur Member State**	**Column 4** **EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data**
2(1)	General comment	Applicant: It is strongly asserted that the "relevance" of RH-2651 cannot be concluded yet. The RMS conclusion that RH-2651 is a relevant metabolite is based on a positive result in an *in vitro* chromosome aberration study, claiming that the follow-up *in vivo* micronucleus (negative) did not show evidence of bone marrow exposure. In order to make a definitive regulatory decision on this matter, stage 2 of step 3 must be completed, in accordance with Sanco/221/2000 – rev.10- final (25 February 2003). The applicant is committed to concluding this point with further work including: - Addressing the genotoxicity of RH-2651 with an in vitro study to show that the results of the in vitro chromosome aberration study are due to oxidative stress, or; - Conducting (upon request, as required for vertebrate studies), an in vivo study to show that the bone marrow is reached.	RMS: Due to the way GD SANCO/221/2000 has to be applied and based on the submitted data, currently, RH-2651 needs to be regarded a relevant groundwater metabolite. Due to the scarce information given on the nature of the *in vivo* study that could be conducted upon request, we cannot conclude at this point whether further *in vivo* studies would be helpful.	Based on the submitted data, RH-2651 has to be considered as a relevant groundwater metabolite since the absence of genotoxic potential in vivo has not been fully demonstrated. See also comments 2(6), 2(7), 2(8), 2(9), 2(10), 2(11), 2(12), 2(13), 2(14), 2(15).

		See comments 8, 9 and 10		
2(2)	Addendum to the Additional Report, Confirmatory Information, text before the first table at page 3	Applicant: "The respective chemical structures which were provided by the notifier are reproduced in Table B. 6.8-1". Table B. 6.8-1 should be amended into Table B. 6.8-2	RMS: This typo does not occur in our version. Possibly there is an issue with word's cross-referencing function.	Noted. This has no impact on the risk assessment.
2(3)	Addendum to Vol. 3, Studies on RH-6595, RH-2651 and M2, analysis of test substance	EFSA: For many studies, it is highlighted that the stability and homogeneity of test substance and of test substance in the vehicle and analysis of achieved concentration were not assessed. This could limit the reliability of the results. Further argumentation/evidence could be provided by the applicant.	RMS: Noted. All information provided by the applicant was included in the addendum. See also 2(5).	See comment 2(5).
2(4)	Addendum to the Additional Report, Confirmatory Information, B.6.8.1.1.3 Gene mutation in mammalian cells, B.6.8.1.1.4 Test for clastogenicity, B.6.8.1.2.3 Gene mutation in mammalian cells, B.6.8.1.2.4 Test for clastogenicity, B.6.8.1.2.5 In vivo genotoxicity testing (somatic cells) – Metaphase analysis in rodent bone marrow or micronucleus test in rodents, B.6.8.1.3.1 Acute oral toxicity,	Applicant: For all new studies, acceptability of the study is given in the evaluation by RMS at the end of the summary. A "yes" or "no" should be added for "Acceptability" at the end of Reference, or "Acceptability" here should be deleted.	RMS: The table cell "Acceptability" will be removed in a revised version.	Noted. This has no impact on the risk assessment.

	B.6.8.1.3.2 Gene mutation in bacterial cells, B.6.8.1.3.3 Gene mutation in mammalian cells, and B.6.8.1.3.4 Test for clastogenicity - Acceptability			
2(5)	Addendum to the Additional Report, Confirmatory Information, same points as per No. (2), Evaluation by RMS (2014): "Stability and homogeneity of test substance and of test substance in the vehicle and analysis of achieved concentration were not assessed."	Applicant: Misleading, please delete. This is not a requirement of relevant guidelines. The "Test report" section of the Guidelines only mention "solubility and stability of the test chemical, if known." among data to be reported. Verification of achieved concentration in these types of studies, where formulations/media are made up on the day of use, is also generally not required.	RMS: The mentioned analytical determinations may be required by the GLP principles. In any case, it is a true observation, that these analytical determinations were not conducted.	Addressed. It is noted that no analytical determinations were conducted in some genotoxicity studies. Considering the type of studies, this is unlikely to have an impact on the reliability of the results. See also comment 2(3).
2(6)	Addendum to Vol. 3, B.6.8.1.2 Studies on RH-2651, Test for clastogenicity, p.34-42	EFSA: Agree with the RMS that evidence is missing to support the hypothesis of the occurrence of redox-cycling/oxidative stress and to conclude that the positive results are not relevant (and with a threshold).	RMS: Thank you for the support.	See comment 2(1).
2(7)	Addendum to Vol. 3, B.6.8.1.2 Studies on RH-2651, In vivo micronucleus test, p.43-46	EFSA: Agree with the RMS that there is no evidence that the target tissue was reached under the conditions of the study. As a consequence, negative results should not be relied upon. The genotoxic potential of RH-2651 should be further investigated.	RMS: Thank you for the support.	See comment 2(1).
2(8)	B.6.8.1.2.4 Test for	FR: FR agrees with RMS that RH-2651	RMS: Thank you for the support.	See comment 2(1).

	clastogenicity RH-2651 B.6.8.1.2.5 In vivo genotoxicity testing (somatic cells) – Metaphase analysis in rodent bone marrow or micronucleus test in rodents	was clastogenic in the *in vitro* Mammalian Chromosome Aberration Test in Human Lymphocytes. In the absence of proof of bone marrow exposure, the negative *in vivo* test cannot dismiss the clastogenic concern highlighted *in vitro*. Pending to clarification of its genotoxic potential, RH-2651 should be considered as relevant.		
2(9)	Addendum to the Additional Report, Confirmatory Information, B.6.8.1.2.4 Test for clastogenicity with RH-2651, Evaluation by RMS (2014), Last sentence ("The negative results following 3-hour treatment in the absence of S9 mix is considered less reliable…")	Applicant: We strongly disagree that the deviation had any impact on the validity of the negative results in the absence of S9 mix. Evaluation of the two additional slides, prepared at the same time as the initial two, for a total of 200 metaphases scored for the positive control lead to the expected significant increase. In addition, comparison of treated groups against concurrent solvent control showed comparable results, and no significant difference. The results of the assay are therefore fully reliable.	RMS: The study report mentioned as deviation that "following the decoding of slides from the 3-hour treatment in the absence of S9 mix, the positive control values (Mitomycin C, 0.2 µg/mL) did not produce a reproducible and detectable increase over background". Hence the addendum appropriately summarises the submitted study report.	See comment 2(1).
2(10)	Addendum to the Additional Report, Confirmatory Information, B.6.8.1.2.4 Test for clastogenicity with RH-2651, Evaluation by RMS (2014) of Further reasoning from the	Applicant: We draw the attention of the RMS to the structure of RH-2651, which is practically identical to the parent molecule, except that the carboxylic acid group, substituting the ethyl group of the parent, making it more water soluble.	RMS: Noted. This statement is not supported by data/information.	See comment 2(1).

