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Item 5 (c) (iv) of the provisional agenda*

Technical work: review of notifications of final regulatory action: chlorpyrifos

Chlorpyrifos: supporting documentation provided by the European Union

Note by the Secretariat

As is mentioned in the note by the Secretariat on chlorpyrifos: notifications of final regulatory action (UNEP/FAO/RC/CRC.19/8), the annex to the present note sets out documentation provided by the European Union to support its notification of final regulatory action for chlorpyrifos in the pesticide category. The present note, including its annex, has not been formally edited.

* UNEP/FAO/RC/CRC.19/1/Rev.1.

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Annex

Chlorpyrifos: supporting documentation provided by the European Union

List of documents:

1. Official Journal of the European Union. Commission Implementing Regulation (EU) 2020/18 of 10 January 2020 concerning the non-renewal of the approval of the active substance chlorpyrifos.

2. Final Renewal report for the active substance chlorpyrifos finalised in the Standing Committee on Plants, Animals, Food and Feed at its meeting on 6 December 2019 in view of the non-renewal of the approval of chlorpyrifos as an active substance in accordance with Regulation (EC) No 1107/2009 (SANTE/11938/2019 Rev 1).

3. EFSA (European Food Safety Authority), 2019. Statement on the available outcomes of the human health assessment in the context of the pesticides peer review of the active substance chlorpyrifos. EFSA Journal 2019;17(8):5809, 23 pp. https://doi.org/10.2903/j.efsa.2019.5809.

4. Monograph (DRAR), Volume I Chlorpyrifos May 2017, List of Endpoints - EU initial risk assessment. https://www.efsa.europa.eu/en/consultations/call/171018-0.

COMMISSION IMPLEMENTING REGULATION (EU) 2020/18

of 10 January 2020

concerning the non-renewal of the approval of the active substance chlorpyrifos, in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market, and amending the Annex to Commission Implementing Regulation (EU) No 540/2011

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to 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 ([1]), and in particular Article 20(1) and Article 78(2) thereof,

Whereas:

(1) Commission Directive 2005/72/EC ([2]) included chlorpyrifos as an active substance in Annex I to Council Directive 91/414/EEC ([3]).

(2) Active substances included in Annex I to Directive 91/414/EEC are deemed to have been approved under Regulation (EC) No 1107/2009 and are listed in Part A of the Annex to Commission Implementing Regulation (EU) No 540/2011 ([4]).

(3) The approval of the active substance chlorpyrifos, as set out in Part A of the Annex to Implementing Regulation (EU) No 540/2011, expires on 31 January 2020.

(4) Applications for the renewal of the approval of the active substance chlorpyrifos were submitted in accordance with Article 1 of Commission Implementing Regulation (EU) No 844/2012 ([5]) within the time period provided for in that Article.

(5) The applicants submitted the supplementary dossiers required in accordance with Article 6 of Implementing Regulation (EU) No 844/2012. The applications were found to be complete by the rapporteur Member State.

(6) The rapporteur Member State prepared a renewal assessment report in consultation with the co-rapporteur Member State and submitted it to the European Food Safety Authority ('the Authority') and the Commission on 3 July 2017.

(7) The Authority made the supplementary summary dossier available to the public. The Authority also circulated the renewal assessment report to the applicants and to the Member States for comments and launched a public consultation on it. The Authority forwarded the comments received to the Commission.

(8) On 4 July 2018, the Authority requested that the applicants supply additional information to the Member States, the Commission and the Authority. The assessment of the additional information by the rapporteur Member State was submitted to the Authority in the form of an updated renewal assessment report.

([1]) OJ L 309, 24.11.2009, p. 1.

([2]) Commission Directive 2005/72/EC of 21 October 2005 amending Council Directive 91/414/EEC to include chlorpyrifos, chlorpyrifos-methyl, mancozeb, maneb, and metiram as active substances (OJ L 279, 22.10.2005, p. 63).

([3]) Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market (OJ L 230, 19.8.1991, p. 1).

([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).

([5]) Commission Implementing Regulation (EU) No 844/2012 of 18 September 2012 setting out the provisions necessary for the implementation of the renewal procedure for active substances, as provided for in Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market (OJ L 252, 19.9.2012, p. 26).

(9) The Authority organised an expert discussion in April 2019 to discuss certain elements related to the human health risk assessment. Due to concerns about genotoxicity and developmental neurotoxicity raised during that discussion, on 1 July 2019 the Commission sent a mandate to the Authority requesting a statement on the available outcomes of the human health assessment and an indication whether the active substance can be expected to meet the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009.

(10) On 31 July 2019, the Authority sent its statement ([6]) to the Commission. In its statement, the Authority confirmed that its conclusions on the human health assesment indicate that critical areas of concerns exist. Based on the information available, it cannot be excluded that chlorpyrifos has a genotoxic potential, since positive results were found in a number of *in vitro* and *in vivo* studies. Consequently, it is not possible to establish health-based reference values for chlorpyrifos and to conduct the relevant consumer and non-dietary risk assessments. Furthermore, developmental neurotoxicity (DNT) effects were observed in the available study on developmental neurotoxicity in rats and epidemiological evidence exists showing an association between exposure to chlorpyrifos and/or chlorpyrifos-methyl during development and adverse neurodevelopmental outcomes in children. Moreover, it is indicated that the peer review experts considered it appropriate to classify chlorpyrifos as toxic for reproduction, category 1B, in accordance with the criteria established under Regulation (EC) No 1272/2008 of the European Parliament and of the Council ([7]).

(11) The Commission invited the applicants to submit their comments on the statement of the Authority. Furthermore, in accordance with the third subparagraph of Article 14(1) of Implementing Regulation (EU) No 844/2012, the Commission invited the applicants to submit comments on the draft renewal report. The applicants submitted their comments, which have been carefully examined.

(12) However, despite the arguments put forward by the applicants, the concerns regarding the active substance could not be eliminated.

(13) Consequently, it has not been established, with respect to one or more representative uses of at least one plant protection product that the approval criteria provided for in Article 4 of Regulation (EC) No 1107/2009 are satisfied. The environmental risk assessment, although not finalised, cannot alter this conclusion since the approval criteria related to the effects on human health are not satisfied and should therefore not delay further the decision-making on the renewal of the approval of the active substance. It is therefore appropriate not to renew the approval of the active substance chlorpyrifos in accordance with Article 20(1)(b) of that Regulation.

(14) Implementing Regulation (EU) No 540/2011 should therefore be amended accordingly.

(15) Member States should be given sufficient time to withdraw authorisations for plant protection products containing chlorpyrifos.

(16) For plant protection products containing chlorpyrifos, where Member States grant any grace period in accordance with Article 46 of Regulation (EC) No 1107/2009, that period should not exceed 3 months from the date of entry into force of this Regulation.

(17) Commission Implementing Regulation (EU) 2018/1796 ([8]) extended the approval period of chlorpyrifos to 31 January 2020 in order to allow the renewal process to be completed before the expiry of the approval period of that substance. However, given that a decision on the non-renewal of the approval is being taken ahead of the expiry of that extended approval period, this Regulation should apply as soon as possible.

([6]) EFSA (European Food Safety Authority), 2019. Statement on the available outcomes of the human health assessment in the context of the pesticides peer review of the active substance chlorpyrifos. *EFSA Journal* 2019;17(5):5809. https://doi.org/10.2903/j.efsa.2019.5809

([7]) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1).

([8]) Commission Implementing Regulation (EU) 2018/1796 of 20 November 2018 amending Implementing Regulation (EU) No 540/2011 as regards the extension of the approval periods of the active substances amidosulfuron, bifenox, chlorpyrifos, chlorpyrifos-methyl, clofentezine, dicamba, difenoconazole, diflubenzuron, diflufenican, dimoxystrobin, fenoxaprop-p, fenpropidin, lenacil, mancozeb, mecoprop-p, metiram, nicosulfuron, oxamyl, picloram, pyraclostrobin, pyriproxyfen and tritosulfuron (OJ L 294, 21.11.2018, p. 15).

(18) This Regulation does not prevent the submission of a further application for the approval of chlorpyrifos pursuant to Article 7 of Regulation (EC) No 1107/2009.

(19) The measures provided for in this Regulation are in accordance with the opinion of the Standing Committee on Plants, Animals, Food and Feed,

HAS ADOPTED THIS REGULATION:

Article 1

Non-renewal of the approval of the active substance

The approval of the active substance chlorpyrifos is not renewed.

Article 2

Amendment to Implementing Regulation (EU) No 540/2011

In Part A of the Annex to Implementing Regulation (EU) No 540/2011, row 111, on chlorpyrifos, is deleted.

Article 3

Transitional measures

Member States shall withdraw authorisations for plant protection products containing chlorpyrifos as an active substance by 16 February 2020.

Article 4

Grace period

Any grace period granted by Member States in accordance with Article 46 of Regulation (EC) No 1107/2009 shall expire by 16 April 2020.

Article 5

Entry into force

This Regulation shall enter into force on the third day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 10 January 2020.

For the Commission

The President

Ursula VON DER LEYEN

Chlorpyrifos
SANTE/11938/2019 Rev 1
6 December 2019

FINAL Renewal report for the active substance **chlorpyrifos**

finalised in the Standing Committee on Plants, Animals, Food and Feed
at its meeting on 6 December 2019
in view of the non-renewal of the approval of chlorpyrifos as an active substance
in accordance with Regulation (EC) No 1107/2009[1]

1. Procedure followed for the re-evaluation process

This renewal report has been established as a result of the evaluation of **chlorpyrifos** (also known as chlorpyrifos-ethyl), in accordance with Regulation (EC) No 1107/2009[2] and Commission Implementing Regulation (EU) No 844/2012[3] following the submission of an application to renew the approval of this active substance expiring in January 2020.

Chlorpyrifos is a substance that was included in Annex I to Council Directive 91/414/EEC concerning the placing of plant protection products on the market by Commission Directive 2005/72/EC[4]. Chlorpyrifos is deemed to have been approved under Regulation (EC) No 1107/2009 and is listed in Part A of the Annex to Commission Implementing Regulation (EU) No 540/2011[5].

Separate applications for the renewal of the approval of chlorpyrifos were submitted by the Chlorpyrifos Task Force (comprising Dow AgroSciences Limited and Adama Agricultural Solutions Limited), and by SAPEC Agro S.A. in accordance with Article 1 of Regulation No 844/2012.

The approval period of chlorpyrifos, originally expiring on 30 June 2016, has been extended three times in accordance with Article 17 of Regulation (EC) No 1107/2009:

- Commission Implementing Regulation (EU) No 762/2013[6] extended until 31 January 2018 the period of approval of chlorpyrifos as part of the organisation of the AIR3 renewal programme[7].

1 Renewal Report established in accordance with Art. 14 of Regulation (EU) No 844/2012; does not necessarily represent the views of the European Commission.
2 OJ L 309, 24.11.2009, p. 1.
3 OJ L 252, 19.9.2012, p. 26.
4 Commission Directive 2005/72/EC of 21 October 2005 amending Council Directive 91/414/EEC to include chlorpyrifos, chlorpyrifos-methyl, mancozeb, maneb, and metiram as active substances. OJ L 279, 22.10.2005, p. 63.
5 OJ L 153, 11.6.2011, p. 1.
6 OJ L 213, 8.8.2013, p. 14.

- Commission Implementing Regulation No 2018/84[8] extended until 31 January 2019 the period of approval of chlorpyrifos to allow the completion of its review due to delays in the scientific assessment process.
- Commission Implementing Regulation (EU) 2018/1796[9] extended until 31 January 2020 the period of approval of chlorpyrifos to allow the completion of its review due to delays in the scientific assessment process.

Commission Implementing Regulation (EU) No 686/2012[10] designated the rapporteur Member States and the co-rapporteur Member States which had to submit the relevant renewal assessment reports and recommendations to the European Food Safety Authority (EFSA), for substances whose approval expired on or before 31 December 2018.

For chlorpyrifos the rapporteur Member State was Spain and the co-rapporteur Member State was Poland.

On 3 July 2017, Spain sent to the Commission and EFSA a draft renewal assessment report (RAR). This RAR included a recommendation concerning the decision to be taken with regards to the renewal of the approval of chlorpyrifos for the supported uses.

In accordance with Article 13 of Implementing Regulation (EU) No 844/2012, EFSA organised an intensive consultation of technical experts from Member States, to review the RAR and the comments received thereon (peer review). EFSA also launched a public consultation on the RAR.

In April 2019, EFSA convened an expert meeting to discuss certain elements related to mammalian toxicology and human health.

The results of the expert discussions led the Commission to send, on 1 July 2019, a mandate to EFSA asking for a statement on the main findings of the assessment related to human health, and to indicate whether chlorpyrifos can be expected to meet the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009.

On 31 July 2019, EFSA sent to the Commission a statement[11] on the outcomes of the risk assessment for human health for chlorpyrifos, in which it took the view that the active substance cannot be expected to meet the approval criteria.

According to the provisions of Article 14 of Implementing Regulation (EU) No 844/2012, the Commission referred a draft renewal report to the Standing Committee on Plants, Animals, Food and Feed, for examination on 22 October 2019. The draft renewal report was finalised in the meeting of the Standing Committee on 6 December 2019.

The present renewal report contains the conclusions of the final examination by the Standing Committee. Given the importance of the statement of EFSA and the RAR these documents are also considered to be part of this renewal report.

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7 To ensure that 'new' data requirements under Commission Implementing Regulations (EU) No 283/2013 and 284/2013 would apply to the dossiers and to distribute work in a more manageable fashion for EFSA.

8 OJ L 16, 20.1.2018, p. 8.

9 OJ L 294, 21.11.2018, p. 15.

10 OJ L 200, 27.7.2012, p. 5.

11 EFSA (European Food Safety Authority), 2019. Statement on the available outcomes of the human health assessment in the context of the pesticides peer review of the active substance chlorpyrifos. EFSA Journal 2019;17(5):5809 DOI: 10.2903/j.efsa.2019.5809.

2. Purposes of this renewal report

This renewal report, including the documents referred to above, has been developed and finalised in support of **Commission Implementing Regulation (EU) 2020/18**[12] concerning the non-renewal of approval of chlorpyrifos as an active substance under Regulation (EC) No 1107/2009.

This renewal report will be made available to the public.

The information in this renewal report is, at least partly, based on information, which is confidential and/or protected under the provisions of Regulation (EC) No 1107/2009. It is therefore recommended that this renewal report would not be accepted to support any registration outside the context of that Regulation, e.g. in third countries, for which the applicant has not demonstrated to have regulatory access to the information on which this renewal report is based.

3. Overall conclusion in the context of Regulation (EC) No 1107/2009

The overall conclusion of the evaluation in relation to impacts on human health, based on the information available and the proposed conditions of use, is that:

- **the information available indicates that the approval criteria** as set out in Article 4(1) to (3) of Regulation (EC) No 1107/2009 are not satisfied as **concerns were identified** with regards to:

  - The genotoxic potential of chlorpyrifos, which can not be ruled out based on the information available - positive findings were found in an *in vitro* chromosome aberration study and two *in vitro* unscheduled DNA synthesis assays; *in vivo* positive findings were found in open literature on chromosome aberration and on DNA damage caused through oxidative stress or by topoisomerase II inhibition which is considered a molecular initiating event for infant leukaemia. Consequently, health based reference values cannot be established for chlorpyrifos and the dietary and non-dietary risk assessments cannot be conducted.
  - Developmental neurotoxicity (DNT) - effects were observed in the available study on developmental neurotoxicity in rats (adverse effects were seen at the lowest dose tested in rats and a no observed adverse effects level 'NOAEL' could not be established) and epidemiological evidence exists showing an association between exposure to chlorpyrifos and/or chlorpyrifos-methyl[13] during development and adverse neurodevelopmental outcomes in children.
  - Based on the evidence for DNT, experts during the peer review suggested that classification of chlorpyrifos as toxic for reproduction, category 1B, H360D 'May damage the unborn child', in accordance with the criteria set out in Commission Regulation (EC) No 1272/2008[14] would be appropriate.

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[12] OJ L 7, 13.1.2020, p. 14.

[13] Taking into account that the methodology used for determining exposure (measurement of the common metabolite, trichloro-pyridinol (TCP), in urine) cannot discriminate between exposure to chlorpyrifos and chlorpyrifos-methyl.

[14] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. (OJ L 353, 31.12.2008, p. 1).

In conclusion, from the assessments made on the basis of the available information (RAR, comments thereon, EFSA statement, applicant comments on the EFSA statement and draft renewal report), no plant protection product containing the active substance chlorpyrifos is expected to satisfy the requirements laid down in Article 29(1) of Regulation (EC) No 1107/2009 and the uniform principles laid down in Regulation (EU) No 546/2011.

The approval of chlorpyrifos in accordance with Regulation (EC) No 1107/2009 should therefore not be renewed.

Check for updates

STATEMENT

EFSA Journal

APPROVED: 31 July 2019

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Statement on the available outcomes of the human health assessment in the context of the pesticides peer review of the active substance chlorpyrifos

European Food Safety Authority (EFSA)

Abstract

In July 2019, the European Commission asked EFSA to provide a statement on the available outcomes of the human health assessment in the context of the pesticides peer review for the renewal of approval of the active substance chlorpyrifos conducted in accordance with Commission Implementing Regulation (EC) No 844/2012. The current statement contains a summary of the main findings of the assessment related to human health following the pesticides peer review expert discussions in mammalian toxicology held between 1 and 5 April 2019, as well as EFSA's additional considerations, including whether the active substance can be expected to meet the approval criteria applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009. The identified concerns are presented as follows.

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Keywords: chlorpyrifos, pesticide, insecticide, peer review, human health assessment

Requestor: European Commission

Question number: EFSA-Q-2019-00414

Correspondence: pesticides.peerreview@efsa.europa.eu

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Summary

Chlorpyrifos is an active substance covered by the third batch of the renewal programme for pesticides (‘AIR3’) in accordance with Commission Implementing Regulation (EU) No 844/2012.

Applications (June 2013) and supplementary dossiers (July 2015) for the renewal of approval of the active substance chlorpyrifos were submitted by a Task Force (comprising of Dow AgroSciences and Adama Agriculture B.V.) and by Sapec Agro SA.

An initial evaluation of the dossiers was provided by the rapporteur Member State (RMS) Spain in the Renewal Assessment Report (RAR) which was submitted to European Food Safety Authority (EFSA) in July 2017. Subsequently, EFSA initiated a peer review of the pesticides risk assessment on the RMS evaluation in line with the provisions of Commission Implementing Regulation (EU) No 844/2012.

The commenting period was completed and included a public consultation on the RAR. Following evaluation of the comments received as well as the additional information provided by the applicants in response to a request in accordance with Article 13(3) of Regulation (EU) No 844/2012, a meeting of experts from EFSA and Member States, including relevant experts from the EFSA Panel on Plant Protection Products and their Residues (PPR Panel), took place to discuss certain elements related to mammalian toxicology.

In July 2019, prior to completion of the full peer review process, EFSA was mandated by the European Commission to provide a statement on the available outcomes of the human health assessment in the context of the peer review of chlorpyrifos.

The present statement contains a summary of the main findings of the assessment related to mammalian toxicology and human health following the Pesticides Peer Review Expert discussions in mammalian toxicology held between 1 and 5 April 2019. It also comprises EFSA’s additional considerations, including whether the active substance can be expected to meet the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009.

Due to the fact that the genotoxic potential of chlorpyrifos remains unclear, toxicological reference values could not be established. Moreover, significant uncertainties were linked to the neurodevelopmental toxicity study, where effects were observed at the lowest dose tested in rats (decrease in cerebellum height corrected by brain weight). These concerns were supported by the available epidemiological evidence related to developmental neurological outcomes in children. In the absence of toxicological reference values, a risk assessment for consumers, operators, workers, bystanders and residents cannot be conducted. This issue represents a critical area of concern for chlorpyrifos.

In addition, the recorded toxicological effects meet the criteria for classification as toxic for reproduction category 1B (regarding developmental toxicity).

Based on the above results, it is considered that the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009 are not met.

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1. Introduction

Chlorpyrifos is an active substance covered by the third batch of the renewal programme for pesticides ('AIR3') in accordance with Commission Implementing Regulation (EU) No 844/2012[1].

Applications (June 2013) and supplementary dossiers (July 2015) for the renewal of approval of the active substance chlorpyrifos were submitted by a Task Force (comprising of Dow AgroSciences and Adama Agriculture B.V.) and by Sapec Agro SA. The rapporteur Member State (RMS) is Spain and the co-rapporteur Member State (co-RMS) is Poland.

An initial evaluation of the dossiers was provided by the RMS in the Renewal Assessment Report (RAR) which was submitted to EFSA on 3 July 2017 (Spain, 2017). On 18 October 2017, EFSA initiated a peer review of the pesticides risk assessment on the RMS evaluation, by dispatching the RAR to the Member States and applicants for consultation and comments in line with the provisions of Commission Implementing Regulation (EU) No 844/2012. In addition, a public consultation was also conducted.

After the completion of the commenting period, and following a comment evaluation phase, on 4 July 2018 EFSA requested the applicants to provide certain additional information related to all areas of the assessment including mammalian toxicology in accordance with Article 13(3) of Regulation (EU) No 844/2012 which was evaluated by the RMS and presented in an updated RAR (Spain, 2019). Subsequently, in April 2019 a meeting of experts from EFSA and Member States including relevant experts from the EFSA PPR Panel took place to discuss certain elements related to mammalian toxicology.

By means of the mandate received on 1 July 2019 from the European Commission, prior to completion of the full peer review process, EFSA was requested to provide a statement with an overview of the available outcomes of the human health assessment in the context of the peer review of chlorpyrifos.

The present document is an EFSA statement containing a summary of the outcome of the expert consultation outlining the main findings of the assessment related to mammalian toxicology and human health following the pesticides peer review expert discussions in mammalian toxicology held in April 2019, including EFSA's additional considerations and an indication whether the active substance can be expected to meet the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009[2].

The list of endpoints for the active substance and the representative formulations assessed in the context of the peer review with regard to the impact on human health is available in Appendix A.

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

On 1 July 2019 EFSA was mandated by the European Commission to provide a statement with an overview of the available outcomes of the human health assessment in the context of the pesticides peer review for the renewal of approval of the active substance chlorpyrifos conducted in accordance with Commission Implementing Regulation (EU) No 844/2012.

In addition, EFSA was requested to indicate, whether the active substance chlorpyrifos can be expected to meet the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009.

2. Assessment

2.1. Mammalian toxicity

The toxicological profile of the active substance chlorpyrifos was discussed at the Pesticides Peer Review Experts' Meeting 01 in April 2019 and assessed based on the following guidance documents: SANCO/10597/2003-rev. 10.1 (European Commission, 2012), Guidance on dermal absorption (EFSA PPR Panel, 2012), ECHA/EFSA Guidance for the identification of endocrine disruptors (EDs) (ECHA and EFSA, 2018) and Guidance on the application of the classification, labelling and packaging (CLP) Criteria (ECHA, 2017).

Regarding the technical specifications of the substance placed on the market by of the three applicants, they are not supported by the toxicological assessment since the level of most impurities contained in the batches was not tested at adequate levels. However, regarding the toxicological

[1] Commission Implementing Regulation (EU) No 844/2012 of 18 September 2012 setting out the provisions necessary for the implementation of the renewal procedure for active substances, as provided for in Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market. OJ L 252, 19.9.2012, p. 26.

[2] 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.

relevance of the impurities, considering the toxicological profile including the high acute toxicity and the genotoxic potential of chlorpyrifos, it is not expected that the impurities present in the technical specification would have the potential to add additional hazard established for the parent. One impurity (sulfotep) has been considered as toxicologically relevant by the European Commission (European Commission, 2012). Its relevance is likely based upon the fact that it has a lower oral LD_{50} value than chlorpyrifos; no toxicological concern is identified for this impurity up to its specified limit in the technical specifications of 3 g/kg. The analytical methods used in the toxicological studies were not available for most of the toxicological studies, representing a concern in particular for the genotoxicity assessment (based on regulatory studies) but not for the critical findings which were retrieved from the published literature (such as the Columbia Center for Children's Environmental Health (CCCEH) study).

In rats, chlorpyrifos is extensively absorbed after oral administration, it is widely distributed, moderately to extensively metabolised by oxidation and hydrolysis and eliminated mostly through urine within 48 h. An *in vitro* metabolism study indicates that liver microsomes from human, mouse and rat more readily produce a detoxication product (i.e. 3,5,6-trichloro-2-pyridinol – TCP) than an activation product (i.e. chlorpyrifos-oxon – CPO) and the formation of TCP has been estimated to exceed the formation of chlorpyrifos-oxon by a factor of 3. A data gap for the determination of the toxicokinetic values for chlorpyrifos (Tmax, Cmax, $t_{1/2}$, AUC) was identified.

In the acute toxicity studies, chlorpyrifos showed high, moderate and low acute toxicity when administered by the oral, dermal and inhalation routes, respectively, meeting, in the view of the peer review experts, the classification criteria as Acute Tox. 3, H301 'Toxic if swallowed' and Acute Tox. 4, H312 'Harmful in contact with skin' according to the CLP criteria. It is noted that harmonised classification establishes only Acute Tox. 3, H301 according to Annex VI of Regulation (EC) No 1272/2008[3] regarding human health. The substance did not elicit a potential for skin or eye irritation, skin sensitisation or phototoxicity.

The main effect following short- to long-term repeated oral administration of chlorpyrifos was the inhibition of acetylcholinesterase (AChE) activity, which, at high-dose levels, was leading to endogenous cholinergic overstimulation resulting in typical cholinergic symptoms. Erythrocyte (RBC) AChE inhibition was the critical effect in all studies. The relevant no observed adverse effect level (NOAEL) was 0.1 mg/kg body weight (bw) per day for both short-term and long-term exposure based on a significant decrease of RBC AChE activity at 1 mg /kg bw per day in a 90-day and 2-year rat study supported by a 2-year study in dogs. No evidence for a carcinogenicity potential was found upon chlorpyrifos administration in rats or mice.

No information has been provided on the immunotoxic potential of chlorpyrifos; therefore, a data gap was identified.

2.2. Genotoxicity

During the Pesticides Peer Review 01 Experts' meeting, the experts discussed the *in vitro* and *in vivo* regulatory studies provided in the RAR:

- gene mutation: the experts considered that the results from the six bacterial and the three mammalian gene mutations assays overall showed that chlorpyrifos does not induce gene mutations *in vitro*.
- chromosome aberration: chlorpyrifos was also considered not capable to induce chromosome aberration *in vitro*. Four studies were submitted: although three of them had some methodological limitations and therefore considered acceptable with reservations (one of these three studies produced positive findings), the fourth one was considered fully acceptable and provided negative results.
- unscheduled DNA synthesis: six *in vitro* studies were submitted out of which two produced positive results; the two positive studies were considered acceptable as additional information and were retrieved from a well-documented publication (Cui et al., 2011).
- *in vivo* studies in somatic cells (mouse bone marrow micronucleus test): the five studies available in the dossiers and evaluated in the RAR, although presenting some methodological limitations, consistently showed negative findings.

The RMS proposed to the applicant to conduct a new *in vivo* Comet assay (according to OECD Test Guideline 489, OECD, 2014) with batches representative of the current production, in order to clarify the

[3] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, p. 1–1355.

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positive findings observed *in vitro* in one of the chromosome aberration tests and in two studies on unscheduled DNA synthesis. The applicants did not conduct and submit the new study during the renewal procedure. In addition, the experts noted that several publications are available for chlorpyrifos (some of them included in the RAR) which report chromosomal aberrations *in vivo* (Abdelaziz et al., 2010) and DNA damage in Comet assays both *in vitro* and *in vivo* (Mehta et al., 2008; Cui et al., 2011; Sandhu et al., 2013; Kopjara et al., 2018). Although some of these publications present deficiencies as highlighted in the RAR, all the experts agreed that the concerns observed in the public literature studies cannot be ignored and that a genotoxic potential for chlorpyrifos cannot be ruled out. EFSA notes that other organophosphates (OPs) have been reported to cause DNA damage: chlorpyrifos and fenthion have been reported to induce oxidative stress resulting in tissue damage and nuclear DNA damage; diazinon has been shown to cause immediate and direct inhibitory actions on DNA synthesis (Adler et al., 2006). Chlorpyrifos, methyl parathion and malathion have been reported to induce oxidative stress which, in turn, causes damage to all vital macromolecules including lipids, proteins and DNA: oxidative DNA damage can be followed by DNA single and double strand breaks; also, oxidative species may also interact with biological molecules to disrupt normal DNA synthesis and repair. Both acute and chronic exposure with chlorpyrifos, methyl parathion and malathion caused significantly marked DNA damage in rat tissues, namely liver, brain, kidney and spleen, when measured 24 h post treatment (Ojha et al., 2013).

It was also noted that chlorpyrifos can produce DNA damage through topoisomerase II inhibition, as reported in one study using human foetal liver haematopoietic stem cells (Lu et al., 2015), which was mentioned in the EFSA Scientific Opinion on the 'Investigation into experimental toxicological properties of plant protection products having a potential link to Parkinson's disease and childhood leukaemia' (EFSA PPR Panel, 2017), but not evaluated in the RAR. Topoisomerase II inhibition is a mechanism likely to have a threshold (EFSA Scientific Committee, 2011); in addition, topoisomerase II inhibition may be involved as a molecular initiating event (MIE) for infant leukaemia (EFSA PPR Panel, 2017). All the experts agreed that a new Comet assay study might not be able to cover this concern. Some experts also pointed out that epidemiological studies showed an important association between pesticides exposure and childhood leukaemia, including infant leukaemia (Ntzani et al., 2013; Hernández and Menéndez, 2016). It was noted that it is not possible to measure endpoints relevant for childhood leukaemia in current OECD standard Test Guidelines, due to higher sensitivity of haematopoietic stem and progenitor cells (HSPCs) compared to the standard cells, and the lack of exposure during the critical period (EFSA PPR Panel, 2017). This could be covered (in terms of exposure window, developmental period) by the extended one generation OECD 443 Test Guideline study (OECD, 2018), but the study is not designed for carcinogenicity assessment. Some experts indicated that this concern may be assessed by using a chromosome aberration study in HSPCs (because these cells have different sensitivity) by using the appropriate window of exposure. All the experts supported the RMS view on the need for additional data to address the concerns regarding chromosome aberration and DNA damage. However, they were not in a position to propose a specific study that could clarify all the above-mentioned issues (chromosome aberration, DNA damage caused by oxidative stress or through topoisomerase II inhibition, infant leukaemia) and all the experts agreed that these uncertainties should be considered in the risk assessment.

2.3. Reproductive/developmental toxicity and endocrine disruption

In a two-generation reproductive toxicity study in rats, chlorpyrifos did not affect the reproductive performance up to the highest dose of 5 mg/kg bw per day tested, while RBC AChE inhibition was the critical effect related to parental toxicity with a NOAEL of 0.1 mg/kg bw per day; in this study, reduced pup growth and viability was observed with a NOAEL of 1 mg/kg bw per day. Developmental toxicity was investigated in rats, rabbits and mice. Rats were the most sensitive species in these studies. In rats, erythrocyte AChE inhibition was the critical effect identified regarding maternal toxicity, while increased post-implantation loss was seen at the highest dose tested. Decreased foetal size and increased post-implantation loss were observed in rabbits at maternal toxic doses (based on reduced body weight gain). No developmental toxicity potential was observed in mice.

The experts agreed that chlorpyrifos is not an ED in humans, because, in line with other ED assessments recently conducted by EFSA and the guidance for the identification of EDs in the context of Regulation (EU) No 1107/2009 (ECHA and EFSA, 2018), an ED assessment is not scientifically necessary for chlorpyrifos. In all the studies conducted with chlorpyrifos, the NOAEL, the lowest observable adverse effect level (LOAEL) and the maximum tolerated dose (MTD) were based on erythrocyte AChE inhibition and clinical signs at high doses. The overall dose–response pattern for

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cholinergic overstimulation indicates that chlorpyrifos is a potent AChE inhibitor, and this is practically limiting the possibility of exploring additional target organs/systems.

2.4. Developmental neurotoxicity (DNT)

During the Pesticides Peer Review 01 Experts' meeting in April 2019, Member State experts and two experts from EFSA's Panel on Plant Protection Products and their Residues (PPR Panel) discussed the available data regarding developmental neurotoxicity (DNT) of chlorpyrifos. They took into consideration and discussed in details: (a) an unpublished study in rats, 1998 (Spain, 2019); (b) public literature presented in the systematic review provided by the applicants; (c) additional literature provided by the experts or during the commenting period.

In the DNT study in rats (1998) (Spain, 2019), pregnant rats were exposed to different levels of chlorpyrifos (0.3, 1 and 5 mg/kg bw per day) from day 6 of gestation until postnatal day (PND) 11. This study was performed according to the United States Environmental Protection Agency (US EPA) guideline OPPTS 870.6300 (US EPA, 1998) and presented some limitations according to the EPA guideline, as well as deviations from the current OECD 426 guideline (OECD, 2007) (lack of findings in the positive control, too short exposure period – from gestational day 6 to lactation day 11 instead of 21 –, lower number of individuals for neuropathology and for learning and memory, behavioural ontogeny, etc); however, the majority of experts agreed that the DNT effects observed in this study were relevant for the risk assessment. The results of the study indicated a decrease in body weight, food consumption and cholinergic toxicity in the dams at the highest dose level. In addition, a statistically significant dose-related decrease in plasma cholinesterase (ChE) and RBC AChE activities was observed in all treated groups; brain AChE activity was decreased at mid- and high-dose only. According to the contract laboratory, the relevant findings in pups (motor activity changes, decrease in body weight, etc.) were observed at the high-dose level only. The RMS proposed a maternal LOAEL at 0.3 mg/kg bw per day, based on the inhibition of plasma ChE and RBC AChE, while a pup DNT NOAEL at 1 mg/kg bw per day, based on the decrease in body weight, body weight gain and food consumption, decrease in the viability index, decrease in the absolute brain weight and increase in the relative brain weight observed at 5 mg/kg bw per day.

The US EPA reviewed the same study in 2000 (US EPA, 2000) and concluded that: (1) there were adverse treatment related effects at 1.0 mg/kg bw per day (decrease in the measurement of the parietal cortex, supported by possible, although not significant, alterations in the hippocampal gyrus) in the brain of females at PND 66 and (2) a NOAEL could not be determined due to lack of morphometric data for low dose (0.3 mg/kg bw per day) and a LOAEL for the study was set by the US EPA at 0.3 mg/kg bw per day.

During the discussion of the findings of the DNT study during the peer review experts' meeting, particular attention was given to the re-evaluation of the study provided by Mie et al. (2018). Mie expressed each brain regional measure relative to brain weight in order to properly demonstrate the absence of a sensitive target region: a statistically significant decrease in the cerebellum height corrected by brain weight was present in both sexes in the pups at 0.3 and 1 mg/kg bw per day. The absence of a statistically significant effect at high dose can be explained because the decrease of cerebellum height is paralleled with a significant decrease in brain weight (observed at the high-dose only).

It is well known that morphometry of brain regions is a valuable data for regulatory authorities (Tsuji and Crofton, 2012): the decrease in cerebellum height corrected by brain weight was considered an adverse effect indicating a damage of the architecture of the developing brain (in 2014, the PPR Panel considered the relevance of morphometric analyses as endpoint for hazard characterisation[4]). The structural changes in the developing rat brain found in regulatory studies are consistent with human data. In particular, children with high prenatal exposure to chlorpyrifos showed frontal and parietal cortical thinning (Rauh et al., 2012). During the peer review meeting, all the experts, but one, agreed to set the LOAEL of the study at 0.3 mg/kg bw per day (for both maternal and pup toxicity). The experts also considered that the reduction of cerebellum height corrected by brain weight could not be explained by the level of AChE inhibition at 0.3 and 1 mg/kg bw per day and this could be related to the difference in sensitivities to AChE inhibition in pups vs. adult rats: foetuses are less exposed than dams and have a high rate of resynthesis of foetal AChE that can result in less net inhibition of foetal AChE (Mattsson et al., 2000). The absence of the effect at high dose was considered related to the high maternal toxicity observed at the dose level tested.

[4] https://www.efsa.europa.eu/sites/default/files/wgs/pesticides/wgDNTacetamipridimidacloprid.pdf

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The experts discussed other *in vivo*, *in vitro* evidence available from the public literature and the assessment performed in 2016 by the US EPA (US EPA, 2016). They also discussed the potential key events (KEs) of mode of action (MoA)/adverse outcome pathways (AOPs) for these DNT effects: several publications indicate potential MIEs or KEs for DNT of chlorpyrifos and chlorpyrifos-oxon (e.g. inhibition of fatty acid amide hydroxylase (FAAH), decrease in calcium/calmodulin-dependent protein kinase type II (CaMKII), interference with tubulin polymerisation and axonal growth, axonal transport, etc.). The experts concluded that AOPs and MIEs for DNT cannot be described at this stage.