	notifier, ("The notifier did not provide evidence…")			
2(11)	Addendum to the Additional Report, Confirmatory Information, B.6.8.1.2.4 Test for clastogenicity with RH-2651, Evaluation by RMS 2014) "Currently…the results as irrelevant positive seem quite speculative."	Applicant: 'false positive' conclusion is supportable, based on the nature of the results, which is typical for materials eliciting oxidative stress. Only the results excluding gaps are considered useful. At 3 hours without S9 there is no clear increase in aberrations across the doses, and all results are clearly below the historical control maximum. At 21 hours continuous exposure without S9 there appears to be a real treatment-related increase in aberrations. Contrasting with the 3 hour exposure, the 21 hour exposure gave sufficient time for the reductive capability of the cells to be exhausted and overwhelmed at all three dose levels, resulting in the generation of the secondary oxidative radical species from the cells' own respiratory processes and entropy. There is no dose response, but this is typical for materials eliciting oxidative stress. The oxidative species ultimately produced are	RMS: Essentially, no new arguments compared to those already presented in the addendum are presented. RMS's conclusion in the addendum is re-iterated: "Currently, both the hypothesis of the occurrence of redox-cycling/oxidative stress and thereby rendering the results as irrelevant positive seem quite speculative."	See comment 2(1).

		proportional to the biomass of cells rather than the dose of test material. At 3 hours with S9 the result only becomes potentially meaningful at the top dose examined, which exceeds the historical control range. It is noteworthy that there is a no response in the previous two concentrations. This is also typical of materials producing oxidative stress. Only at the top dose was there sufficient test material available to overwhelm the reductive capability of the cells within the short exposure time. However, the applicant the applicant is committed to support this hypothesis with an in vitro study to show that the results of the in vitro chromosome aberration study are due to oxidative stress. An appropriate timeframe is requested to complete this work.		
2(12)	Addendum to the Additional Report, Confirmatory Information, B.6.8.1.2.5 In vivo genotoxicity testing (somatic cells) with RH-2651, Evaluation by RMS (2014) ("The study is considered supplementary.")	Applicant: Negative result obtained from a study where the limit dose of 2000 mg/kg was administered twice, over two consecutive days should be acceptable, even if there were no clear evidence for exposure of target tissue. The in vivo mouse micronucleus test was adequately conducted at the time the study was undertaken. The relevant version of OECD 474 (1997) suggested the test to be not	RMS: See 2(1), 2(7), 2(8).	See comment 2(1).

		appropriate "If there is evidence that the test substance, or a reactive metabolite, will not reach the target tissues" rather than requiring definitive demonstration of exposure. The study should not therefore be retrospectively appraised on this basis. However, upon request (as required for vertebrate studies) the applicant is committed to support the study with additional in vivo testing to demonstrate exposure of target tissue. A suitable timeframe is requested for the applicant to address this issue accordingly.		
2(13)	Vol.3 B.6.8.2 Assessment of the relevance of metabolites in groundwater according to SANCO/221/2000-rev.10 (25 February 2003)	FR: RMS conclusions are agreed. RH-6595 and M2: the available data are sufficient to allow an assessment of their relevance according to SANCO/221/2000-rev.10 (25 February 2003) up to step 4 (even though not necessary for M2 since the relevance assessment is not triggered by predicted concentrations). RH-2651 considered relevant. It does not pass stage 2 of step 3 (screening for genotoxicity) and cannot be tolerated in groundwater in concentrations above/equal to 0.1 µg/L.	RMS: Thank you for the support.	Addressed. See also comment 2(1).
2(14)	Addendum to Vol. 3, B.6.8.2, Assessment of the relevance of GW	EFSA: Considering the predicted concentrations in GW (see section 5) and the available toxicological	RMS: Thank you for the support.	Addressed. See also comment 2(1).

	metabolites, p.69-	data, the metabolites M2 and RH-6596 are considered not toxicologically relevant whereas the metabolite RH-2651 is considered toxicologically relevant.		
2(15)	Addendum to the Additional Report, Confirmatory Information, B.6.8.2.1.3 RH-2651, 2nd paragraph ("The Guidance document indicates following…")	Applicant: The interpretation of GW metabolites guidance document by the RMS appears rather speculative and unilateral, and against the wider, more conventionally held Scientific opinion of the EU with respect to genotoxicity testing. GW metabolites are not exempt from EFSA strategies for genotoxicity testing. The final conclusion on genotoxic potential must be made in-line with the accepted current guidance, and relevance of a positive result *in vitro* still needs to be tested *in vivo*. This is further supported by text in the EFSA conclusion on tebufenozide (European Food Safety Authority; Conclusion on the peer review of the pesticide risk assessment of the active substance tebufenozide EFSA Journal 2010;8(12):1871) where, on pages 7-8 it is stated: "For the groundwater metabolites GH-6595 and GH-2651 a data gap has been set for further *in vitro* genotoxicity studies (gene mutation test with mammalian cells, chromosome aberration test) in order to complete the assessment of their toxicological relevance. *If positive*	RMS: The assessment of relevance of groundwater metabolites needs to be conducted according to GD SANCO/221/2000. An *in vivo* follow-up study was submitted, which did not lead to increases in MN; however bone marrow exposure was not demonstrated. Hence, the positive *in vitro* CA test could not be placed into perspective. According to the relevant GD SANCO/221/2000, a metabolite with positive genotoxicity tests needs to be considered as relevant.	See comments 2(1) and 2(16).

		results are obtained, further in vivo genotoxicity testing might be needed. For the groundwater metabolite M2, a full assessment of its toxicological relevance is needed according to the Guidance Document on the Assessment of the Relevance of Metabolites in Groundwater (European Commission 2003)."		
2(16)	Addendum to the Additional Report, Confirmatory Information, B.6.8.2.1.3 RH-2651, 4th paragraph ("The compound therefore passes stage 3 of step 3 of the Guidance document but not stage 2 of step 3. In summary, the compound does not pass step 3 of the relevance assessment and needs to be considered relevant."	Applicant: Until the genotoxic potential of RH-2651 is clarified by *in vivo* testing, and *no conclusion* can be made as to its relevance, it remains at stage 2 of step 3. The wording in the Addendum should be modified appropriately. "Relevance" cannot be asserted yet for RH-2651.	RMS: This proposed wording is not covered by the GD SANCO/221/2000: "Any metabolite that does not pass all three stages [of Step 3] is considered as "relevant" under regulatory aspects and thus unacceptable at groundwater contamination levels exceeding 0.1 µg/L."	Addressed. It is confirmed that, according to SANCO/221/2000 (European Commission, 2003), any metabolite that does not pass all three stages [of Step 3] is considered as "relevant" under regulatory aspects and thus unacceptable at groundwater contamination levels exceeding 0.1 µg/L. See also comment 2(15).

Environmental fate and behaviour

Route and rate of degradation in soil				
No.	**Column 1** **Reference to addendum to assessment report**	**Column 2** **Comments from Member States / applicant / EFSA**	**Column 3** **Evaluation by rapporteur Member State**	**Column 4** **EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data**
4(1)	List of endpoints rate of	EFSA: For the northern France clay	RMS: The respective values the	Addressed.

	degradation in soil laboratory studies parent tebufenozide.	loam the actual DT_{50} and DT_{90} of 140 and 783 days along with the g value and Kfast and Kslow should be included in the list of endpoints along with the DT_{50} slow that was selected as the modelling endpoint for this soil. g 0.2895 kfast 0.09307 p-value (kfast) 0.000322 kslow 0.002503 p-value (kslow) 0.000536 DT50 (overall) 140.4 DT90 (overall) 783.5	northern France clay loam have been included in the LoEP.	The RMS appropriately updated the list of endpoints in the version dated March 2018.
4(2)	Vol. 3 B.8.1.1.1 Aerobic degradation	FR: Metabolite RH-2703 exceeds 10% AR after 29 days in study Rieder 2013. Maximum occurrence should be updated in the LoEP. Since it is major, it should be included in the residue definition for soil and groundwater (it is already included for surface water).	RMS: The maximum occurrence of the metabolites and the residue definition for soil and groundwater has been updated in the LoEP (see also comment 4(11) from EFSA). Metabolite RH-2703 is now included in the residue definition for soil and groundwater.	Addressed. The RMS appropriately updated the list of endpoints in the version dated March 2018.
4(3)	Vol. 3 B.8.1.1.1 Aerobic degradation	FR: Please note that according to the DAR, pH of soils Speyer 2.1, 2.2, 2.3 and SLV was measured in $CaCl_2$ and not in water. Please check this point and update Table B.8.1-13 and Figure B.8.1-7 accordingly.	RMS: The pH values of the soils Speyer 2.1, 2.2, 2.3 and SLV were measured in CaCl2 and are now recalculated to pH in water. Table B.8.1-13, Figure B.8.1-7 and the LoEP have been updated.	Addressed. The RMS appropriately updated the list of endpoints in the version dated March 2018.
4(4)	Vol. 3 B.8.1.1.1	FR: Based on DT_{50} values presented in	RMS: We agree with FR, that the soil	Addressed.

Aerobic degradation	Table B.8.1-13 obtained from valid OECD studies, a pH-dependence of Tebufenozid degradation rates cannot be excluded. It is agreed that additional data from Rieder 2013 does not seem to confirm this dependence. However it is questionable whether this study with only 2 sampling dates at 0 and 29 days can be relied on to address this point. A clear degradation pattern cannot be defined based on 2 points, especially when considering results from Northern France soil from study Traub 2013 which show that degradation can be biphasic. Further argumentation may be needed to exclude pH-dependence.	residue measurements at two time points 0 days and 29 days in the study of Rieder (2013) do not have the same data quality for kinetic assessment as the six available OECD degradation soils with more measurements at different time points. However, the RMS is still of the opinion, that the objective of the study of Rieder (2013) to provide evidence for degradation dependency from soil pH, is suitably met by a comparison of measured residues at the same time point. Relating to the soil characteristics, the 15 soils in the study of Rieder (2013) cover a wide range of pH values (CaCl2) between 5.2 to 7.9 (pH range in water: 6.1-8.5) and other soil parameters, which gives reason for robust statistical estimations from that dataset compared to standard data requirements. The RMS still suggests, that it was suitably shown, that the range of degradation between 14 % and 91 % until day 29 does not correlate with the pH in 15 different soils. Because of non-correlation between degradation and pH, a further requirement for more detailed argumentation or kinetic data evaluation is not necessary in the view of the RMS.

4(5)	B.8.1.1.1, KIIA 7.1/1. P74	Applicant: The author of the M2 identification study should be Wendelburg and not Wandelburg.	RMS: The author´s name has been corrected.	Addressed.

PEC in surface water and ground water				
No.	**Column 1** **Reference to addendum to assessment report**	**Column 2** **Comments from Member States / applicant / EFSA**	**Column 3** **Evaluation by rapporteur Member State**	**Column 4** **EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data**
4(1)	Vol. 3 B.8.2.1 PECgw (notifier)	FR: PECgw modelling from the applicant is not considered acceptable, for the main following reasons: - Metabolite RH-2703 is not included in the degradation scheme; - Kfoc used for RH-6595 was not validated during the initial peer review; - Koc for M2 is not justified. It is also noted that only PEARL model was used and the time of 1st application (1st may) is quite different from the one used in the calculations reported in the EFSA conclusion (1st August) without any justification.	RMS: The PECgw calculations of the applicant (Hilton & Montesano, 2013) were not accepted by the RMS. The RMS added a note below the PECgw calculation of the applicant for clarification (see below Hilton & Montesano, 2013, page 103 in the revised Addendum 2017). A new PECgw calculation was already provided by the RMS in the Addendum 2017 on page 103ff and in the LoEP: - RH-2703 was included in the risk assessment, - a Kfoc value of 105 mg/L was used for RH-6595, see next comment 4(7) in the reporting table, - a Kfoc of 105 mg/L was used for M2, because of comparable molecule structure to RH-2651 (and RH-6595) - a first application at 1st July was used in the simulation.	Addressed.