The experts discussed the epidemiological evidence showing associations between chlorpyrifos exposure during neurodevelopment and adverse health effects (attention deficit/hyperactivity disorders, decrease in intelligent quotient and working memory, etc). In particular, three main birth cohort studies were considered: the Columbia Center for Children's Environmental Health (CCCEH) study (US EPA, 2016), the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) (Castorina et al., 2010; Marks et al., 2010) and Mt. Sinai study (Sebe et al., 2005). Using different biomarkers of exposure, these studies show that prenatal exposure to OPs produces a consistent pattern of early cognitive and behavioural deficits (Rauh et al., 2012). The experts discussed also other epidemiological evidence from the public literature. The majority of the experts considered that the results from some of these studies (mainly from CCCEH study, Engel et al., 2011; Rauh et al., 2012; Silver et al., 2017) contribute to the evidence of DNT effects in humans due to the exposure to chlorpyrifos and chlorpyrifos-methyl and occurring at doses lower than that causing 20% inhibition of AChE. Overall, separate lines of evidence indicate that chlorpyrifos and other OPs may affect a variety of neuronal targets and processes that are not directly related to AChE. Therefore, this would represent an additional concern to be taken into consideration for the risk assessment. In addition, it should be noted that in the CHAMACOS study measurement of trichloro-pyridinol (TCP) in urine[5] , common metabolite of both chlorpyrifos and chlorpyrifos-methyl, contributed to the evidence of DNT effects in humans and exposure to chlorpyrifos and chlorpyrifos-methyl.

Taking into consideration the DNT study outcome (reduction in cerebellum height – that could not be explained by the maternal AChE inhibition), the epidemiological evidence showing an association between chlorpyrifos exposure during development and neurodevelopmental outcomes, and the overall analysis of the published literature (*in vivo*, *in vitro* and human data), the experts suggested[6] that the classification of chlorpyrifos as toxic for the reproduction, REPRO 1B, H360D 'May damage the unborn child' in accordance with the criteria set out in Regulation (EC) No 1272/2008 would be appropriate.

3. Conclusions

During the Pesticides Peer Review 01 Experts' meeting in April 2019, all the experts, except one, agreed that the Point of Departure (PoD) for chlorpyrifos should be the DNT LOAEL of 0.3 mg/kg. With regard to the uncertainty factors, the experts went through the overall assessment and concluded that:

- the genotoxicity potential remains unclarified (positive findings from an *in vitro* chromosome aberration study and two *in vitro* unscheduled DNA synthesis assays; *in vivo* positive findings from open literature on chromosome aberration and on DNA damage caused through oxidative stress or by topoisomerase II inhibition which was considered a MIE for infant leukaemia);
- the effects recorded in the DNT study (decrease in cerebellum height corrected by brain weight already at the lowest dose tested, which is a relevant endpoint for hazard characterisation) indicate a concern;
- the epidemiological evidence supports the developmental neurological outcomes in children for chlorpyrifos

Overall, no reference values could in any case be set because of the unclear genotoxicity potential of chlorpyrifos; moreover, significant uncertainties were linked to the neurodevelopmental toxicity study, where effects were observed at the lowest dose tested in rats (decrease in cerebellum height corrected by brain weight). These concerns were supported by the available epidemiological evidence related to developmental neurological outcomes in children. In the absence of toxicological reference values, a risk assessment for consumers, operators, workers, bystanders and residents cannot be conducted. This issue represents a critical area of concern for chlorpyrifos.

5 Post-meeting note: it is also possible that a significant portion of TCP present in urine samples can result from direct intake of TCP preformed in the environment and not as a result of chlorpyrifos or chlorpyrifos-methyl ingestion (Eaton et al., 2008).

6 It should be noted that classification is formally proposed and decided in accordance with Regulation (EC) No 1272/2008.

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In addition, the recorded toxicological effects meet the criteria for classification as toxic for reproduction category 1B (regarding developmental toxicity).

Based on the above, it is considered that the approval criteria which are applicable to human health as laid down in Article 4 of Regulation (EC) No 1107/2009 are not met.

References

Abdelaziz KB, El Makawy AI, El-Abidin Abd Elsalam AZ and Darwish AM, 2010. Genotoxicity of chlorpyrifos and the antimutagenic role of lettuce leaves in male mice. Communicata Scientiae, 1, 137–145.

Adler M, Aschner M, Bagchi D, Bagchi M, Bakshi KS, Ballantyne B, Baskin SI, Bushnell Us PJ, Chambers JE, Cole TB, Costa LG, De Bleecker JL, Dekundy A, Dettbarn WD, Fonnum F, Fujimoto N, Furlong CE, Garcia SJ, Goodall R, Gordon CJ, Ghosh MC, Gupta PK, Gupta RC, Gurbuz N, Hauschild V, Hilmas CJ, Hosokawa M, Jain AV, Jett DA, King J, Kitamura S, Lein PJ, Lockridge O, Lotti M, Lowit AB, Mack CM, Makris SL, Marrs TC, McCauley LA, Milatovic D, Moffett DB, Moretto A, Mortensen SR, Moser VC, Mulay S, Narahashi T, Opresko D, Padilla S, Pelkonen O, Pope CN, Qian Y, Radic Z, Ray AK, Reiner E, Riviere JE, Rose RL, Rowsey PJ, Salem H, Satoh T, Savolainen K, Schopfer LM, Sharma RP, Sikka SC, Simeon-Rudolf V, Slotkin TA, Sterri SH, Sugihara K, Umdnj LGS, Syversen T, Tang J, Taylor P, Thorne G, Tiffany-Castiglioni EC, Timchalk C, Vähäkangas K, Vale JA, Varma DR, Venkatraj V, Viialone A, Watson A, Wild JR, Woltjer RL, Young R, Zafra S and Zoltani CK, 2006. Toxicology of Organophosphate & Carbamate Compounds, Academic Press, Editor(s): Ramesh C. Gupta, 2006. Pages 533–548, ISBN 9780120885237, https://doi.org/10.1016/b978-012088523-7/50000-4

Castorina R, Bradman A, Fenster L, Barr DB, Bravo R, Vedar MG, Harnly ME, McKone TE, Eisen EA and Eskenazi B, 2010. Comparison of current-use pesticide and other toxicant urinary metabolite levels among pregnant women in the CHAMACOS cohort and NHANES. Environmental Health Perspectives, 118, 856–863.

Cui Y, Guo J, Xu B and Chen Z, 2011. Genotoxicity of chlorpyrifos and cypermethrin to ICR mouse hepatocytes. Toxicology Mechanisms and Methods, 21, 70–74.

Eaton DL, Daroff RB, Autrup H, Bridges J, Buffler P, Costa LG, Coyle J, McKhann G, Mobley WC, Nadel L, Neubert D, Schulte-Hermann R and Spencer PS, 2008. Review of the toxicology of chlorpyrifos with an emphasis on human exposure and neurodevelopment. Critical Reviews in Toxicology, 38(Suppl 2), 1–125.

ECHA (European Chemicals Agency), 2017. Guidance on the Application of the CLP Criteria; Guidance to Regulation (EC) No 1272/2008 on classification, labelling and packaging (CLP) of substances and mixtures. Version 5.0, July 2017. Reference: ECHA-17-G-21-EN; ISBN: 978-92-9020-050-5. Available online: https://echa.europa.eu/guidance-documents/guidance-on-clp

ECHA (European Chemicals Agency) and EFSA (European Food Safety Authority) with the technical support of the Joint Research Centre (JRC), Andersson N, Arena M, Auteri D, Barmaz S, Grignard E, Kienzler A, Lepper P, Lostia AM, Munn S, Parra Morte JM, Pellizzato F, Tarazona J, Terron A and Van der Linden S, 2018. Guidance for the identification of endocrine disruptors in the context of Regulations (EU) No 528/2012 and (EC) No 1107/2009. EFSA Journal 2018;16(6):5311, 135 pp. https://doi.org/10.2903/j.efsa.2018.5311. ECHA-18-G-01-EN.

EFSA (European Food Safety Authority), 2014. Conclusion on the peer review of the pesticide human health risk assessment of the active substance chlorpyrifos. EFSA Journal 2014;12(4):3640, 34 pp. https://doi.org/10.2903/j.efsa.2014.3640

EFSA PPR Panel (EFSA Panel on Plant Protection Products and their Residues), 2012. Guidance on dermal absorption. EFSA Journal 2012;10(4):2665, 30 pp. https://doi.org/10.2903/j.efsa.2012.2665.

EFSA PPR Panel (EFSA Panel on Plant Protection Products and their Residues), Ockleford C, Adriaanse P, Berny P, Brock T, Duquesne S, Grilli S, Hernandez-Jerez AF, Bennekou SH, Klein M, Kuhl T, Laskowski R, Machera K, Pelkonen O, Pieper S, Smith R, Stemmer M, Sundh I, Teodorovic I, Tiktak A, Topping CJ, Wolterink G, Angeli K, Fritsche E, Hernandez-Jerez AF, Leist M, Mantovani A, Menendez P, Pelkonen O, Price A, Viviani B, Chiusolo A, Ruffo F, Terron A and Bennekou SH, 2017. Scientific Opinion on the investigation into experimental toxicological properties of plant protection products having a potential link to Parkinson's disease and childhood leukaemia. EFSA Journal 2017; 15(3):4691, 325 pp. https://doi.org/10.2903/j.efsa.2017.4691.

EFSA Scientific Committee, 2011. Scientific Opinion on genotoxicity testing strategies applicable to food and feed safety assessment. EFSA Journal 2011;9(9):2379, 69 pp. https://doi.org/10.2903/j.efsa.2011.2379. Available online: www.efsa.europa.eu/efsajournal

Engel SM, Wetmur J, Chen J, Zhu C, Barr DB, Canfield RL and Wolff MS, 2011. Prenatal exposure to organophosphates, paraoxonase 1, and cognitive development in childhood. Environmental Health Perspectives, 119, 1182–1188.

European Commission, 2012. Guidance document on the assessment of the equivalence of technical materials of substances regulated under Regulation (EC) No 1107/2009. SANCO/10597/2003-rev. 10.1, 13 July 2012.

Hernández AF and Menéndez P, 2016. Linking pesticide exposure with pediatric leukemia: potential underlying mechanisms. International Journal of Molecular Sciences, 17, 461.

Kopjara N, Žunecb S, Mendašc G, Micekd V, Kašubaa V, Mikolíće A, Lovakovíće BT, Milića M, Pavičićf I, Čermakf AMM, Pizente A, Vrdoljakb AL and Želježić D, 2018. Cholinesterase activity, oxidative stress responses, parent compound/metabolite levels, and primary DNA damage in blood and brain tissue of adult male Wistar rats. Chemico-Biological Interactions, 279, 51–63.

18314732, 2019, 8, Downloaded from https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2019.5809 by Fao Headquarters, Wiley Online Library on [02/10/2023]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Lu C, Liu X, Liu C, Wang J, Li C, Liu Q, Li Y, Li S, Sun S, Yan J and Shao J, 2015. Chlorpyrifos induces MLL translocations through Caspase 3-dependent genomic instability and topoisomerase II inhibition in human foetal liver haematopoietic stem cells. Toxicological Sciences, 147, 588–606.

Marks AR, Harley K, Bradman A, Kogut K, Barr DB, Johnson C, Calderon N and Eskenazi B, 2010. Organophosphate pesticide exposure and attention in young Mexican-American children: the CHAMACOS study. Environmental Health Perspectives, 118, 1768–1774.

Mattsson JL, Maurissen PJ, Nolan RJ and Brzak KA, 2000. Lack of differential sensitivity to cholinesterase inhibition in Fetuses and neonates compared to dams treated perinatally with chlorpyrifos. Toxicological Sciences, 53, 438–446.

Mehta A, Verma RS and Srivastava N, 2008. Chlorpyrifos-induced DNA damage in rat liver and the brain. Environmental and Molecular Mutagenesis, 49, 426–433.

Mie A, Rudén C and Grandjean P, 2018. Safety of safety evaluation of pesticides: developmental neurotoxicity of chlorpyrifos and chlorpyrifos-methyl. Environmental Health, 17, 77. https://doi.org/10.1186/s12940-018-0421-y

Ntzani EE, Chondrogiorgi M, Ntritsos G, Evangelou E and Tzoulaki I, 2013. Literature review on epidemiological studies linking exposure to pesticides and health effects. EFSA Supporting Publication 2013;10(10):EN-497, 159 pp. https://doi.org/10.2903/sp.efsa.2013.en-497

OECD (Organisation for Economic Co-operation and Development), 2007. Test No. 426: Developmental Neurotoxicity Study, OECD Guidelines for the Testing of Chemicals, Section 4, OECD Publishing, Paris. https://doi.org/10.1787/9789264067394-en

OECD (Organisation for Economic Co-operation and Development), 2014. Test No. 489: In Vivo Mammalian Alkaline Comet Assay. OECD Publishing, Paris. https://doi.org/10.1787/9789264224179-en

OECD (Organisation for Economic Co-operation and Development), 2018. Test No. 443: Extended One-Generation Reproductive Toxicity Study, OECD Guidelines for the Testing of Chemicals, Section 4, OECD Publishing, Paris. https://doi.org/10.1787/9789264185371-en

Ojha A, Yaduvanshi SK, Pant SC, Lomash V and Srivastava N, 2013. Evaluation of DNA damage and cytotoxicity induced by three commonly used organophosphate pesticides individually and in mixture, in rat tissues. Environmental Toxicology, 28, 543–552.

Rauh VA, Perera FP, Horton MK, Whyatt RM, Ravi Bansal R, Hao X, Liu J, Barr DB, Slotkin TA and Peterson BS, 2012. Brain anomalies in children exposed prenatally to a common organophosphate pesticide. PNAS, Proceedings of the National Academy of Sciences of the United States of America, 109, 7871–7876, May 15, 2012.

Sandhu MA, Saeed AA, Khilji MS, Ahmed A, Latif MS and Khalid N, 2013. Genotoxicity evaluation of chlorpyrifos: a gender related approach in regular toxicity testing. The Journal of Toxicological Sciences, 38, 237–244.

Sebe A, Satar S, Alpay R, Kozaci N and Hilal A, 2005. Organophosphate poisoning associated with fetal death. Mount Sinai Journal of Medicine, 72, 354–356.

Silver MK, Shao J, Zhu B, Chen M, Xia Y, Kaciroti N, Lozoff B and Meeker JD, 2017. Prenatal naled and chlorpyrifos exposure is associated with deficits in infant motor function in a cohort of Chinese infants. Environment International, 106, 248–256. https://doi.org/10.1016/j.envint.2017.05.015. Epub 2017 Jun 8.

Spain, 2017. Renewal Assessment Report (RAR) on the active substance chlorpyrifos prepared by the rapporteur Member State Spain in the framework of Commission Implementing Regulation (EU) No 844/2012, May 2017. Available online: www.efsa.europa.eu

Spain, 2019. Revised Renewal Assessment Report (RAR) on the active substance chlorpyrifos, volumes relevant for mammalian toxicology, prepared by the rapporteur Member State Spain in the framework of Commission Implementing Regulation (EU) No 844/2012, February 2019.

Tsuji R and Crofton KM, 2012. Developmental neurotoxicity guideline study: issues with methodology, evaluation and regulation. Congenital Anomalies, 52, 122–128. https://doi.org/10.1111/j.1741-4520.2012.00374.x

US EPA (United States Environmental Protection Agency), 1998. The Office of Prevention, Pesticides and Toxic Substances (OPPTS), Health Effects Test Guidelines OPPTS 870.6300 Developmental Neurotoxicity Study, Prevention, Pesticides and Toxic Substances (7101). EPA 712–C–98–239, August 1998.

US EPA (United States Environmental Protection Agency), 2000. Memorandum of agreement between the Environmental Protection Agency and signatory registrants regarding the registration of pesticide products containing chlorpyrifos. United States Environmental Protection Agency, Washington, DC, June 7, 2000.

US EPA (United States Environmental Protection Agency), 2016. US EPA, Office of Chemical Safety and Pollution prevention. Memorandum on Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. November 3, 2016.

Abbreviations

AAOEL	acute acceptable operator exposure level
AChE	acetylcholinesterase
ADI	acceptable daily intake
AOEL	acceptable operator exposure level
AOP	adverse outcome pathway

ARfD	acute reference dose
AUC	area under the blood concentration/time curve
bw	body weight
CaMKII	calcium/calmodulin-dependent protein kinase type II
CCCEH	Columbia Center for Children's Environmental Health
CHAMACOS	Center for the Health Assessment of Mothers and Children of Salinas
ChE	cholinesterase
CLP	classification, labelling and packaging
Cmax	concentration achieved at peak blood level
CNS	central nervous system
co-RMS	co-rapporteur Member State
DNT	developmental neurotoxicity
ECHA	European Chemicals Agency
ED	endocrine disruptor
FAAH	fatty acid amide hydroxylase
HSPC	haematopoietic stem and progenitor cells
ICR	Institute of Cancer Research
KE	key event
LC_{50}	lethal concentration, median
LD_{50}	lethal dose, median; dosis letalis media
LOAEL	lowest observable adverse effect level
MIE	molecular initiating event
M&K	Maximization test of Magnussen and Kligman
MoA	mode of action
MTD	maximum tolerated dose
NOAEL	no observed adverse effect level
OECD	Organisation for Economic Co-operation and Development
OP	organophosphate
PND	postnatal day
PoD	point of departure
PPR panel	EFSA's Panel on Plant Protection Products and their Residues
QSAR	quantitative structure–activity relationship
RAR	Renewal Assessment Report
RBC	red blood cells
RMS	rapporteur Member State
SD	standard deviation
$t_{1/2}$	half-life (define method of estimation)
Tmax	time until peak blood levels achieved
UDS	unscheduled DNA synthesis
US EPA	United States Environmental Agency

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Appendix A – List of endpoints for the active substance and the representative formulations with regard to impact on human health

Impact on Human and Animal Health

Absorption, distribution, metabolism and excretion (toxicokinetics) (Regulation (EU) No 283/2013, Annex Part A, point 5.1)

Rate and extent of oral absorption/systemic bioavailability	Rapid (84% – 93%) rats, based on urinary excretion
Toxicokinetics	Not available – data gap
Distribution	Widely distributed
Potential for bioaccumulation	No evidence for accumulation
Rate and extent of excretion	Nearly completely, excreted within 48 hours, mainly via urine (approx. 80%)
Metabolism in animals	Moderate-extensive. Steps: oxidation and hydrolysis
In vitro metabolism	The *in vitro* metabolic studies indicate that liver microsomes from human, mouse and rat more readily produce a detoxication product (i.e. 3,5,6,-trichloro-2-pyridinol – TCP) than an activation product (i.e. chlorpyrifos-oxon – CPO). These observations are similar to the *in vivo* metabolism studies in rodents.
Toxicologically relevant compounds (animals and plants)	Chlorpyrifos
Toxicologically relevant compounds (environment)	Chlorpyrifos

Acute toxicity (Regulation (EU) No 283/2013, Annex Part A, point 5.2)

Rat LD_{50} oral	66–223 mg/kg bw	H301
Rat LD_{50} dermal	1,250–2,000 mg/kg bw	H312
Rat LC_{50} inhalation	> 1.0 mg/L air per 4h (whole-body)	
Skin irritation	Non-irritant	
Eye irritation	Non-irritant	
Skin sensitisation	Non-sensitiser (M&K and Buehler tests)	
Phototoxicity	No phototoxicity potential	

LD_{50}: lethal concentration, median; LC_{50}: lethal dose, median.

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Short-term toxicity (Regulation (EU) No 283/2013, Annex Part A, point 5.3)

Target organ/critical effect	Rat: Nervous system/RBC AChE inhibition Mouse: RBC and brain AChE inhibition Dog: RBC AChE inhibition	
Relevant oral NOAEC	90-day, rat: 0.1 mg/kg bw per day 90-day, mouse: 1 mg/kg bw per day 90-day & 2-year, dog: 0.1 mg/kg bw per day	
Relevant dermal NOAEC	21-day, rat: > 5 mg/kg bw per day	
Relevant inhalation NOAEC	14-day, rat: > 0.296 x 10^{-3} mg/L air (nose-only)	

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw: body weight.

Genotoxicity (Regulation (EU) No 283/2013, Annex Part A, point 5.4)

In vitro studies	Bacterial gene mutation tests: 6 negative Mammalian gene mutation tests: 3 negative Chromosome aberration tests: – 2 negative (cultured rat lymphocytes and Chinese hamster ovary cells) – with some reservations – 1 positive (mouse spleen cells) – with some reservations – 1 negative (human peripheral blood lymphocytes) – acceptable UDS: Primary culture of rat hepatocytes: negative – with some reservations Rec-assay with *Bacillus subtilis*: negative – supportive Microtitration SOS chromotest: negative – supportive Sister chromatid exchange assay: negative – supportive with some reservations Cytokinetic and cytogenetic effect on human lymphoid cells: positive – supportive with some reservations ICR mouse hepatocytes: dose-related increase in DNA damage (in the form of strand breaks) was seen in the comet assay, but UDS was not affected. DNA hypomethylation was seen at all concentrations – with some reservations	
In vivo studies	Micronucleus tests: – 3 negative (supportive with reservations) – 1 negative (supportive) – 1 negative (acceptable) DNA damage (mainly clastogenicity) reported in the public literature: – for chromosomal aberrations – for DNA damage in *in vivo* Comet assays	
Photomutagenicity	Not required	
Potential for genotoxicity	Chlorpyrifos did not induce gene mutation nor clastogenic effects in regulatory studies Regarding DNA damage, positive results in Comet assay were observed *in vitro* and *in vivo* (well-documented publications) DNA damaging potential cannot be ruled out for chlorpyrifos	

UDS: unscheduled DNA synthesis.

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Long-term toxicity and carcinogenicity (Regulation (EU) No 283/2013, Annex Part A, point 5.5)

Long-term effects (target organ/critical effect)	Nervous system/RBC AChE inhibition (rat, mouse) Decrease in bw gain (rat)	
Relevant long-term NOAEL	0.1 mg/kg bw per day (2-year, rat) 0.9 mg/kg bw per day (18-month, mouse)	
Carcinogenicity (target organ, tumour type)	No carcinogenic potential	
Relevant NOAEL for carcinogenicity	10 mg/kg bw per day (highest dose tested in 2-year, rat studies) 47.1 mg/kg bw per day (highest dose tested in 18-month, mouse study)	

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw: body weight.

Reproductive toxicity (Regulation (EU) No 283/2013, Annex Part A, point 5.6) Reproduction toxicity

Reproduction target/critical effect	Parental toxicity: RBC AChE inhibition Reproductive toxicity: no adverse effects Offspring's toxicity: Decreased pup growth and viability	
Relevant parental NOAEL	0.1 mg/kg bw per day	
Relevant reproductive NOAEL	5 mg/kg bw per day (highest dose tested)	
Relevant offspring NOAEL	1 mg/kg bw per day	

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw: body weight.

Developmental toxicity

Developmental target/critical effect	Rat: Maternal toxicity: RBC AChE inhibition Developmental toxicity: Increased post-implantation loss at maternal toxic doses Rabbit: Maternal toxicity: decreased bw gain Developmental toxicity: decreased foetal size and increased post-implantation loss Mouse: Maternal toxicity: RBC AChE inhibition Developmental toxicity: reduced AChE activity	
Relevant maternal NOAEL	Rat: 0.1 mg/kg bw per day Rabbit: 81 mg/kg bw per day Mouse: 1 mg/kg bw per day	
Relevant developmental NOAEL	Rat: 2.5 mg/kg bw per day Rabbit: 81 mg/kg bw per day Mouse: 1 mg/kg bw per day	

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw: body weight.

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Neurotoxicity (Regulation (EU) No 283/2013, Annex Part A, point 5.7)

Acute neurotoxicity	NOAEL= 10 mg/kg bw Clinical signs, decreased motor activity and grip performance, decreased bodyweight (between day 1-4 postdosing); AChE activity was not evaluated	
Repeated neurotoxicity	90-day, rat: NOAEL= 1 mg/kg bw per day Based on perineal soiling; AChE was not evaluated	
Additional studies (delayed neurotoxicity)	Acute and 90-day, hens: No evidence of delayed neurotoxicity	
Additional studies (developmental neurotoxicity)	Maternal LOAEL= 0.3 mg/kg bw per day, based on RBC AChE inhibition Developmental neurotoxicity LOAEL= 0.3 mg/kg bw per day, based on reduction in cerebellum height – that could not be explained by the maternal AChE inhibition Epidemiological evidence showed an association between chlorpyrifos exposure during development and neurodevelopmental outcomes DNT potential of chlorpyrifos cannot be dismissed on the basis of the evaluation of the DNT studies provided in the RAR, the epidemiological evidence and analysis of the overall literature (*in vivo*, *in vitro* and human data)	H360D
Additional studies (AChE activity)	Critical effect: RBC AChE inhibition NOAEL acute = 1 mg/kg bw, rat NOAEL short-term = 0.1 mg/kg bw per day, rat	

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw:body weight; LOAEL: lowest observable adverse effect level; DNT: developmental neurotoxicity.

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Other toxicological studies (Regulation (EU) No 283/2013, Annex Part A, point 5.8)

Supplementary studies on the active substance	• Acute oral study in humans: – LOAEL = 2 mg/kg bw per day based on RBC AChE inhibition (NOAEL = 1.0 mg/kg bw per day) • Subacute oral study in humans (males): – LOAEL= 0.5 mg/kg bw per day based on clinical symptoms • 6-week dietary study in dogs: – peripheral tissue AChE inhibition NOAEL = 1 mg/kg bw per day – brain AChE inhibition NOAEL = 2 mg/kg bw per day; RBC AChE inhibition NOAEL < 0.5 mg/kg bw per day • Comparative Cholinesterase study in juvenile and preweaning adult rats after acute and repeated exposure to chlorpyrifos and chlorpyrifos-oxon (CCA study): – NOAEL in acute CCA study for RBC AChE inhibition: 0.5 mg/kg bw per day – NOAEL in repeated CCA study for RBC AChE inhibition: 0.1 mg/kg bw per day • Nose-only inhalation exposure to chlorpyrifos vapors (6 h) in rats results in no clinical signs of exposure and no inhibition of AChE activity • The immunotoxic potential of chlorpyrifos could not be determined
Endocrine disrupting properties	An endocrine disruptor (ED) assessment in line with the current guidance for the identification of endocrine disruptors in the context of Regulation (EU) No 1107/2009 is not scientifically necessary for chlorpyrifos (ECHA/EFSA, 2018). In all the studies conducted with chlorpyrifos, the NOAEL, LOAEL and MTD were based on erythrocyte AChE inhibition and clinical signs at higher doses. The overall dose–response pattern for cholinergic overstimulation indicates that chlorpyrifos is a potent AChE inhibitor, and this is practically limiting the possibility of exploring additional target organs/systems
Studies performed on metabolites or impurities 3,5,6-trichloro-2-pyridinol (TCP)	• Rat oral LD_{50} is estimated in 3,129 mg/kg bw in females • TCP did not show a genotoxic potential (Ames test, *in vitro* UDS and mammalian cell gene mutation, *in vivo* micronucleus) • 90-day, rat: NOAEL = 30 mg/kg bw per day based on ↑ liver and kidney weight

	• 1-year, dog: NOAEL = 12 mg/kg bw per day (based on based on ↓ body weight, haematological and clinical chemistry effects • Developmental toxicity in rats: – Maternal NOAEL = 50 mg/kg bw per day based on ↓ in body weight gain – Developmental toxicity NOAEL = 150 mg/kg bw per day (highest dose tested) • Developmental toxicity in rabbit: – Maternal NOAEL = 100 mg/kg bw per day based on ↓ in body weight gain – Developmental toxicity NOAEL = 25 mg/kg bw per day based on ↑ incidence of foetal and litter CNS malformations • QSAR assessment: TCP is expected to be less toxic than chlorpyrifos **ADI = 0.06 mg/kg bw per day** (based on the NOAEL of 12 mg/kg bw per day from the 1-year study in dogs and applying an uncertainty factor of 200 **ARfD = 0.25 mg/kg bw** (based on the NOAEL of 25 mg/kg bw per day from the rabbit developmental toxicity study and applying an uncertainty factor of 100
2,3,5-trichloro-6-methoxypyridine (TMP)	• Rat oral LD_{50} > 2,000 mg/kg bw in females • Three *in vitro* genotoxicity studies: negative (±S9) (Ames test, *in vitro* mammalian cells gene mutation and chromosome aberration assays)
3,6-dichloro-2-pyridinol (3,6-DCP)	• Rat oral LD_{50}: > 2,000 < 5,000 mg/kg bw (females) • Ames test (±S9): negative
Desethyl chlorpyrifos	• Rat oral LD_{50} cut-off value: 500 mg/kg bw (females) • Rat oral LD_{50} > 920 mg/kg bw (females) • Test Ames and *in vitro* micronucleus test: both negative • QSAR assessment: desethyl chlorpyrifos is expected to be less toxic than chlorpyrifos
Chlorpyrifos-oxon (CPO)	• Rat oral LD_{50} = 100/300 mg/kg bw (male and female, respectively) – Acute Tox. 3, H301 'Toxic if swallowed'

NOAEL: no observed adverse effect level; RBC: red blood cells; AChE: acetylcholinesterase; bw: body weight; LOAEL: lowest observable adverse effect level; LD50: lethal concentration, median; LC50: lethal dose, median; UDS: unscheduled DNA synthesis; ADI: acceptable daily intake; ARfD: acute reference dose; QSAR: quantitative structure–activity relationship; CNS: central nervous system.

Medical data (Regulation (EU) No 283/2013, Annex Part A, point 5.9)

	No neurotoxic effects in manufacturing plant personnel reported. Evidence of polyneuropathy from acute poisonings Epidemiological studies (taken together toxicity literature studies) suggest that chlorpyrifos might be acting on the developing nervous system through unknown mechanisms (H360D)

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Summary[7] (Regulation (EU) No 1107/2009, Annex II, point 3.1 and 3.6)

	Value	Study	Uncertainty factor
Acceptable daily intake (ADI)	Open[1,2]	–	–
Acute reference dose (ARfD)	Open[1,2]	–	–
Acceptable operator exposure level (AOEL)	Open[1,2]	–	–
Acute acceptable operator exposure level (AAOEL)	Open[1]	–	–

(1): Reference values could not be derived since a genotoxic potential could not be excluded for chlorpyrifos.

(2): Previously set toxicological reference values of chlorpyrifos (EFSA, 2014): ADI 0.001 mg/kg bw per day, AOEL 0.001 mg/kg bw per day, ARfD 0.005 mg/kg bw.

Dermal absorption (Regulation (EU) No 284/2013, Annex Part A, point 7.3)

Representative formulation (Pyrinex 250 CS, 250 g/L)	Concentrate: 25% Spray dilution (0.5 g/L): 70% Based on default values
Representative formulation (EF-1551 EC, 480 g/L)	Concentrate: 0.8% Spray dilution (1.8 g/L): 5% Spray dilution (0.48 g/L): 7% Based on triple pack approach
Representative formulation (RIMI 101 RB, 10 g/kg)	Concentrate: 9% Spray dilution: NA Based on *in vitro* study on human skin
Representative formulation (Chlorpyrifos-ethyl 5G GR, 50 g/kg)	Concentrate: – Spray dilution (0.351 g/L): 0.2% Based on *in vitro* study on human skin
Representative formulation (SAP250 CS, 250 g/L)	Concentrate 25% Spray dilution: 70% Based on default values

Exposure scenarios (Regulation (EU) No 284/2013, Annex Part A, point 7.2)

Operators	Open. Risk assessment cannot be conducted in the absence of toxicological reference values
Workers	Open. Risk assessment cannot be conducted in the absence of toxicological reference values
Bystanders and residents	Open. Risk assessment cannot be conducted in the absence of toxicological reference values

[7] For metabolites, refer to section: Studies performed on metabolites or impurities

Classification with regard to toxicological data (Regulation (EU) No 283/2013, Annex Part A, Section 10)

Substance:	Chlorpyrifos
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][(a)]:	Acute Tox. 3, H301 'Toxic if swallowed'
Peer review proposal[(b)] for harmonised classification according to Regulation (EC) No 1272/2008:	Acute Tox. 3, H301 'Toxic if swallowed' Acute Tox. 4, H312 'Harmful in contact with skin' Repro 1B, H360D 'May damage the unborn child'

(a): Regulation (EC) No 1272/2008 of the Europe an Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1–1355.

(b): It should be noted that classification is formally proposed and decided in accordance with Regulation (EC) No 1272/2008.

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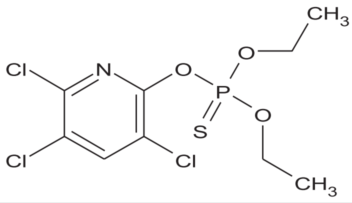
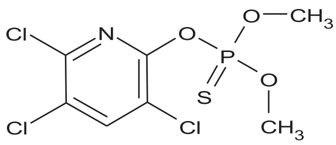
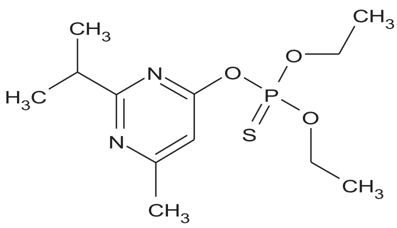
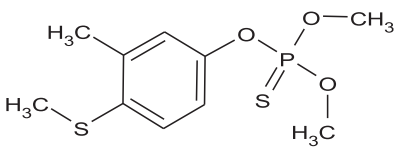
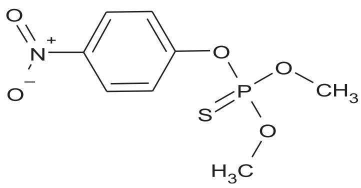
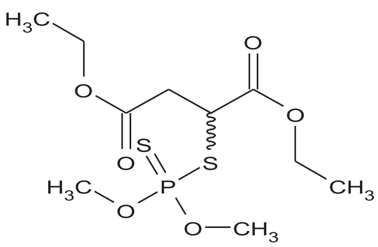
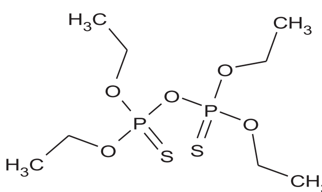
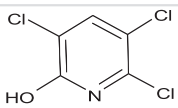
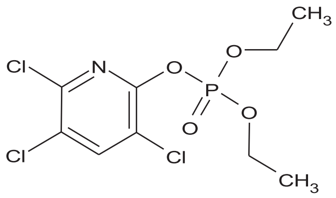
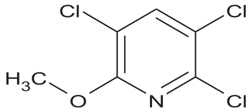
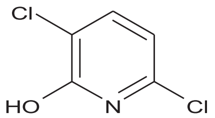
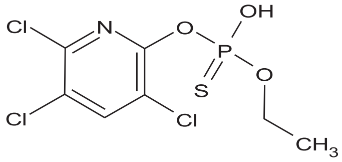
Appendix B – Used compound codes

Code/trivial name	IUPAC name/SMILES notation/InChIKey[a]	Structural formula[b]
chlorpyrifos	*O*,*O*-diethyl *O*-3,5,6-trichloro-2-pyridyl phosphorothioate Clc1cc(Cl)c(Cl)nc1OP(=S)(OCC)OCC SBPBAQFWLVIOKP-UHFFFAOYSA-N	
chlorpyrifos-methyl	*O*,*O*-dimethyl *O*-3,5,6-trichloro-2-pyridyl phosphorothioate Clc1cc(Cl)c(Cl)nc1OP(=S)(OC)OC HRBKVYFZANMGRE-UHFFFAOYSA-N	
diazinon	*O*,*O*-diethyl *O*-2-isopropyl-6-methylpyrimidin-4-yl phosphorothioate Cc1cc(OP(=S)(OCC)OCC)nc(n1)C(C)C FHIVAFMUCKRCQO-UHFFFAOYSA-N	
fenthion	*O*,*O*-dimethyl *O*-4-methylthio-*m*-tolyl phosphorothioate Cc1cc(ccc1SC)OP(=S)(OC)OC PNVJTZOFSHSLTO-UHFFFAOYSA-N	
parathion-methyl	*O*,*O*-dimethyl *O*-4-nitrophenyl phosphorothioate S=P(Oc1ccc(cc1)[N+]([O-])=O)(OC)OC RLBIQVVOMOPOHC-UHFFFAOYSA-N	
malathion	*S*-1,2-bis(ethoxycarbonyl)ethyl *O*,*O*-dimethyl phosphorodithioate CCOC(=O)CC(SP(=S)(OC)OC)C(=O)OCC JXSJBGJIGXNWCI-UHFFFAOYSA-N	
sulfotep	*O*,*O*,*O*′,*O*′-tetraethyl dithiopyrophosphate CCOP(=S)(OCC)OP(=S)(OCC)OCC XIUROWKZWPIAIB-UHFFFAOYSA-N	
TCP	3,5,6-trichloro-2-pyridinol Clc1cc(Cl)c(Cl)nc1O WCYYAQFQZQEUEN-UHFFFAOYSA-N	

Code/trivial name	IUPAC name/SMILES notation/InChIKey[(a)]	Structural formula[(b)]
chlorpyrifos-oxon (CPO)	diethyl 3,5,6-trichloro-2-pyridyl phosphate Clc1cc(Cl)c(Cl)nc1OP(=O)(OCC)OCC OTMOUPHCTWPNSL-UHFFFAOYSA-N	
TMP	2,3,5-trichloro-6-methoxypyridine Clc1cc(Cl)c(Cl)nc1OC RLIVUWLXZBDMBL-UHFFFAOYSA-N	
3,6-DCP	3,6-dichloro-2-pyridinol Oc1nc(Cl)ccc1Cl UGPDKBDRRLFGFD-UHFFFAOYSA-N	
desethyl chlorpyrifos	*O*-ethyl *O*-(3,5,6-trichloro-2-pyridyl) hydrogen (*RS*)-phosphorothioate Clc1cc(Cl)c(Cl)nc1OP(O)(=S)OCC WHGNMEMHTPXJRR-UHFFFAOYSA-N	

(a): ACD/Name 2018.2.2 ACD/Labs 2018 Release (File version N50E41, Build 103230, 21 July 2018).
(b): ACD/ChemSketch 2018.2.2 ACD/Labs 2018 Release (File version C60H41, Build 106041, 07 December 2018).

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Level 2 (Appendix 1)

CHLORPYRIFOS

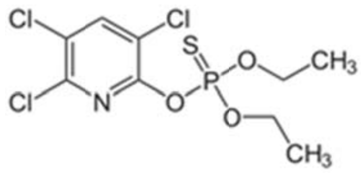
Appendix 1. List of end points

Identity, Physical and Chemical Properties, Details of Uses, Further Information (Regulation (EU) N° 283/2013, Annex Part A, points 1.3 and 3.2)

Active substance (ISO Common Name)	CHLORPYRIFOS
Function (*e.g.* fungicide)	Insecticide

Rapporteur Member State	Spain
Co-rapporteur Member State	Poland

Identity (Regulation (EU) N° 283/2013, Annex Part A, point 1)

Chemical name (IUPAC)	O,O-diethyl-O-3,5,6-trichloro-2-pyridyl phosphorothioate
Chemical name (CA)	O,O-diethyl-O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate
CIPAC No	221
CAS No	2921-88-2
EC No (EINECS or ELINCS)	EINECS: 2208644 EEC: 015-084-00-4
FAO Specification (including year of publication)	FAO Specification 221/TC (October 2004)
Minimum purity of the active substance as manufactured	970 g/kg
Identity of relevant impurities (of toxicological, ecotoxicological and/or environmental concern) in the active substance as manufactured	Sulfotepp (O,O,O',O'-tetraethyl dithiopyrophosphate) – Max. 3 g/kg
Molecular formula	$C_9H_{11}Cl_3NO_3PS$
Molar mass	350.6 g/mol
Structural formula	

Physical and chemical properties (Regulation (EU) N° 283/2013, Annex Part A, point 2)

Melting point (state purity)	Melting Point at 42°C (99.9% wt% chlorpyrifos)
Boiling point (state purity)	Decomposes before boiling.
Temperature of decomposition (state purity)	Decomposition Temperature between 170-180°C (98.4% wt% chlorpyrifos)
Appearance (state purity)	White crystalline solid (99.9% chlorpyrifos) Off-white molten-solid (98.0% chlorpyrifos)
Vapour pressure (state temperature, state purity)	3.35×10^{-3} Pa (2.51×10^{-5} mm Hg) at 25°C 1.43×10^{-3} Pa (1.07×10^{-5} mm Hg) at 20°C (99.8% chlorpyrifos)
Henry's law constant	0.478 Pa m^3 mol^{-1} at 20°C
Solubility in water (state temperature, state purity and pH)	Unbuffered water – 1.05 (±0.14) mg/L at 20ºC (99.8% Chlorpyrifos)

Solubility in organic solvents (state temperature, state purity)	Hexane 774 g/L at 20°C (99.9%) Toluene > 4000 g/L at 20°C (99.9%) Dichloromethane > 4000 g/L at 20°C (99.9%) Methanol 290 g/L at 20°C (99.9%) Acetone > 4000 g/L at 20°C (99.9%) Ethyl acetate > 4000 g/L at 20°C (99.9%)
Surface tension (state concentration and temperature, state purity)	72.0-66.8 mN/m at 20°C (99.8% Chlorpyrifos)
Partition coefficient (state temperature, pH and purity)	$\log_{10} P_{ow}$ = 4.7 - 5.21 at 20°C (99.8% Chlorpyrifos)
Dissociation constant (state purity)	Not determinable by Titration, Spectrophotometric or Conductometric methods, due to very low water solubility.
UV/VIS absorption (max.) incl. ε (state purity, pH)	In neutral medium (CH3OH/H2O): λmax (nm) ε (L x mol-1x cm-1) 203 21,174 230 10,359 290 5,620 In acidic medium (CH3OH/HCl): λmax (nm) ε (L x mol-1x cm-1) 203 22,223 230 10,347 290 5,907 In alkaline medium (CH3OH/NaOH): λmax (nm) ε (L x mol-1x cm-1) 242 9,413 290 1,633 323 6,701 (99.8% Chlorpyrifos)
Flammability (state purity)	Not flammable (98.4% Chlorpyrifos)
Explosive properties (state purity)	Not Explosive (98.1% Chlorpyrifos)
Oxidising properties (state purity)	Non-Oxidising (97.6% Chlorpyrifos)

DOW (DOW&ADAMA): EF-1551

Crop and/or situation (a)	**Member State or Country**	**Product Name**	**F G or I** (b)	**Pests or Group of pests controlled** (c)	**Formulation**		**Application**				**Application rate per treatment**			**PHI (days)** (l)	**Remarks** (m)
					Type (d-f)	**Conc. of a.s.** (i)	**Method Kind** (f-h)	**Growth stage & season** (j)	**Number min max** (k)	**Interval between apps. (min)**	**kg a.s./hL min max**	**water (L/ha) min max**	**kg a.s./ha min max**		
Brassicas (Broccoli, Brussels Sprouts, Cabbage, Cauliflower)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Lepidoptera	EC	480	Broadcast foliar	BBCH 11 – 40 (spring/ summer)	1	n/a	0.096 / 0.24	200/500	**0.48/ 0.48**	n/a	Drench (field) or one foliar application
Cereals (Spring barley, Spring wheat, Winter barley, Winter wheat)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Coleoptera, Orange wheat blossom midge (SITMO)	EC	480	Broadcast foliar	BBCH 12 – 59	1	n/a	0.06 / 0.24	200/400	**0.24/ 0.48**	n/a	
Grapes, Wine	Rep Use GAP: EU Central Zone	All PPPs	F	Grape berry moth	EC	480	Broadcast foliar	19 – 89 (spring/summer)	1	n/a	0.072 / 0.18	200/500	**0.36/ 0.36**	21	No application during flowering (BBCH 60-69)
Oilseed rape	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Coleoptera, Weevils (CEUTSP), Pollen beetle (MELISP)	EC	480	Broadcast foliar	30 – 59 (sping/ summer)	1	n/a	0.048 / 0.16	300/500	**0.24/ 0.48**	n/a	
Dessert Pome (Apple, Pear, Nishi Pear, Quince)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Leipdiptea	EC	480	Broadcast foliar	10 – 55 (spring/ summer)	1	n/a	0.048 / 0.096	500/1000	**0.48/ 0.48**	n/a	
Cider/Perry Pome (Apple, Pear)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Leipdiptea	EC	480	Broadcast foliar	10 – 89 (spring/ summer)	1	n/a	0.048 / 0.064	750/1000	**0.48/ 0.48**	21	

Crop and/or situation (a)	Member State or Country	Product Name	F G or I (b)	Pests or Group of pests controlled (c)	Formulation		Application				Application rate per treatment			PHI (days) (l)	Remarks (m)
					Type (d-f)	Conc. of a.s. (i)	Method Kind (f-h)	Growth stage & season (j)	Number min max (k)	Interval between apps. (min)	kg a.s./hL min max	water (L/ha) min max	kg a.s./ha min max		
Raspberry (Cane fruit)	Rep Use GAP: EU Central Zone	All PPPs	F	Cane midge (THOMTE), Raspberry beetle (BYTUTO)	EC	480	Broadcast foliar	BBCH 11 - 89	1	n/a	0.048 / 0.064	750/1000	**0.48/ 0.48**	7	No application during flowering (BBCH 60-69)
Fresh solanaceous vegetables (tomato)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, thrips, Lepidoptera	EC	480	Broadcast foliar	BBCH 11 – 59 (spring/ summer)	1	n/a	0.072	500	**0.36**	n/a	
Canning/Puree varieties solanaceous vegetables (tomato)	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, thrips, Lepidoptera	EC	480	Broadcast foliar	BBCH 11 – 89 (spring/ summer)	1	n/a	0.072	500	**0.36**	5	
Stone fruit	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, Lepidotera	EC	480	Broadcast foliar	BBCH 10 – 59 (spring/ summer)	1	n/a	0.048 / 0.064	750/1000	**0.48/ 0.48**	n/a	
Strawberry	Rep Use GAP: EU Central Zone	All PPPs	F	Aphids, weevils (OTIOSU)	EC	480	Broadcast foliar	BBCH 35 - 95	1	n/a	0.048 / 0.064	750/1000	**0.48/ 0.48**	15	No application during flowering (BBCH 60-69)

Crop and/or situation (a)	Member State or Country	Product Name	F G or I (b)	Pests or Group of pests controlled (c)	Formulation		Application				Application rate per treatment			PHI (days) (l)	Remarks (m)
					Type (d-f)	Conc. of a.s. (i)	Method Kind (f-h)	Growth stage & season (j)	Number min max (k)	Interval between apps. (min)	kg a.s./hL min max	water (L/ha) min max	kg a.s./ha min max		
Artichoke	Rep Use GAP: EU South Zone	All PPPs	F	Plume moth (PLALCA), Artichoke aphid (DACTTO)	EC	480	Broadcast foliar	BBCH 11 – 89 (spring/ summer)	1	n/a	0.048 / 0.096	500/1000	**0.48/ 0.48**	5	No application during flowering (BBCH 60-69
Brassicas (Broccoli, Cabbage, Cauliflower)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, Lepidoptera, Root flies	EC	480	Broadcast foliar	BBCH 11 – 40 (spring/ summer)	1	n/a	0.06 / 0.096	500/800	**0.48/ 0.48**	n/a	Drench (field) or one foliar application
Cereals (Spring barley, Spring wheat, Winter barley, Winter wheat)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, Coleoptera	EC	480	Broadcast foliar	BBCH 12 – 59	1	n/a	0.06 / 0.24	200/400	**0.24/ 0.48**	n/a	
Citrus (Citron, Grapefruit, Lemon, Lime, Manadarin, Orange)	Rep Use GAP: EU South Zone	All PPPs	F	Scale insects, Whitefly (ALEUFA)	EC	480	Broadcast foliar	BBCH 11 – 89	1	n/a	**0.075/0.096**	1500/ 2000	1.13 – 1.92	21	No application during flowering (BBCH 60-69)
Grapes, Wine	Rep Use GAP: EU South Zone	All PPPs	F	Grape berry moth	EC	480	Broadcast foliar	BBCH 19 – 89 (spring/ summer)	1	n/a	0.072/ 0.18	200/500	**0.36/ 0.36**	21	No application during flowering (BBCH 60-69)
Oilseed rape	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, Coleoptera, Weevils (CEUTSP), Pollen beetle (MELISP)	EC	480	Broadcast foliar	BBCH 30 – 59 (sping/ summer)	1	n/a	0.048 / 0.16	300/500	**0.24/ 0.48**	n/a	No application during flowering (BBCH 60-69)
Dessert Pome (Apple, Pear, Nashi Pear, Quince)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, Lepidoptea	EC	480	Broadcast foliar	BBCH 10 – 59 (spring/ summer)	1	n/a	**0.048 / 0.064**	750/1000	0.48/ 0.48	n/a	
Fresh solanaceous vegetables (tomato, pepper, eggplant)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, thrips, Lepidoptera (*Heliothis, Agrotis*)	EC	480	Broadcast foliar	BBCH 11 – 59 (spring/ summer)	1	n/a	0.036 / 0.072	500/1000	**0.36/ 0.36**	n/a	

Crop and/or situation (a)	Member State or Country	Product Name	F G or I (b)	Pests or Group of pests controlled (c)	Formulation		Application				Application rate per treatment			PHI (days) (l)	Remarks (m)
					Type (d-f)	Conc. of a.s. (i)	Method Kind (f-h)	Growth stage & season (j)	Number min max (k)	Interval between apps. (min)	kg a.s./hL min max	water (L/ha) min max	kg a.s./ha min max		
Canning/Puree varieties solanaceous vegetables (tomato, pepper, eggplant)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, thrips, Lepidoptera (*Heliothis, Agrotis*)	EC	480	Broadcast foliar	BBCH 11 – 89 (spring/ summer)	1	n/a	0.036 / 0.072	500/1000	**0.36/ 0.36**	5	
Stone fruit (apricot, peach, nectarine)	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, Lepidotera	EC	480	Broadcast foliar	BBCH 10 – 59 (spring/ summer)	1	n/a	**0.032 / 0.048**	1000/ 1500	0.48/ 0.48	n/a	
Strawberry	Rep Use GAP: EU South Zone	All PPPs	F	Aphids, weevils (OTIOSU)	EC	480	Broadcast foliar	BBCH 35 - 95	1	n/a	0.048 / 0.064	750/1000	**0.48/ 0.48**	15	No application during flowering (BBCH 60-69)

DOW (DOW&ADAMA): PYRINEX 250 CS

GAP table – Pyrinex 250 CS																
Crop and/ or situation (a)	**Country/ Zone**	**Product code**	**F/G or I (b)**	**Pests or Group of pests controlled (c)**	**Formulation**		**Application**				**Application rate per treatment**			**PHI (days) (l)**	**Application rate per treatment L or Kg product/ha min-max L/ha min-max**
					Type (d-f)	**Conc. of as (i)**	**method kind (f-h)**	**growth stage & season (j)**	**number min max (k)**	**interval between applications (min)**	**g as/hL min max**	**water L/ha min max**	**g as/ha min max**		
OSR	FR / South	Pyrinex 250 CS	F	Pollen beetle (*Meligethes aeneus)* Stem Weevil (*Ceutorrhynchus spp.)*	CS	chloropyrifos 250 g/l	Foliar spraying	31-59	1	-	46,9-187,5	100-400	187,5	63	0,75 L/ha
OSR	PL/Central	Pyrinex 250 CS	F	Pollen beetle (*Meligethes aeneus)* Stem Weevil (*Ceutorrhynchus spp.)*	CS	chloropyrifos 250 g/l	Foliar spraying	31-59	1	-	46,9-187,5	100-400	187,5	63	0,75 L/ha

DOW (DOW&ADAMA): RIMI 1% GB

PPP (product name/code):	RIMI 101 (code: AI-044)	**Formulation type:**	RB
active substance:	chlorpyrifos	**Conc. of the active substance:**	10 g/ kg

1	2	3	4	5	6	7	8	9	10	11	12	13
					Application			**Application rate**				
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	kg product / ha a) max. rate per appl. b) max. total rate per crop/season	g as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max	**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
1	Southern zone	Maize Sweet corn	F	*Coleoptera larvae* (wireworms)	Incorporation. Soil application in the seedling	At sowing BBCH 00	a) 1 (-) b) 1 (-)	a) 10-20 b) 10-20	a) 100-200 b) 100-200	-	n.a.	The PHI is covered by the time remaining between application and harvest.
2	Southern zone	Potato	F	*Coleoptera larvae* (wireworms)	Incorporation. Soil application in the seedling	At sowing BBCH 00	a) 1 (-) b) 1 (-)	a) 10-20 b) 10-20	a) 100-200 b) 100-200	-	n.a.	The PHI is covered by the time remaining between application and harvest.
3	Southern zone	Bulb vegetables (Onion, garlic, shallot)	F	*Lepidoptera larvae*, *Coleoptera larvae* (wireworms), *Orthoptera, Dermaptera, Ants*	Mechanical spreading directed to the soil; close to plant rows	BBCH<15	a) 1 (-) b) 1 (-)	a) 10-20 b) 10-20	a) 100-200 b) 100-200	-	n.a.	The PHI is covered by the time remaining between application and harvest.
4	Southern zone	Cotton	F	*Lepidoptera larvae*, *Coleoptera larvae* (wireworms), *Orthoptera, Dermaptera, Ants*	Mechanical spreading directed to the soil; close to plant rows	At sowing BBCH 00	a) 1 (-) b) 1 (-)	a) 10-20 b) 10-20	a) 100-200 b) 100-200	-	n.a.	The PHI is covered by the time remaining between application and harvest.
5	Southern zone	Cucurbits non-edible peel (Melon, watermelon)	F	*Lepidoptera larvae*, *Coleoptera larvae* (wireworms), *Orthoptera*, *Dermaptera*, Ants	Mechanical spreading directed to the soil; close to plant rows	Up to PHI	a) 1 (-) b) 1 (-)	a) 10-20 b) 10-20	a) 100-200 b) 100-200	-	1	

SAP (SAPEC): INSECT 5G

		GAP rev. 1, date: 2015-04-17	
PPP (product name/code) **active substance 1** **safener** **synergist**	**Chlorpyrifos-ethyl 5G** ***Chlorpyrifos*** **N.A.** **N.A.**	**Formulation type:** **Conc. of as 1:** **Conc. of safener:** **Conc. of synergist:**	**GR** **50 g/kg** **N.A.** **N.A.**
Applicant: **Zone(s):**	**SAPEC Agro S.A.** **SOUTHERN EU**	**professional use** **non professional use**	☒ ☐
Verified by MS:	**N**		

1	2	3	4	5	6	7	8	10	11	12	13	14
Use-No.	**Member state(s)**	**Crop and/ or situation** **(crop destination / purpose of crop)**	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	**Application**			**Application rate**			**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
					Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	kg, L product / ha a) max. rate per appl. b) max. total rate per crop/season	kg a.s./ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max		
1	France	Maize	F	*Agriotes sp.* *Scutigerella imaculata* *Melolontha sp.* *Tipula* spp. *Diabrotica* spp.	Located	Incorporated at sowing	a) 1 b) 1	a) 10 b) 10	a) 0.500 b) 0.500	n.a	n.a.	10-kg FP/ha

SAP (SAPEC): SAP250CS

GAP rev. 1, date: 2015-06-15

PPP (product name/code)	**SAP250CSI**	**Formulation type:**	**CS**
active substance 1	**chlorpyrifos-ethyl**	**Conc. of as 1:**	**250 g/l**
active substance 2	**-**	**Conc. of as 2:**	**-**
safener -		**Conc. of safener:**	**-**
synergist	**-**	**Conc. of synergist:**	**-**
Applicant:	**SAPEC AGRO SA**	**professional use**	**X**
Zone(s):	**SEU/EU**	**non professional use**	
Verified by MS: j/n			

1	2	3	4	5	6	7	8	10	11	12	13	14
					Application			**Application rate**				
Use-No.	**Member state(s)**	**Crop and/ or situation** (crop destination / purpose of crop)	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	L product / ha a) max. rate per appl. b) max. total rate per crop/season	kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max	**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
1	PT,SP, FR,IT,GR, BG	Oil Seed Rape	F	*Ceutorhynchus* spp. *Meligethes aeneus*	Foliar spray	BBCH 10-59	a)1 b)1	a)0.75 b)0.75	a)0.1875 b)0.1875	200-500	NA	

* For uses where the column „Remarks“ in marked in grey further consideration is necessary. Uses should be crossed out when the notifier no longer supports this use(s).
(a) For crops, the EU and Codex classification (both) should be taken into account ; where relevant, the use situation should be described (e.g. fumigation of a structure)
(b) Outdoor or field use (F), greenhouse application (G) or indoor application (I)
(c) *e.g.* biting and suckling insects, soil born insects, foliar fungi, weeds
(d) *e.g.* wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) GCPF Codes – GIFAP Technical Monograph N° 2, 1989
(f) All abbreviations used must be explained
(g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
(h) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plant – type of equipment used must be indicated
(i) g/kg or g/L. Normally the rate should be given for the active substance (according to ISO) and not for the variant in order to compare the rate for same active substances used in different variants (e.g. fluoroxypyr). **In certain cases, where only one variant synthesised, it is more appropriate to give the rate for the variant (e.g. benthiavalicarb-isopropyl).**
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) Indicate the minimum and maximum number of application possible under practical conditions of use
(l) The values should be given in g or kg whatever gives the more manageable number (e.g. 200 kg/ha instead of 200 000 g/ha or 12.5 g/ha instead of 0.0125 kg/ha
(m) PHI - minimum pre-harvest interval

Further information, Efficacy

Effectiveness (Regulation (EU) N° 284/2013, Annex Part A, point 6.2)

	Chlorpyrifos-ethyl is a broad spectrum insecticide with activity by contact, stomach action and inhalation. It is an organophosphorus compound and acts as a cholinesterase inhibitor. It’s been used for long ago to control a wide range of foliar pests with a large amount of supporting evidence of efficacy control on the representative uses of the GAP.

Adverse effects on field crops (Regulation (EU) N° 284/2013, Annex Part A, point 6.4)

	Chlorpyrifos-ethyl is used as broad spectrum insecticide on a wide range of crops from long ago. A large amount of supporting evidence of the absence of negative effects on field crops is available. The safety of Chlorpyrifos-ethyl is therefore considered as supported for the representative uses of the GAP.

Observations on other undesirable or unintended side-effects (Regulation (EU) N° 284/2013, Annex Part A, point 6.5)

	Chlorpyrifos-ethyl is used as broad spectrum insecticide on a wide range of crops from long ago. Based on the large experience of use of the product no undesirable or unintended side-effects are expected to occur under the proposed directions of use of the GAP.

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

Activity against target organism	No relevant groundwater metabolites above 0.1 µg/L

Methods of Analysis

Analytical methods for the active substance (Regulation (EU) N° 283/2013, Annex Part A, point 4.1 and Regulation (EU) N° 284/2013, Annex Part A, point 5.2)

Technical a.s. (analytical technique)	HPLC-DAD, HPLC-UV
Impurities in technical a.s. (analytical technique)	HPLC-DAD, GC-FID
Plant protection product (analytical technique)	HPLC-UV, GC-FID

Analytical methods for residues (Regulation (EU) N° 283/2013, Annex Part A, point 4.2 & point 7.4.2)

Residue definitions for monitoring purposes

Food of plant origin	Chlorpyrifos
Food of animal origin	Chlorpyrifos
Soil	Chlorpyrifos
Sediment	Chlorpyrifos
Water surface	Chlorpyrifos
drinking/ground	Chlorpyrifos
Air	Chlorpyrifos
Body fluids and tissues	Chlorpyrifos

Monitoring/Enforcement methods

Food/feed of plant origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS: LOQ = 0.01 mg/kg QuEChERS multi-residue method: LC-ESI-MS/MS: LOQ = 0.01 mg/kg
Food/feed of animal origin (analytical technique and LOQ for methods for monitoring purposes)	LC-MS/MS: LOQ = 0.01 mg/kg
Soil (analytical technique and LOQ)	LC-MS/MS: LOQ = 0.01 mg/kg
Water (analytical technique and LOQ)	Surface water: LC-MS/MS: LOQ = 0.01 µg/L Drinking water: LC-MS/MS: LOQ = 0.1 µg/L
Air (analytical technique and LOQ)	GC/FPD: LOQ = 0.3 µg/m^3 TCP: LC-MS/MS: LOQ = 15 µg/m^3
Body fluids and tissues (analytical technique and LOQ)	Tissues: LC-MS/MS: LOQ = 0.01 mg/kg Body fluids (blood): LC-MS/MS : LOQ = 0.05 mg/L

Classification and labelling with regard to physical and chemical data (Regulation (EU) N° 283/2013, Annex Part A, point 10)

Substance	Chlorpyrifos

Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][1]:	Not needed according to physical and chemical data
Peer review proposal [2] for harmonised classification according to Regulation (EC) No 1272/2008:	

[1] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[2] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Impact on Human and Animal Health

Absorption, distribution, metabolism and excretion (toxicokinetics) (Regulation (EU) N° 283/2013, Annex Part A, point 5.1)

Rate and extent of oral absorption/systemic bioavailability	Rapid (84%-93%) rats, based on urinary excretion
Toxicokinetics	Not available
Distribution	Widely distributed.
Potential for bioaccumulation	No evidence for accumulation
Rate and extent of excretion	Nearly completely, excreted within 48 hours, mainly via urine (approx. 80%)
Metabolism in animals	Moderately-extensively. Steps: oxidation and hydrolysis
In vitro metabolism	The *in vitro* metabolic studies indicate that liver microsomes from human, mouse and rat more readily produce a detoxication product (i.e., TCP) than an activation product (i.e., CPO). These observations are similar to the *in vivo* metabolism studies on rodents
Toxicologically relevant compounds (animals and plants)	3,5,6-trichloro-2-pyridinol (TCP) Chlorpyrifos-oxon Des-ethyl chlorpyrifos
Toxicologically relevant compounds (enviroment)	3,5,6-trichloro-2-pyridinol (TCP) 3,6-dichloro-2-pyridinol (3,6-DCP) 2,3,5-trichloro-6-methoxypyridine (TMP)

Acute toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.2)

Rat LD_{50} oral	66-223 mg/kg bw	H301
Rat LD_{50} dermal	1250-2000 mg/kg bw	H312
Rat LC_{50} inhalation	> 1.0 mg/l (whole-body)	
Skin irritation	Non-irritant	
Eye irritation	Non-irritant	
Skin sensitisation	Non-sensitiser (M&K and Buehler tests)	
Phototoxicity	No phototoxicity potential	

Short-term toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.3)

Target organ / critical effect	Nervous system / RBC ChE inhibition	
Relevant oral NOAEL	0.1 mg/kg bw per day; 90-day rat	
Relevant dermal NOAEL	> 5 mg/kg bw per day; 21-days rat	
Relevant inhalation NOAEL	>0.296x10-3mg/l (nose-only)	

Genotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.4)

In vitro studies	No genotoxic potential *in vitro* based on several bacterial reverse mutation,	

	mammalian cytogenetic and mammalian forward mutation studies.	
In vivo studies	Chlorpyrifos is unlikely to be genotoxic *in vivo* based on several micronucleus tests were submitted.	
Photomutagenicity	Not required	
Potential for genotoxicity	Chlorpyrifos does not induce gene mutation nor clastogenic effects. Regarding DNA damage, positive results in Comet assay were observed *in vitro* and *in vivo* (well-documented publications).	

Long-term toxicity and carcinogenicity (Regulation (EU) N°283/2013, Annex Part A, point 5.5)

Long-term effects (target organ/critical effect)	Nervous system/ RBC ChE inhibition	
Relevant long-term NOAEL	0.1 mg/kg bw per day: 2-years rat, dog (RBC ChE inhibition)	
Carcinogenicity (target organ, tumour type)	No carcinogenic potential	
Relevant NOAEL for carcinogenicity	-	

Reproductive toxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.6)

Reproduction toxicity

Reproduction target / critical effect	RBC cholinesterase activity inhibition Decreased pup growth and viability	
Relevant parental NOAEL	0.1 mg/kg bw per day , rats	
Relevant reproductive NOAEL	5 mg/kg bw per day , rats	
Relevant offspring NOAEL	1 mg/kg bw per day , rats	

Developmental toxicity

Developmental target / critical effect	RBC cholinesterase activity inhibition Increased post-implantation loss at maternal toxic doses	
Relevant maternal NOAEL	0.1 mg/kg bw per day, rats	
Relevant developmental NOAEL	3 mg/kg bw per day, rats Not teratogenic	

Neurotoxicity (Regulation (EU) N° 283/2013, Annex Part A, point 5.7)

Acute neurotoxicity	NOAEL= 10 mg/kg bw Clinical signs, decreased motor activity and grip performance, decreased bodyweight (between day 1-4 postdosing). Cholinesterase activity was not evaluated	
Repeated neurotoxicity	NOAEL= 1 mg/kg bw per day (13-weeks, rats) Perineal soiling Cholinesterase was not evaluated	
Additional studies (delayed neurotoxicity)	No evidence of delayed neurotoxicity (Acute, 13-weeks, hens)	

Additional studies (developmental neurotoxicity)	Maternal LOAEL= 0.3 mg/kg bw/day, based on RBC Cholinesterase activity inhibition. Offspring NOAEL= 1 mg/kg bw/day, based on decreased viability, pup weight, delayed developmental landmarks. Neurodevelopmental NOAEL = 1 mg/kg bw/day, based on transient neuropathological effects in brain (PND 12), increased latency auditory startle response (PND 23), both resolved at PND 60-77 (adult age). Literature studies reported neurodevelopmental effects at 1 mg/kg bw/day.	
Additional studies (Cholinesterase activity)	Critical effect: RBC cholinesterase activity inhibition NOAEL acute = 1 mg/kg bw, rat NOAEL short-term = 0.1 mg/kg bw/day, rat	

Other toxicological studies (Regulation (EU) N° 283/2013, Annex Part A, point 5.8)

Supplementary studies on the active substance	Acute oral study in humans: LOAEL = 2 mg/kg bw per day based on RBC ChE inhibition (NOAEL=1.0 mg/kg bw per day) Subacute oral study in humans (males): LOAEL= 0.5 mg/kg bw per day based on clinical symptoms. 6-week-dietary study in dogs: – peripheral tissue AchE inhibition NOAEL = 1 mg/kg bw per day; – brain AchE inhibition NOAEL = 2 mg/kg bw per day; RBC ChE inhibition NOAEL < 0.5 mg/kg bw per day. Comparative Cholinesterase study in juvenile and preweanling adult rats after acute and repeated exposure to chlorpyrifos and chlorpyrifos oxon (CCA study): – NOAEL in acute CCA study for RBC ChE inhibition: 0.5 mg/kg bw per day. – NOAEL in repeated CCA study for RBC ChE inhibition: 0.1 mg/kg bw per day. Nose-only inhalation exposure to CPF vapors (6h) in rats results in no clinical signs of exposure and no inhibition of ChE activity. The inmunopotential of CPF could not be determined

Endocrine disrupting properties	EAT patways *In vitro* mammalian assays: (provisional conclusions until Laboratories proficiency can be confirmed) ER binding assay: no interactive (negative responses) AR binding assay: equivocal results ER transactivation assay: Positive responses Aromatasa was not inhibited. Steroidogenesis assay: production of testosterone decreased and the production of estradiol increased at the high test concentrations. Results from literature review: weak androgen receptor binding activity (Medjakovic S., 2014) *In vivo* mammalian assays: (Provisional conclusions of uterotrophic and male pubertal assays until sensitivity of laboratory´s method can be confirmed). Uterotrophic assay: no indication of estrogenicity at doses from 0.5 to 4 mg/kg bw/day Female pubertal assay: not evidence of endocrine activity (regarding to estrogen pathway and thyroid parameters) at doses from 0.5 to 2 mg/kg bw/d. Hershberger assay: negative for both androgenic and antiandrogenic activity at doses from 1 to 6 mg/kg bw/d. Male pubertal assay: no treatment-related changes in any of the thyroid parameters or androgenic patway at doses from 0.5 to 2 mg/kg bw/day, which caused significant cholinesterase inhibition. Scientific literature data relating to endocrine effects of Chlorpyrifos/Chlorpyrifos methyl (Meeker *et al*,2004, 2006aand 2006b, Jeong et als., 2006, Kang et al , 2014, Juberg, 2013) indicate weak androgen receptor binding activity, hipotiroidism and anti-androgenic effect in male rats and dose dependent decreases in testosterone levels, decrease in T4 and increases in TSH levels associates with urinary TCPY concentration in masculine poblation tested, while not apparent effect were seen in estrogen pathway Chlorpyrifos seems to be no potential to interact with the estrogen pathway, while hipotiroidism and antiandrogenic effects cannot be discarded. Non-EAT pathways, atypical EAT pathways and neuroendocrine pathways: not assessed.

Studies performed on metabolites or impurities	TCP metabolite: The oral LD50 is estimated in 3129 mg/kg in female The short-term relevant NOAEL is 12 mg/kg bw per day (1-y oral dog study).TCP did not show any genotoxic potential. Developmental studies: The maternal NOAEL is 100 and 50 mg/kg bw per day in rabbits and rats, respectively whereas the developmental NOAEL is 25 and 100 mg/kg bw per day, in rabbits and rats, respectively. TCP showed to be teratogenic in rabbits. ADI= 0.06 mg/kg bw/day (based on one-year dietary study in dog (NOAEL=12 mg/kg/bw) and a safety factor of 200. ARfD =0.25 mg/kg bw/day (based on the NOAEL from the rabbit teratogenicity study and applying a safety factor of 100). TMP metabolite: LD50 > 2000 mg/kg bw in female rats. Three *in vitro* genotoxicity studies: negative (±S9). DCP metabolite: LD50: 2000-5000mg/kg bw in female rats. Test Ames (±S9): negative. Desethyl Chlorpyrifos metabolite: LD50 cut-off value: 500 mg/kg bw in female rats. Acute oral LD50 >920 mg/kg bw in female rats Test Ames and *in vitro* micronucleus test: both negative. Chlorpyrifos oxon metabolite: LD50= 100-300 mg/kg bw (male and female, respectively), Acute Tox. 3, H301. QSAR assessment (TCP and desethyl chlorpyrifos): is expected for the metabolites to be less toxic than chlorpyrifos

Medical data (Regulation (EU) N° 283/2013, Annex Part A, point 5.9)

	No neurotoxic effects in manufacturing plant personnel reported. Evidence of polyneuropathy from acute poisonings. Epidemiological studies (taken together toxicity literature studies) suggest that the CPF might be acting on the developing nervous system through unknown mechanisms.

Summary[3] (Regulation (EU) N°1107/2009, Annex II, point 3.1 and 3.6)	Value	Study	Uncertainty factor
Acceptable Daily Intake (ADI)	0.001 mg/kg bw per day	2-years rat and dog.	100
Acute Reference Dose (ARfD)	0.005 mg/kg bw/day	Acute CCA study rat	100
Acceptable Operator Exposure Level (AOEL)	0.001 mg/kg bw per day	Repeated CCA study rat (supported by 90-d rat study)	100

[3] If available include also reference values for metabolites

Acute Acceptable Operator Exposure Level (AAOEL)	No necessary

Dermal absorption (Regulation (EU) N° 284/2013, Annex Part A, point 7.3)

Representative formulation (Pyrinex 250 CS, 250 g/L)	Concentrate: 1 % Spray dilution (0.5 g/L): 1 % Based on *in vitro* human skin
Representative formulation (EF-1551 EC, 480 g/L)	Concentrate: 0.9 % Spray dilution (1.8 g/L): 5 % Spray dilution (0.48 g/L): 7 % Based on triple pack approach
Representative formulation (RIMI 101 RB, 10 g/kg)	Concentrate: 9 % Spray dilution: NA Based on *in vitro* human skin
Representative formulation (Chlorpyrifos-ethyl 5G GR, 50 g/kg)	Concentrate: - Spray dilution (0.351 g/L): 0.2% Based on *in vitro* human skin
Representative formulation (SAP250 CS, 250 g/L)	Concentrate 25% Spray dilution: 25 % Based on Guidance on Dermal Absorption (EFSA Journal 2012;10(4):2665)

Exposure scenarios (Regulation (EU) N° 284/2013, Annex Part A, point 7.2)

Operators (Pyrinex 250 CS)	Use: oil seed rape, tractor mounted equipment, application rate 0.1875 kg as/ha Exposure estimates (model): % of AOEL **No PPE** UK POEM 1819 German model (geomean) 246 German model (75th percentile) 1371 EFSA model 802 **PPE** UK POEM (gloves and coverall): 406 German model (geomean) (gloves M/L, coverall and sturdy footwear): 38 German model (75th percentile) (gloves, coverall and sturdy footwear): 93 AOEM (gloves M/L, coverall and sturdy footwear): 55
Operators (EF-1551)	Uses: Field crops, grapes, orchards, citrus. Tractor mounted equipment. Exposure estimates (model): % of AOEL <u>**Field crops (0.48 kg as/ha)**</u> **No PPE** UK POEM 15474 German model (geomean) 817 German model (75th percentile) 4278 EFSA model 1323 **PPE** UK POEM PPE (gloves and coverall) 2406 German model (geomean) (gloves, coverall and sturdy footwear): 163 PPE, RPE and hood and visor 86

	German model (75th percentile) PPE, RPE and hood and visor 388 EFSA model: (gloves, coverall): 98 **Grapes (0.36 kg as/ha)** **No PPE** German model geo(mean) 613 German model (75th percentile) 3208 PPE (gloves, coverall and sturdy footwear): 705 PPE, RPE and hood and visor 291 EFSA model: 1878 **PPE** German model geo(mean) PPE (gloves, coverall and sturdy footwear): 122 PPE and hood and visor 81 German model (75th percentile): PPE, RPE and hood and visor 291 EFSA model: PPE (gloves, coverall): 782 PPE, RPE, hood and visor and closure cab 57 **Orchards (0.48 kg as/ha)** **No PPE** UK POEM : 15494 German model (geomean): 1134 German model (75th percentile): 3862 EFSA model : 2412 **PPE** UK POEM: PPE (gloves and coverall): 10166 German model (geomean): PPE (gloves, coverall and sturdy footwear): 751 PPE, RPE and hood and visor 208 German model (75th percentile): PPE (gloves, coverall and sturdy footwear): 2230 PPE, RPE and hood and visor 482 EFSA model: PPE (gloves, coverall): 1007 PPE, RPE, hood and visor and closure cab 75 **Citrus (1.92 kg as/ha)** **NO PPE** UK POEM : 23059 German model (geomean): 4537 German model (75th percentile): 15450 EFSA model: PPE (gloves, coverall): 3533 **PPE** UK POEM : PPE (gloves and coverall): 13795 German model (geomean): PPE (gloves, coverall and sturdy footwear): 3004 PPE, RPE and hood and visor 834 German model (75th percentile): PPE (gloves, coverall and sturdy footwear): 8922 PPE, RPE and hood and visor 1931 EFSA model: PPE (gloves, coverall): 3533 PPE, RPE, hood and visor and closure cab 288
Operators (RIMI 101)	Use: Maize, onion, melon, potato, cotton, tractor mounted equipment, application rate 0.2 kg as/ha Exposure estimates (model): % of AOEL PHED (75th percentile) With PPE (working clothes and gloves): 199

	PPE (all operations), RPE (loading): 43 EFSA model With PPE (gloves, coverall): 401 PPE (all operations), RPE (loading): 89
Operators (Chlorpyrifos-ethyl 5G)	Use: Maize, tractor mounted equipment, application rate 0.5 kg as/ha Exposure estimates (model): % of AOEL PHED (75th percentile) With PPE (working clothes and gloves): 455 PPE (all operations), RPE (loading): 65 EFSA model With PPE (gloves, coverall): 918 PPE and RPE (all operations): 94
Operators (SAP250 CS)	Use: oil seed rape, tractor mounted equipment, application rate 0.1875 kg as/ha Exposure estimates (model): % of AOEL **No PPE** UK POEM 16946 German model (geomean) 5955 AOEM model 19640 **PPE** UK POEM (gloves and coverall): 1566 German model (geomean) (gloves, RPE M/L and gloves, hood and visor, coverall and sturdy footwear A): 148 German model (75th percentile) (gloves, RPE M/L and gloves, hood and visor, coverall and sturdy footwear A): 726 AOEM (gloves, hood and visor, coverall and sturdy footwear M/L & A): 223 AOEM Drif reduction (gloves, hood and visor, coverall and sturdy footwear M/L & A): 160
Workers (Pyrinex 250 CS)	EUROPOEM II worker re-entry model for crop inspection With coverall: 40% of the AOEL EFSA model With coverall: 26% of the AOEL
Workers (EF-1551)	EUROPOEM II, % of AOEL: Vegetables: 2520%, cereals: 504%, citrus : 18144%, grapes 3402%, orchards: 4536%, solanaceous: 1890%, strawberry 3024% BfR: % of AOEL: Vegetables: 960%, cereals 144%, Citrus: 6912%, grapes: 2880%, Orchards: 1728%, strawberry 1152% **With gloves**: Vegetables 48%, cereals 7.2%, citrus 345%, grapes 144%, orchards 86%, strawberry 57%. **Refined DFR data:** Scouting: Vegetables 105%, cereals 63%, citrus 61%, grapes 26%, orchards 15%, solanaceous 78% strawberry 126%. Harvesting: Vegetables 50%, citrus 151%, grapes 65%, orchards 38%, strawberry 60%.