			Additional corrections in a new PECgw calculation have been provided by the RMS in the revised Addendum and in the LoEP: - the first application was now changed to 1st August, - M2 was additionally calculated with a Kfoc value of 50 mg/L as in the LoEP from the EFSA conclusion.	
4(2)	B.8.2.1, P101/103	Applicant: In Table 8.2-2 the notifier has used a Koc value of 248 ml/g for RH-6595, based on further justification provided in the report (Hilton & Montesano, 2013). The RMS has not used this value in their simulations (see Table B.8.2-7) and it would be helpful if The RMS provided consideration/explanation of the relative merits of the two values.	RMS: The adsorption value of 248 mg/L for RH-6595 used by the Applicant for PECgw calculation (Hilton & Montesano, 2013) would be the arithmetic mean Kfoc value from 4 soils from the OECD 106 study of Schwedler, Wendelburg & Balcer (2009). The study results in terms of the influence of the 10°C during the experiment were already discussed in detail in the PRAPeP 82 meeting. The soil adsorption/desorption experiment with metabolite RH-6595 performed at 10°C was considered not appropriate for the exposure assessment by the experts. It was further decided to use the adsorption value of 105 mg/L from the metabolite RH-2651 as worst case surrogate for PECgw modelling.	Addressed.
4(3)	Vol. 3 B.8.2.1 PECgw (RMS)	FR: The degradation scheme reported to be used by RMS in the text on page 103 and in Table B.8.2-7 does not seem consistent. Please clarify if	RMS: There was a detailed discussion about the position of RH-2651 in the tebufenozide degradation scheme. There are good reasons	Addressed.

		RH-2651 was considered to be formed from parent with a formation fraction of 1 or from both metabolites RH-2703 and RH-6595 with a formation fraction of 1. The 2nd approach was used in the EFSA conclusions and should be kept.	from soil degradation studies to assume, that the transformation of RH-2651 in parallel to RH-2703 and RH-6595 would be suitable for PECgw calculation (previous RMS position). However, the RMS agrees with FR, that RH-2651 was considered in the EFSA conclusion to be formed from both metabolites RH-2703 and RH-6595. This subsequent formation of RH-2651 was considered by the RMS as PEC calculation c) in previous addenda, but not in the last addendum. Therefore, a subsequent formation of RH-2651 from RH-2703 and RH-6595 without sink was considered in a new PECgw calculation by the RMS in the revised Addendum and LoEP. In addition, the RMS identified erroneous PECgw values for the metabolite RH-6595. Those values have been additionally corrected in the revised addendum and LoEP.	
4(4)	Vol. 3 B.8.2.1 PECgw (RMS)	FR: For M2 initial PECgw calculations reported in EFSA conclusion were performed with both Kfoc of 105 and 50 mL/g. It was also reported that the input parameters used for M2 may not necessarily represent a worst-case. In the calculations performed by RMS, only the value of 105 mL/g is used	RMS: A new adsorption study according to OECD 106 for the identified formation product M2 was not provided by the applicant. Therefore, the RMS decided to use the adsorption value of 105 mg/L from the metabolite RH-2651 as conservative surrogate for PECgw modelling. This seems justified,	Addressed.

		and no justification is provided. Since metabolite M2 is now identified, it is considered that an adsorption study according to OECD 106 should be performed in order to obtain an appropriate value for modelling. This would allow performing a more robust risk assessment, especially since only 1 DT_{50} and ffm values are available for this metabolite, leading to some uncertainty. At least additional simulations with a Kfoc of 50 mL/g should be presented pending new experimental data are available.	because the size and structure of the molecules of both metabolites RH-2651 and M2 and their molecular weight are quite comparable. However, the RMS agrees with FR, that original based PECgw calculations in the EFSA conclusion were based on both a Kfoc of 105 mg/L and 50 mg/L. Finally, an additional PECgw calculation for M2 with a Kfoc value of 50 mg/L was conducted by the RMS.	
4(5)	Vol. 3 B.8.2.1 PECgw (RMS)	FR: It is suggested that additional calculations using PEARL model are also provided for completeness.	RMS: Additional PECgw simulations with FOCUS PEARL 4.4.4 have been performed by the RMS. The results are provided in the revised Addendum and LoEP.	Addressed.

Definition of the residues				
No.	**Column 1** **Reference to addendum to assessment report**	**Column 2** **Comments from Member States / applicant / EFSA**	**Column 3** **Evaluation by rapporteur Member State**	**Column 4** **EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data**
4(1)	List of endpoints residues requiring further assessment.	EFSA: The list of endpoints entry Residues requiring further assessment section should be updated so the subheading is 'Environmental occurring residues requiring further assessment by other disciplines (toxicology and ecotoxicology) and or	RMS: The section ´Residues requiring further assessment´ in the list of endpoints was updated. Tebufenozide, RH-2651, RH-6595, RH-2703, M2 are listed under ground water.	Addressed. The RMS appropriately updated the list of endpoints in the version dated March 2018.

		triggering groundwater exposure assessment' For groundwater just the compounds assessed should be listed (i.e. information on groundwater concentrations should not be indicated here. M2 (currently 'struck through') should be reinstated.		