Workers (RIMI 101)	No dislodgeable residues as 'RIMI 101' is intended for soil application at an early stage of plant growth in onion. No dislodgeable residues as 'RIMI 101' is intended for soil application at sowing in maize, potato and cotton. Melon (up to PHI): 1799% of AOEL without PPE (coverall) 420% of AOEL with PPE (coverall and gloves) Refined DFR data: 233% of AOEL without PPE (coverall) 58% of AOEL with PPE (coverall and gloves)
Workers (Chlorpyrifos-ethyl 5G)	No dislodgeable residues as 'Chlorpyrifos-ethyl 5G' is intended for soil application at sowing.
Workers (SAP250 CS)	EUROPOEM II worker re-entry model for crop inspection With coverall: 201% of the AOEL EFSA model With coverall: 66% of the AOEL
Bystanders and residents (Pyrinex 250 CS)	Exposure estimates (model): % of AOEL Bystander (EUROPOEM II): adult: 103 Bystander (EUROPOEM II, refined, 15m): 50 Bystander (BfR model): adult: 9 child: 7 Bystander (CRD model): adult: 22 Resident (BfR model): adult: 28 child: 60 Resident (CRD model): child: 59
Bystanders and residents (EF-1551)	Exposure estimates (model): % of AOEL Bystander (PSD 2008): Low crops 43 Pome/stone fruit 343 Citrus fruit 454 Bystander (BfR 2012): Low crops: child: 13, adult: 16 Grapes (10 m): child: 43; adult: 53 Pome/stone fruit (early)(10 m): child: 519, adult: 663 Pome/stone fruit (early)(20 m): child:124, adult: 157 Pome/stone fruit (late) (20 m): child:51, adult: 62 Citrus (10 m): child: 2077, adult: 2651 Citrus (20 m): child: 497, adult: 626 Resident (CRD model): Low crops : 75 Pome/stone fruit (20m): 167 Citrus fruit (20m) : 504 Resident (BfR 2012): Low crops: child: 55, adult: 28 Grapes (10 m): child: 43, adult:53 Pome/stone fruit (10m): child: 203, adult: 75 Pome/stone fruit (20 m): child: 87, adult: 39 Citrus (10 m): child: 658, adult: 220 Citrus (20 m): child: 193, adult: 72
Bystanders and residents (RIMI 101)	Exposure estimates (model): % of AOEL Bystander (BfR 2012): adult and child ≤ 9 Resident (BfR 2012): adult and child ≤ 53

Bystanders and residents (Chlorpyrifos-ethyl 5G)	No bystander and resident exposure is to be expected. It should not be possible for a casual bystander to be exposed to Chlorpyrifos-ethyl 5G since product is a solid granule formulation to be applied directly to soil incorporated at sowing by tractor mounted equipment. Chlorpyrifos-ethyl 5G is considered as essentially non dusty.
Bystanders and residents (SAP250 CS)	Exposure estimates (model): % of AOEL Exposure estimates (model): % of AOEL Bystander (EUROPOEM II): adult: 117 Bystander (BfR model): adult: 23 child: 8 Bystander (CRD model): adult: 41 Resident (BfR model): adult: 29 child: 55 Resident (CRD model): adult: 53

Classification with regard to toxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

Substance :	Chlorpyrifos
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][4] :	Acute Tox. 3, H301 (Toxic if swallowed) Acute Tox. 4, H3012 (Harmful in contact with skin)
Peer review proposal [5] for harmonised classification according to Regulation (EC) No 1272/2008:	Acute Tox. 3, H301 (Toxic if swallowed) Acute Tox. 4, H3012 (Harmful in contact with skin)

[4] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[5] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Residues in or on treated products food and feed

Metabolism in plants (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.1, 6.5.1, 6.6.1 and 6.7.1)

Primary crops (Plant groups covered)	**Crop groups**	**Crop(s)**	**Application(s)**	**DAT** (days)
	Fruit crops	Oranges Apples Tomatoes	Spray: 1x3.97 kg a.s./ha Spray: 9x0.1 kg a.s./hl Spray: 1x0.99 kg a.s./ha (chlorpyrifos-methyl) Spray: 2x0.0075 kg a.s./hL (chlorpyrifos-methyl)	0, 6, 21 14 14 5, 20
	Root crops	Radish Potato	Spray: 1x1.92 kg a.s./ha Granular: 1x0.75 kg a.s./ha	0, 7, 14, 21, 35 91
	Leafy crops	Head cabbage Lettuce	Spray: 1x1.43 kg a.s./ha Spray:2x 0.75 g a.s./hL (chlorpyrifos-methyl)	0, 7, 14, 21, 42 21
	Cereals/grass crops	Maize Wheat and maize grains	Granular + Spray: 223 mg a.s./m row + 0.275 kg a.s./ha 2.2 kg a.s./ha Direct: 32.4 mg a.s/kg grain	49 (forage) 92 (fodder, grain) 14 30, 90, 180
	Pulses/Oilseeds	Peas with pods Soya bean	Spray: 1x1.9 kg a.s./ha Spray: 1x1.11 kg a.s./ha	0, 7, 14, 21, 28 14, 52
	Miscellaneous			
	The metabolic pattern after foliar and granular application in four different crop groups showed to be similar, mainly following a single metabolic pathway, which included the hydroxylation to form 3,5,6-TCP and polar residues, mainly TCP conjugates.			

Rotational crops (metabolic pattern)	**Crop groups**	**Crop(s)**	**PBI** (days)	**Comments**
	Root/tuber crops	Turnip Sugar beet	30 129	The applied rate was 5.6 Kg a.s./ha (10x the maximum intended rate). < 0.02 mg/kg of TCP in rotational crops. Chlorpyrifos or other metabolites not observed.
	Leafy crops	Lettuce Spinach	30, 129 30	
	Cereal (small grain)	Wheat	30, 129	
	Other	Soybean	129	
Rotational crop and primary crop metabolism similar?	Yes			

Processed commodities (standard hydrolysis study)	**Conditions**	Chlorpyrifos	TCP	Desethyl-chlorpyrifos
	20 min, 90°C, pH 4	77.2	3.8	20.6
	60 min, 100°C, pH 5	28.9	7.7	61.1
	20 min, 120°C, pH 6	2.6	15.6	81.2
Residue pattern in processed commodities similar to residue pattern in raw commodities?	No. During the processes of pasteurisation, baking/brewing/boiling and sterilisation major metabolites, TCP and desethyl-chlorpyrifos are formed. Metabolite desethyl-chlorpyrifos, not detected in RAW commodities, is formed during processing.			

Plant residue definition for monitoring (RD-Mo)	Chlorpyrifos
Plant residue definition for risk assessment (RD-RA)	Two separate residue definitions: 1) Chlorpyrifos 2) Sum TCP and its conjugates expressed as TCP
Conversion factor (monitoring to risk assessment)	-

Metabolism in livestock (Regulation (EU) N° 283/2013, Annex Part A, points 6.2.2, 6.2.3, 6.2.4, 6.2.5 6.7.1)

	Animal	**Dose** (mg/kg bw/d)	**Duration** (days)	**N rate/comment**
Animals covered	Laying hen	1.26	10	1/day, 12 animals
	Goat/Cow	0.86	10	2/day, 2 animals
	Pig	Not available		
	Fish	Not required		
	Overall pattern of absorption/elimination was similar in species investigated and laboratory animals. Chlorpyrifos and TCP were rapidly absorbed and excretion occurred mainly via urine. Residues are mainly accumulating in fat.			

Time needed to reach a plateau concentration in milk and eggs (days)	Not available
Animal residue definition for monitoring (RD-Mo)	Chlorpyrifos
Animal residue definition for risk assessment (RD-RA)	Sum of chlorpyrifos + TCP + conjugates expressed as chlorpyrifos No change is proposed since it is not relevant for this submission.
Conversion factor (monitoring to risk assessment)	-
Metabolism in rat and ruminant similar (Yes/No)	Yes
Fat soluble residues (Yes/No)	Yes

Residues in succeeding crops (Regulation (EU) N° 283/2013, Annex Part A, point 6.6.2)

Confined rotational crop study (Quantitative aspect)	Confined rotational crop on carrots, lettuce, wheat at 5.4 kg a.i./ha, 30 and 132 days after treatment. Chlorpyrifos was only found in trace amounts. Other components of the residues were the metabolites 3,5,6-trichloro-2-pyridinol (TCP) and 3,5,6-trichloro-2-methoxypyridine (TMP) in low levels, but the main portion of the residues appeared to be the result of incorporation into natural plant components, such as starch, cellulose, and lignin.
Field rotational crop study	One rotational crops field trial on wheat, soybean and sugar beets at 2.4 kg a.i./ha, 119 days after treatment. Another field trial at 5.6 kg a.i./ha with wheat, lettuce, spinach, turnips as replacement crops, 30 days after treatment and with wheat, soybean, lettuce, sugar beets as rotational crops, 129 days after treatment and with wheat 365 days after treatment. Only traces of TCP found in all cases. No chlorpyrifos or other metabolite observed.

Stability of residues (Regulation (EU) N° 283/2013, Annex Part A, point 6.1)

Plant products (Category)	**Commodity**	**T** (°C)	**Stability** (Month/Year)	
			Chlorpyrifos	TCP
High water content	Peach, banana, cauliflower, onion	≤ -18ºC	12 months	14 months
	alfalfa, fruits, tomato, beet tops	≤ -20ºC	5 years	5 years
	apple, peach, cabbage, tomato	≤ -18ºC	18 months	18 months
High oil content	Oilseed rape	≤ -18ºC	6 months	6 months
	nuts	≤ -20ºC	5 years	5 years
	Oilseed rape	≤ -18ºC	18 months	18 months
High starch content	Maize	≤ -18ºC	3 months (ongoing until 7 months)	3 months (ongoing until 7 months)
	Field beans	≤ -18ºC	12 months	14 months
	potato	≤ -18ºC	18 months	18 months
	sugar beet, maize, sweet potato, sorghum	≤ -20ºC	5 years	5 years
	Wheat grain and wheat straw	≤ -18ºC	24 months	24 months
High acid content	grape, orange peel and orange pulp	≤ -18ºC	18 month	18 month
	orange	≤ -20ºC	5 years	5 years

Animal	**Animal commodity**	**T** (°C)	**Stability** (Month/Year)	
			Chlorpyrifos	TCP
	Muscle	≤ -18ºC	2 years	2 years
	Liver	≤ -18ºC	2 years	2 years
	Kidney	≤ -18ºC	2 years	2 years
	Milk	≤ -18ºC	2 years	2 years
	Egg	≤ -18ºC	2 years	2 years

TASK FORCE DAS&ADAMA

Summary of residues data from the supervised residue trials (Regulation (EU) N° 283/2013, Annex Part A, point 6.3)

Crop	Region/ Indoor (a)	Residue levels (mg/kg) observed in the supervised residue trials relevant to the supported GAPs (b)	Recommendations/comments (OECD calculations)	MRL proposals (mg/kg)	HR (mg/kg) (c)	STMR (mg/kg) (d)
Globe artichokes	S	0.045, 0.068, 0.081, 0.088, 0.097, 0.103, 0.207, 0.197	MRL calculated using the OECD MRL calculator	0.40	0.20	0.09
Head cabbage	S	15x<0.01, 0.015 ; 0.023 ; 0.027 ; 0.043 ; 0.228 ; 0.318	MRL calculated using the OECD MRL calculator	0.4	0.32	0.01
Head cabbage	C/N	14<0.01, 0.04, 0.067, 0.121, 0.111, 0.346 (4<0.01)	MRL calculated using the OECD MRL calculator	0.4	0.35	0.01
Broccoli	S/N	SEU :7x<0.01, 0.015 ; 0.025 ; 0.13 ; 0.15 ; 0.21 NEU : 2x<0.01 ; 0.01, 0.015, 0.06, 0.095	MRL calculated using the OECD MRL calculator	0.4	0.21	0.01
Cauliflower	N/S	NEU: 6<0.01, 4x0.01, 2x0.105, 0.17 SEU: 3x<0.01 ; 0.015	MRL calculated using the OECD MRL calculator	0.3	0.17	0.01
Brussels sprouts	C/N	<0.01, 0.015, 0.02, 0.03, 0.035, 0.04, 0.045, 2x0.055, 0.08, 0.11, 0.215, 2x0.135, 0.14, 0.16	MRL calculated using the OECD MRL calculator	0.40	0.215	0.055
Barley and wheat grain	S	0.01, <0.01, 0.03, 0.046, <0.01, ND, <0.01, ND	MRL calculated using the OECD MRL calculator	0.08	0.046	0.01
Barley and wheat grain	C/N	0.075*, <0.01, <0.01, ND, <0.01, <0.01, <0.01	MRL calculated using the OECD MRL calculator	0.15	0.08	0.01
Citrus	S	Oranges: 0.516, 0.578, 0.310, 0.360, 0.250, 0.192, 0.350, 0.159, 0.436,(0.438, 0.296, 0.212, 0.234 Mandarins: 0.276, 0.484, 0.482, 0.660, 0.649, 0.258, 0.386, 0.174, 0.523	MRL calculated using the OECD MRL calculator	1.5	0.660	0.355
Wine Grapes	S	0.018, 0.032,0.032, 0.091 (0.145, 0.171)*	MRL calculated using the OECD MRL calculator	0.4	0.17	0.06
Wine Grapes	C/N	0.065, 0.096, 0.114, 0.141, 0.153, 0.160, 0.375, (0.058,	MRL calculated using the OECD	0.60	0.38	0.11

Crop	Region/ Indoor (a)	Residue levels (mg/kg) observed in the supervised residue trials relevant to the supported GAPs (b)	Recommendations/comments (OECD calculations)	MRL proposals (mg/kg)	HR (mg/kg) (c)	STMR (mg/kg) (d)
		0.093)*	MRL calculator			
EF-1551						
Oilseed rape seeds	C/N	7<ND	MRL calculated using the OECD MRL calculator	0.01	0.01	0.01
Dessert pome fruit (Apples/Pears)	S	<0.01, ND, 0.013, ND, ND, ND, <0.01, ND, <0.01, <0.01, ND	MRL calculated using the OECD MRL calculator	0.02	0.013	0.003
Dessert pome fruit (Apples/Pears)	C/N	ND, ND, <0.01, ND, ND, ND, ND, ND, <0.01, ND, <0.01, ND, ND	MRL calculated using the OECD MRL calculator	0.02	0.014	0.003
Cider/perry pome fruit (Apples/Pears)	S	0.079, 0.027, 0.066, 0.009, 0.059, 0.202, 0.011, 0.0725, 0.18, 0.041, 0..065,(0.029, 0.047, 0.036, 0.359)	MRL calculated using the OECD MRL calculator	0.5	0.5	0.36
Cider/perry pome fruit (Apples/Pears)	C/N	0.072, 0.078, 0.063, 0.188, 0.020, 0.415, 0.052, 0.070, 0.016, 0.264, 0.0145, 0.425, 0.0715, (0.0815, 0.007, 0.05, 0.0055)*	MRL calculated using the OECD MRL calculator	0.70	0.43	0.07
Fresh tomato	S	<0.01, ND, ND, ND, ND, ND	MRL calculated using the OECD MRL calculator	0.02	0.01	0.003
Fresh tomato	N	ND, 0.015, ND, ND, ND, <0.01	MRL calculated using the OECD MRL calculator	0.03	0.015	0.003
Fresh pepper	S	0.035, 0.074, 0.064, 0.150, 0.099, 0.042, 0.016, 0.050, 0.053, 0.121	MRL calculated using the OECD MRL calculator	0.30	0.150	0.058
Fresh pepper	C/N	0.041, 0.042, 0.047, 0.101, 0.069, 0.027, 0.026	MRL calculated using the OECD MRL calculator	0.20	0.101	0.042
Apricot	S	0.116, <0.01, <0.01, 0.033, ND	MRL calculated using the OECD MRL calculator	0.30	0.116	0.01
Peach	S	0.239, ND, 0.112, ND, 0.07, ND, 0.03, <0.01	MRL calculated using the OECD	0.40	0.239	0.02

Crop	Region/ Indoor (a)	**Residue levels** (mg/kg) **observed in the supervised residue trials relevant to the supported GAPs** (b)	**Recommendations/comments** (OECD calculations)	**MRL** proposals (mg/kg)	**HR** (mg/kg) (c)	**STMR** (mg/kg) (d)
			MRL calculator			
Cherry	C/N	ND, ND, <0.01, 0.01, <0.01, <0.01, <0.01, ND	MRL calculated using the OECD MRL calculator	0.03	0.01	0.01
Plum	C/N	0.039, 0.0745, 0.0115, 0.044, 0.0465, 0.0605, 0.075, 0.0345	MRL calculated using the OECD MRL calculator	0.15	0.080	0.048
Strawberry	S	0.026, 0.024, 0.017, <0.01, <0.01, 0.015, <0.01, <0.01, 0.059, 0.024	MRL calculated using the OECD MRL calculator	0.08	0.059	0.016
Strawberry	C/N	0.037, 0.015, <0.01, 0.07, 0.011, 0.016, <0.01, <0.01	MRL calculated using the OECD MRL calculator	0.15	0.070	0.013
RIMI 101 GB						
Bulb vegetables (onion, garlic, shallot)	S	4x<0.02	MRL calculated using the OECD MRL calculator	0.05 (except onion 0.2)	0.02	0.02
Cucurbits – inedible (melon, watermelon)	S	4x<0.02	MRL calculated using the OECD MRL calculator	0.01*	0.01	0.01
Maize	S	4x<0.02	MRL calculated using the OECD MRL calculator	0.05	0.02	0.02
Potato	S	10x<0.01	MRL calculated using the OECD MRL calculator	0.01*	0.01	0.01
Cotton	S	2x<0.01	MRL calculated using the OECD MRL calculator	0.05*	0.01	0.01
PYRINEX 250 CS						
Oilseed rape	S-EU	4x <0.01	MRL calculated using the OECD MRL calculator	0.01	0.01	0.01

Summary of data on residues in pollen and bee products (Regulation (EU) No 283/2013, Annex Part A, point 6.10.1)						
Product(s)	**Region**	**Residue data** (mg/kg)	**Recommendations/comments**			
Nectar Polen	N/S EU	Study ongoing.				

(a): **NEU** or **SEU** for northern or southern **outdoor** trials in EU member states (**N+SEU** if both zones), **Indoor** for glasshouse/protected crops, **Country** if non-EU location.
(b): Residue levels in trials conducted according to GAP reported in ascending order (*e.g.* 3x <0.01, 0.01, 6x 0.02, 0.04, 0.08, 3x 0.10, 2x 0.15, 0.17). When residue definition for monitoring and risk assessment differs, use **Mo/RA** to differentiate data expressed according to the residue definition for **Mo**nitoring and **R**isk **A**ssessment.
(c): **HR**: Highest residue. When residue definition for monitoring and risk assessment differs, HR according to residue definition for monitoring reported in brackets (HR_{Mo}).
(d): **STMR:** Supervised Trials Median Residue. When residue definition for monitoring and risk assessment differs, STMR according to definition for monitoring reported in brackets ($STMR_{Mo}$).

Inputs for animal burden calculations

Feed commodity	Median dietary burden		Maximum dietary burden	
	(mg/kg)	**Comment**	(mg/kg)	**Comment**
Representative uses - Chlorpyrifos (including TCP, worst case)				
Commodity	**Median dietary burden**[1]		**Maximum dietary burden**[1]	
	Input value	**Comment**	**Input value (mg/kg)**	**Comment**
Risk assessment residue definition: chlorpyrifos + Fress/conjugated-TCP, expressed as chlorpyrifos (worst case)				
Orange wet pomace	0.94	STMR*PF (0.457 x 2.05)	0.94	STMR*PF (0.457 x 2.05)
Apple dry pomace	1.38	STMR*PF (0.078 x 17.63)	1.38	STMR*PF (0.078 x 17.63)
Rape seeds	0.01	STMR	0.02	Highest residue
Rape seed meal	0.02	STMR*PF (0.01 x 2)	0.02	STMR*PF (0.01 x 2)
Wheat, barley, rye, oat	0.031	STMR	0.112	Highest residue
Wheat, rye bran	0.54	STMR*PF (0.031 x 17.34)	0.54	STMR*PF (0.031 x 17.34)
Wheat flour	0.032	STMR*PF (1.02)	0.032	STMR*PF (1.02)
Wheat and barley straw	0.298	STMR	0.653	Highest residue
[1] Values from Table 6.7-1, STMR = Medium residue, PF = Mean processing factor				

Residues from livestock feeding studies (Regulation (EU) N° 283/2013, Annex Part A, points 6.4.1, 6.4.2, 6.4.3 and 6.4.4)

MRL calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Highest expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	CHP: 0.0007	Ram/Ewe	CHP: 0.0001	Breeding	CHP: 0.0005	Broiler	CHP: 0.0012	Carp	No guideline available
	Dairy cattle	CHP: 0.0011	Lamb	CHP: 0.001	Finishing	CHP: 0.0006	Layer	CHP: 0.0011	Trout	No guideline available
							Turkey	CHP:0.0012	Fish intake >0.1 mg/kg DM	
Intake >0.004 mg/kg bw	No		No		No		No		Yes/No	
Feeding study submitted	DAR, IIA 6.2/02 DAR, IIA 6.2/04				DAR, IIA 6.2/03		DAR, IIA 6.2/01		No guideline available	
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level	Beef: N Dairy: N	Level	Lamb: N Ewe: N	Level	N rate Breed/Finish	Level	B or T: N Layer: N	Level	N rate Carp/Trout
	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL** proposals
Muscle	-	0.4	-	0.4	-	0.05	-	0.01*		
Fat	-	0.4	-	0.4	-	0.05	-	0.01*		
Meat[b]	-		-		-		-			
Liver	-	0.01*	-	0.01*	-	0.01*	-	0.01*		
Kidney	-	0.01*	-	0.01*	-	0.01*	-	0.01*		
Milk[a]	-	0.01*	-	0.01*						
Eggs							-	0.01*		
Method of calculation[c]										

(a): Estimated HR calculated at 1N level (**estimated mean level for milk**).
(b): HR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry
(c): The OECD guidance document on residues in livestock (series on pesticides 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.
(d): MRL proposal based in the conclusions by EFSA, 2012 (EFSA Journal 2012; 10(1): 2510.

STMR calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Median expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	CHP: 0.0007 TCP: 0.0006	Ram/Ewe	CHP: 0.0001 TCP: 0.0004	Breeding	CHP: 0.0005 TCP: 0.0004	Broiler	CHP: 0.0012 TCP: 0.0008	Carp	No guideline available
	Dairy cattle	CHP: 0.0011 TCP: 0.0009	Lamb	CHP: 0.001 TCP: 0.0008	Finishing	CHP: 0.0006 TCP: 0.0004	Layer	CHP: 0.0011 TCP: 0.0009	Trout	No guideline available
							Turkey	CHP:0.0012 TCP: 0.0008		
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level	Beef: N Dairy: N	Level	Lamb : N Ewe: N	Level	N rate Breed/Finish	Level	B or T: N Layer: N	Level	N rate Carp/Trout
	Mean level in feeding level[(d)]	Estimated **STMR**[(b)] at 1N[(d)]	Mean level in feeding level[(d)]	Estimated **STMR**[(b)] at 1N[(d)]	Mean level in feeding level[(d)]	Estimated **STMR**[(b)] at 1N[(d)]	Mean level in feeding level[(d)]	Estimated **STMR**[(b)] at 1N[(d)]	Mean level in feeding level	Estimated **STMR**[(b)] at 1N
Muscle	-	-	-	-	-	-	-	-		
Fat	-	-	-	-	-	-	-	-		
Meat[(a)]	-	-	-	-	-	-	-	-		
Liver	-	-	-	-	-	-	-	-		
Kidney	-	-	-	-	-	-	-	-		
Milk	-	-	-	-						
Eggs							-	-		
Method of calculation[(c)]										

(a): STMR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

(b): When the mean level is set at the LOQ, the STMR is set at the LOQ.

(c): The OECD guidance document on residues in livestock (series on pesticide 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

(d): Not required since the trigger value of 0.004 mg/kg bw/day is not exceeded according dietary burden calculations performed.

Processing factors (Regulation (EU) N° 283/2013, Annex Part A, points 6.5.2 and 6.5.3)

Crop/processed crop	Number of studies	Mean Processing factor			Crop's HR*	Processed Fraction's HR*
		CHP	TCP	CHP*	(mg/kg)	(mg/kg)
Orange / juice	4	0.01	Not analysed	N/A	1.17	N/A
Orang / wet pomace	4	2.05	Not analysed	N/A	1.17	N/A
Orange / pulp	4	0.02	Not analysed	N/A	1.17	N/A
Orange / juice	1	0.04	0.05	0.05	1.17	0.06
Orange / pulp	11	0.02	0.05	0.05	1.17	0.06
Orang / oil	1	1.17	0.68	0.68	1.17	0.80
Apple / puree	2	0.01	0.55	0.55	0.81	0.45
Apple / juice	2	None	0.05	0.05	0.81	0.04
Apple / dry pomace	2	11.62	17.63	17.63	0.81	14.28
Grape / raisins	2	0.56	0.81	0.81	0.39	0.32
Grape / heated must	1	0.21	0.35	0.35	0.39	0.14
Grape / not heated must	3	0.34	0.34	0.34	0.39	0.13
Grape / dry pomace by heating	1	8.08	6.32	6.32	0.39	2.46
Grape / dry pomace by maceration	3	11.16	7.11	7.11	0.39	2.77
Grape / wine at bottling by heating	1	None	0.32	0.32	0.39	0.12
Grape / wine at bottling by maceration	3	0.06	0.16	0.16	0.39	0.06
Grape / wine after 6 months by heating	1	None	0.38	0.38	0.39	0.15
Grape / wine after 6 months by maceration	3	None	0.24	0.24	0.39	0.09
Peach / juice	1	None	0.77	0.77	0.49	0.38
Peach / dry pomace	1	2.50	6.46	6.46	0.49	3.17
Plum / puree	1	0.71	0.83	0.82	0.17	0.14
Plum / canned	1	0.86	0.83	0.82	0.17	0.14
Tomato/ canned	1	None	0.15	0.15	0.28	0.04
Tomato/ puree	1	0.54	1.25	1.25	0.28	0.35
Tomato/ juice	1	None	0.18	0.18	0.28	0.05
Cabbage / cooked	1	1.00	1.00	1.00	0.76	0.76
Barley / beer	3	None	0.07	0.07	0.65	0.05
Barley / brewers malt	3	0.38	0.82	0.82	0.65	0.53
Barley / brewers yeast	3	0.04	0.23	0.23	0.65	0.15
Barley / cleaned grain	3	0.70	0.76	0.76	0.65	0.49
Barley / malt sprouts	3	0.31	0.31	0.31	0.65	0.20
Barley / spent grains	3	0.27	0.31	0.31	0.65	0.20
Wheat / bran	3	12.32	17.34	17.34	0.65	11.27
Wheat / wholemeal flour	3	2.73	5.06	5.06	0.65	3.29
Wheat / wholemeal bread	3	1.97	3.70	3.70	0.65	2.41
Wheat / flour	3	0.63	1.02	1.02	0.65	0.66
Wheat / white bread	3	1.77	0.70	0.70	0.65	0.46
Maize / Flour	3	None	1.0	1.0	0.03	0.03
Maize / oil	3	3.90	3.90	3.90	0.03	0.12
Maize / pressed cake	3	1.00	2.00	2.00	0.03	0.06

CHP = Chlorpyrifos, TCP = Total TCP, HR = Highest Residue, *Chlorpyrifos + Free/Conjugated TCP Expressed as Chlorpyrifos

TASK FORCE DAS&ADAMA

Consumer risk assessment (Regulation (EU) N° 283/2013, Annex Part A, point 6.9)
Including all uses (representative uses and uses related to an MRL application).

ADI	0.001 mg/kg bw per day – chlorpyrifos 0.03 mg/kg bw per day - TCP
TMDI according to EFSA PRIMo	-
NTMDI, according to (to be specified)	-
IEDI (% ADI), according to EFSA PRIMo	-
NEDI (% ADI), according to (to be specified)	122.3% DE child
Factors included in the calculations	
ARfD	0.005 mg/kg bw – chlorpyrifos 0.25 mg/kg bw - TCP
IESTI (% ARfD), according to EFSA PRIMo	Highest IESTI: >100 % ARfD apple, pear, head cabbage, peach, broccoli, cauliflower, pepper
NESTI (% ARfD), according to (to be specified)	-
Factors included in IESTI and NESTI	None

Consumer risk assessment limited to the representative uses

TMDI (% ADI), according to EFSA PRIMo	
NTMDI (% ADI), according to (to be specified)	
IEDI (% ADI), according to EFSA PRIMo	
NEDI (% ADI), according to (to be specified)	122.3% DE child
Factors included in the calculations	
IESTI (% ARfD, according to EFSA PRIMo)	Highest IESTI: >100 % ARfD apple, pear, head cabbage, peach, broccoli, cauliflower, pepper
NESTI (% ARfD, according to (to be specified)	
Factors included in IESTI and NESTI	

Proposed MRLs (Regulation (EU) No 283/2013, Annex Part A, points 6.7.2 and 6.7.3)

Code [(a)]	Commodity/Group	Current MRL (mg/kg)	Proposed MRL (mg/kg)	MRL/Import tolerance(b) (mg/kg) and Comments
Plant commodities				
Representative uses				
DOW EF-1551				
	Globe artichokes	**0.01***	**0.40**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Head cabbage	**0.01***	**0.4**	Acute risk can not be ruled out
	Broccoli	**0.05***	**0.4**	Acute risk can not be ruled out
	Cauliflower	**0.05***	**0.3**	Acute risk can not be ruled out
	Brussels sprouts	**0.05***	**0.40**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	wheat grain	**0.05***	**0.15**	Use not supported
	Barley	**0.2**	**-**	Use not supported
	maize	**0.05**	**-**	Use supported
	Citrus: grapefruit, orange, lime, other citrus	**0.3**	**1.5**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Citrus: lemon	**0.2**	**1.5**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Citrus: mandarine	**1.5**	**1.5**	Use supported

Code [(a)]	Commodity/Group	Current MRL (mg/kg)	Proposed MRL (mg/kg)	MRL/Import tolerance(b) (mg/kg) and Comments
	Wine Grapes	**0.5**	**0.60**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Oilseed rape seeds	**0.05***	**0.01**	Use supported
	Dessert pome fruit (Apples/Pears)	**0.01***	**0.02**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Other pome fruit	**0.01**	**0.01**	Use supported
	Cider/perry pome fruit (Apples/Pears)	**0.01***	**0.70**	Acute risk can not be ruled out
	Fresh tomato	**0.01***	**0.03**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	eggplant	**0.4**	**0.03**	Use supported
	Fresh pepper	**0.01***	**0.30**	Acute risk can not be ruled out
	Apricot	**0.05**	**0.30**	this use is not comply with the current MRL and under Article 8 of Regulation (EC) No 396/2005, an application to set/modify the existing MRL for the active substance should be requested or in parallel to this process or as part of this DRAR.
	Peach	**0.01***	**0.40**	Acute risk can not be ruled out
	Cherry	**0.3**	**0.03**	Use supported
	Plum	**0.2**	**0.15**	Use supported
	Strawberry	**0.2**	**0.15**	Use supported
DOW RIMI 101				
	Bulb vegetables (onion, garlic, shallot)	**0.05 (except onion 0.02)**	**0.02***	Use supported

Code [(a)]	**Commodity/Group**	**Current MRL (mg/kg)**	**Proposed MRL (mg/kg)**	**MRL/Import tolerance(b) (mg/kg) and Comments**
	Cucurbits – inedible (melon, watermelon)	**0.01***	**0.02***	Use supported
	Maize	**0.05**	**0.02***	Use supported
	Potato	**0.01***	**0.01***	Use supported
	Cotton	**0.05***	**0.01**	Use supported
DOW PYRINEX 250 CS				
	Oilseed rape seeds	**0.01***	**0.01***	Use supported

(a): Commodity code number, as listed in Annex I of Regulation (EC) No 396/2005
(b): MRLs proposed at the LOQ, should be annotated by an asterisk (*) after the figure.

SAPEC

Summary of residues data from the supervised residue trials (Regulation (EU) N° 283/2013, Annex Part A, point 6.3)

Crop	Region/ Indoor (a)	**Residue levels** (mg/kg) **observed in the supervised residue trials relevant to the supported GAPs** (b)	**Recommendations/comments** (OECD calculations)	**MRL** proposals (mg/kg)	**HR** (mg/kg) (c)	**STMR** (mg/kg) (d)
Representative uses						
SAP250 CS						
Maize	N-EU	**CHP: <0.01 x 4** **TCP: <0.01 x 4**		0.01*	0.01	0.01
Maize	S-EU	**CHP: <0.01 x 4** **TCP: <0.01 x 4**				
Oilseed rape	N-EU	**CHP: <0.01 x 4** **TCP: <0.01 x 4**		0.02	0.013	0.01
Oilseed rape	S-EU	**CHP: <0.01 x 3, 0.013** **TCP: <0.01 x 3, 0.012**				
Summary of data on residues in pollen and bee products (Regulation (EU) No 283/2013, Annex Part A, point 6.10.1)						
Product(s)	**Region**	**Residue data** (mg/kg)	**Recommendations/comments**			
Nectar Polen	N/S EU	**Study ongoing.**				

(a): **NEU** or **SEU** for northern or southern **outdoor** trials in EU member states (**N+SEU** if both zones), **Indoor** for glasshouse/protected crops, **Country** if non-EU location.
(b): Residue levels in trials conducted according to GAP reported in ascending order (*e.g.* 3x <0.01, 0.01, 6x 0.02, 0.04, 0.08, 3x 0.10, 2x 0.15, 0.17). When residue definition for monitoring and risk assessment differs, use **Mo/RA** to differentiate data expressed according to the residue definition for **Mo**nitoring and **R**isk **A**ssessment.
(c): **HR**: Highest residue. When residue definition for monitoring and risk assessment differs, HR according to residue definition for monitoring reported in brackets (HR_{Mo}).
(d): **STMR:** Supervised Trials Median Residue. When residue definition for monitoring and risk assessment differs, STMR according to definition for monitoring reported in brackets ($STMR_{Mo}$).