Other comments incl. available monitoring data

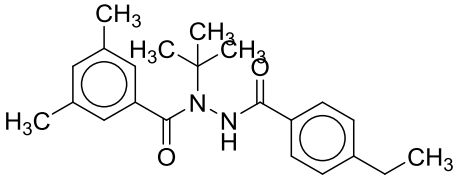
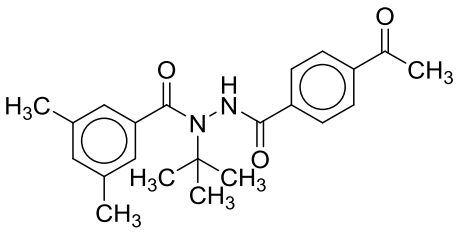
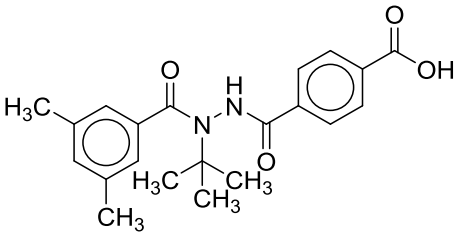
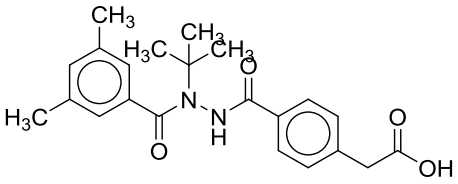
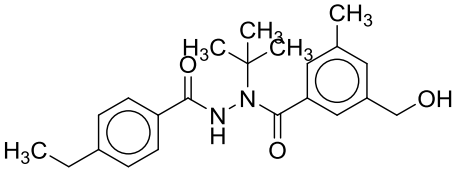
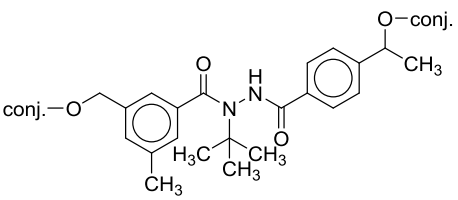
No.	Column 1 Reference to addendum to assessment report	Column 2 Comments from Member States / applicant / EFSA	Column 3 Evaluation by rapporteur Member State	Column 4 EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data
4(1)	General	EFSA: We agree the RMS assessment and conclusions regarding their evaluation of the confirmatory fate and behaviour data provided.	RMS: Noted.	Addressed

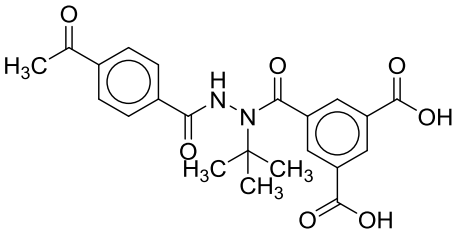
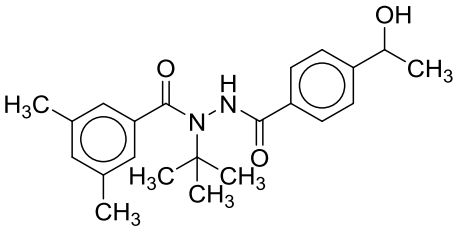
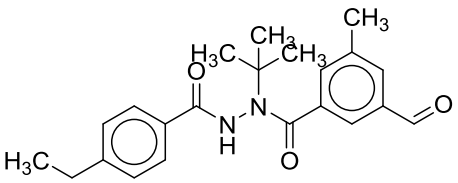
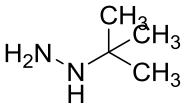
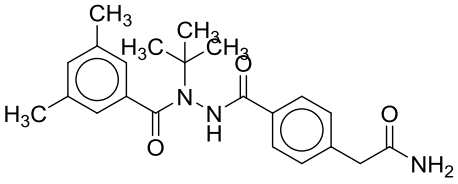
Ecotoxicology

Other comments incl. available monitoring data

No.	Column 1 Reference to addendum to assessment report	Column 2 Comments from Member States / applicant / EFSA	Column 3 Evaluation by rapporteur Member State	Column 4 EFSA's scientific views on the specific points raised in the commenting phase conducted on the RMS's assessment of confirmatory data
5(1)	-	Applicant: No comments		Noted
5(2)	Vol. 3, B.9.9, Effects on other non-target organisms (flora and fauna) believed to be at risk	FR: Agreed with RMS conclusion.	RMS: Noted.	Noted

Appendix B – Used compound codes

Code/trivial name[a]	IUPAC name/SMILES notation/InChiKey[b]	Structural formula[c]
tebufenozide	*N-tert*-butyl-*N*'-(4-ethylbenzoyl)-3,5-dimethylbenzohydrazide CCc1ccc(cc1)C(=O)NN(C(=O)c1cc(C)cc(C)c1)C(C)(C)C QYPNKSZPJQQLRK-UHFFFAOYSA-N	
RH 6595	*N'*-(4-acetylbenzoyl)-*N*-(*tert*-butyl)-3,5-dimethylbenzohydrazide Cc1cc(C)cc(c1)C(=O)N(NC(=O)c1ccc(cc1)C(C)=O)C(C)(C)C HBFBSZKRQXEISA-UHFFFAOYSA-N	
RH 2651	4-(2-(*tert*-butyl)-2-(3,5-dimethylbenzoyl)hydrazine-1-carbonyl)benzoic acid OC(=O)c1ccc(cc1)C(=O)NN(C(=O)c1cc(C)cc(C)c1)C(C)(C)C LAARFOZSARYPMO-UHFFFAOYSA-N	
RH-2703	2-(4-(2-(*tert*-butyl)-2-(3,5-dimethylbenzoyl)hydrazine-1-carbonyl)phenyl)acetic acid O=C(O)Cc1ccc(C(NN(C(C)(C)C)C(c2cc(C)cc(C)c2)=O)=O)cc1 QWBPAVBETVFMQN-UHFFFAOYSA-N	
RH-9886	*N*-(*tert*-butyl)-*N'*-(4-ethylbenzoyl)-3-(hydroxymethyl)-5-methylbenzohydrazide O=C(N(C(C)(C)C)NC(c1ccc(CC)cc1)=O)c2cc(C)cc(CO)c2 CFNNCPNLRFTHTN-UHFFFAOYSA-N	
RH-120282	N-tert-butyl-N'-{[4-(1-hydroxyethyl)phenyl]carbonyl}-3-(hydroxymethyl)-5-methylbenzohydrazide conjugates	

RH-0897	5-(2-(4-acetylbenzoyl)-1-(*tert*-butyl)hydrazine-1-carbonyl)isophthalic acid O=C(O)c1cc(C(N(C(C)(C)C)NC(c2ccc(C(C)=O)cc2)=O)=O)cc(C(O)=O)c1 AWOBJDMDZBCGQI-UHFFFAOYSA-N	
RH-1788	*N*-(*tert*-butyl)-*N'*-(4-(1-hydroxyethyl)benzoyl)-3,5-dimethylbenzohydrazide O=C(N(C(C)(C)C)NC(c1ccc(C(O)C)cc1)=O)c2cc(C)cc(C)c2 OQGYYPMIBMOCNC-UHFFFAOYSA-N	
RH-0970	*N*-(*tert*-butyl)-*N'*-(4-ethylbenzoyl)-3-formyl-5-methylbenzohydrazide O=C(N(C(C)(C)C)NC(c1ccc(CC)cc1)=O)c2cc(C)cc(C=O)c2 ADEIUYVKYBIUBX-UHFFFAOYSA-N	
t-butyl hydrazine	*tert*-butylhydrazine NNC(C)(C)C MUQNAPSBHXFMHT-UHFFFAOYSA-N	
M2	2-(4-(2-(*tert*-butyl)-2-(3,5-dimethylbenzoyl)hydrazine-1-carbonyl)phenyl)acetamide O=C(N)Cc1ccc(cc1)C(=O)NN(C(=O)c1cc(C)cc(C)c1)C(C)(C)C QQMKQCTUPLPACK-UHFFFAOYSA-N	