Inputs for animal burden calculations

Feed commodity	Median dietary burden		Maximum dietary burden	
	(mg/kg)	Comment	(mg/kg)	Comment
Representative uses - Chlorpyrifos				
Corn field forage/silage	0.01	STMRxPF (1)	0.01	HRxPF (1)
Corn field stover	0.01	STMR	0.01	HR
Corn field grain	0.01	STMR	0.01	HR
Corn field aspirated grain fraction	0.01	STMR	0.01	HR
Corn field milled by products	0.018	STMRxPF (1.8)	0.018	HRxPF (1.8)
Corn field hominy meal	0.012	STMRxPF (1.2)	0.012	HRxPF (1.2)
Corn field gluten feed	0.018	STMRxPF (1.8)	0.018	HRxPF (1.8)
Corn field gluten meal	0.018	STMRxPF (1.8)	0.018	HRxPF (1.8)
Rape meal	0.02	STMRxPF (2)	0.026	HRxPF (2)
Representative uses - TCP				
Corn field forage/silage	0.01	STMRxPF (1)	0.01	HRxPF (1)
Corn field stover	0.01	STMR	0.01	HR
Corn field grain	0.01	STMR	0.01	HR
Corn field aspirated grain fraction	0.01	STMR	0.01	HR
Corn field milled by products	0.01	STMR	0.01	HR
Corn field hominy meal	0.01	STMR	0.01	HR
Corn field gluten feed	0.01	STMR	0.01	HR
Corn field gluten meal	0.01	STMR	0.01	HR
Rape meal	0.02	STMRxPF (2)	0.24	HRxPF (2)

Residues from livestock feeding studies (Regulation (EU) N° 283/2013, Annex Part A, points 6.4.1, 6.4.2, 6.4.3 and 6.4.4)

MRL calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Highest expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	CHP: 0.0007	Ram/Ewe	CHP: 0.0001	Breeding	CHP: 0.0005	Broiler	CHP: 0.0012	Carp	No guideline available
	Dairy cattle	CHP: 0.0011	Lamb	CHP: 0.001	Finishing	CHP: 0.0006	Layer	CHP: 0.0011	Trout	No guideline available
							Turkey	CHP:0.0012	Fish intake >0.1 mg/kg DM	
Intake >0.004 mg/kg bw	No		No		No		No		Yes/No	
Feeding study submitted	DAR, IIA 6.2/02 DAR, IIA 6.2/04				DAR, IIA 6.2/03		DAR, IIA 6.2/01		No guideline available	
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level	Beef: N Dairy: N	Level	Lamb: N Ewe: N	Level	N rate Breed/Finish	Level	B or T: N Layer: N	Level	N rate Carp/Trout
	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL[d]** proposals	Estimated HR[a] at 1N	**MRL** proposals
Muscle	-	0.4	-	0.4	-	0.05	-	0.01*		
Fat	-	0.4	-	0.4	-	0.05	-	0.01*		
Meat[b]	-		-		-		-			
Liver	-	0.01*	-	0.01*	-	0.01*	-	0.01*		
Kidney	-	0.01*	-	0.01*	-	0.01*	-	0.01*		
Milk[a]	-	0.01*	-	0.01*						
Eggs							-	0.01*		
Method of calculation[c]										

(a): Estimated HR calculated at 1N level (**estimated mean level for milk**).

(b): HR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

(c): The OECD guidance document on residues in livestock (series on pesticides 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

(d): MRL proposal based in the conclusions by EFSA, 2012 (EFSA Journal 2012; 10(1): 2510.

STMR calculations	**Ruminant**				**Pig/Swine**		**Poultry**		**Fish**	
Median expected intake (mg/kg bw/d) (mg/kg DM for fish)	Beef cattle	CHP: 0.0007 TCP: 0.0006	Ram/Ewe	CHP: 0.0001 TCP: 0.0004	Breeding	CHP: 0.0005 TCP: 0.0004	Broiler	CHP: 0.0012 TCP: 0.0008	Carp	No guideline available
	Dairy cattle	CHP: 0.0011 TCP: 0.0009	Lamb	CHP: 0.001 TCP: 0.0008	Finishing	CHP: 0.0006 TCP: 0.0004	Layer	CHP: 0.0011 TCP: 0.0009	Trout	No guideline available
							Turkey	CHP:0.0012 TCP: 0.0008		
Representative feeding level (mg/kg bw/d, mg/kg DM for fish) and **N rates**	Level	Beef: N Dairy: N	Level	Lamb : N Ewe: N	Level	N rate Breed/Finish	Level	B or T: N Layer: N	Level	N rate Carp/Trout
	Mean level in feeding level[d]	Estimated **STMR**[b] at 1N[d]	Mean level in feeding level[d]	Estimated **STMR**[b] at 1N[d]	Mean level in feeding level[d]	Estimated **STMR**[b] at 1N[d]	Mean level in feeding level[d]	Estimated **STMR**[b] at 1N[d]	Mean level in feeding level	Estimated **STMR**[b] at 1N
Muscle	-	-	-	-	-	-	-	-		
Fat	-	-	-	-	-	-	-	-		
Meat[a]	-	-	-	-	-	-	-	-		
Liver	-	-	-	-	-	-	-	-		
Kidney	-	-	-	-	-	-	-	-		
Milk	-	-	-	-						
Eggs							-	-		
Method of calculation[c]										

[a]: STMR in meat calculated for mammalian on the basis of 20% fat + 80% muscle and 10% fat + 90% muscle for poultry

[b]: When the mean level is set at the LOQ, the STMR is set at the LOQ.

[c]: The OECD guidance document on residues in livestock (series on pesticide 73) recommends three different approaches to derive MRLs for animal products; by applying a transfer factor (Tf), by intrapolation (It) or by linear regression (Ln). Fill in method(s) considered to derive the MRL proposals.

[d]: Not required since the trigger value of 0.004 mg/kg bw/day is not exceeded according dietary burden calculations performed.

Processing factors (Regulation (EU) N° 283/2013, Annex Part A, points 6.5.2 and 6.5.3)

Crop (RAC)/Edible part or Crop (RAC)/Processed product	Number of studies[(a)]	Processing Factor (PF)		Conversion Factor (CF_P) for RA[(b)]
		Individual values	Median PF	
Representative uses – Chlorpyrifos				
Maize, large grits (dry milling)	1	0.2	-	
Maize, medium grits (dry milling)	1	0.8	-	
Maize, small grits (dry milling)	1	1	-	
Maize, coarse meal (dry milling)	1	1.2	-	
Maize, Flour (dry milling)	1	1.8	-	
Maize, Meal (dry milling)	1	1.2	-	
Maize, crude oil (dry milling)	1	1.5	-	
Maize, refined oil (dry milling)	1	1.5	-	
Maize, coarse gluten-starchb (wet milling)	1	1.8	-	
Maize, starchb (wet milling)	1	0.2	-	
Maize, crude oilb (wet milling)	1	3	-	
Maize, Refined oilb (wet milling)	1	1.5	-	

[(a)]: Studies with residues in the RAC at or close to the LOQ should be disregarded (unless concentration)
[(b)]: When the residue definition for risk assessment differs from the residue definition for monitoring

Consumer risk assessment (Regulation (EU) N° 283/2013, Annex Part A, point 6.9)
Including all uses (representative uses and uses related to an MRL application).

ADI	0.001 mg/kg bw per day – chlorpyrifos 0.03 mg/kg bw per day - TCP
TMDI according to EFSA PRIMo	-
NTMDI, according to (to be specified)	-
IEDI (% ADI), according to EFSA PRIMo	Highest IEDI: 96.7 % ADI (WHO Cluster diet B)
NEDI (% ADI), according to (to be specified)	-
Factors included in the calculations	None
ARfD	0.005 mg/kg bw – chlorpyrifos 0.25 mg/kg bw - TCP
IESTI (% ARfD), according to EFSA PRIMo	Highest IESTI: 1.3 % ARfD (Maize) - Chlorpyrifos 0.027% ARfD (Maize) - TCP
NESTI (% ARfD), according to (to be specified)	-
Factors included in IESTI and NESTI	None

Consumer risk assessment limited to the representative uses

TMDI (% ADI), according to EFSA PRIMo	Highest TMDI: Chlorpyrifos: 2.5 % ADI (WHO Cluster diet B) TCP: 0.1 % ADI (WHO Cluster diet B)
NTMDI (% ADI), according to (to be specified)	-

IEDI (% ADI), according to EFSA PRIMo	Highest IEDI: Chlorpyrifos: 2.5 % ADI (WHO Cluster diet B) TCP: 0.1% ADI (WHO Cluster diet B)
NEDI (% ADI), according to (to be specified)	-
Factors included in the calculations	None
IESTI (% ARfD, according to EFSA PRIMo)	Highest IESTI: Chlorpyrifos: 1.3 % ARfD (maize) TCP: 0.027% ARfD (maize)
NESTI (% ARfD, according to (to be specified)	-
Factors included in IESTI and NESTI	None

Proposed MRLs (Regulation (EU) No 283/2013, Annex Part A, points 6.7.2 and 6.7.3)

Code[(a)]	Commodity/Group	MRL/Import tolerance[(b)] (mg/kg) and Comments	
Plant commodities			
Representative uses			
401060	Rape seed	0.02	
500030	Maize	0.01*	

(a): Commodity code number, as listed in Annex I of Regulation (EC) No 396/2005
(b): MRLs proposed at the LOQ, should be annotated by an asterisk (*) after the figure.

Environmental fate and behaviour

Route of degradation (aerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.1)

Mineralisation after 100 days	[2,6-^{14}C-Chlorpyrifos] 8-13.6 % after 84 d, (n= 2) 23.6-54.2 % after 120 d, (n=6)
Non-extractable residues after 100 days	[2,6-^{14}C-Chlorpyrifos] 8.4-9.9% after 84 d, (n= 2) 11-25% after 120 d, (n=6)
Metabolites requiring further consideration - name and/or code, % of applied (range and maximum)	**TCP** – (5.5-60.2) % at (10-63) d (n= 8) Sterile conditions: 71.8 % after 161 d (n= 1) **TMP** – (0.9-8.7) % at (14-84) d (n= 8) 13% at 120 d (from TCP) (n=4) Sterile conditions: ND % after 161 d (n= 1)

Route of degradation (anaerobic) in soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.2)

Mineralisation after 100 days	[2,6-^{14}C-Chlorpyrifos] 2.06-5.52 % after 120 d, (n=4)
Non-extractable residues after 100 days	12.85-21.64% after 120 d, (n= 4)
Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	**TCP** – (73.31-82.08) % at (14-45) d (n= 4) **3,6-DCP** – (25.85-66.78) % at (80-120) d (n= 4)

Route of degradation (photolysis) on soil (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3)

Metabolites that may require further consideration for risk assessment - name and/or code, % of applied (range and maximum)	**TCP –** 47.4 % at 23 h (n= 1)
Mineralisation at study end	5 % after 716.5 h [^{14}C-Chlorpyrifos]-label (n=1)
Non-extractable residues at study end	32 % A.R. after 716.5 h

Rate of degradation in soil (aerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1). Persistence endpoints.

Parent	Dark aerobic conditions							
Soil type	X[6]	pH	t. °C / % MWHC	DT_{50} (d)	DT_{90} (d)	Kinetic parameter	St. (χ^2)	Method of calculation
Silt Loam (Boone soil)		5.2/4.7[+]	50% MWHC 20±2°C	21.43 9.55 (fast phase) 60.70 (slow phase)	141.8	k1= 7.255e-02 k2= 1.142e-02 g= 4.949e-01	4.49	DFOP
Sandy Clay Loam (Raymondville soil)		8.0/7.6[+]	50% MWHC 20±2°C	5.964	19.81	K= 0.11621	10.39	SFO
Sandy Loam (MSL-PF)		6.4/6.2[+]	50% MWHC 20±2°C	9.6	98.31	α= 0.90201 β= 8.30189	2.62	FOMC
Clay Loam (Tehama soil)		6.7/6.4[+]	50% MWHC 20±2°C	36.87 5.3 (fast phase) 49.19 (slow phase)	150.9	k1= 1.307e-01 k2= 1.409e-02 g= 1.616e-01	1.17	DFOP
Sandy clay loam (Marcham soil)		7.7/8.3*	40% MWHC 20°C	22.25	>1000	α= 0.32288 β= 2.94411	2.48	FOMC
Silty clay loam (Charentilly soil)		6.1/8.0*	40% MWHC 20°C	94.1	312.6	K= 7.366e-03	3.59	SFO
Sand (Cuckney soil)		6.0/6.8*	40% MWHC 20°C	110.3	366.6	K= 6.282e-03	3.97	SFO
Sandy silt loam (Tessaloniki soil)		7.9/8.2*	40% MWHC 20°C	56.59	>1000	α= 0.44131 β= 14.85348	2.505	FOMC
Persistence endpoint (worst-case value)				110.3				
pH dependence,					No			

* pH (1:1 v/v)/ pH (saturated paste in water)
[+] pH in 1:1 soil:water ratio/ pH in 1:2 soil:0.01M CaCl2 (aq)

[6] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

Rate of degradation in soil (aerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1). Modelling endpoints.

Chlorpyrifos	Dark aerobic conditions						
Soil type	*X*[7]	pH[a)]	t. °C / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C pF2/10kPa[a)]	St. (χ^2)	Method of calculation
Silt Loam (Boone soil)		5.2/4.7[+]	50% MWHC 20±2ºC	30.14/100.1	30.14	8.74	SFO
Sandy Clay Loam (Raymondville soil)		8.0/7.6[+]	50% MWHC 20±2ºC	5.96/19.81	5.96	10.39	SFO
Sandy Loam (MSL-PF)		6.4/6.2[+]	50% MWHC 20±2ºC	9.6/98.31	29.61 (DT90/3.32)	2.62	FOMC
Clay Loam (Tehama soil)		6.7/6.4[+]	50% MWHC 20±2ºC	41.85/139	41.85	3.86	SFO
Sandy clay loam (Marcham soil)		7.7/8.3[*]	40% MWHC 20ºC	23.73/260.5	90.19 (ln2/Kslow)	3.09	DFOP
Silty clay loam (Charentilly soil)		6.1/8.0[*]	40% MWHC 20ºC	94.1/312.6	65.09	3.59	SFO
Sand (Cuckney soil)		6.0/6.8[*]	40% MWHC 20ºC	110.3/366.6	110.3	3.97	SFO
Sandy silt loam (Tessaloniki soil)		7.9/8.2[*]	40% MWHC 20ºC	60.6/201.3	46.90	5.33	SFO
Geometric mean (if not pH dependent)					40.16		
pH dependence,					No		

* pH (1:1 v/v)/ pH (saturated paste in water)
[+] pH in 1:1 soil:water ratio/ pH in 1:2 soil:0.01M CaCl2 (aq)
[a)] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7

[7] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

Rate of degradation in soil (aerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1). Modelling endpoints.

TCP	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was chlorpyrifos							
Soil type	X^7	pH[a)]	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Sandy clay loam (Marcham)		8.3	20ºC / 40% MWHC	49.31 / 368.6	-	121.46	2.83	Applied as parent DFOP
Silty clay loam (Charentelly)		8.0	20ºC / 40% MWHC	10.45 / 34.7	-	7.23	8.46	Applied as parent SFO
Sand (Cuckney)		6.8	20ºC / 40% MWHC	12.16 / 40.39	-	12.16	7.17	Applied as parent SFO
Sandy silt loam (Thessaloniki)		8.2	20ºC / 40% MWHC	61.02 / 202.7	-	47.27	5.53	Applied as parent SFO
Silt loam (Boone)		5.2	20ºC / 50% MWHC	12.6 / 41.85	1	12.60	13.19	From CLP SFO-SFO
Sandy loam (Raymondville)		8.0	20ºC / 50% MWHC	26.76 / 88.90	0.8797	26.76	12.74	From CLP SFO-SFO
Sandy clay loam (MSL-PF)		6.7	20ºC / 50% MWHC	22.28 / 74.00	0.8900	22.28	7.44	From CLP FOMC-SFO
Clay loam (Tehama)		7.7	20ºC / 50% MWHC	10.28 / 34.16	1	10.28	15.70	From CLP SFO-SFO
Sandy clay loam (Marcham)		8.3	20ºC / 40% MWHC	1000 / 1000	1	1000	-	From CLP Default value*
Silty clay loam (Charentelly)		8.0	20ºC / 40% MWHC	8.66 / 28.76	0.7947	5.99	11.74	From CLP SFO-SFO
Sand (Cuckney)		6.8	20ºC / 40% MWHC	8.55 / 28.39	0.9476	8.55	12.49	From CLP SFO-SFO
Sandy silt loam (Thessaloniki)		8.2	20ºC / 40% MWHC	1000 / 1000	1	1000	-	From CLP Default value*
Geometric mean (if not pH dependent)						33.50		
Arithmetic mean					0.94			
pH dependence,						No		

CLP: Chlorpyrifos

*No decline observed. Default value.

TMP	Dark aerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was TCP							
Soil type	X^7	pH[a)]	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Sandy clay loam (Marcham)		8.3	20ºC / 40% MWHC	1000 / 1000	0.1853	1000 (fixed)	-	From TCP Default value*
Sandy silt loam (Thessaloniki)		8.2	20ºC / 40% MWHC	1000 / 1000	0.0813	1000 (fixed)	-	From TCP Default value*
Sandy clay loam (MSL-PF)		6.4	20ºC / 50% MWHC	17.13 / 56.90	0.119	17.13	39.98	From CLP DFOP-SFO-SFO
Clay loam (Tehama)		6.7	20ºC / 50% MWHC	12.02 / 39.94	0.127	12.02	22.29	From CLP SFO-SFO-SFO
Silty clay loam (Charentelly)		8.0	20ºC / 40% MWHC	1000 / 1000	0.1496	1000 (fixed)	-	From CLP Default value*
Geometric mean (if not pH dependent)						183.11		
Arithmetic mean					0.132			
pH dependence,						No		

DCP	Dark aerobic conditions Metabolite dosed							
Soil type	X^7	pH[a)]	t. °C / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20 °C pF2/10kPa[b)]	St. (χ^2)	Method of calculation
Clay loam (Brierlow)			20ºC / pF2	9.33 / 30.99	-	9.33	4.05	Applied as parent SFO
Sandy loam (Longwoods)			20ºC / pF2	11.35 / 37.70	-	11.35	6.81	Applied as parent SFO
Silt loam (South Witham)			20ºC / pF2	8.47 / 28.14	-	8.47	6.78	Applied as parent SFO
Sandy loam (Hickman)			20ºC / pF2	7.52 / 24.97	-	7.52	12.34	Applied as parent SFO
Geometric mean (if not pH dependent)						9.06		
Arithmetic mean					-			
pH dependence,						No		

Rate of degradation field soil dissipation studies (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.1)

Persistence endpoints

Chlorpyrifos	Field conditions								
Soil type (indicate if bare or cropped soil was used).	Location (country or USA state).	X[8]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90}(d) actual	Kinetic parameters	St. (χ^2)	Method of calculation
Sandy clay Loam (Bare soil)	Tranent, UK		6.7	20	7.86	26.1	k 0.08824	16.81	SFO
Sandy clay Loam (Bare soil)	Valtohori, Greece		8.0	20	9.022 2.24 (fast) 61.67[c)] (slow)	146.8	k1 3.098e-1 k2 1.124e-2 g 4.790e-1	5.829	DFOP
Sandy clay Loam (Bare soil)	Tivenys, Spain		8.2	20	0.323 0.09 (fast) 5.42 [c)] (slow)	12.21	k1 7.732 k2 1.278E-1 g 5.242E-1	3.28	DFOP
Sandy clay Loam (Cropped soil)	Geneseo, Illinois		5.9	15	88.89	295.3	k 0.007798	11.75	SFO
Sandy silt Loam (Cropped soil)	Midland, Michigan		7.7	15	30.04	99.8	k 0.023073	18.8	SFO
Loam (Cropped soil)	Davis, California		7.9	15	29.18	96.93	k 2.375E-2	9.69	SFO
Maximum (worst-case)					88.89				
pH dependence, *Yes or No*						No			

[a)] Measured in water
[b)] Normalised using a Q10 of 2.58 and Walker equation coefficient of 0.7, values are DegT50matrix
[c)] DT50 calculated from k slow phase for DFOP kinetics (DT50 = ln(2) / k2)

TCP	Field conditions The precursor from which the f.f. was derived was chlorpyrifos									
Soil type	Location	X[8]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90} (d) actual	Kinetic parameters	St. (χ^2)	f. f. k_f / k_{dp}	Method of calculation
Sandy silt loam	Valtohori, Greece		8.0	20	44.17	146.7	k 0.01569	21.7	0.1462	SFO

[8] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

TCP	Field conditions The precursor from which the f.f. was derived was chlorpyrifos									
Soil type	Location	*X*[8]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90} (d) actual	Kinetic parameters	St. (χ^2)	f. f. k_f / k_{dp}	Method of calculation
Clay loam	Tivenys, Spain		8.2	20	166.1	551.9	k 4.172E-3	21.6	0.1547	SFO
Loam	Davis, California		7.9	15	15.59	51.8	k 0.044448	15.7	1.0000	SFO
Maximum (worst-case)					166.1					
Arithmetic mean (worst-case)									1	
pH dependence, Yes or No										

[a)] Measured in [medium to be stated, usually calcium chloride solution or water]

Modelling endpoints

Chlorpyrifos	Field conditions									
Soil type	Location	*X*[8]	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90} (d) actual	St. (χ^2)	DT_{50} (d) Norm[b)].	f. f. k_f / k_{dp}	Method of calculation
Clay loam (Bare soil)	Charentilly France		7.1	20	-	-	7.91	25.09	-	SFO
Sandy silt Loam (Bare soil)	Valtohori, Greece		8.80	20	-	-	7.12	15.37	-	SFO
Clay Loam (Bare soil)	Tivenys, Spain		8.82	20	-	-	8.66	5.165	-	SFO
Silt loam (Cropped soil)	Geneseo, Illinois		7.8	15	-	-	11.24	105.5	-	SFO
Sandy Loam (Cropped soil)	Midland, Michigan		8.0	15	-	-	12.8	37.84	-	SFO
Loam (Cropped soil)	Davis, California		8.2	15	-	-	12.43	65.68	-	SFO
Geometric mean (if not pH dependent)								28.38		
Arithmetic mean									-	
pH dependence, Yes or No										

TCP	Field conditions	The precursor from which the f.f. was derived was chlorpyrifos.								
Soil type	Location	X^8	pH[a)]	Depth (cm)	DT_{50} (d) actual	DT_{90} (d) actual	St. (χ^2)	DT_{50} (d) Norm[b)].	f. f. k_f / k_{dp}	Method of calculation
Sandy silt loam	Valtohori, Greece		8.0	20	-	-	12.01	42.9	-	SFO Top down
Clay loam	Tivenys, Spain		8.2	20	-	-	21.6	111.3	1.000	SFO
Loam	Davis, California		7.9	15	-	-	14.3	41.64	1.000	SFO
Geometric mean (if not pH dependent)								58.37		
Arithmetic mean									1.0	
pH dependence, Yes or No										

Combined laboratory and field kinetic endpoints for modelling (when not from different populations)*

Rate of degradation in soil active substance, normalised geometric mean (if not pH dependent)	**Chlorpyrifos** DegT50matrix = **34.6 d** (n= 14)
Rate of degradation in soil transformation products, normalised geometric mean (if not pH dependent)	**TCP** DegT50matrix = **37.4 d** (n= 15)
Kinetic formation fraction (f. f. k_f / k_{dp}) of transformation products, arithmetic mean	TCP from Chlorpyrifos ff = **0.95** (n=10)

* Only relevant after implementation of the published EFSA guidance describing how to amalgamate laboratory and field endpoints.

Soil accumulation (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.2)

Soil accumulation and plateau concentration	**Chlorpyrifos** Chlorpyrifos persistence $DegT_{90}$ (field) = 295.3 d indicates no potential for soil accumulation. **DCP** DCP persistence $DegT_{90}$ (lab) = 37.70 d indicates no potential for soil accumulation. **TCP** Max TCP $DegT_{90}$ (field) = 551.9 days indicates potential for soil accumulation. Plateau concentration of 0.399 mg/kg reached after 10 years (based on calculation) **TMP** Max TCP $DegT_{90}$ (lab) > 1000 days (default) indicates potential for soil accumulation. TMP: Plateau concentration of 0.216 mg/kg reached after 13 years (based on calculation)

Soil accumulation (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.2.2)

Rate of degradation in soil (anaerobic) laboratory studies active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

Chlorpyrifos	Dark anaerobic conditions						
Soil type	*X*[9]	pH[a)]	t. ºC / % MWHC	DT_{50} / DT_{90} (d)	DT_{50} (d) 20 °C[b)]	St. (χ^2)	Method of calculation
Sandy Loam		7.7	20 ± 2°C/-	2.8/37.7	11.36	13.8	FOMC
Loam		7.4	20 ± 2°C/-	5.2/43.5	13.10	4.94	FOMC
Clay		7.8	20 ± 2°C/-	6.9/22.9	22.9	6.7	SFO
Sandy Loam		6.8	20 ± 2°C/-	9.2/76.3	22.99	5.27	FOMC
Geometric mean (if not pH dependent)					16.73		

a) Measured in water
b) Normalised using a Q10 of 2.58
c) Calculated from DT90 of FOMC (DT50 = DT90 / 3.32)

Rate of degradation in soil (anaerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.4 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

TCP	Dark anaerobic conditions Metabolite dosed or the precursor from which the f.f. was derived was Chlorpyrifos.							
Soil type	*X*[10]	pH[a)]	t. ºC / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20°C[b)]	St. (χ^2)	Method of calculation
Sandy Loam		7.7	20 ± 2°C/-	46.2/153	1	46.2	21.2	FOMC/SFO
Loam		7.4	20 ± 2°C/-	21.1/70	1	21.1	16.6	FOMC/SFO
Clay		7.8	20 ± 2°C/-	82.1/273	1	82.1	8.72	SFO/SFO
Sandy Loam		6.8	20 ± 2°C/-	46.7/155	1	46.7	15.7	FOMC/SFO
Geometric mean (if not pH dependent)						43.97		
Arithmetic mean					1			

a) Measured in [medium to be stated, usually calcium chloride solution or water]
b) Normalised using a Q10 of 2.58

Rate of degradation in soil (anaerobic) laboratory studies transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.2.1.4 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.1.1)

TCP	Dark anaerobic conditions. The precursor from which the f.f. was derived was Chlorpyrifos. **Top-down.**							
Soil type	*X*[10]	pH[a)]	t. ºC / % MWHC	DT_{50}/ DT_{90} (d)	f. f. k_f / k_{dp}	DT_{50} (d) 20°C[b)]	St. (χ^2)	Method of calculation
Sandy Loam		7.7	20 ± 2°C/-	52.2/173	-	52.2		SFO
Loam		7.4	20 ± 2°C/-	18.7/62.1	-	18.7		SFO

[9] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

Clay		7.8	20 ± 2°C/-	85.0/282	-	85.0		SFO
Sandy Loam		6.8	20 ± 2°C/-	42.7/142	-	42.7		SFO
Geometric mean (if not pH dependent)						43.38		
Arithmetic mean					.			

[c)] Measured in [medium to be stated, usually calcium chloride solution or water]
[d)] Normalised using a Q10 of 2.58

Rate of degradation on soil (photolysis) laboratory active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3

Chlorpyrifos	Soil photolysis					
Soil type	*X*[10]	pH[a)]	t. °C / % MWHC	DT_{50} (h) Light source: Natural sunlight. Exposure dates: August 22, 1990/ September 21, 1990; Latitude: 37.45°N, Longitude: 122.26°N;	St. (χ^2)	Method of calculation
Silt loam (Light)		7.4	24.0±0.4	30 h (R^2= 0.94)	.	pseudo-first order kinetics
Silt loam (Dark)		7.4	24.1±0.2	28.5 h R^2=0.96	.	pseudo-first order kinetics

[a)] Measured in water

Rate of degradation on soil (photolysis) laboratory transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.1.3

TCP	Soil photolysis					
Soil type	*X*[11]	pH[a)]	t. °C / % MWHC	DT_{50} (h) Light source: Natural sunlight. Exposure dates: April 20, 1994/ May 20, 1994; Latitude: 37.45°N, Longitude: 122.26°N;	St. (χ^2)	Method of calculation
Silt loam (Light)		7.4	25.1 ± 0.1 °C/75% of 0.3 bar	14.1 days (R^2 = 0.820) 13.6% AR at 30 d	.	first-order regression
Silt loam (Dark)		7.4	25.3 ± 0.1 °C/75% of 0.3 bar	101.6 days (R^2 = 0.423) 66.4% AR at 30 d	.	first-order regression

[10] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.
[11] X This column is reserved for any other property that is considered to have a particular impact on the degradation rate. Column and this footnote may be removed if not used.

Soil adsorption active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Chlorpyrifos							
Soil Type	OC %	Soil pH[a)]	K_d (mL/g)	K_{doc} (mL/g)	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Clay loam	3.5	7.4	98.8	3187	53.2	1520	0.862
Sand	1.5	6.6	116	7733	76.7	5113	0.901
Loam	1.0	6.1	55.2	5520	48.7	4870	0.971
Sandy clay loam	1.6	7.3	67.9	4244	45.2	2825	0.901
Sandy loam	4.3	5.5	295	6860	234	5442	0.943
Geometric mean (if not pH dependent)*						3572	0.915
Arithmetic mean (if not pH dependent)						3954	0.916
pH dependence,			No				

[a)] Measured in calcium chloride solution
* Only relevant after implementation of the published EFSA guidance.

Soil adsorption transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.3.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

TCP					
Soil Type	OC %	Soil pH[a)]	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Clay loam (M549)	3.5	7.4	1.78	51	0.893
Sand (M579)	1.5	6.6	1.29	86	0.833
Loam (M584)	1.0	6.1	0.68	68	0.787
Sandy clay loam (M585)	1.6	7.3	1.68	105	0.752
Sandy loam (M601)	4.3	5.5	6.4	14	0.800
Clay loam (M354)	2.5	7.8	1.95	77	0.784
Sandy loam (M355)	0.3	7.1	0.60	194	0.811
Silt loam (M404)	2.1	6.9	1.69	81	0.781
Geometric mean (if not pH dependent)*			1.55	**93**	
Arithmetic mean (if not pH dependent)					0.805
pH dependence,			No		

[a)] Measured in [medium to be stated, usually calcium chloride solution or water]
* Only relevant after implementation of the published EFSA guidance.

TMP					
Soil Type	OC %	Soil pH[a)]	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Clay loam (M549)	3.1	7.4	11.3	323	0.813
Sand (M579)	1.5	6.6	9.28	619	0.885
Loam (M584)	1.0	6.1	5.62	562	0.877
Sandy clay loam (M585)	1.6	7.3	8.69	543	0.725

Sandy loam (M601)	4.3	5.5	27.5	640	0.893
Geometric mean (if not pH dependent)*			10.71	523	
Arithmetic mean (if not pH dependent)					0.839
pH dependence,			No		

DCP					
Soil Type	OC %	Soil pH[a)]	K_F (mL/g)	K_{Foc} (mL/g)	1/n
Sandy Loam (PD-SL-PF)	0.81	6.3	0.692	85	0.802
Clay Loam (E1)	3.5	8	3.453	99	0.773
Sandy Loam (I2)	1.3	8.4	0.233	18	0.781
Silt Loam (J2)	5.3	5.9	0.689	13	0.812
Loam (CA-L)	0.64	7.5	0.119	19	0.747
Geometric mean (if not pH dependent)*			0.539	33	
Arithmetic mean (if not pH dependent)					0.783
pH dependence,			No		

a) Measured in Measured in water

Mobility in soil column leaching active substance (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.1 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	The sorption behaviour of chlorpyrifos was determined in the batch equilibrium studies. Therefore, column leaching studies with the active substance are not required. However, data to address this point were presented in the dossier submitted in April 1995 for the Active Approval. Study showed 0.7% AR in leachate (not characterized). Chlorpyrifos can be classified as an immobile substance.
Aged residue leaching	The sorption behaviour of chlorpyrifos was determined in the batch equilibrium studies. Therefore, aged residue leaching studies with the active substance are not required. However, data to address this point were presented in the dossier submitted in April 1995 for the Active Approval. Study showed 5%AR in leachate, distributed as follows: 1.7% AR CO2, 1.9 %AR non-extractable residues, 9% AR unknown polar metabolite. No chlorpyrifos or TCP were detected in leachate.
Lysimeter/field leaching studies	The sorption behaviour of chlorpyrifos was determined in the batch equilibrium studies. Therefore, lysimeter/field leaching studies with the active substance are not required. However, data to address this point were presented in the dossier submitted in April 1995 for the Active Approval. Studies showed no leaching potential for chlorpyrifos or TCP.

Mobility in soil column leaching transformation products (Regulation (EU) N° 283/2013, Annex Part A, point 7.1.4.1.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.1.2.1)

Column leaching	Not available; not required.
Aged residue leaching	Not available; not required.
Lysimeter/field leaching studies	Not available; not required.

Hydrolytic degradation (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.1.1

Hydrolytic degradation of the active substance and metabolites > 10 %	pH 4.7-5: 63-73 d at 25 °C ph 5 TCP: 13.2 % AR (35 d) Desethyl chlorpyrifos: 17.7% (35 d)
	pH 6.9-7: 35-72 d at 25 °C ph 7 TCP: 14.3 % AR (35 d) Desethyl chlorpyrifos: 16.4 % (35 d)
	pH 8.1-9: 23.1-16 d at 25 °C ph 9 TCP: 47.9 % AR (35 d) Desethyl chlorpyrifos: 12.5 % (35 d)

Aqueous photochemical degradation (Regulation (EU) N° 283/2013, Annex Part A, points 7.2.1.2 / 7.2.1.3)

Photolytic degradation of active substance and metabolites above 10 %	From quantum yield of 0.0063, photolysis half-live valuesas a function of latitude and season were determined: DT50= 14.61 d mid-summer 20ºN DT50= 30 d mid-summer 40ºN DT50= 29208 d mid-winter 60ºN M5: 31.4% AR (17 d) Ph 6; 46.4% AR (17 d) in natural water Met 7: 4.6 % AR (17 d) Ph 6; 5.5 % AR (17 d) in natural water
Quantum yield of direct phototransformation in water at Σ > 290 nm	0.0063

'Ready biodegradability' (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.1)

Readily biodegradable (yes/no)	No

Aerobic mineralisation in surface water (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.2 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.1)

Parent										
System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sed [a]	t. °C [b]	DT_{50} /DT_{90} whole sys. (suspended sediment test)		St. (χ^2)	$DisT_{50}$ /$DisT_{90}$ Water (pelagic test)		St. (χ^2)	Method of calculation
				At study temp	Normalised to *x* °C [c]		At study temp	Normalised to 20 °C [c]		
Fröschweiher pond (Fresh water) 12.1 µg a.s./L	7.89	-	22.0 ± 0.2 °C	-	-	-	46/153	55.2/183.5	5.84	SFO
Fröschweiher pond (Fresh water) 126 µg a.s./L	7.89	-	22.0 ± 0.2 °C	-	-	-	21/69.7	25.19/83.6	7.51	SFO

[a] Measured in or water

[b] Temperature of incubation=temperature that the environmental media was collected or std temperature of 20°C

[c] Normalised using a Q10 of 2.58 to the temperature of the environmental media at the point of sampling. (note temp of x should be stated).

Mineralisation and non extractable residues (for parent dosed experiments)					
System identifier (indicate fresh, estuarine or marine)	pH water phase	pH sed	Mineralisation *x* % after *n* d. (end of the study).	Non-extractable residues. max *x* % after *n* d (suspended sediment test)	Non-extractable residues. max *x* % after *n* d (end of the study) (suspended sediment test)
Fröschweiher pond (Fresh water) 12.1 µg a.s./L	7.89	-	0.8 at 61 d	-	-
Fröschweiher pond (Fresh water) 126 µg a.s./L	7.89	-	0.9 at 61 d	-	-

Water / sediment study (Regulation (EU) N° 283/2013, Annex Part A, point 7.2.2.3 and Regulation (EU) N° 284/2013, Annex Part A, point 9.2.2)

Chlorpyrifos	Distribution: Chlorpyrifos declined in water from a maximum of 95.9% AR at Day 0 to ND at Day 150 (Calwich Abbey Lake) and from 88.0 % AR at Day 0 to 0.54 % AR at Day 150 (Swiss Lake). Chlorpyrifos reached a maximum of 53.85 % AR (Day 14) and 47.40 % AR (Day 14) in the sediment of Calwich Abbey Lake and Swiss Lake, respectively.									
	Chlorpyrifos declined in water from a maximum of 94.9% AR at Day 0 to ND at Day 63 (river system) and from 95.5 % AR at Day 0 to ND at Day 100 (pond system). Chlorpyrifos reached a maximum of 58.6 % AR (Day 7) and 63.4 % AR (Day 7) in the sediment of river and pond system, respectively.									
Water / sediment system	pH water phase	pH sed [a)]	t. °C	DT_{50} /DT_{90} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	DT_{50} /DT_{90} sed	St. (χ^2)	Method of calculation
Calwich Abbey, Silt loam, (UK)	7.71	7.5	20 ± 2	30.88/102.58	13.69	-	-	-	-	SFO
Swiss Lake, Loamy sand, (UK)	7.84	7.0	20 ± 2	58.13/193.10	9.08	-	-	-	-	SFO
Rhein (River system)	7.99	7.47	20.7 ± 0.2	20.63/68.54	10.27	-	-	-	-	SFO
Föschweiher (Pond system)	8.24	7.25	20.7 ± 0.2	21.68/72.0	6.268	-	-	-	-	SFO
Geometric mean at 20°C[b)]				29.93						

[a)] Measured in water

TCP	Distribution Max in water 46.6 % after 30 d. Max. sed 26.7% after 63 d Max in total system 67.2 % after 63 days kinetic formation fraction (k_f/k_{dp}): 1.00 (Default value)									
Water / sediment system	pH water phase	pH sed [c)]	t. °C	DT_{50} /DT_{90} whole sys.	St. (χ^2)	DT_{50} /DT_{90} water	St. (χ^2)	DT_{50} /DT_{90} sed	St. (χ^2)	Method of calculation
Calwich Abbey, Silt loam, (UK)	7.71	7.5	20 ± 2	1000b	-	-	-	-	-	-
Swiss Lake, Loamy sand, (UK)	7.84	7.0	20 ± 2	1000[d]	-	-	-	-	-	-
Rhein (River system)	7.99	7.47	20.7 ± 0.2	1000[d]	-	-	-	-	-	-

Föschweiher (Pond system)	8.24	7.25	20.7 ± 0.2	1000[d]	-	-	-	-	-	-
Geometric mean at 20°C[b)]				1000[d]		-		-		-

[b)] 1:1 water/sediment ratio
[c)] Default value

Mineralisation and non extractable residues (from parent dosed experiments)					
Water / sediment system	pH water phase	pH sed	Mineralisation x % after n d. (end of the study).	Non-extractable residues in sed. max x % after n d	Non-extractable residues in sed. max x % after n d (end of the study)
Calwich Abbey, Silt loam, (UK)	7.71	7.5	9.19 % at 150 d	12.41 % at 150 d	12.41 % at 150 d
Swiss Lake, Loamy sand, (UK)	7.84	7.0	7.38 % at 150 d	6.68% at 150 d	6.68% at 150 d
Rhein (River system)	7.99	7.47	6.8 % at 100 d	8.0% at 100 d	8.0% at 100 d
Föschweiher (Pond system)	8.24	7.25	8.1% at 100 d	7.7% at 100 d	7.7% at 100 d

Fate and behaviour in air (Regulation (EU) N° 283/2013, Annex Part A, point 7.3.1)

Direct photolysis in air	@Latitude: 39.5° N Season: summer DT50 4.3 h (experimental data)
Photochemical oxidative degradation in air	Atmospheric Oxidation Program (Atkinson calculation): DT50 1.4 hours (chlorpyrifos), 60.5 days (TCP), 12.2 days (TMP)
Volatilisation	from plant surfaces (BBA guideline): 79-81 % after 24 hours
	from soil surfaces (BBA guideline): 22-26 % after 24 hours
Metabolites	Please, refer to photochemical oxidative degradation in air

Residues requiring further assessment (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.1)

Environmental occurring residues requiring further assessment by other disciplines (toxicology and ecotoxicology) and or requiring consideration for groundwater exposure	**Soil:** Chlorpyrifos, TCP, TMP, DCP. **Surface water:** Chlorpyrifos, Desethyl chlorpyrifos, TCP, TMP, DCP. **Sediment:** Chlorpyrifos, Desethyl chlorpyrifos, TCP, TMP, DCP. **Ground water:** Chlorpyrifos, TCP, TMP, DCP. **Air:** Chlorpyrifos, TCP, Chlorpyrifos-oxon.

Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2)

	See section 5, Ecotoxicology

Monitoring data, if available (Regulation (EU) N° 283/2013, Annex Part A, point 7.5

Soil (indicate location and type of study)	Several studies suggest no accumulation of soil residues due to continuous use
Surface water (indicate location and type of study)	When chlorpyrifos-methyl has been used under commercial conditions, the “official” monitoring data show that levels of exposure of surface water are low. A review of monitoring data conducted in 2002 showed that the total number of detections (>LOD) from the 494 groundwater samples was 1 (0.2%), of which none were >0.1 µg/L. The maximum concentration seen was 0.03 µg/L. In surface waters chlorpyrifos-methyl was detected in 19 samples from 2555 surface water samples (0.7%) and the 0.1 µg/L level was exceeded only in Belgium, with the maximum concentration reported as 0.15 µg/L. For drinking water (31 samples), no cases of non-compliance with the drinking water standard of 0.1 µg/L were reported in Germany. In the 2008 survey, of over 7 000 samples analysed from

@ If direct photolysis data is provided, information on the latitude etc. should be included.

	over 2 800 sites, 13 (0.18%) positive findings were reported, but with only 3 (0.04%) samples above 0.1 µg/L, all from the UK, with the maximum at 0.4 µg/L. For surface waters there were nearly 9 000 samples from over 800 sites, and chlorpyrifos-methyl was somewhat more frequently detected, particularly in Belgium, but also on a few occasions in France, Italy and the Netherlands and once in the UK. In total, chlorpyrifos-methyl was detected in 33 samples (0.4%). The 0.1 µg/L level was exceeded only in Belgium, with the maximum concentration reported as 0.15 µg/L. No chlorpyrifos-methyl was detected in drinking water samples in Germany, nor in the few sediment samples analysed in Italy. In total, the majority of water samples (over 99%) reported were below the limits of detection, at concentrations predominantly below 0.1 µg/L (over 99.9%). However, it must be noted that, in a small number of cases, the limit of detection was at 0.2 µg/L. Overall, these data show minimal contamination of European waters with chlorpyrifos-methyl, which was detected in 46 (0.3%) of nearly 16 000 samples from over ~3700 sites (groundwater and surface water), with only 4 (0.03%) samples at concentrations above 0.1 µg/L. The results of the surface water monitoring for chlorpyrifos and chlorpyrifos-methyl conducted as part of the exposure trials carried out in a variety of agricultural catchments at sites in Spain (citrus), Italy (vines and citrus), France (orchards and vines) and the UK (mixed arable) were combined and analysed using a number of statistical methods in order to derive the reasonable worst case exposure concentrations (defined as the 90th percentile) at edge of field and at catchment (receiving water) scale. The results show that average 90th percentile exposure concentration for the edge of field water dataset is 0.026 µg/L. The average 90th percentile exposure concentration for the catchment/receiving water dataset is 0.014 µg/L. For most of the trials sites the distance between the treated fields and the water bodies was between ~6m and ~11m.
Ground water (indicate location and type of study)	Refer to surface water
Air (indicate location and type of study)	No data available

PEC soil (Regulation (EU) N° 284/2013, Annex Part A, points 9.1.3 / 9.3.1)

EF-1551

Chlorpyrifos Method of calculation	DT50 (d): 88.9 days Kinetics: SFO

	Field or Lab: Field (worst-case)
Application data	Crop: **Cereals** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 0 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Brassicas** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 25 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Grapes** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 60 Number of applications: 1 Interval (d): - Application rate(s): 360 g a.s./ha Crop: **OSR** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 80 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Pome/Stone fruits** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 60 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Solanaceous** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 50 Number of applications: 1

	Interval (d): - Application rate(s): 360 g a.s./ha Crop: **Strawberry** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 50 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Artichoke** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 25 Number of applications: 1 Interval (d): - Application rate(s): 480 g a.s./ha Crop: **Citrus** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 80 Number of applications: 1 Interval (d): - Application rate(s): 1920 g a.s./ha

Compound	**Crop**	**Max PECsoil (mg/kg)**	**21d-PEC twa**
Chlorpyrifos	Cereals	0.640	0.590
	Brassicas	0.480	0.443
	Grapes	0.192	0.177
	OSR	0.128	0.118
	Pome/Stone fruits	0.256	0.236
	Solanaceous	0.240	0.221
	Strawberry	0.320	0.295
	Artichoke	0.480	0.443
	Citrus	0.512	0.443

TCP Method of calculation	Molecular weight: 198.5 Kinetics: SFO Field or Lab: Worst case value from field dissipation studies DisT50 (d): 166.1 Max. occurrence in soil: 82.08% Molar correction factor: 0.57
Application data	Application rate assumed TCP is formed at a maximum of 82.08 % of the applied dose: Crop: **Cereals** Application rate(s): 224.6 g TCP/ha Crop: **Brassicas** Application rate(s): 224.6 g TCP/ha Crop: **Grapes** Application rate(s): 168.4 g TCP/ha Crop: **OSR** Application rate(s): 224.6 g TCP/ha Crop: **Pome/Stone fruits** Application rate(s): 224.6 g TCP/ha Crop: **Solanaceous** Application rate(s): 168.4 g TCP/ha Crop: **Strawberry** Application rate(s): 224.6 g TCP/ha Crop: **Artichoke** Application rate(s): 224.6 g TCP/ha Crop: **Citrus** Application rate(s): 898.3 g TCP/ha

Compound	**Crop**	**Max PECsoil (mg/kg)**	**21d-PEC twa (mg/kg)**	**Accumulation PECsoil (mg/kg)**	**Year plateau reached**
TCP	**Cereals**	0.299	0.287	0.383	10 yr
	Brassicas	0.225	0.215	0.287	10 yr
	Grapes	0.090	0.086	0.115	10 yr
	OSR	0.060	0.057	0.077	10 yr
	Pome/Stone fruits	0.120	0.115	0.153	10 yr

	Solanaceous	0.112	0.108	0.144	10 yr
	Strawberry	0.150	0.143	0.191	10 yr
	Artichoke	0.225	0.215	0.287	10 yr
	Citrus	0.240	0.215	0.306	10 yr

TMP Method of calculation	Molecular weight: 212.5 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 1000 Max. occurrence in soil: 13% Molar correction factor: 0.61
Application data	Application rate assumed TMP is formed at a maximum of 13 % of the applied dose: Crop: **Cereals** Application rate(s): 38.1 g TMP /ha Crop: **Brassicas** Application rate(s): 35.6 g TMP /ha Crop: **Grapes** Application rate(s): 26.7 g TMP /ha Crop: **OSR** Application rate(s): 35.6 g TMP /ha Crop: **Pome/Stone fruits** Application rate(s): 35.6 g TMP /ha Crop: **Solanaceous** Application rate(s): 26.7 g TMP /ha Crop: **Strawberry** Application rate(s): 35.6 g TMP /ha Crop: **Artichoke** Application rate(s): 35.6 g TMP /ha Crop: **Citrus** Application rate(s): 142.3 g TMP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TMP	**Cereals**	0.051	0.050	0.216	13 yr
	Brassicas	0.038	0.038	0.162	13 yr
	Grapes	0.015	0.015	0.065	13 yr
	OSR	0.010	0.010	0.043	13 yr
	Pome/Stone fruits	0.020	0.020	0.086	13 yr
	Solanaceous	0.019	0.019	0.081	13 yr
	Strawberry	0.025	0.025	0.108	13 yr
	Artichoke	0.038	0.038	0.162	13 yr
	Citrus	0.041	0.038	0.173	13 yr

DCP Method of calculation	Molecular weight: 164 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 11.35 Max. occurrence in soil: 66.78% Molar correction factor: 0.47
Application data	Application rate assumed DCP is formed at a maximum of 66.78 % of the applied dose: Crop: **Cereals** Application rate(s): 150.7 g DCP /ha Crop: **Brassicas** Application rate(s): 150.7 g DCP /ha Crop: **Grapes** Application rate(s): 113 g DCP /ha Crop: **OSR** Application rate(s): 150.7 g DCP /ha Crop: **Pome/Stone fruits** Application rate(s): 150.7 g DCP /ha Crop: **Solanaceous** Application rate(s): 113 g DCP /ha Crop: **Strawberry** Application rate(s): 150.7 g DCP /ha Crop: **Artichoke** Application rate(s): 150.7 g DCP /ha Crop: **Citrus**

	Application rate(s): 602.6 g DCP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)
DCP	**Cereals**	0.201	0.113
	Brassicas	0.151	0.085
	Grapes	0.060	0.034
	OSR	0.040	0.023
	Pome/Stone fruits	0.080	0.045
	Solanaceous	0.075	0.042
	Strawberry	0.100	0.057
	Artichoke	0.151	0.085
	Citrus	0.161	0.085

PYRINEX 250 CS

Chlorpyrifos Method of calculation	DT50 (d): 88.9 days Kinetics: SFO Field or Lab: Field (worst-case)
Application data	Crop: **Oilseed rape** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 80 Number of applications: 1 Interval (d): - Application rate(s): 187.5 g a.s./ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
Chlorpyrifos	**OSR**	0.050	0.046	-	-

TCP Method of calculation	Molecular weight: 198.5 Kinetics: SFO Field or Lab: Worst case value from field dissipation studies DisT50 (d): 166.1 Max. occurrence in soil: 82.08% Molar correction factor: 0.57
Application data	Application rate assumed TCP is formed at a maximum of 82.08 % of the applied dose:

	Crop: **Oilseed rape** Application rate(s): 87.8 g TCP/ha

Compound		Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TCP		**OSR**	0.023	0.022	0.030	10 yr

TMP Method of calculation	Molecular weight: 212.5 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 1000 Max. occurrence in soil: 13% Molar correction factor: 0.61
Application data	Application rate assumed TMP is formed at a maximum of 13 % of the applied dose: Crop: **Oilseed rape** Application rate(s): 15 g TMP /ha

Compound		Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TMP		**OSR**	0.004	0.004	0.017	10 yr

DCP Method of calculation	Molecular weight: 164 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 11.35 Max. occurrence in soil: 66.78% Molar correction factor: 0.47
Application data	Application rate assumed DCP is formed at a maximum of 66.78 % of the applied dose: Crop: **Oilseed rape** Application rate(s): 58.8 g DCP /ha

Compound		Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
DCP		**OSR**	0.016	0.009	-	-

RIMI 101

Chlorpyrifos Method of calculation	DT50 (d): 88.9 days Kinetics: SFO Field or Lab: Field (worst-case)
Application data	Crop: **Bulb vegetables/cotton/ cucurbits (Not incorporated)** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 0 Number of applications: 1 Interval (d): - Application rate(s): 200 g a.s./ha Crop: **Potato/maize (Incorporated)** Depth of soil layer: 20 cm Soil bulk density: 1.5g/cm3 % plant interception: 0 Number of applications: 1 Interval (d): - Application rate(s): 200 g a.s./ha

Compound	**Crop**	**Max PECsoil (mg/kg)**	**21d-PEC twa (mg/kg)**	**Accumulation PECsoil (mg/kg)**	**Year plateau reached**
Chlorpyrifos	**Bulb vegetables/cotton/ cucurbits Not incorporated**	0.267	0.246	-	-
	Potato/maize Incorporated	0.067	0.061	-	-

TCP Method of calculation	Molecular weight: 198.5 Kinetics: SFO Field or Lab: Worst case value from field dissipation studies DisT50 (d): 166.1 Max. occurrence in soil: 82.08% Molar correction factor: 0.57
Application data	Application rate assumed TCP is formed at a maximum of 82.08 % of the applied dose: Crop: **Bulb vegetables/cotton/ cucurbits**

	(Not incorporated) Application rate(s): 93.6 g TCP/ha Crop: **Potato/maize** **(Incorporated)** Application rate(s): 93.6 g TCP/ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TCP	**Bulb vegetables/cotton/ cucurbits Not incorporated**	0.125	0.119	0.160	10 yr
	Potato/maize Incorporated	0.031	0.030	0.066	10 yr

TMP Method of calculation	Molecular weight: 212.5 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 1000 Max. occurrence in soil: 13% Molar correction factor: 0.61
Application data	Application rate assumed TMP is formed at a maximum of 13 % of the applied dose: Crop: **Bulb vegetables/cotton/ cucurbits** **(Not incorporated)** Application rate(s): 15.9 g TMP/ha Crop: **Potato/maize** **(Incorporated)** Application rate(s): 15.9 g TMP/ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TMP	**Bulb vegetables/cotton/ cucurbits Not incorporated**	0.021	0.021	0.090	13 yr
	Potato/maize Incorporated	0.005	0.005	0.022	13 yr

DCP Method of calculation	Molecular weight: 164 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 11.35 Max. occurrence in soil: 66.78% Molar correction factor: 0.47
Application data	Application rate assumed DCP is formed at a maximum of 66.78 % of the applied dose: Crop: **Bulb vegetables/cotton/ cucurbits** **(Not incorporated)** Application rate(s): 62.8 g DCP/ha Crop: **Potato/maize** **(Incorporated)** Application rate(s): 62.8 g DCP/ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
DCP	**Bulb vegetables/cotton/ cucurbits Not incorporated**	0.084	0.047	-	-
	Potato/maize Incorporated	0.021	0.012	-	-

SAP250CS

Chlorpyrifos Method of calculation	DT50 (d): 88.9 days Kinetics: SFO Field or Lab: Field (worst-case)
Application data	Crop: **Oilseed rape** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 40 Number of applications: 1 Interval (d): - Application rate(s): 187.5 g a.s./ha

Compound		Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
Chlorpyrifos		**OSR**	0.150	0.138	-	-

TCP Method of calculation	Molecular weight: 198.5 Kinetics: SFO Field or Lab: Worst case value from field dissipation studies DisT50 (d): 166.1 Max. occurrence in soil: 82.08% Molar correction factor: 0.57
Application data	Application rate assumed TCP is formed at a maximum of 82.08 % of the applied dose: Crop: **Oilseed rape** Application rate(s): 87.8 g TCP/ha

Compound		Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TCP		**OSR**	0.070	0.067	0.090	10 yr

TMP Method of calculation	Molecular weight: 212.5 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 1000 Max. occurrence in soil: 13% Molar correction factor: 0.61
Application data	Application rate assumed TMP is formed at a maximum of 13 % of the applied dose: Crop: **Oilseed rape** Application rate(s): 15 g TMP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TMP	**OSR**	0.012	0.012	0.022	13 yr

DCP Method of calculation	Molecular weight: 164 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 11.35 Max. occurrence in soil: 66.78% Molar correction factor: 0.47
Application data	Application rate assumed DCP is formed at a maximum of 66.78 % of the applied dose:

	Crop: **Oilseed rape** Application rate(s): 58.8 g DCP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
DCP	**OSR**	0.047	0.027	-	-

CHLORPYRIFOS-ETHYL 5G

Chlorpyrifos Method of calculation	DT50 (d): 88.9 days Kinetics: SFO Field or Lab: Field (worst-case)
Application data	Crop: **Maize** Depth of soil layer: 5cm Soil bulk density: 1.5g/cm3 % plant interception: 0 Number of applications: 1 Interval (d): - Application rate(s): 500 g a.s./ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
Chlorpyrifos	**Maize**	0.667	0.615	-	-

TCP Method of calculation	Molecular weight: 198.5 Kinetics: SFO Field or Lab: Worst case value from field dissipation studies DisT50 (d): 166.1 Max. occurrence in soil: 82.08% Molar correction factor: 0.57
Application data	Application rate assumed TCP is formed at a maximum of 82.08 % of the applied dose: Crop: **Maize** Application rate(s): 233.9 g TCP/ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TCP	**Maize**	0.312	0.299	0.399	10 yr

TMP Method of calculation	Molecular weight: 212.5 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 1000 Max. occurrence in soil: 13% Molar correction factor: 0.61
Application data	Application rate assumed TMP is formed at a maximum of 13 % of the applied dose: Crop: **Maize** Application rate(s): 39.7 g TMP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
TMP	**Maize**	0.053	0.052	0.070	13 yr

DCP Method of calculation	Molecular weight: 164 Kinetics: SFO Field or Lab: Worst case value from lab studies DT50 (d): 11.35 Max. occurrence in soil: 66.78% Molar correction factor: 0.47
Application data	Application rate assumed DCP is formed at a maximum of 66.78 % of the applied dose: Crop: **Maize** Application rate(s): 156.9 g DCP /ha

Compound	Crop	Max PECsoil (mg/kg)	21d-PEC twa (mg/kg)	Accumulation PECsoil (mg/kg)	Year plateau reached
DCP	**Maize**	0.209	0.118	-	-

PEC ground water (Regulation (EU) N° 284/2013, Annex Part A, point 9.2.4.1)

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 FOCUSgw scenarios, according to FOCUS guidance. Model(s) used: FOCUS PEARL v 4.4.4; FOCUS PELMO v 5.5.3; FOCUS MACRO v 5.5.4 Crop uptake factor: 0 **Chlorpyrifos:** Water solubility (mg/L): 1.05 at pH 7 and 20°C Vapour pressure: 1.43 e-03 Pa at 20°C Geometric mean parent $DT_{50lab-field}$ 34.6 d K_{OC}: parent, geometric mean 3572 mL/g, arithmetic mean $^1/_n$= 0.916. Metabolites: **TCP:** DT50lab-field= 37.4 d; ff from CHP= 0.95; Koc/Kom= 93/54 mL/g; 1/n= 0.805 Water solubility (mg/L): 3007 at pH 7 and 20°C Vapour pressure: 1.79 e-03 Pa at 20°C **TMP:** DT50lab= 183.11 d; ff from TCP= 0.132; Koc/Kom= 523/303 mL/g; 1/n= 0.839 Water solubility (mg/L): 7.78 at pH 7 and 20°C Vapour pressure: 0.90 Pa at 20°C **DCP:** DT50lab= 9.1 d; applied as parent; Koc/Kom= 33/19 mL/g; 1/n= 0.783 Water solubility (mg/L): 3007 at pH 7 and 20°C Vapour pressure: 1.79 e-03 Pa at 20°C Maximum occurrence in soil : 66.78 %
Application rate	<u>**GF-1551**</u> **Citrus** Gross application rate: 1920 g/ha. Crop growth stage: All stages Canopy interception %: 80 Application rate net of interception: 384 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Apples** Gross application rate: 480 g/ha. Crop growth stage: BBCH 10-89

Canopy interception %: 60-65 Application rate net of interception: 192-168 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Grapes** Gross application rate: 480 g/ha. Crop growth stage: BBCH 19-89 Canopy interception %: 50-75 Application rate net of interception: 240-120 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Cabbage** Gross application rate: 480 g/ha. Crop growth stage: BBCH 11-40 Canopy interception %: 25-765 Application rate net of interception: 360-192 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Winter cereals** Gross application rate: 480 g/ha. Crop growth stage: BBCH 12-59 Canopy interception %: 0 Application rate net of interception: 480 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **PYRINEX 250 CS** **OSR winter** Gross application rate: 187.5 g/ha. Crop growth stage: BBCH 31-59 Canopy interception %: 80 Application rate net of interception: 37.5 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **OSR summer** Gross application rate: 187.5 g/ha. Crop growth stage: BBCH 31-59 Canopy interception %: 80

	Application rate net of interception: 37.5 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **<u>RIMI 101</u>** **Maize** Gross application rate: 200 g/ha. Crop growth stage: Pre-emergence Canopy interception %: 0 Depth: 5 cm Application rate net of interception: 200 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Potato** Gross application rate: 200 g/ha. Crop growth stage: Pre-emergence Canopy interception %: 0 Depth: 10 cm Application rate net of interception: 200 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Onion, Garlic, Chalote** Gross application rate: 200 g/ha. Crop growth stage: Pre-emergence Canopy interception %: 0 Application rate net of interception: 200 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Melon, watermelon** Gross application rate: 200 g/ha. Crop growth stage: Pre-emergence Canopy interception %: 0 Application rate net of interception: 200 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **Cotton** Gross application rate: 200 g/ha. Crop growth stage: Pre-emergence

	Canopy interception %: 0 Application rate net of interception: 200 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **SAP250CS** **OSR winter** Gross application rate: 187.5 g/ha. Crop growth stage: BBCH 10-59 Canopy interception %: 40 Application rate net of interception: 112.5 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **OSR summer** Gross application rate: 187.5 g/ha. Crop growth stage: BBCH 10-59 Canopy interception %: 40 Application rate net of interception: 112.5 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application **CHLORPYRIFOS-ETHYL 5G** **Maize** Gross application rate: 500 g/ha. Crop growth stage: at sowing Canopy interception %: 0 Application rate net of interception: 500 g/ha. No. of applications: 1 Time of application: absolute application dates according to BBCH; For DCP: 80 days after application
	* Only relevant after implementation of the published EFSA guidance.

EF-1551

PEC(gw) - FOCUS modelling results (80th percentile annual average concentration at 1m)

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	*TMP*	*DCP*
Model PEARL/Citrus	**Spring Application**				
	Piacenza	<0.001	0.002	0.004	<0.001
	Porto	<0.001	<0.001	0.001	<0.001
	Sevilla	<0.001	<0.001	0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Summer Application				
	Piacenza	<0.001	0.015	0.014	0.055
	Porto	<0.001	0.003	0.003	0.003
	Sevilla	<0.001	<0.001	0.001	<0.001
	Thiva	<0.001	<0.001	0.001	<0.001

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	*TMP*	*DCP*
Model PELMO/Citrus	**Spring Application**				
	Piacenza	<0.001	0.005	<0.001	<0.001
	Porto	<0.001	0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Summer Application				
	Piacenza	<0.001	0.020	<0.001	0.065
	Porto	<0.001	0.006	<0.001	0.010
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	0.001	<0.001	0.001

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)	
			TCP	*TMP*
Model MACRO/Citrus	**Spring Application**			
	Châteaudun	<0.001	<0.001	<0.001
	Summer Application			
	Châteaudun	<0.001	<0.001	<0.001

Model PEARL/Apples	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	*TMP*	*DCP*
	Early Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	0.002	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Mid Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.002	0.003	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.001	<0.001
	Piacenza	<0.001	<0.001	0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Late Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	0.002	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	*TMP*	*DCP*
Model PELMO/Apples	**Early Season Application**				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	0.001	<0.001	<0.001
	Piacenza	<0.001	0.002	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Mid Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	0.001	<0.001	<0.001
	Piacenza	<0.001	0.002	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Late Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	0.001	<0.001	<0.001
	Piacenza	<0.001	0.002	<0.001	<0.001
	Porto	<0.001	0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model MACRO/ Apples	Scenario	**Parent (µg/L)**	***Metabolite* (µg/L)**
			TCP	***TMP***
	Early Season Application			
	Châteaudun	<0.001	<0.001	<0.001
	Mid Season Application			
	Châteaudun	<0.001	<0.001	<0.001
	Late Season Application			
	Châteaudun	<0.001	<0.001	<0.001

Model PEARL/Vines	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Mid Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Late Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Vines

Scenario	**Parent (µg/L)**	***Metabolite* (µg/L)**		
		TCP	***TMP***	***DCP***
Early Season Application				
Châteaudun	<0.001	<0.001	<0.001	<0.001
Hamburg	<0.001	0.001	<0.001	<0.001
Kremsmünster	<0.001	0.001	<0.001	<0.001
Piacenza	<0.001	0.001	<0.001	<0.001
Porto	<0.001	<0.001	<0.001	<0.001
Sevilla	<0.001	<0.001	<0.001	<0.001
Thiva	<0.001	<0.001	<0.001	<0.001
Mid Season Application				
Châteaudun	<0.001	<0.001	<0.001	<0.001
Hamburg	<0.001	<0.001	<0.001	<0.001
Kremsmünster	<0.001	<0.001	<0.001	<0.001
Piacenza	<0.001	<0.001	<0.001	<0.001
Porto	<0.001	<0.001	<0.001	<0.001
Sevilla	<0.001	<0.001	<0.001	<0.001
Thiva	<0.001	<0.001	<0.001	<0.001
Late Season Application				
Châteaudun	<0.001	<0.001	<0.001	<0.001
Hamburg	<0.001	<0.001	<0.001	<0.001
Kremsmünster	<0.001	<0.001	<0.001	<0.001
Piacenza	<0.001	<0.001	<0.001	<0.001
Porto	<0.001	<0.001	<0.001	<0.001
Sevilla	<0.001	<0.001	<0.001	<0.001
Thiva	<0.001	<0.001	<0.001	<0.001

Model MACRO/ Vines

Scenario	**Parent (µg/L)**	***Metabolite* (µg/L)**	
		TCP	***TMP***
Early Season Application			
Châteaudun	<0.001	<0.001	<0.001
Mid Season Application			
Châteaudun	<0.001	<0.001	<0.001
Late Season Application			
Châteaudun	<0.001	<0.001	<0.001

Model PEARL/Cabbage	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Châteaudun	<0.001	<0.001	0.001	<0.001
	Hamburg	<0.001	0.024	0.022	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	0.004	0.003	<0.001
	Porto	<0.001	0.003	0.005	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Late Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.003	0.005	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	0.001	0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Cabbage	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.018	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	0.006	<0.001	<0.001
	Porto	<0.001	0.016	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001
	Late Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.002	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	0.001	<0.001	<0.001
	Porto	<0.001	0.002	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model MACRO/ Cabbage	Scenario	**Parent (µg/L)**	***Metabolite* (µg/L)**	
			TCP	***TMP***
	Early Season Application			
	Châteaudun	<0.001	<0.001	<0.001
	Late Season Application			
	Châteaudun	<0.001	<0.001	<0.001

Model PEARL/Winter cereals	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.008	0.010	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	0.001	0.001	<0.001
	Okehampton	<0.001	0.006	0.010	<0.001
	Piacenza	<0.001	0.001	0.002	<0.001
	Porto	<0.001	<0.001	0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	0.004	<0.001

Model PELMO/Winter cereals	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.008	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	0.003	<0.001	<0.001
	Okehampton	<0.001	0.008	<0.001	<0.001
	Piacenza	<0.001	0.002	<0.001	<0.001
	Porto	<0.001	0.002	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model MACRO/ Winter cereals	Scenario	**Parent (µg/L)**	***Metabolite* (µg/L)**	
			TCP	***TMP***
	Early Season Application			
	Châteaudun	<0.001	<0.001	<0.001

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Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
Model PEARL/ OSR spring	**BBCH 31**				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	BBCH 59				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
Model PELMO/ OSR spring	**BBCH 31**				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	BBCH 59				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model PEARL/ OSR winter	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	BBCH 31				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	BBCH 59				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model PELMO/ OSR winter	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	BBCH 31				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	BBCH 59				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
Model MACRO/OSR	**Early Season Application**				
	Châteaudun	<0.001	<0.001	<0.001	<0.001

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Model	Scenario	Parent (µg/L)	*Metabolite (µg/L)*		
			TCP	***TMP***	***DCP***
Model PEARL/Maize	**Pre-emergence application**				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.001	<0.001
	Piacenza	<0.001	<0.001	0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model	Scenario	Parent (µg/L)	*Metabolite (µg/L)*		
			TCP	***TMP***	***DCP***
Model PELMO/Maize	**Pre-emergence application**				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	0.001	<0.001	<0.001
	Piacenza	<0.001	0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PEARL/Potatoes	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	0.002	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	0.001	<0.001
	Piacenza	<0.001	<0.001	0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Potatoes	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PEARL/Onion	**Scenario**	**Parent (µg/L)**	***Metabolite (µg/L)***		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Onion	**Scenario**	**Parent (µg/L)**	***Metabolite (µg/L)***		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PEARL/Tomatoes	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Tomatoes	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Pre-emergence application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PEARL/Cotton	**Scenario**	**Parent (µg/L)**	***Metabolite* (µg/L)**		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

Model PELMO/Cotton	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	Early Season Application				
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

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Model PEARL/ OSR summer	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	Emergence Application				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model PELMO/ OSR summer	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	Emergence Application				
	Jokioinen	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model PEARL/ OSR winter	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	Emergence Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

Model PELMO/ OSR winter	Scenario	Parent (µg/L)	*Metabolite* (µg/L)		
			TCP	***TMP***	***DCP***
	Emergence Application				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	<0.001	<0.001	<0.001
	Kremsmünster	<0.001	<0.001	<0.001	<0.001
	Okehampton	<0.001	<0.001	<0.001	<0.001
	Piacenza	<0.001	<0.001	<0.001	<0.001
	Porto	<0.001	<0.001	<0.001	<0.001

CHLORPYRIFOS-ETHYL 5G

Model PEARL/Maize	Scenario	Parent (µg/L)	***Metabolite (µg/L)***		
			TCP	***TMP***	***DCP***
	Pre-emergence application (soil incorporation 5 cm)				
	Châteaudun	<0.001	<0.001	0.001	<0.001
	Hamburg	<0.001	0.015	0.015	<0.001
	Kremsmünster	<0.001	0.003	0.002	<0.001
	Okehampton	<0.001	0.011	0.015	<0.001
	Piacenza	<0.001	0.007	0.009	<0.001
	Porto	<0.001	<0.001	0.001	<0.001
	Sevilla	<0.001	<0.001	0.001	<0.001
	Thiva	<0.001	<0.001	0.002	<0.001

Model PELMO/Maize	Scenario	Parent (µg/L)	***Metabolite (µg/L)***		
			TCP	***TMP***	***DCP***
	Pre-emergence application (soil incorporation 5 cm)				
	Châteaudun	<0.001	<0.001	<0.001	<0.001
	Hamburg	<0.001	0.005	<0.001	<0.001
	Kremsmünster	<0.001	0.002	<0.001	<0.001
	Okehampton	<0.001	0.008	<0.001	<0.001
	Piacenza	<0.001	0.010	<0.001	<0.001
	Porto	<0.001	0.001	<0.001	<0.001
	Sevilla	<0.001	<0.001	<0.001	<0.001
	Thiva	<0.001	<0.001	<0.001	<0.001

PEC surface water and PEC sediment (Regulation (EU) N° 284/2013, Annex Part A, points 9.2.5 / 9.3.1)

Chlorpyrifos Parameters used in FOCUSsw step 3 (if performed)	**Version control no.'s of FOCUS software:** Spin (Substances Plug In) v.2.2 SWASH, version 5.1 incorporating: MACRO, version 5.5.4, PRZM, version 4.3.1, TOXSWA, version 4.4.3, SWAN, version 4.0.1 (<u>not</u> using the VFSmod) **Substance parameters:** Molar mass (g/mol): 350.5 Water solubility (mg/L): 1.05 Vapour pressure: 1.43 e-03 Pa at 20°C Kom/Koc (mL/g): 2072/3572 (geometric mean, n = 5) 1/n: 0.916 (Freundlich exponent general or for soil, susp. solids or sediment respectively) DT50 soil (days): 34.6 (geomean, n = 14) DT50 water (days): 1000 DT50 sediment (days): 29.93 (geomean, n = 4) Q10=2.58, Walker equation coefficient 0.7 DT50crop= 10-3 d
Application rate	**<u>EF-1551</u>** **Citrus** Crop growth stage: BBCH 11-89 Number of applications: 1 Application rate: 1920 g/ha. Application window: spring/summer Spring: D6 and R4 (91-121) Summer: D6 and R4 (196-226) **Pome/stone fruit** Crop growth stage: BBCH 10-87 Number of applications: 1 Application rate: 480 g/ha. Application window: Spring/Summer Early-season: D3 (105-135), D4 (110-140), D5 (91-121), R1 (105-135), R2 (74-104), R3 (91-121), R4 (74-104) Mid season: D3, D4, D5, R1, R2, R3, R4 (135-165) Late-season: D3 (252-282), D4 (252-282), D5 (232-262), R1 (252-282), R2 (222-252), R3 (237-267), R4 (237-267) **Grapes** Crop growth stage: BBCH 19-89 Number of applications: 1 Application rate: 480 g/ha. Application window: Spring/Summer Early-season: D6 (32-62), R1 (105-135), R2 (74-104),

	R3 (91-121), R4 (69-99) Mid-season: D6, R1, R2, R3, R4 (135-165) Late-season: D6 (277-307), R1 (266-296), R2 (236-266), R3 (268-298), R4 (226-256) **Leafy vegetables** Crop growth stage: BBCH 11-40 Number of applications: 1 Application rate: 480 g/ha. Application window: Spring/Summer Early-season (1st crop): D3 (115-145), D4 (130-160), D6 (127-257), R1 (110-140), R2 (59-89), R3 (60-90), R4 (60-90) Early-season (2nd crop): D3 (217-247), R1 (212-242), R2 (212-242), R3 (166-196), R4 (166-196) Late-season (1st crop): D3 (166-196), D4 (234-264), D6 (299-329), R1 (161-191), R2 (147-177), R3 (117-147), R4 (117-147) Late-season (2nd crop): D3 (258-288), R1 (253-283), R2 (284-314), R3 (223-253), R4 (223-253) **Winter cereals** Crop growth stage: BBCH 12-59 Number of applications: 1 Application rate: 480 g/ha. Application window: D1 (108-138), D2 (89-119), D3 (97-127), D4 (103-133), D5 (66-96), D6 (51-81), R1 (82-112), R3 (52-82), R4 (66-96) **<u>PYRINEX 250 CS</u>** **Spring oilseed rape** Crop growth stage: BBCH 31-59 Number of applications: 1 Application rate: 187.5 g/ha. Application window: D1 (147-177), D3 (108-138), D4 (129-159), D5 (82-112), R1 (97-127) **Winter oilseed rape** Crop growth stage: BBCH 31-59 Number of applications: 1 Application rate: 187.5 g/ha. Application window: D2 (76-106), D3 (59-89), D4 (67-97), D5 (84-114), R1 (84-114), R3 (51-81) **<u>RIMI 101</u>**

	Maize Crop growth stage: at sowing (BBCH 00) Number of applications: 1 Application rate: 200 g/ha. Application window: 15 days before emergence **Potatoes** Crop growth stage: at sowing (BBCH 00) Number of applications: 1 Application rate: 200 g/ha. Application window: 15 days before emergence **Bulb vegetables** Crop growth stage: BBCH <15 Number of applications: 1 Application rate: 200 g/ha. Application window: 1 day before emergence **Cotton** Crop growth stage: at sowing (BBCH 00) Number of applications: 1 Application rate: 200 g/ha. Application window: 1 day before emergence **Cucurbits** Crop growth stage: up to PHI Number of applications: 1 Application rate: 200 g/ha. Application window: 1 day before emergence **SAP250CS** **Spring oilseed rape** Crop growth stage: BBCH 10-59 Number of applications: 1 Application rate: 187.5 g/ha. Application window: D1 (139-169), D3 (100-130), D4 (121-151), D5 (74-104), R1 (100-130) **Winter oilseed rape**

	Crop growth stage: BBCH 10-59 Number of applications: 1 Application rate: 187.5 g/ha. Application window: D2 (258-288), D3 (245-275), D4 (246-276), D5 (263-293), R1 (247-277), R3 (278-308) **CHLORPYRIFOS-ETHYL 5G** **Maize** Crop growth stage: at sowing (BBCH 00) Number of applications: 1 Application rate: 500 g/ha. Application window: D3 (90-120), D4 (95-125), D5 (95-125), D6 (75-105), R1 (88-118), R2 (86-116), R3 (86-116), R4 (65-95)

EF-1551

Citrus Spring appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	70.64	drift	0.3279	drift	98.86	drainage	0.5152	drainage
R4	Stream	53.92	drift	1.080	Runoff	8.913	Runoff	1.523	Runoff

Citrus Summer appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	70.66	drift	0.3280	drift	101.4	drainage	0.5256	drainage
R4	Stream	53.99	drift	0.6325	Runoff	8.286	drift	0.4375	Runoff