(a): The metabolite name in bold is the name used in the conclusion.
(b): ChemBioDraw Ultra v. 13.0.2.3021
(c): ChemBioDraw Ultra v. 13.0.2.3021

Appendix C – Updated parts of list of endpoints

Further information, Efficacy

Effectiveness

Considering that tebufenozide containing plant protection products have already been evaluated according to Uniform Principles (Regulation (EC) No 546/2011), no other efficacy documentation is deemed to be necessary at this stage.

Adverse effects on field crops

Pre and post emergence trials on five monocotyledon and five dicotyledon plants at approximately 10 times the field rate showed tebufenozide to be safe to plants. No phytotoxicity was observed.

Observations on other undesirable or unintended side-effects

Same as above

Groundwater metabolites: Screening for biological activity (SANCO/221/2000-rev.10-final Step 3 a Stage 1)

Activity against target organisms

RH-6595	M2	RH-2651
no	no	no

Other toxicological studies (Annex IIA, point 5.8)

Mechanism studies ‡	Specific studies on blood parameters with tebufenozide demonstrated complete recovery within 28 days following 6 weeks dietary exposure and no acute effects on red blood cells after a single exposure: NOAEL: 89.4 mg/kg bw (1-day dietary dog)
Studies performed on metabolites or impurities ‡	Studies on metabolites (RH-9886, RH-120282, RH-0897, RH-2703, RH-1788, RH-0970): LD_{50} (mouse) oral: > 5000 mg/kg bw Ames test: negative Studies on metabolite RH-6595: Mouse oral LD_{50}: > 5000 mg/kg bw Ames test: negative Mouse lymphoma assay: negative in vitro CA: negative Studies on metabolite RH-2651: Mouse oral LD_{50}: > 5000 mg/kg bw Ames test: negative Mouse lymphoma assay: negative in vitro CA: positive In vivo MN assay (mouse): negative (exposure of target tissue not demonstrated) Studies on metabolite M2: Rat oral LD_{50}: > 5000 mg/kg bw Ames test: negative Mouse lymphoma assay: negative in vitro CA: negative Studies on t-butyl hydrazine (impurity): LD_{50} (mouse) oral: 891 mg/kg bw Ames test: negative

Route of degradation (aerobic) in soil (Annex IIA, point 7.1.1.1.1)	
Mineralisation after 100 days :	Investigated: [4-ethyl (UL-^{14}C)-benzoyl tebufenozide. Sand: 34.5 % after 92 days 35.4 % after 120 days (study end) Loamy sand: 33.6 % after 92 days 27.2 % after 120 days (study end) Loamy sand: 27.9 % after 92 days 33.4 % after 120 days (study end) Sandy loam: 32.2 % after 92 days 38.7 % after 120 days (study end) Silt loam: 4.6 % after 91 days 6.0 % after 118 days (study end) Clay loam: 9.9 % after 91 days 10.2 % after 118 days (study end)
Non-extractable residues after 100 days :	Investigated: [4-ethyl (UL-^{14}C)-benzoyl tebufenozide. Sand: 41.4 % after 92 days 40.6 % after 120 days (study end) Loamy sand: 42.0 % after 92 days 42.8 % after 120 days (study end) Loamy sand: 37.9 % after 92 days 38.2 % after 120 days (study end) Sandy loam: 34.2 % after 92 days 37.1 % after 120 days (study end) Silt loam: 9.7 % after 91 days 14.5 % after 118 days (study end) Clay loam: 11.8 % after 91 days 16.5 % after 118 days (study end)
Metabolites requiring further consideration ‡ - name and/or code, % of applied (range and maximum) :	Investigated: [4-ethyl (UL-^{14}C)-benzoyl tebufenozide Study duration: 120 days (values %TAR) RH-2703 <0.1 - 8.0 29 loamy sand RH-2651 <0.1 - 20.0 29 sand RH-6595 <0.1 - 8.8 64 sand M2 <0.1 - 9.1 64 sand

Route of degradation in soil - Supplemental studies (Annex IIA, point 7.1.1.1.2)

Anaerobic degradation ‡	
Mineralisation after 100 days	3.1 % after 120 days, 17.2 % after 356 days
Non-extractable residues after 100 days	24.1 % after 120 days, 33.7 % after 365 days
Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	RH-6595: max. 8.8 % after 29 days (Schanne, 1995) RH-2651: max. 36.6 % after 29 days (Rieder, 2013) Met 2: max 9.1 % after 64 days (Schanne, 1995) RH-2703: max. 19.7 % after 29 days (Rieder, 2013)

Rate of degradation in soil (Annex IIA, point 7.1.1.2, Annex IIIA, point 9.1.1)

Laboratory studies ‡

Parent Tebufenozide	Aerobic conditions						
Soil type	% oC	pH	t. °C / % MWHC	DT_{50} / DT_{90} actual (d)	DT_{50} (d) 20 °C pF2/10 kPa	% χ^2 error	Method of calculation
Speyer 2.1, sand	0,98	6.1	20/ 40% MWHC	31.0	24.2	7.47	SFO
Speyer 2.2,loamy sand	2,5	6.1	20/ 40% MWHC	28.2	28.2	10.8	SFO
Speyer 2.3, sandy loam	1,11	6.9	20/ 40% MWHC	27.8	20.8	11.5	SFO
SLV, loamy sand	1,07	6.4	20/ 40% MWHC	31.4	31.2	5.51	SFO
S-France, silt loam	0.99	7.07	20/ pF2	158/526	158	2.8	SFO
N-France, clay loam	1.4	7.63	20/ pF2	140/784	277*	2.3	DFOP
Geometric mean (n = 6)					51.8		
Median (n = 6)					29.7		