Pome/stone fruit Early appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	37.14	drift	0.2045	drift	24.97	drainage	0.1449	drainage
D4	Pond	2.256	drift	0.02250	drift	11.47	drainage	0.1322	drainage
D4	Stream	35.12	drift	0.2114	drift	1.317	drift	0.007958	drift
D5	Pond	2.256	drift	0.02251	drift	11.38	drainage	0.1312	drainage
D5	Stream	36.84	drift	0.2218	drift	1.130	drift	0.006849	drift
R1	Pond	2.256	drift	0.02250	drift	10.57	Runoff	0.1224	Runoff
R1	Stream	30.03	drift	0.1808	drift	3.819	drift	0.05632	Runoff
R2	Stream	39.79	drift	0.2396	drift	2.459	drift	0.09570	Runoff
R3	Stream	42.50	drift	0.2559	drift	9.744	Runoff	0.1974	Runoff
R4	Stream	30.04	drift	0.1809	drift	3.843	drift	0.2191	Runoff

Pome/stone fruit Mid-season appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	17.54	drift	0.08156	drift	13.15	drainage	0.06466	drainage
D4	Pond	0.7863	drift	0.01130	drift	3.565	drainage	0.05835	drainage
D4	Stream	16.89	drift	0.09056	drift	1.379	drift	0.007445	drift
D5	Pond	0.7867	drift	0.01131	drift	3.492	drainage	0.05726	drainage
D5	Stream	19.02	drift	0.1020	drift	5.028	drainage	0.02753	drainage
R1	Pond	0.7861	drift	0.01131	drift	3.306	Runoff	0.05602	Runoff
R1	Stream	13.47	drift	0.07226	drift	1.935	Runoff	0.04925	Runoff
R2	Stream	18.05	drift	0.09682	drift	1.421	drift	0.05801	Runoff
R3	Stream	18.89	drift	0.1013	drift	3.905	drift	0.02134	drift
R4	Stream	13.19	drift	0.07074	drift	1.202	drift	0.06161	Runoff

Pome/stone fruit Late appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	17.58	drift	0.08177	drift	17.09	drainage	0.08524	drainage
D4	Pond	0.7864	drift	0.01130	drift	3.829	drainage	0.06270	drainage
D4	Stream	16.99	drift	0.09113	drift	1.525	drift	0.008239	drift
D5	Pond	0.7867	drift	0.01131	drift	3.350	drainage	0.05485	drainage
D5	Stream	19.03	drift	0.1021	drift	5.109	drainage	0.02797	drainage
R1	Pond	0.7862	drift	0.01132	drift	3.719	Runoff	0.06148	drainage
R1	Stream	13.49	drift	0.07237	drift	2.112	drift	0.01485	Runoff
R2	Stream	18.09	drift	0.09702	drift	1.462	drift	0.01307	Runoff
R3	Stream	19.02	drift	0.1137	Runoff	4.889	Runoff	0.09609	Runoff
R4	Stream	13.49	drift	0.07236	drift	2.087	drift	0.09960	Runoff

Vines Early appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	2.671	drift	0.009366	drift	0.8770	drainage	0.003162	drainage
R1	Pond	0.09206	drift	0.001527	Runoff	0.4826	Runoff	0.01493	Runoff
R1	Stream	1.968	drift	0.09180	Runoff	0.3470	Runoff	0.06329	Runoff
R2	Stream	2.610	drift	0.06645	Runoff	1.172	Runoff	0.08858	Runoff
R3	Stream	2.785	drift	0.2215	Runoff	1.054	Runoff	0.1665	Runoff
R4	Stream	1.968	drift	0.1779	Runoff	0.8706	Runoff	0.1900	Runoff

Vines Mid-season appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	8.205	drift	0.03131	drift	14.57	drainage	0.06210	drainage
R1	Pond	0.2917	drift	0.004664	drift	1.283	Runoff	0.02714	Runoff
R1	Stream	6.003	drift	0.08380	Runoff	0.8790	drift	0.05976	Runoff
R2	Stream	8.038	drift	0.03696	drift	0.9772	Runoff	0.06465	Runoff
R3	Stream	8.394	drift	0.03860	drift	1.571	drift	0.007380	drift
R4	Stream	5.902	drift	0.03308	Runoff	0.5777	drift	0.02876	Runoff

Vines Late appl. FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	8.205	drift	0.06305	drainage	14.97	drainage	0.06387	drainage
R1	Pond	0.2918	drift	0.004679	drift	1.474	Runoff	0.03021	Runoff
R1	Stream	6.018	drift	0.04799	Runoff	0.9447	drift	0.02471	Runoff
R2	Stream	8.067	drift	0.03710	drift	0.6544	drift	0.01862	Runoff
R3	Stream	8.483	drift	0.07536	Runoff	3.872	Runoff	0.2772	Runoff
R4	Stream	6.017	drift	0.08049	Runoff	0.9403	drift	0.06229	Runoff

Leafy vegetables Early appl. 1st crop FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	3.030	drift	0.01144	drift	2.030	drainage	0.008020	drainage
D4	Pond	0.1044	drift	0.003623	drainage	0.5314	drainage	0.02503	drainage
D4	Stream	2.375	drift	0.02463	drainage	0.1055	drift	0.01506	drainage
D6	Ditch	2.965	drift	0.1274	drainage	0.5805	drainage	0.02944	drainage
R1	Pond	0.1060	Runoff	0.01865	Runoff	0.8876	Runoff	0.1312	drainage
R1	Stream	1.997	drift	0.1752	Runoff	2.154	Runoff	0.2121	Runoff
R2	Stream	2.619	drift	0.06417	Runoff	4.033	Runoff	0.2677	Runoff
R3	Stream	2.806	drift	0.2929	Runoff	1.434	Runoff	0.2006	Runoff
R4	Stream	1.994	drift	0.2908	Runoff	1.621	Runoff	0.3409	Runoff

Leafy vegetables Early appl. 2nd crop FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	3.034	drift	0.01145	drift	2.153	drainage	0.008525	drainage
R1	Pond	0.1140	Runoff	0.02306	Runoff	1.346	Runoff	0.2636	Runoff
R1	Stream	2.004	drift	0.08937	Runoff	1.140	Runoff	0.1161	Runoff
R2	Stream	2.686	drift	0.01697	Runoff	3.250	Runoff	0.1906	Runoff
R3	Stream	2.816	drift	0.1898	Runoff	1.116	Runoff	0.1485	Runoff
R4	Stream	1.985	drift	0.3689	Runoff	1.706	Runoff	0.2989	Runoff

Leafy vegetables Late appl. 1st crop FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	3.032	drift	0.01144	drift	2.072	drainage	0.008191	drainage
D4	Pond	0.1043	drift	0.002177	drift	0.4989	drainage	0.01205	drainage
D4	Stream	2.159	drift	0.01072	drift	0.05338	drift	0.003418	drainage

Leafy vegetables Late appl. 1st crop FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Ditch	3.018	drift	0.6226	drainage	1.526	drainage	0.1068	drainage
R1	Pond	0.1670	Runoff	0.02330	Runoff	1.182	Runoff	0.1469	Runoff
R1	Stream	2.004	drift	0.1168	Runoff	7.564	Runoff	0.4606	Runoff
R2	Stream	2.686	drift	0.03424	Runoff	3.608	Runoff	0.1981	Runoff
R3	Stream	2.821	drift	0.1448	Runoff	1.366	Runoff	0.1152	Runoff
R4	Stream	1.959	drift	0.1687	Runoff	3.261	Runoff	0.3743	Runoff

Leafy vegetables Late appl. 2nd crop FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	3.016	drift	0.01138	drift	1.403	drainage	0.005474	drainage
R1	Pond	0.1105	drift	0.08181	Runoff	1.196	Runoff	0.9388	Runoff
R1	Stream	2.004	drift	0.1939	Runoff	2.304	Runoff	2.282	Runoff
R2	Stream	2.655	drift	0.02904	Runoff	16.06	Runoff	0.8445	Runoff
R3	Stream	2.813	drift	0.1283	Runoff	3.321	Runoff	0.2052	Runoff
R4	Stream	2.003	drift	0.1714	Runoff	1.363	Runoff	0.1810	Runoff

Winter cereals FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D1	Ditch	3.059	drift	0.01154	drift	8.238	drainage	0.03526	drainage
D1	Stream	2.610	drift	0.01296	drift	0.4923	drift	0.002525	drift
D2	Pond	3.051	drift	0.01152	drift	5.558	drainage	0.02388	drainage
D2	Stream	2.524	drift	0.01253	drift	0.2364	drift	0.001667	drift
D3	Ditch	3.025	drift	0.01142	drift	1.795	drainage	0.007061	drainage
D4	Pond	0.1044	drift	0.002178	drift	0.5903	drainage	0.01383	drainage
D4	Stream	2.312	drift	0.01148	drift	0.08366	drift	0.004769	drainage

Winter cereals FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D5	Pond	0.1044	drift	0.002207	drift	0.5893	drainage	0.01435	drainage
D5	Stream	2.392	drift	0.01188	drift	0.06505	drift	0.000385	drift
D6	C	2.993	drift	0.01129	drift	0.9336	drainage	0.003760	drainage
R1	Pond	0.1044	drift	0.009602	Runoff	0.7242	Runoff	0.08555	Runoff
R1	Stream	2.002	drift	0.1808	Runoff	1.004	Runoff	0.1260	Runoff
R3	Stream	2.823	drift	0.1357	Runoff	0.7498	Runoff	0.05084	Runoff
R4	Stream	1.995	drift	0.1087	Runoff	0.8489	Runoff	0.1737	Runoff

PYRINEX 250 CS

OSR spring FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D1	Ditch	1.197	drift	0.004293	drift	3.105	drainage	0.01266	drainage
D1	Stream	1.046	drift	0.005190	drift	0.6145	drainage	0.003153	drainage
D3	Ditch	1.183	drift	0.004244	drift	0.8078	drainage	0.003029	drainage
D4	Pond	0.04077	drift	0.000891	drift	0.2022	drainage	0.004934	drainage
D4	Stream	0.9688	drift	0.004805	drift	0.06868	drift	0.001157	drainage
D5	Pond	0.04076	drift	0.000896	drift	0.2324	drainage	0.005844	drainage
D5	Stream	0.9386	drift	0.004655	drift	0.02635	drift	0.000145	drift
R1	Pond	0.04101	drift	0.004526	Runoff	0.3207	Runoff	0.03788	Runoff
R1	Stream	0.7787	drift	0.05792	Runoff	0.7276	Runoff	0.07154	Runoff

OSR summer FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D2	Pond	1.192	drift	0.004276	drift	2.342	drainage	0.009243	drainage

OSR summer FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D2	Stream	0.9913	drift	0.004916	drift	0.1012	drift	0.000541	drift
D3	Ditch	1.180	drift	0.004232	drift	0.6371	drainage	0.002369	drainage
D4	Pond	0.04075	drift	0.000890	drift	0.2549	drainage	0.006235	drainage
D4	Stream	0.8821	drift	0.004375	drift	0.02751	drift	0.001444	drainage
D5	Pond	0.04076	drift	0.000897	drift	0.2382	drainage	0.005962	drainage
D5	Stream	0.9434	drift	0.004679	drift	0.02730	drift	0.000151	drift
R1	Pond	0.04078	drift	0.002110	Runoff	0.2548	Runoff	0.01930	Runoff
R1	Stream	0.7774	drift	0.02238	Runoff	0.7774	Runoff	0.03280	Runoff
R3	Stream	1.102	drift	0.03451	Runoff	0.2920	Runoff	0.01321	Runoff

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Maize FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	< 1e-6	drainage	-	-	< 1e-6	drainage	-	-
D4	Pond	0.000037	drainage	-	-	0.000275	drainage	-	-
D4	Stream	0.000370	drainage	-	-	0.000155	drainage	-	-
D5	Pond	0.000011	drainage	-	-	0.000070	drainage	-	-
D5	Stream	0.000174	drainage	-	-	0.000020	drainage	-	-
D6	Stream	0.000136	drainage	-	-	0.000028	drainage	-	-
R1	Pond	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R1	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R2	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R3	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R4	Stream	< 1e-6	Runoff	-		< 1e-6	Runoff	-	-

Potato FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	< 1e-6	drainage	-	-	< 1e-6	drainage	-	-
D4	Pond	0.000106	drainage	-	-	0.000781	drainage	-	-
D4	Stream	0.000830	drainage	-	-	0.000455	drainage	-	-
D6	Stream	0.000163	drainage	-	-	0.000038	drainage	-	-
D6	Stream	0.001821	drainage			0.000350	0.000350		
R1	Pond	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R1	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R2	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R3	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-

Onion FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	< 1e-6	drainage	-	-	< 1e-6	drainage	-	-
D4	Pond	0.001538	drainage	-	-	0.01045	drainage	-	-
D4	Stream	0.01051	drainage	-	-	0.006457	drainage	-	-
D6 1st	Stream	0.003210	drainage	-	-	0.000923	drainage	-	-
D6 2nd	Stream	0.1750	drainage	-	-	0.04958	drainage	-	-
R1	Pond	0.06892	Runoff	0.01386	Runoff	0.5116	Runoff	0.09875	Runoff
R1	Stream	0.7361	Runoff	0.1742	Runoff	3.054	Runoff	0.2626	Runoff
R2	Stream	0.2818	Runoff	0.06501	Runoff	6.555	Runoff	0.3932	Runoff
R3	Stream	0.7702	Runoff	0.1841	Runoff	1.326	Runoff	0.1602	Runoff
R4	Stream	1.691	Runoff	0.4011	Runoff	4.178	Runoff	0.5274	Runoff

Melon FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Stream	0.002043	drainage	-	drainage	0.000499	drainage	-	drainage
R2	Stream	0.3159	Runoff	0.07521	Runoff	15.36	Runoff	0.8438	Runoff
R3	Stream	1.054	Runoff	0.2492	Runoff	1.089	Runoff	0.1498	Runoff
R4	Stream	1.546	Runoff	0.3680	Runoff	3.741	Runoff	0.5182	Runoff

Cotton FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D6	Stream	0.002031	drainage	-	drainage	0.000531	drainage	-	drainage

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OSR winter FOCUS STEP 3+4 Scenario 0days after emergence	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D2	Pond	1.198	drift	0.004303	drift	3.164	drainage	0.01300	drainage
D2	Stream	1.066	drift	0.005287	drift	2.820	drainage	0.01568	drainage
D3	Ditch	1.188	drift	0.004260	drift	1.151	drainage	0.004385	drainage
D4	Pond	0.04078	drift	0.001600	drainage	0.2197	drainage	0.01326	drainage
D4	Stream	1.023	drift	0.01625	drainage	0.2165	drift	0.006174	drainage
D5	Pond	0.04079	drift	0.000892	drift	0.2051	drainage	0.005091	drainage
D5	Stream	1.103	drift	0.006604	drainage	0.3003	drainage	0.001519	drainage
R1	Pond	0.04155	drift	0.006860	Runoff	0.4079	Runoff	0.06570	Runoff
R1	Stream	0.7818	drift	0.05234	Runoff	0.3713	Runoff	0.05621	Runoff

OSR winter FOCUS STEP 3+4 Scenario 0days after emergence	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
R3	Stream	1.093	drift	0.09946	Runoff	3.158	Runoff	0.2467	Runoff

OSR spring FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D1	Ditch	1.197	drift	0.004293	drift	3.106	drainage	0.01266	drainage
D1	Stream	1.046	drift	0.005190	drift	0.6145	drainage	0.003152	drainage
D3	Ditch	1.182	drift	0.004241	drift	0.7621	drainage	0.002851	drainage
D4	Pond	0.04077	drift	0.000891	drift	0.2022	drainage	0.004935	drainage
D4	Stream	0.9688	drift	0.004805	drift	0.06868	drift	0.001514	drainage
D5	Pond	0.04076	drift	0.000896	drift	0.2324	drainage	0.005845	drainage
D5	Stream	0.9386	drift	0.004655	drift	0.02635	drift	0.000145	drift
R1	Pond	0.04101	drift	0.004526	Runoff	0.3208	Runoff	0.03788	Runoff
R1	Stream	0.7787	drift	0.05792	Runoff	0.7277	Runoff	0.07154	Runoff

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Maize FOCUS STEP 3+4 Scenario	Water body	Overall maximum PECSW (µg/L)				Overall maximum PECSED (µg/kg)			
		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction		STEP 3		STEP 4 20 m buffer zone 20 m Vegetated Filter Strip (80/95 % runoff reduction) 95% spray drift reduction	
D3	Ditch	< 1e-6	drainage	-	-	< 1e-6	drainage	-	-
D4	Pond	0.000091	drainage	-	-	0.000664	drainage	-	-
D4	Stream	0.000897	drainage	-	-	0.000381	drainage	-	-
D5	Pond	0.000026	drainage	-	-	0.000164	drainage	-	-
D5	Stream	0.000399	drainage	-	-	0.000048	drainage	-	-
D6	Stream	0.000370	drainage	-	-	0.000080	drainage	-	-
R1	Pond	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R1	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R2	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R3	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-
R4	Stream	< 1e-6	Runoff	-	-	< 1e-6	Runoff	-	-

Estimation of concentrations from other routes of exposure (Regulation (EU) N° 284/2013, Annex Part A, point 9.4)

Method of calculation	Not calculated

PEC

Maximum concentration	Not calculated

Ecotoxicology

Effects on birds and other terrestrial vertebrates (Regulation (EU) N° 283/2013, Annex Part A, point 8.1 and Regulation (EU) N° 284/2013, Annex Part A, point 10.1)

Species	Test substance	Time scale	End point	Toxicity (mg/kg bw per day)
Birds				
House sparrow (*Passer domesticus*)	Technical	Acute	LD_{50}	122
Mallard duck (*Anas platyrhynchos*)	Technical	Acute	LD_{50}	476
Bobwhite quail (*Colinus virginianus*)	Technical	Acute	LD_{50}	39.24
Bobwhite quail (Colinus virginianus)	CHA 7110	Acute	LD_{50}	38
Bobwhite quail (Colinus virginianus)	480 g/L	Acute	LD_{50}	19.92
Mallard duck (*Anas platyrhynchos* L.)	Pyrinex 25CS	Acute	LD_{50}	>448
Bobwhite quail (*Colinus virginianus*)	SAP250CSI	Acute	LD_{50}	17.5
Mallard duck	Dursban 5G	Acute	LD_{50}	>2000
Bobwhite quail (*Colinus virginianus*)	TCP	Acute	LD_{50}	>2000
Mallard duck (*Anas platyrhynchos*)	Technical	Long-term	NOEC	2.885
Bobwhite quail (*Colinus virginianus*)	Technical	Long-term	NOEC	125
Mammals				
Mouse	Technical	Acute	LD_{50}	64
Rat	TCP	Acute	LD_{50}	3129
Rat	Technical	Long-term	NOAEL	1
Endocrine disrupting properties (Annex Part A, points 8.1.5) *[list evidence/indication on the potential for endocrine disrupting properties]*				

Additional higher tier studies (Annex Part A, points 10.1.1.2):

Several higher tier studies have been submitted to refine the risk identified in the Tier 1 risk assessment:

Reference	**Crop**	**Location**	**Purpose**	**Output**
CP 10.1.1.2/24 Gallagher et al 1994	Citrus	California	Residues on soil invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/4, McQuillen et al., 1998a	Citrus	California, USA	Residues on insects, soil invertebrates and seeds	Residue decline on invertebrates after CP application
CP 10.1.1.2/8, Wilkens et al., 2008a	Citrus	Valencia, Spain	Residues on invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/7, Lawrence, 2006	Pome	Southern England	Residues on invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/9, Frese et al., 2008	Pome	Verona, Italy	Residues on invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/10, Schneider and Wilkens, 2008	Vegetables	Sochaczew, Poland	Residues on invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/5, McQuillen et al., 1998b	Cereals	Iowa, USA	Residues on insects, soil invertebrates and seeds	Residue decline on invertebrates and seeds after CP application
CP 10.1.1.2/6, Brown et al., 2006	Cereals	Cornwall, England	Residues on invertebrates	Residue decline on invertebrates after CP application
CP 10.1.1.2/11, Day, 1986	Grass	Germany	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/12, Dawson, 1987	Grass	Germany	Residues on grass	Residue decline on food items after CP application
CP 10.1.1.2/13, Portwood and Williams, 1995	Grass	Belgium	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/14, Gale, 1997	Grass	Germany	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/15, Gale, 1998	Grass	Northern/ Southern France	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/22, Rawle, 2008	Grass	Northern France, Germany	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/23, Hansford, 2008a	Grass	Germany, Poland	Residues on grass	Residue decline on grass after CP application
CP 10.1.1.2/16, Old, 2005	Vegetables	Poland, Hungary, Germany	Residues on sugar beet	Residue decline on sugar beet tops after CP application
CP 10.1.1.2/17, Old, 2006a	Vegetables	France, UK	Residues on sugar beet	Residue decline on sugar beet tops after CP application
CP 10.1.1.2/18, Livingstone, 2006a	Vegetables	England, France, Germany	Residues on sugar beet	Residue decline on sugar beet tops after CP application
CP 10.1.1.2/19, Livingstone, 2006b	Vegetables	Germany, Hungary, Poland	Residues on sugar beet	Residue decline on sugar beet tops after CP application
CP 10.1.1.2/20, Old, 2006b	Vegetables	Spain, Italy, France	Residues on sugar beet	Residue decline on sugar beet tops after CP application

CP 10.1.1.2/21, Livingstone, 2006c	Vegetables	Spain, Italy, France	Residues on sugar beet	Residue decline on sugar beet tops after CP application
CP 8.1.3/1, Mallet, 2007	not applicable	not applicable	Residues in earthworms	Residue accumulation on earthworms after CP application

Moreover, several studies have been submitted to further refine the risk to birds. A summary table is included below (for details, please refer to Vol. 3 B.9, Appendix 1):

Data Point/Study	**Rationale**
CA 8.1.1.1/8, [redacted] 2015	**Laboratory study on Bobwhite Quail to determine bioavailability, adsorption, and elimination**, after oral dosing with insects carrying topically-applied chlorpyrifos. Blood AChE inhibition assayed. **To provide data for derivation of kinetic parameters for body burden modelling. Blood AChE data to provide link with equivalent data from birds in the field sampled in orchards in 2014**
CP 10.1.1.2/1, Kleinmann and Wang, 2015a	**Body burden modelling** for **refinement of the risk assessment for birds**
CP 10.1.1.2/25, [redacted] 2007a	Identification of **focal bird species in citrus in Spain** and allocation of these species to foraging guilds and size classes **for the higher tier risk assessment in citrus**.
CP 10.1.1.2/26, [redacted] 2008	Derivation of **PT & PD** for Sardinian Warblers and Great Tits in **citrus** in **Spain** using radio-tracking and analysing faeces **for the higher tier risk assessment for citrus.**
CP 10.1.1.2/27, [redacted] 2009a	Supplementary report to the study below (Selbach and Wilkens 2008; CP 10.1.1.2/28) on possible reasons for loss of signals for some radio-tagged birds.
CP 10.1.1.2/28, [redacted] 2008	**Field effect study on application of chlorpyrifos in citrus in Spain (2007)**, including radio-tracking individuals after application, carcass searches, visual observations, nest monitoring, arthropod biomass. **For the higher tier risk assessment.**
CP 10.1.1.2/29, [redacted] 2010 (amendment by [redacted] 2011)	**Field effect study on status & reproductive performance of bird communities in chlorpyrifos-treated citrus in Spain (2010)** and evaluation of factors influencing reproduction. Bird trapping, nest searches and monitoring, sampling arthropod biomass. **For the higher tier risk assessment.**
CP 10.1.1.2/30, [redacted] 2014	**Field effect study on status & reproductive performance of bird communities in chlorpyrifos-treated citrus orchards in Spain (2011)** and evaluation of factors influencing reproduction. Bird trapping, radio-tracking, habitat mapping, surveys, nest searches and monitoring, carcass searches, carcass analysis, arthropod biomass, predator observations. **For the higher tier risk assessment.**
CP 10.1.1.2/31, [redacted] 2015a	**Field effect study on the status and reproductive performance of bird communities in chlorpyrifos-treated citrus orchards in Spain (2012)** and evaluation of factors influencing reproduction. Bird trapping, radio-tracking, habitat mapping, surveys, nest searches and monitoring, carcass searches, carcass analysis, arthropod biomass, predator observations. **For the higher tier risk assessment.**
CP 10.1.1.2/32, [redacted] 2015b	Field **effect study** to monitor whether effects observed in birds in one site in **citrus** in **Spain** in 2011 and 2012 (CP 10.1.1.2/30 and CP 10.1.1.2/31) following **misuse** could be reduced by **stewardship** actions.
CP 10.1.1.2/34, [redacted] 2007a	Generic study to identify **focal species** in **pome fruit** orchards (South France) **for higher tier risk assessment.**

CP 10.1.1.2/35, [redacted] 2006a	Generic study to identify **focal species** in **pome fruit** orchards in Cataluña, Spain **for higher tier risk assessment**
CP 10.1.1.2/36, [redacted] 2007b	Generic study to identify **focal species** in **stone fruit** orchards in Languedoc-Roussillon (South France) **for higher tier risk assessment.**
CP 10.1.1.2/37, [redacted] 2007b	Generic study to identify **focal species** in **stone fruit** orchards in Cataluña, Spain **for higher tier risk assessment**
CP 10.1.1.2/38, [redacted] 2006a	Generic study to identify **focal species** in **stone fruit** orchards in Valencia, Spain **for higher tier risk assessment**
CP 10.1.1.2/39, [redacted] 2007	Generic study to identify **focal species** in **pome fruit** orchards in Centre region and Pays de la Loire (France) **for higher tier risk assessment.**
CP 10.1.1.2/40, [redacted] 2007	**Pilot field effect study** for chlorpyrifos application in **pome fruit** orchards in S. France on birds & mammals, **for higher tier risk assessment**
CP 10.1.1.2/41, [redacted] 2008b	**Generic field study** to obtain **PT and PD** for Blackcaps, Great Tits and Blackbirds, all relevant species in or near **pome fruit** orchards, in Italy by radio-tracking and faeces analyses, **for higher tier risk assessment**
CP 10.1.1.2/42, [redacted] 2009b	Supplementary report to study below (Wilkens et al. 2008b; CP 10.1.1.2/41). Assessment of possible reasons for loss of signals of some radio-tagged birds.
CP 10.1.1.2/43, [redacted] 2008c	**Field effect study on birds for chlorpyrifos in pome fruit orchards** in N. Italy. Radio-tracking & visual observations during and after application, carcass searches & residue analysis, nest monitoring and arthropod biomass. **For higher tier risk assessment**.
CP 10.1.1.2/44, [redacted] 2014	**Field effect study on status & reproductive performance of bird & mammal communities in chlorpyrifos-treated pome fruit in UK (2012)** and to evaluate factors which influence reproductive performance. Trapping, bird surveys, nest searching & monitoring. **For higher tier risk assessment.**
CP 10.1.1.2/45, [redacted] 2015	**Field effect study on status & reproductive performance of bird communities in chlorpyrifos-treated pome fruit orchards in UK (2013)** and to evaluate factors influencing reproduction. Bird trapping, radio-tracking, bird surveys, nest searching and monitoring. Blood sampling for ChE activity assays. **For higher tier risk assessment.**
CP 10.1.1.2/46, [redacted] 2014	**Field effect study on status & reproductive performance of bird communities in chlorpyrifos-treated pome fruit orchards in UK (2014)** and to evaluate factors influencing reproduction. Bird trapping, radio-tracking, bird surveys, nest searching and monitoring. **For higher tier risk assessment.**
CP 10.1.1.2/47, [redacted] 2007	Generic study to identify **focal species** in **vineyards** in the Centre region and Pays de la Loire, France. **For higher tier risk assessment.**
CP 10.1.1.2/48, [redacted] 2006b	Generic study to identify **focal species** in **vineyards** in Languedoc-Roussillon, France. **For higher tier risk assessment.**
CP 10.1.1.2/49, [redacted] 2006c	Generic study to identify **focal species** in **vinyards** in Cataluña, Spain. **For higher tier risk assessment.**
CP 10.1.1.2/52, [redacted] 2007	Generic field study to obtain **PT & PD** for birds using **vinyards** in France. Radio-tracking, faeces analysis, stomach content analysis. **For higher tier risk assessment.**
CP 10.1.1.2/53, [redacted] 2006	Generic study on **PT** for birds in **oilseed rape** in central France. Radio-tracking. **For higher tier risk assessment**

CP 10.1.1.2/54, [redacted] 2008	Generic field study to obtain **PT** & **PD** for birds using **brassica fields** in France. Radio-tracking, faeces analysis. **For higher tier risk assessment.**
CP 10.1.1.2/55, [redacted] 2008	**Field effect study for birds in chlorpyrifos-treated brassic fields in Poland (2007).** Radio-tracking, bird observation, nest monitoring, carcass searching. **For higher tier risk assessment.**
CP 10.1.1.2/57, [redacted] 2006	**Effect study** for the duck ***Anas penelope*** caged over in chlorpyrifos-treated **pasture**. **For higher tier risk assessment.**
CP 10.1.1.2/60, [redacted] 2006b	Generic study to identify **focal species** in **cereal fields** in Cataluña ES. **For higher tier risk assessment.**
CP 10.1.1.2/61, [redacted] 2006c	Generic field study to identify **focal species** in **cereal fields** in Midi-Pyrenees. **For higher tier risk assessment**
CP 10.1.1.2/62, [redacted] 2006	**Literature and internet review** for **wildlife incidents** with chlorpyrifos with emphasis on Europe.
CP 10.1.1.2/63, [redacted] 2015	Field effects study on bird community in treated cereals fields, UK, 2013. Pilot study, evaluating bird community in winter wheat fields sprayed in May-June. Bird surveys and nest monitoring. **For higher tier risk assessment.**
CP 10.1.1.2/64, [redacted] 2015	Field effects study on bird community in treated cereals fields, UK, 2014. Visual surveys to assess diversity and abundance of birds, and detect any clinical signs. Radio-tracking of Yellow Wagtails and Skylarks before and after application, to assess any changes in foraging. Nest searching and monitoring, including in-field nests before and after application. **For higher tier risk assessment**

Several studies have been also submitted to refine the risk identified in other terrestrial vertebrates:

Data Point/Study	**Rationale**
CP 10.1.2.2/2, Hansford, 2008b	Assessment of **residues in pome fruits and grass understor**y at intervals following applications of GF-1668 and EF-1551 or EF-1315 in France, Spain and Italy for higher tier risk assessment refinement.
CP 10.1.2.2/3, Hansford, 2008c	Assessment of **residues in pome fruits and grass understory** at intervals following applications of GF-1668 and EF-1551 or EF-1315 in Poland, France and England for higher tier risk assessment refinement.
CP 10.1.2.2/4, Hansford, 2008d	Assessment of **residues in stone fruits and grass understory** at intervals and harvest following multiple applications of GF-1668 and EF-1551 or EF-1315 in Italy and Spain for higher tier risk assessment refinement.
CP 10.1.2.2/5, Hansford, 2008e	Assessment of **residues in stone fruits and grass understory** at intervals following multiple applications of GF-1668 and EF-1551 or EF-1315 in France and Poland for higher tier risk assessment refinement.
CP 10.1.2.2/6, Hansford, 2008f	Assessment of **residues in wine grapes and grass understory** at intervals following multiple applications of GF-1668 and EF-1551 or EF-1315 in France and Hungary for higher tier risk assessment refinement.
CP 10.1.2.2/7, [redacted] 2008	Assessment of **focal mammal species** in **citrus orchards** in **Spain** for the higher tier risk assessment in citrus.
CP 10.1.2.2/8, [redacted] 2010	Field **effect study** to assess effects on **mammals** following application of chlorpyrifos in a **citrus orchard** in **Spain** by monitoring and carcass searches.
CP 10.1.2.2/9, [redacted] 2010	Field **effect study** to assess effects on **mammals** following applications of chlorpyrifos in a **citrus orchard** in **Spain** by monitoring and carcass searches.

CP 10.1.2.2/10, [redacted] [redacted] 2013	Field **effect study** to assess effects on **mammals** following application of chlorpyrifos in a **citrus orchard** in **Spain** by monitoring and carcass searches.
CP 10.1.2.2/11, [redacted] 2010	Field **effect study** to assess effects on **mammals** following application of chlorpyrifos in a **pome fruit orchard** in the **Czech Republic** by monitoring and carcass searches.
CP 10.1.2.2/12, [redacted] [redacted] 2010	Field **effect study** to assess effects on **mammals** following application of chlorpyrifos in a **pome fruit orchard** in the **Czech Republic** by monitoring and carcass searches.
CP 10.1.2.2/13, [redacted]	Assessment of **PT and PD** for wood mice in **Vineyards** in **France** using radio-tracking and analysing faeces for the higher tier risk assessment for Vineyards.
CP 10.1.2.2/14, [redacted] 2008a	Assessment of **focal mammal species** in **cabbage fields** in **Poland** for the higher tier risk assessment in brassica.
CP 10.1.2.2/15, [redacted] [redacted] 2008	Field **effect study** to assess effects on **mammals** following applications of chlorpyrifos in a **cabbage field** in **Poland** by monitoring and carcass searches.

Terrestrial vertebrate wildlife (birds, mammals, reptile and amphibians) (Annex Part A, points 8.1.4, 10.1.3):

[To provide available data]

Toxicity/exposure ratios for terrestrial vertebrates (Regulation (EU) N° 284/2013, Part A, Annex point 10.1)

FORMULATED PRODUCT : EF-1551

Leafy vegetables at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	76.22	0.3	10
All	Small omnivorous bird	Long-term	16.5	0.2	5
Tier 1 (Birds)					
BBCH 10-19	Small insectivorous bird “wagtail”	Acute	12.86	1.5	10
BBCH 10-19	Medium herbivorous / granivorous bird “pigeon”	Acute	43.48	0.5	10
BBCH 10-49	Small omnivorous bird “lark”	Acute	11.52	1.7	10
BBCH 10-49	Small granivorous bird “finch”	Acute	13.15	1.5	10
BBCH ≥ 20	Small insectivorous bird “wagtail”	Acute	12.09	1.6	10
BBCH ≥ 50	Small omnivorous bird “lark”	Acute	3.45	5.8	10
BBCH ≥ 50	Small granivorous bird “finch”	Acute	3.93	5.1	10
BBCH 10-19	Small insectivorous bird wagtail‘	Long-term	2.9	1	5
BBCH 10-19	Medium herbivorous / granivorous bird “pigeon”	Long-term	9.4	0.3	5
BBCH 10-49	Small omnivorous bird “lark”	Long-term	2.8	1	5
BBCH 10-49	Small granivorous bird “finch”	Long-term	3.2	0.9	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 20	Small insectivorous bird “wagtail”	Long-term	2.5	1.2	5
BBCH ≥ 50	Small omnivorous bird “lark”	Long-term	0.8	3.4	5
BBCH ≥ 50	Small granivorous bird “finch”	Long-term	1	3	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger

Higher tier (birds): Based on RUD and PT refinement.