* slow phase DT_{50} from DFOP kinetic (kf_{ast}=0.09307; k_{slow}=0.002503; g=0.2895)

Met RH-2703	Aerobic conditions							
Soil type	% o C	pH	t. °C / % MWHC	DT_{50} (d)	f. f. k_{dp}/k_f	DT_{50} (d) 20 °C pF2/10 kPa	% χ^2 error	Method of calculation
Speyer 2.1, sand	0,98	6.1	20/ 40% MWHC	39.7	*	31.0	22.8	SFO (Top down)
Speyer 2.2,loamy sand	2,5	6.1	20/ 40% MWHC	23.1	*	23.1	31.7	SFO (Top down)
Speyer 2.3, sandy loam	1,11	6.9	20/ 40% MWHC	57.7	*	43.2	23.7	SFO (Top down)
SLV, loamy sand	1,07	6.4	20/ 40% MWHC	22.5	0.203	22.4	18.9	SFO (Top down)
Geometric mean (n = 4)						28.9		
Median (n = 4)						27.1		

*error is greater than calculated parameter value

Met RH-2651	Aerobic conditions							
Soil type	% o C	pH	t. °C / % MWHC	DT_{50} (d)	f. f. k_{dp}/k_f	DT_{50} (d) 20 °C pF2/10 kPa	% χ^2 error	Method of calculation
Speyer 2.1, sand	0,98	6.1	20/ 40% MWHC	20.7	*	16.1	0.87	SFO (Top down)
Speyer 2.2,loamy sand	2,5	6.1	20/ 40 % MWHC	18.2	*	18.2	1.25	SFO (Top down)
Speyer 2.3, sandy loam	1,11	6.9	20/ 40 % MWHC	39.0	*	29.2	65.7	SFO **
SLV, loamy sand	1,07	6.4	20/ 40 % MWHC	57.4	0.272	57.1	19.3	SFO (Top down)
Geometric mean (n = 4)						26.4		
Median (n = 4)						23.7		

*error is greater than calculated parameter value
** too few points to allow Top Down analysis

Met RH-6595	Aerobic conditions							
Soil type	% o C	pH	t. °C / % MWHC	DT_{50} (d)	f. f. k_{dp}/k_f	DT_{50} (d) 20 °C pF2/10kPa	% χ^2 error	Method of calculation
Speyer 2.1, sand	0,98	6.1	20/ 40% MWHC	22.0	*	17.2	27.6	SFO (Top down)
Speyer 2.2,loamy sand	2,5	6.1	20/ 40 % MWHC	43.0	*	43.0	24.2	SFO (Top down)
Speyer 2.3, sandy loam	1,11	6.9	20/ 40 % MWHC	58.6	*	43.8	6.91	SFO (Top down)
SLV, loamy sand	1,07	6.4	20/ 40 % MWHC	47.8	0.145	35.0	35.2	SFO (Top down)
Geometric mean (n = 4)						32.6		
Median (n = 4)						39.0		

*error is greater than calculated parameter value

Met M2 unknown	Aerobic conditions							
Soil type	% o C	pH	t. °C / % MWHC	DT_{50} (d)	f. f. k_{dp}/k_f	DT_{50} (d) 20 °C pF2/10kPa	% χ^2 error	Method of calculation
Speyer 2.1, sand	0.98	6.1	20/ 40% MWHC	41.6	0.164	32.4	27.6	SFO

Laboratory studies ‡

Parent	Anaerobic conditions

Soil type	X6	pH	t. °C / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa	St. (r^2)	Method of calculation
Lawrenceville, silt loam (sediment)		5.6	25 / anaerobic	163.5 / 543.3	-n.d.	7.1	SFO

Metabolite M2							
No measured values agreed values (Addendum 3): Koc value and 1/n value of RH-2651 as worst case surrogate							
Arithmetic mean						105	0.9 (default)
pH dependence (yes or no)			-				

PEC (ground water) (Annex IIIA, point 9.2.1)

Method of calculation and type of study (*e.g.* modelling, field leaching, lysimeter)	For $FOCUS_{gw}$ modelling, values used - Modelling using FOCUS model(s), with appropriate $FOCUS_{gw}$ scenarios, according to FOCUS guidance. Model(s) used: FOCUS PELMO (5.5.3) and FOCUS PEARL 4.4.4 with all 9 standard scenarios Crop: vine and pome fruit $DT_{50\ lab}$(pF2, 20 °C with Q10 of 2.58): tebufenozide 51.8 d (geometric mean, n = 6), RH-2703 28.8 d (geomean, n = 4), RH-2651 26.4 d (geomean, n = 4), RH-6595 32.6 d (geomean, n = 4); Worst case formation fractions for RH-2703: 0.5, RH-2651: 1.0, RH-6595: 0.5, K_{OC}: tebufenozide 572 (arithmetic mean , n = 5), RH-2703 78 (arithmetic mean, n = 4), RH-2651 105 (arithmetic mean, n = 4), RH-6595 105 (arithmetic mean, n = 4), $^1/_n$: tebufenozide 1.005 (arithmetic mean , n = 5), RH-2703 0.753 (arithmetic mean, n = 4), RH-2651 0.987 (arithmetic mean, n = 4), RH-6595 0.90 (default) Plant uptake factor: 0
Application rate	Application rate: Vine - 192 g as/ha annual application. 14 days interval. 85 % crop interception pome fruit 288 g as/ha annual application. 15 days interval. 80 % crop interception No. of applications: vine 3 times, pome fruit 2 times Time of application (month or season): first application: 1 August

6 X This column is reserved for any other property that is considered to have a particular impact on the degradation rate.

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in vine (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			RH-6595	RH-2703	RH-2651
FOCUS PELMO 5.5.3, Vine	Chateaudun	0.001	0.011	<0.001	**0.273**
	Hamburg	0.003	0.035	0.001	**0.528**
	Kremsmünster	0.004	0.028	0.001	**0.411**
	Piacenza	0.007	0.049	0.001	**0493**
	Porto	0.003	0.029	<0.001	**0.490**
	Sevilla	<0.001	<0.001	<0.001	0.062
	Thiva	<0.001	0.002	<0.001	0.073

PEC_{gw} - FOCUS modelling results (80th percentile annual average concentration at 1 m) in pome fruit (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			RH-6595	RH-2703	RH-2651
FOCUS PELMO 5.5.3, pome fruit	Châteaudun	0.003	0.024	<0.001	**0.472**
	Hamburg	0.005	0.062	0.001	**0.862**
	Jokioinen	0.001	0.010	<0.001	**0.358**
	Kremsmünster	0.004	0.036	0.001	**0.607**
	Okehampton	0.009	0.073	0.001	**0.876**
	Piacenza	0.012	0.087	0.002	**0.807**
	Porto	0.004	0.055	0.001	**0.724**
	Sevilla	<0.001	0.002	<0.001	**0.151**
	Thiva	<0.001	0.005	<0.001	**0.165**

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in vine (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			RH-6595	RH-2703	RH-2651
FOCUS PEARL 4.4.4, Vine	Chateaudun	0.002	0.013	<0.001	**0.304**
	Hamburg	0.004	0.029	<0.001	**0.406**
	Kremsmünster	0.003	0.018	<0.001	**0.326**
	Piacenza	0.005	0.035	<0.001	**0.401**
	Porto	0.001	0.015	<0.001	**0.304**
	Sevilla	0.001	0.005	<0.001	**0.195**
	Thiva	<0.001	0.003	<0.001	**0.107**

PEC_{gw} - FOCUS modelling results (80th percentile annual average concentration at 1 m) in pome fruit (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L)		
			RH-6595	RH-2703	RH-2651
FOCUS PEARL 4.4.4, pome fruit	Châteaudun	0.003	0.026	<0.001	**0.500**
	Hamburg	0.011	0.098	0.001	**1.167**
	Jokioinen	0.001	0.008	<0.001	**0.361**
	Kremsmünster	0.004	0.035	<0.001	**0.572**
	Okehampton	0.006	0.050	<0.001	**0.667**
	Piacenza	0.007	0.060	0.001	**0.676**
	Porto	0.003	0.031	<0.001	**0.520**
	Sevilla	0.001	0.013	<0.001	**0.358**
	Thiva	0.002	0.018	<0.001	**0.396**

Method of calculation and type of study (*e.g.* modelling, field leaching, lysimeter)	For $FOCUS_{gw}$ modelling, values used - Modelling using FOCUS model(s), with appropriate $FOCUS_{gw}$ scenarios, according to FOCUS guidance. Model(s) used: FOCUS PELMO (5.5.3) and FOCUS PEARL 4.4.4 with all standard scenarios Crop: vine and pome fruit $DT_{50\ lab}$(pF2, 20 °C with Q10 of 2.58): tebufenozide 24.2 d (n = 1), M2 (identified) 32.4 d (n = 1) Formation fractions for M2 (identified) 0.1637 K_{OC}: tebufenozide 572 (arithmetic mean , n = 5), M2 (identified) 105/50 $^1/_n$: tebufenozide 1.005 (arithmetic mean , n = 5), M2 (identified) 0.9 (FOCUS default) Plant uptake factor: 0

Application rate	Application rate: Vine - 192 g as/ha annual application. 14 days interval. 85 % crop interception pome fruit 288 g as/ha annual application. 14 days interval. 80 % crop interception No. of applications: vine 3 times, pome fruit 2 times Time of application (month or season): first application 1 August (both crops)

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in vine (Q10 = 2.58)

	Scenario	Parent(µg/L)	Metabolite (µg/L) M2 (identified)	
			K_{OC} (M2) 105	K_{OC} (M2) 50
FOCUS PELMO, Vine	Châteaudun	<0.001	0.001	0.040
	Hamburg	0.002	0.004	0.085
	Kremsmünster	0.003	0.003	0.063
	Piacenza	0.004	0.006	0.083
	Porto	0.001	0.004	0.074
	Sevilla	<0.001	<0.001	0.007
	Thiva	<0.001	<0.001	0.013

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in pome fruit (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L) M2 (identified)	
			K_{OC} (M2) 105	K_{OC} (M2) 50
FOCUS PELMO, pome fruit	Châteaudun	<0.001	0.002	0.066
	Hamburg	<0.001	0.007	**0.168**
	Jokioinen	<0.001	0.001	0.061
	Kremsmünster	<0.001	0.003	**0.101**
	Okehampton	<0.001	0.009	**0.162**
	Piacenza	<0.001	0.011	**0.146**
	Porto	<0.001	0.006	**0.101**
	Sevilla	<0.001	<0.001	0.016
	Thiva	<0.001	<0.001	0.022

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in vine (Q10 = 2.58)

	Scenario	Parent(µg/L)	Metabolite (µg/L) M2 (identified)	
			K_{OC} (M2) 105	K_{OC} (M2) 50
FOCUS PEARL, Vine	Châteaudun	<0.001	0.001	0.047
	Hamburg	<0.001	0.003	0.082
	Kremsmünster	<0.001	0.002	0.053
	Piacenza	<0.001	0.005	0.073
	Porto	<0.001	0.001	0.051
	Sevilla	<0.001	<0.001	0.028
	Thiva	<0.001	<0.001	0.018

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1 m) in pome fruit (Q10 = 2.58)

	Scenario	Parent (µg/L)	Metabolite (µg/L) M2 (identified)	
			K_{OC} (M2) 105	K_{OC} (M2) 50
FOCUS PEARL, pome fruit	Châteaudun	<0.001	0.002	0.080
	Hamburg	<0.001	0.011	**0.208**
	Jokioinen	<0.001	<0.001	0.062
	Kremsmünster	<0.001	0.003	0.097
	Okehampton	<0.001	0.006	**0.127**
	Piacenza	<0.001	0.008	**0.120**
	Porto	<0.001	0.003	0.078
	Sevilla	<0.001	0.001	0.052
	Thiva	<0.001	0.001	0.055

Residues requiring further assessment

Environmental occurring metabolite requiring further assessment by other disciplines (toxicology and ecotoxicology) and/or triggering groundwater exposure assessment.	Soil: tebufenozide, RH-2651, RH-6595, RH-2703, M2 (identified) Surface Water: tebufenozide, RH-2651, RH-2703 Sediment: tebufenozide, RH-2651, RH-6595 Ground water: tebufenozide, RH-2651, RH-6595, RH-2703, M2 (identified) Air: tebufenozide (default)