The following values were used in the acute risk assessment:

Food item (EFSA, 2009)	**Source of RUDs**	**90th centile RUD for chlorpyrifos**
Chlorpyrifos		
Grass (in orchards and vineyards)	Orchard grass	46.51
Grass (in vegetables, cereals, strawberries, bush and cane fruits)	Pasture grass	72.82
Fruits (in orchards)	Apples, pears, peaches	1.11
Leaves /crop leaves / weeds / non-grass herbs	Leafy vegetables (sugar beet)	46.51
Weed seeds in orchards and vineyards	Seed heads (citrus)	0.07
Weed seeds in other crops than orchards and vineyards	Seed heads (alfalfa)	0.27
Foliar insects	Foliar-dwelling arthropods	22.88
Ground arthropods	Ground-dwelling arthropods	6.81
TCP		
Grass (in orchards and vinyards)[1]	Orchard grass	6.53

The following values were used in the chronic risk assessment:

Matrix	**Used for food item**	**Mean T_0 RUD**	**DT_{50} [days]**	**TWA**	**3-week TWA RUD**
Foliage-dwelling arthropods	Foliar insects	16.34	3.09	0.21	3.43
Ground-dwelling arthropods	Ground arthropods	5.05	4.05	0.27	1.36
Leafy crops	Leaves/crop leaves	25.71	1.91	0.13	3.34
Pasture grass (surrogate for cereal shoots)	Cereal shoots	43.83	2.55	0.17	7.45
Seeds in citrus	Seeds / weed seeds in orchards and vineyards	0.07	-		-
Seeds in alfalfa	Seeds / weed seeds in crops other than orchards and vineyards	0.27	-		-
Grapes	Grapes / fruits (fruiting vegetables, strawberries, bush and cane fruits)	0.98	8.16	0.47	0.46

BBCH 10-19	Small insectivorous bird ‘wagtail’	Acute	5.63	**3.54**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10-19	Medium herbivorous/granivorous bird ‘pigeon’	Acute	17.63	**1.13**	10
BBCH 10-49	Small omnivorous bird ‘lark’	Acute	3.77	**5.29**	10
BBCH 10-49	**Small granivorous bird ‘finch’**	**Acute**	**0.04**	**495.8**	**10**
BBCH > 20	Small granivorous bird ‘finch’	Acute	5.63	14.9	10
BBCH > 50	Small insectivorous bird ‘lark’	Acute	3.77	**5.29**	10
BBCH > 50	Small granivorous bird ‘finch’	Acute	0.04	495.8	10
BBCH 10-19	Small insectivorous bird ‘wagtail’	Long-term	0.38	7.59	5
BBCH 10-19	Medium herbivorous/granivorous bird ‘pigeon’	Long-term	1.27	**2.28**	5
BBCH 10-49	Small omnivorous bird ‘lark’	Long-term	0.39	7.34	5
BBCH 10-49	Small granivorous bird ‘finch’	Long-term	0.04	80.79	5
BBCH > 20	Small insectivorous bird ‘wagtail’	Long-term	0.38	7.59	5
BBCH > 50	Small insectivorous bird ‘lark’	Long-term	0.39	7.34	5
BBCH > 50	Small granivorous bird ‘finch’	Long-term	0.04	80.79	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	65.47	**0.98**	10
All	Small herbivorous mammal	Long-term	18.3	**0.05**	5
Tier 1 (Mammals)					
BBCH 10-19	Small insectivorous mammal “shrew”	Acute	3.65	17.54	10
BBCH 10-49	small omnivorous mammal “mouse”	Acute	8.26	**7.75**	10
BBCH 40-49	Small herbivorous mammal “vole”	Acute	65.47	**0.98**	10
BBCH ≥ 20	Small insectivorous mammal “shrew”	Acute	2.59	24.69	10
BBCH ≥ 50	Small herbivorous mammal “vole”	Acute	19.63	**3.26**	10
BBCH ≥ 50	Small omnivorous mammal “mouse”	Acute	2.50	25.64	10
All season	Large herbivorous mammal “lagomorph”	Acute	16.85	**3.80**	10
BBCH 10-19	Small insectivorous mammal “shrew”	Long-term	1.06	**0.9**	5
BBCH 10-49	Small omnivorous mammal “mouse”	Long-term	1.98	**0.5**	5
BBCH 40-49	Small herbivorous mammal “vole”	Long-term	18.3	**0.1**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.48	**2.1**	5
BBCH ≥ 50	Small herbivorous mammal “vole”	Long-term	5.52	**0.2**	5
BBCH ≥ 50	Small omnivorous mammal “mouse”	Long-term	0.58	**1.7**	5
All season	Large herbivorous mammal “lagomorph”	Long-term	3.63	**0.3**	5
Higher tier (Mammals): Based on RUD refinement. Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10-49	Small omnivorous mammal ‘mouse’	Acute	1.75	36.67	10
BBCH 40 - >50	Small herbivorous mammal ‘vole’	Acute	46.49	**1.38**	10
All season	Large herbivorous mammal ‘lagomorph’	Acute	11.16	**5.73**	10
BBCH 10 - 19	Small insectivorous mammal “shrew”	Long-term	0.359	**2.78**	5
BBCH 10 - 49	Small omnivorous mammal “mouse”	Long-term	0.169	5.9	5
BBCH 40 - 49	Small herbivorous mammal "vole	Long-term	4.88	**0.2**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.359	**2.78**	5
BBCH ≥ 50	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH ≥ 50	Small omnivorous mammal “mouse”	Long-term	0.169	5.9	5
All season	Large herbivorous mammal “lagomorph”	Long-term	0.81	**1.2**	5

Cereals at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	76.22	0.3	10
All	Small omnivorous bird	Long-term	16.5	0.2	5
Tier 1 (Birds)					
BBCH 10-29	Small omnivorous bird “lark”	Acute	11.52	**0.3**	10
BBCH 10-29	Large herbivorous bird “goose”	Acute	14.64	**1.7**	10
BBCH 30-39	Small omnivorous bird “lark”	Acute	5.76	**1.4**	10
BBCH >40	Small omnivorous bird “lark”	Acute	3.45	**3.5**	10
BBCH 10-29	Small omnivorous bird “lark”	Long-term	2.8	**1**	5
BBCH 10-29	Large herbivorous bird “goose”	Long-term	4.1	**0.7**	5
BBCH 30-39	Small omnivorous bird “lark”	Long-term	1.4	**2.1**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH >40	Small omnivorous bird "lark"	Long-term	0.8	**3.4**	5
Higher tier (birds): Based on RUD and PT refinement. Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
BBCH 10>40	Small omnivorous bird "lark"	Acute	3.8	**5.3**	10
BBCH 10-29	Large herbivorous bird "goose"	Acute	10.5	**1.9**	10
BBCH 10-29	Small omnivorous bird "lark"	Long-term	0.39	7.34	5
BBCH 10-29	Large herbivorous bird "goose"	Long-term	1.07	**2.69**	5
BBCH 30-39	Small omnivorous bird "lark"	Long-term	0.39	7.34	5
BBCH >40	Small omnivorous bird "lark"	Long-term	0.39	7.34	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	56.83	**1.13**	10
All	Small herbivorous mammal	Long-term	12.3	**0.08**	5
Tier 1 (Mammals)					
BBCH 10-19	Small insectivorous mammal "shrew"	Acute	3.65	17.54	10
BBCH 10-29	Small omnivorous mammal "mouse"	Acute	8.26	**7.75**	10
BBCH 30-39	Small omnivorous mammal "mouse"	Acute	4.13	15.50	10
BBCH ≥ 20	Small insectivorous mammal "shrew"	Acute	2.59	24.69	10
BBCH ≥ 40	Small herbivorous mammal "vole"	Acute	19.63	**3.26**	10
BBCH ≥ 40	Small omnivorous mammal "mouse"	Acute	2.50	25.64	10
BBCH 10-19	Small insectivorous mammal "shrew"	Long-term	1.06	**0.9**	5
BBCH 10-29	Small omnivorous mammal "mouse"	Long-term	1.98	**0.5**	5
BBCH 30-39	Small omnivorous mammal "mouse"	Long-term	0.99	**1.0**	5
BBCH ≥ 20	Small insectivorous mammal "shrew"	Long-term	0.48	**2.1**	5
BBCH≥ 40	Small herbivorous mammal "vole"	Long-term	5.52	**0.2**	5
BBCH≥ 40	Small omnivorous mammal "mouse"	Long-term	0.58	**1.7**	5
Higher tier (Mammals): Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
BBCH 10-29	Small omnivorous mammal "mouse"	Acute	1.75	36.67	10
BBCH ≥ 40	Small herbivorous mammal "vole"	Acute	46.49	**1.38**	10
BBCH 10 - 19	Small insectivorous mammal "shrew"	Long-term	0.359	**2.78**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10 -29	Small omnivorous mammal “mouse”	Long-term	0.169	5.9	5
BBCH 30 - 39	Small omnivorous mammal “mouse”	Long-term	0.169	5.9	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.35	**2.78**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	4.88	**0.205**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.169	5.9	5

Orchards (Pome and stone fruits) at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small insectivorous bird	Acute	22.46	0.9	10
All	Small insectivorous bird	Long-term	4.6	0.6	5
Tier 1 (Birds)					
BBCH 10-19	Small insectivorous/worm feeding bird „thrush“	Acute	2.83	**7**	10
BBCH 10-19	Small granivorous bird ?finch‘	Acute	10.51	**1.9**	10
BBCH 20-39	Small insectivorous/worm feeding bird „thrush“	Acute	2.11	**9.4**	10
BBCH 20-39	Small granivorous bird finch	Acute	7.87	**2.5**	10
BBCH >40	Small insectivorous/worm feeding bird „thrush“	Acute	1.05	18.9	10
BBCH > 40	Small granivorous bird finch‘	Acute	3.93	**5.1**	10
Spring and summer	Small insectivorous bird, tit	Acute	22.46	**0.9**	10
BBCH 10-19	Small insectivorous/worm feeding bird, thrush	Long-term	0.5	5.4	5
BBCH 10-19	Small granivorous bird ?finch‘	Long-term	2.6	**1.1**	5
BBCH 20-39	Small insectivorous/worm feeding bird „thrush“	Long-term	0.4	7.1	5
BBCH 20-39	Small granivorous bird ?finch‘	Long-term	1.9	**1.5**	5
BBCH >40	Small insectivorous/worm feeding bird „thrush“	Long-term	0.2	14.2	5
BBCH > 40	Small granivorous bird, finch	Long-term	1	**3**	5
Spring and summer	Small insectivorous bird, tit	Long-term	4.6	**0.6**	5
Higher tier (birds): Based on RUD refinement. Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10-19	Small insectivorous/worm feeding bird „thrush“	Acute	2.5	**8**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10-19	Small granivorous bird, finch	Acute	0.01	1912	10
BBCH 20-39	Small insectivorous/worm feeding bird, thrush	Acute	2.5	**8**	10
BBCH 20-39	Small granivorous bird ?finch‘	Acute	0.01	1912	10
BBCH > 40	Small granivorous bird ?finch‘	Acute	0.01	1912	10
Spring and summer	Small insectivorous bird ‚tit‘	Acute	9.4	**2.1**	10
BBCH 10-19	Small granivorous bird, finch	Long-term	0.01	484	5
BBCH 20-39	Small granivorous bird, finch	Long-term	0.01	484	5
BBCH > 40	Small granivorous bird, finch	Long-term	0.01	484	5
Spring and summer	Small insectivorous bird, tit	Long-term	1.18	**2.45**	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	65.47	**0.98**	10
All	Small herbivorous mammal	Long-term	18.4	**0.05**	5
Tier 1 (Mammals)					
BBCH 10-19	Large herbivorous mammal “lagomorph”	Acute	13.49	**4.74**	10
BBCH 10-19	1st tier: Small herbivorous mammal “vole”	Acute	52.42	**1.22**	10
BBCH 10-19	1st tier: Small omnivorous mammal “mouse”	Acute	6.62	**9.66**	10
BBCH 20-40	1st tier: Large herbivorous mammal “lagomorph”	Acute	10.13	**6.32**	10
BBCH 20-40	1st tier: Small herbivorous mammal “vole”	Acute	39.31	**1.63**	10
BBCH 20-40	1st tier: Small omnivorous mammal “mouse”	Acute	4.94	12.94	10
BBCH ≥ 40	1st tier: Large herbivorous mammal “lagomorph”	Acute	5.04	12.70	10
BBCH ≥ 40	1st tier: Small herbivorous mammal “vole”	Acute	19.63	**3.26**	10
BBCH ≥ 40	1st tier: Small omnivorous mammal “mouse”	Acute	2.50	25.64	10
BBCH 10-19	Large herbivorous mammal “lagomorph”	Long-term	2.92	**0.3**	5
BBCH 10-19	Small herbivorous mammal “vole”	Long-term	14.7	**0.1**	5
BBCH 10-19	Small omnivorous mammal “mouse”	Long-term	1.57	**0.6**	5
BBCH 20-40	Large herbivorous mammal “lagomorph”	Long-term	2.18	**0.5**	5
BBCH 20-40	Small herbivorous mammal “vole”	Long-term	11.04	**0.1**	5
BBCH 20-40	Small omnivorous mammal “mouse”	Long-term	1.19	**0.8**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	1.09	**0.9**	5
BBCH ≥ 40	Small herbivorous mammal “vole”	Long-term	5.52	**0.2**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.58	**1.7**	5
Higher tier (Mammals): Please. refer to “leafy vegetables. higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10-40	Large herbivorous mammal “lagomorph”	Acute	11.16	**5.73**	10
BBCH 10 - >40	Small herbivorous mammal “vole“	Acute	30.50	**2.10**	10
BBCH 10-19	Small omnivorous mammal “mouse”	Acute	1.73	36.95	10
BBCH 10 - 19	Large herbivorous mammal “lagomorph”	Long-term	0.89	**1.23**	5
BBCH 10 - 19	Small herbivorous mammal "vole	Long-term	2.44	**0.40**	5
BBCH 10 - 19	Small omnivorous mammal “mouse”	Long-term	0.156	6.41	5
BBCH 20 - 40	Large herbivorous mammal “lagomorph”	Long-term	2.44	**0.40**	5
BBCH 20 - 40	Small herbivorous mammal "vole	Long-term	2.44	**0.40**	5
BBCH 20 - 40	Small omnivorous mammal “mouse”	Long-term	0.156	6.41	5
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	0.809	**1.23**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	2.44	**0.40**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.156	6.41	5

Orchards (Citrus) at 1920 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small insectivorous bird	Acute	89.9	**0.2**	10
All	Small insectivorous bird	Long-term	18.5	**0.2**	5
Tier 1 (Birds)					
BBCH 10-19	Small insectivorous/worm feeding bird „thrush“	Acute	11.32	**1.8**	10
BBCH 10-19	Small granivorous bird finch	Acute	42.04	**0.5**	10
BBCH 20-39	Small insectivorous/worm feeding bird „thrush“	Acute	8.45	**2.4**	10
BBCH 20-39	Small granivorous bird finch‘	Acute	31.5	**0.6**	10
BBCH >40	Small insectivorous/worm feeding bird „thrush“	Acute	4.22	**4.7**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH > 40	Small granivorous bird finch‘	Acute	15.7	**1.3**	10
Spring and summer	Small insectivorous bird, tit	Acute	89.8	**0.2**	10
BBCH 10-19	Small insectivorous / worm feeding bird “thrush”	Long-term	2.13	**1.4**	5
BBCH 10-19	Small granivorous bird “finch”	Long-term	10.27	**0.3**	5
BBCH 20-39	Small insectivorous / worm feeding bird “thrush”	Long-term	1.62	**1.8**	5
BBCH 20-39	Small granivorous bird “finch”	Long-term	7.73	**0.4**	5
BBCH ≥ 40	Small insectivorous / worm feeding bird “thrush”	Long-term	0.81	**3.5**	5
BBCH ≥ 40	Small granivorous bird “finch”	Long-term	3.86	**0.7**	5
Spring and summer	Small insectivorous bird “tit”	Long-term	18.52	**0.2**	5
Higher tier (birds): Based on RUD and PT refinement. Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10 - > 40	Small insectivorous/worm feeding species “thrush”	Acute	9.94	**2**	10
BBCH 10 - >40	Small granivorous bird "finch"	Acute	0.04	498	10
spring and summer	Small insectivorous bird “tit”	Acute	37.78	**0.5**	10
BBCH 10 – 19	Small insectivorous/worm feeding species “thrush”	Long-term	1.45	**1.99**	5
BBCH 10 – 19	Small granivorous bird “finch”	Long-term	0.02	121.2	5
BBCH 20 – 39	Small insectivorous/worm feeding species “thrush”	Long-term	1.45	**1.99**	5
BBCH 20-39	Small granivorous bird “finch”	Long-term	0.02	121.2	5
BBCH ≥ 40	Small insectivorous/worm feeding species “thrush”	Long-term	1.45	**1.99**	5
BBCH ≥ 40	Small granivorous bird “finch”	Long-term	0.02	121.2	5
spring and summer	Small insectivorous bird “tit”	Long-term	3.79	**0.76**	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	261.8	**0.24**	10
All	Small herbivorous mammal	Long-term	73.5	**0.01**	5
Tier 1 (Mammals)					
BBCH 10-19	1st tier: Large herbivorous mammal “lagomorph”	Acute	53.95	**1.19**	10
BBCH 10-19	1st tier: Small herbivorous mammal “vole”	Acute	209.66	**0.31**	10
BBCH 10-19	1st tier: Small omnivorous mammal “mouse”	Acute	26.50	**2.42**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 20-40	1st tier: Large herbivorous mammal "lagomorph"	Acute	40.51	**1.58**	10
BBCH 20-40	1st tier: Small herbivorous mammal "vole"	Acute	157.25	**0.41**	10
BBCH 20-40	1st tier: Small omnivorous mammal "mouse"	Acute	19.78	**3.24**	10
BBCH ≥ 40	1st tier: Large herbivorous mammal "lagomorph"	Acute	20.16	**3.17**	10
BBCH ≥ 40	1st tier: Small herbivorous mammal "vole"	Acute	78.53	**0.81**	10
BBCH ≥ 40	1st tier: Small omnivorous mammal "mouse"	Acute	9.98	**6.41**	10
BBCH 71-79	1st tier: Frugivorous mammal "dormouse"	Acute	91.97	**0.70**	10
BBCH 10-19	Large herbivorous mammal "lagomorph"	Long-term	11.7	**0.1**	5
BBCH 10-19	Small herbivorous mammal "vole"	Long-term	58.8	**0.02**	5
BBCH 10-19	Small omnivorous mammal "mouse"	Long-term	6.3	**0.2**	5
BBCH 20-40	Large herbivorous mammal "lagomorph"	Long-term	8.75	**0.1**	5
BBCH 20-40	Small herbivorous mammal "vole"	Long-term	44.1	**0.02**	5
BBCH 20-40	Small omnivorous mammal "mouse"	Long-term	4.78	**0.2**	5
BBCH ≥ 40	Large herbivorous mammal "lagomorph"	Long-term	4.37	**0.2**	5
BBCH ≥ 40	Small herbivorous mammal "vole"	Long-term	22.1	**0.05**	5
BBCH ≥ 40	Small omnivorous mammal "mouse"	Long-term	2.34	**0.4**	5
BBCH 71-79	Frugivorous mammal "dormouse"	Long-term	23.09	**0.04**	5
Higher tier (Mammals): Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
BBCH 10 - >40	Large herbivorous mammal "lagomorph"	Acute	44.65	**1.43**	10
BBCH 10 - >40	Small herbivorous mammal "vole"	Acute	122	**0.52**	10
BBCH 10 - >40	Small omnivorous mammal "mouse"	Acute	6.93	**9.24**	10
BBCH 71 - 79 currants	Frugivorous mammal "dormouse"	Acute	2.47	25.89	10
BBCH 10 - 19	Large herbivorous mammal "lagomorph"	Long-term	3.23	**0.31**	5
BBCH 10 - 19	Small herbivorous mammal "vole	Long-term	9.78	**0.10**	5
BBCH 10 - 19	Small omnivorous mammal "mouse"	Long-term	0.623	**1.60**	5
BBCH 20 - 40	Large herbivorous mammal "lagomorph"	Long-term	3.23	**0.31**	5
BBCH 20 - 40	Small herbivorous mammal "vole	Long-term	9.78	**0.10**	5
BBCH 20 - 40	Small omnivorous mammal "mouse"	Long-term	0.623	**1.60**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	3.23	**0.31**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	9.78	**0.10**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.62	**1.60**	5
BBCH 71-79	Frugivorous mammal "dormouse"	Long-term	0.60	**1.66**	5

Grapes (Wine) at 360 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small insectivorous bird	Acute	34.3	**0.6**	10
All	Small insectivorous bird	Long-term	7.42	**0.4**	5
Tier 1 (Birds)					
BBCH 10-19	Small insectivorous bird “redstart”	Acute	9.864	**2.0**	10
BBCH 10-19	Small omnivorous bird “lark”	Acute	5.184	**3.8**	10
BBCH 10-19	Small granivorous bird “finch”	Acute	5.328	**3.7**	10
BBCH 20-39	Small omnivorous bird “lark”	Acute	4.32	**4.6**	10
BBCH 20-39	Small granivorous bird “finch”	Acute	4.464	**4.5**	10
BBCH ≥ 20	Small insectivorous bird “redstart”	Acute	9.252	**2.2**	10
BBCH ≥ 40	Small omnivorous bird “lark”	Acute	2.592	**7.7**	10
BBCH ≥ 40	Small granivorous bird “finch”	Acute	2.664	**7.5**	10
Ripening	Frugivorous bird “thrush/starling”	Acute	10.40	**1.9**	10
BBCH 10-19	Small insectivorous bird “redstart”	Long-term	2.19	**1.3**	5
BBCH 10-19	Small omnivorous bird “lark”	Long-term	1.24	**2.3**	5
BBCH 10-19	Small granivorous bird “finch”	Long-term	1.32	**2.2**	5
BBCH 20-39	Small omnivorous bird “lark”	Long-term	1.03	**2.8**	5
BBCH 20-39	Small granivorous bird “finch”	Long-term	1.08	**2.7**	5
BBCH ≥ 20	Small insectivorous bird “redstart”	Long-term	1.89	**1.5**	5
BBCH ≥ 40	Small omnivorous bird “lark”	Long-term	0.63	**4.6**	5
BBCH ≥ 40	Small granivorous bird “finch”	Long-term	0.64	**4.4**	5
Ripening	Frugivorous bird “thrush / starling”	Long-term	2.74	**1.1**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Higher tier (birds): Based on RUD and PT refinement. Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
Vineyard, BBCH 10 - >20	Small insectivorous species "redstart"	Acute	4.33	**4.6**	10
Vineyards, BBCH 10->40	Small omnivorous bird "lark"	Acute	2.83	**7.1**	10
Vineyards, BBCH 10->40	Small granivorous bird "finch"	Acute	0.01	2883	10
Vineyard, Ripening	Frugivorous bird "thrush/starling"	Acute	0.77	26	10
BBCH 10 - 19	Small insectivorous species "redstart"	Long-term	0.20	14.24	5
BBCH 10 - 19	Small omnivorous bird "lark"	Long-term	0.29	10.11	5
BBCH 10-19	Small granivorous bird "finch"	Long-term	0.0045	646	5
BBCH 20 - 39	Small omnivorous bird "lark"	Long-term	0.29	10.11	5
BBCH 20-39	Small granivorous bird "finch"	Long-term	0.0045	646	5
BBCH ≥ 20	Small insectivorous species "redstart"	Long-term	0.20	14.24	5
BBCH ≥ 40	Small omnivorous bird "lark"	Long-term	0.29	10.11	5
Vineyard, BBCH >40	Small granivorous bird "finch"	Long-term	0.0045	646	5
Vineyard, Ripening	Frugivorous bird "trush/Starling"	Long-term	0.29	10.07	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	49.10	**1.30**	10
All	Small herbivorous mammal	Long-term	13.7	**0.07**	5
Tier 1 (Mammals)					
Vineyards, BBCH 10-19	1st tier: Small insectivorous mammal "shrew"	Acute	2.74	23.39	10
Vineyards, BBCH 10-19	1st tier: Large herbivorous mammal "lagomorph"	Acute	5.87	10.91	10
Vineyards, BBCH 20-39	1st tier: Large herbivorous mammal "lagomorph"	Acute	4.90	13.07	10
Vineyards, BBCH ≥ 20	1st tier: Small insectivorous mammal "shrew"	Acute	1.94	32.92	10
Vineyards, BBCH ≥ 40	1st tier: Large herbivorous mammal "lagomorph"	Acute	2.92	21.95	10
Vineyards [1], BBCH 10-19	1st tier: Small herbivorous mammal "vole"	Acute	29.48	**2.17**	10
Vineyards [1], BBCH 10-19	1st tier: Small omnivorous mammal "mouse"	Acute	3.71	17.26	10
Vineyards [1], BBCH 20-39	1st tier: Small herbivorous mammal "vole"	Acute	24.55	**2.61**	10
Vineyards [1], BBCH 20-39	1st tier: Small omnivorous mammal "mouse"	Acute	3.10	20.67	10
Vineyards [1], BBCH ≥ 40	1st tier: Small herbivorous mammal "vole"	Acute	14.72	**4.35**	10
Vineyards [1], BBCH ≥ 40	1st tier: Small omnivorous mammal "mouse"	Acute	1.87	34.19	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10-19	Small insectivorous mammal “shrew”	Long-term	0.80	**1.2**	5
BBCH 10-19	Large herbivorous mammal “lagomorph”	Long-term	1.27	**0.8**	5
BBCH 20-39	Large herbivorous mammal “lagomorph”	Long-term	1.04	**1.0**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.36	**2.8**	5
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	0.62	**1.6**	5
BBCH 10-19	Small herbivorous mammal “vole”	Long-term	8.28	**0.1**	5
BBCH 10-19	Small omnivorous mammal “mouse”	Long-term	0.89	**1.1**	5
BBCH 20-39	Small herbivorous mammal “vole”	Long-term	6.89	**0.1**	5
BBCH 20-39	Small omnivorous mammal “mouse”	Long-term	0.74	**1.3**	5
BBCH ≥ 40	Small herbivorous mammal “vole”	Long-term	4.14	**0.2**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.43	**2.3**	5
Higher tier (Mammals): Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10 - >40	Small herbivorous mammal “vole“	Acute	22.87	**2.80**	10
BBCH 10 - 19	Small insectivorous mammal “shrew”	Long-term	0.27	**3.74**	5
BBCH 10 - 19	Large herbivorous mammal “lagomorph”	Long-term	0.47	**2.11**	5
BBCH 20 - 39	Large herbivorous mammal “lagomorph”	Long-term	0.47	**2.11**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.27	**3.74**	5
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	0.47	**2.11**	5
BBCH 10 - 19	Small herbivorous mammal "vole	Long-term	1.83	**0.54**	5
BBCH 10 - 19	Small omnivorous mammal “mouse”	Long-term	0.12	8.55	5
BBCH 20 - 39	Small herbivorous mammal "vole	Long-term	1.83	**0.54**	5
BBCH 20 - 39	Small omnivorous mammal “mouse”	Long-term	0.12	8.55	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	1.83	**0.54**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.14	7.33	5

Oilseed rape at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	76.2	**0.3**	10
All	Small omnivorous bird	Long-term	16.5	**0.2**	5
Tier 1 (Birds)					
BBCH 30-39	Medium herbivorous / granivorous bird “pigeon”	Acute	1.152	17.3	10
BBCH 30-39	Small omnivorous bird “lark”	Acute	3.456	**5.8**	10
BBCH ≥ 40	Medium herbivorous / granivorous bird “pigeon”	Acute	0.96	20.8	10
BBCH ≥ 40	Small omnivorous bird “lark”	Acute	2.88	**6.9**	10
late – late (with seeds) (BBCH 30-99)	Small insectivorous bird “dunnock”	Acute	3.552	**5.6**	10
BBCH 30-39	Medium herbivorous / granivorous bird “pigeon”	Long-term	0.27	10.3	5
BBCH 30-39	Small omnivorous bird “lark”	Long-term	0.83	**3.4**	5
BBCH ≥ 40	Medium herbivorous / granivorous bird “pigeon”	Long-term	0.22	12.3	5
BBCH ≥ 40	Small omnivorous bird “lark””	Long-term	0.68	**4.2**	5
BBCH 30-99	Small insectivorous bird “dunnock”	Long-term	0.68	**4.2**	5
Higher tier (birds): Based on RUD refinement. Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 30->40	Small omnivorous bird “lark”	Acute	3.8	**5.3**	10
late – late (with seeds) (BBCH 30-99)	Small insectivorous bird “dunnock”	Acute	2.5	**8.0**	10
BBCH 30 - 39	Small omnivorous bird “lark”	Long-term	0.39	7.34	5
BBCH ≥ 40	Small omnivorous bird “lark”	Long-term	0.39	7.34	5
BBCH 30 - 99	Small insectivorous bird "dunnock"	Long-term	0.50	5.82	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	56.83	**1.13**	10
All	Small herbivorous mammal	Long-term	12.2	**0.08**	5
Tier 1 (Mammals)					
BBCH 30-39	Small omnivorous mammal “mouse”	Acute	2.50	25.64	10
BBCH ≥ 20	Small insectivorous mammal “shrew”	Acute	2.59	24.69	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 40	Small herbivorous mammal “vole”	Acute	16.37	**3.91**	10
BBCH ≥ 40	Small omnivorous mammal “mouse”	Acute	2.06	31.01	10
Oilseed rape, All season	Large herbivorous mammal “lagomorph”	Acute	16.85	**3.80**	10
BBCH 30-39	Small omnivorous mammal “mouse”	Long-term	0.58	**1.7**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.48	**2.1**	5
BBCH ≥ 40	Small herbivorous mammal “vole”	Long-term	4.59	**0.2**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.48	**2.1**	5
All season	Large herbivorous mammal “lagomorph”	Long-term	3.63	**0.3**	5
Higher tier (Mammals): Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH ≥ 40	Small herbivorous mammal “vole”	Acute	46.49	**1.38**	10
All season	Large herbivorous mammal “lagomorph”	Acute	11.16	**5.73**	10
BBCH 30 - 39	Small omnivorous mammal “mouse”	Long-term	0.17	5.92	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.36	**2.78**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.17	5.92	5
All season	Large herbivorous mammal “lagomorph”	Long-term	0.81	**1.24**	5

Solanaceus vegetables at 360 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	57.2	**0.3**	10
All	Small omnivorous bird	Long-term	12.3	**0.2**	5
Tier 1 (Birds)					
BBCH 10-19	Small insectivorous bird “wagtail”	Acute	9.65	**2.1**	10
BBCH 10-49	Small granivorous bird “finch”	Acute	8.89	**2.2**	10
BBCH 10-49	Small omnivorous bird “lark”	Acute	8.64	**2.3**	10
BBCH ≥ 20	Small insectivorous bird “wagtail”	Acute	9.07	**2.2**	10
BBCH ≥ 50	Small granivorous bird “finch”	Acute	2.66	**7.5**	10
BBCH ≥ 50	Small omnivorous bird “lark”	Acute	2.59	**7.7**	10
BBCH 71-89	Frugivorous bird “crow”	Acute	20.7	**1.0**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 71-89	Frugivorous bird "starling"	Acute	17.78	**1.1**	10
BBCH 10-19	Small insectivorous bird "wagtail"	Long-term	0.68	**4.24**	5
BBCH 10-49	Small granivorous bird "finch"	Long-term	2.17	**1.3**	5
BBCH 10-49	Small omnivorous bird "lark"	Long-term	2.08	**1.4**	5
BBCH ≥ 20	Small insectivorous bird "wagtail"	Long-term	0.68	**4.24**	5
BBCH ≥ 50	Small granivorous bird "finch"	Long-term	0.65	**4.4**	5
BBCH ≥ 50	Small omnivorous bird "lark"	Long-term	0.62	**4.6**	5
BBCH 71-89	Frugivorous bird "crow"	Long-term	6.11	**0.5**	5
BBCH 71-89	Frugivorous bird "starling"	Long-term	3.94	**0.7**	5
Higher tier (birds): Based on RUD and PT refinement. Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
BBCH 10 - >20	Small insectivorous bird "wagtail"	Acute	4.2	**4.7**	10
BBCH 10->50	Small granivorous bird "finch"	Acute	0.01	2883	10
BBCH 10->50	Small omnivorous bird "lark"	Acute	2.8	**7.0**	10
BBCH 71 - 89	Frugivorous bird "crow"	Acute	0.4	48	10
BBCH 71 - 89	Frugivorous bird "starling"	Acute	0.7	27	10
BBCH 10 - 19	Small insectivorous bird "wagtail"	Long-term	0.68	**4.24**	5
BBCH 10 - 49	Small granivorous bird "finch"	Long-term	0.03	107.71	5
BBCH 10 - 49	Small omnivorous bird "lark"	Long-term	0.29	9.78	5
BBCH ≥ 20	Small insectivorous bird "wagtail"	Long-term	0.68	**4.24**	5
BBCH ≥ 50	Small granivorous bird "finch"	Long-term	0.03	107.7	5
BBCH ≥ 50	Small omnivorous bird "lark"	Long-term	0.29	9.78	5
BBCH 71 - 89	Frugivorous bird "crow"	Long-term	0.15	18.73	5
BBCH 71 - 89	Frugivorous bird "starling"	Long-term	0.27	10.69	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	49.10	**1.30**	10
All	Small herbivorous mammal	Long-term	13.8	**0.07**	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Mammals)					
BBCH 10-19	Small insectivorous mammal “shrew”	Acute	2,74	23,39	10
BBCH 10-49	Small herbivorous mammal “vole”	Acute	49,10	**1,30**	10
BBCH 10-49	Small omnivorous mammal “mouse”	Acute	6,19	10,34	10
BBCH ≥ 20	Small insectivorous mammal “shrew”	Acute	1,94	32,92	10
BBCH ≥ 50	Small herbivorous mammal “vole”	Acute	14,72	**4,35**	10
BBCH ≥ 50	Small omnivorous mammal “mouse”	Acute	1,87	34,19	10
BBCH 71-89	Frugivorous mammal “rat”	Acute	16,27	**3,93**	10
BBCH 10-19	Small insectivorous mammal “shrew”	Long-term	0.80	**1.2**	5
BBCH 10-49	Small herbivorous mammal “vole”	Long-term	13.8	**0.1**	5
BBCH 10-49	Small omnivorous mammal “mouse”	Long-term	1.49	**0.7**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.36	**2.8**	5
BBCH ≥ 50	Small herbivorous mammal “vole”	Long-term	4.14	**0.2**	5
BBCH ≥ 50	Small omnivorous mammal “mouse”	Long-term	0.43	**2.3**	5
BBCH 71-89	Frugivorous mammal “rat”	Long-term	4.81	**0.2**	5
Higher tier (Mammals): Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10->50	Small herbivorous mammal “vole“	Acute	34,87	**1,84**	10
BBCH 71-89	Frugivorous mammal “rat”	Acute	0,32	197,99	10
BBCH 10 - 19	Small insectivorous mammal “shrew”	Long-term	0.27	**3.71**	5
BBCH 10 - 49	Small herbivorous mammal "vole	Long-term	3.66	**0.27**	5
BBCH 10 - 49	Small omnivorous mammal “mouse”	Long-term	0.13	7.89	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.20	5.10	5
BBCH ≥ 50	Small herbivorous mammal "vole	Long-term	1.10	**0.90**	5
BBCH ≥ 50	Small omnivorous mammal “mouse”	Long-term	0.13	7.89	5
BBCH 71-89	Frugivorous mammal "rat"	Long-term	0.12	8.3	5

Strawberry at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	76.2	**0.3**	10
All	Small omnivorous bird	Long-term	16.5	**0.2**	5
Tier 1 (Birds)					
BBCH 10-39	Small omnivorous bird "lark"	Acute	11,52	**1,7**	10
BBCH ≥ 20	Small insectivorous bird "wagtail"	Acute	12,096	**1,6**	10
BBCH ≥ 40	Small omnivorous bird "lark"	Acute	4,608	**4,3**	10
BBCH 61-89	Frugivorous bird "starling"	Acute	12,96	**1,5**	10
BBCH 10-39	Small omnivorous bird "lark"	Long-term	2.77	**1.0**	5
BBCH ≥ 20	Small insectivorous bird "wagtail"	Long-term	2.46	**1.2**	5
BBCH ≥ 40	Small omnivorous bird "lark"	Long-term	1.12	**2.6**	5
BBCH 61-89	Frugivorous bird "starling"	Long-term	3.40	**0.8**	5
Higher tier (birds): Based on RUD refinement. Please, refer to "leafy vegetables, higher tier (birds)" for details on the RUD used in the refined risk assessment.					
BBCH 10 - >40	Small omnivorous bird "lark"	Acute	3.77	**5.3**	10
BBCH ≥ 20	Small insectivorous bird "wagtail"	Acute	3.35	15	10
BBCH 61 - 89	Frugivorous bird "starling"	Acute	0.96	21	10
BBCH 10 - 39	Small omnivorous bird "lark"	Long-term	0.39	7.34	5
BBCH ≥ 20	Small insectivorous bird "wagtail"	Long-term	0.91	**3.18**	5
BBCH ≥ 40	Small omnivorous bird "lark"	Long-term	0.27	10.75	5
BBCH 61-89	Frugivorous bird "starling"	Long-term	0.36	8.07	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	56.83	1.13	10
All	Small herbivorous mammal	Long-term	12.28	**0.08**	5
Tier 1 (Mammals)					
BBCH 10-39	Large herbivorous mammal "lagomorph"	Acute	16,85	**3,80**	10
BBCH 10-39	Small omnivorous mammal "mouse"	Acute	8,26	**7,75**	10
BBCH ≥ 20	Small insectivorous mammal "shrew"	Acute	2,59	24,69	10
BBCH ≥ 40	Large herbivorous mammal "lagomorph"	Acute	6,72	**9,52**	10
BBCH ≥ 40	Small herbivorous mammal "vole"	Acute	26,21	**2,44**	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH ≥ 40	Small omnivorous mammal “mouse”	Acute	3,31	19,32	10
BBCH 10-39	Large herbivorous mammal “lagomorph”	Long-term	3.63	**0.3**	5
BBCH 10-39	Small omnivorous mammal “mouse”	Long-term	1.98	**0.5**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.48	**2.1**	5
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	1.45	**0.7**	5
BBCH ≥ 40	Small herbivorous mammal “vole”	Long-term	7.34	**0.1**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.79	**1.3**	5
Higher tier (Mammals): Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					
BBCH 10->40	Large herbivorous mammal “lagomorph”	Acute	11.16	**5.73**	10
BBCH 10-39	Small omnivorous mammal “mouse”	Acute	1.75	36.67	10
BBCH ≥ 40	Small herbivorous mammal “vole“	Acute	46.49	**1.38**	10
BBCH 10 - 39	Large herbivorous mammal “lagomorph”	Long-term	0.81	**1.2**	5
BBCH 10 - 39	Small omnivorous mammal “mouse”	Long-term	0.17	5.9	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.36	**2.78**	5
BBCH ≥ 40	Large herbivorous mammal “lagomorph”	Long-term	0.81	**1.23**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.17	5.9	5

Raspberry at 480 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small frugivorous bird	Acute	25.1	**0.8**	10
All	Small frugivorous bird	Long-term	5.85	**0.5**	5
Tier 1 (Birds)					
BBCH 00-79	Small insectivorous bird "warbler"	Acute	25,06	**0,8**	10
BBCH 71-79	Frugivorous bird "blackcap"	Acute	22,22	**0,9**	10
BBCH 00-79	Small insectivorous bird "warbler"	Long-term	5.16	**0.6**	5
BBCH 71-79	Frugivorous bird "blackcap"	Long-term	5.85	**0.5**	5
Higher tier (birds): Based on RUD and PT refinement. Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 00 - 79	Small insectivorous bird "warbler"	Acute	10.54	**1.9**	10
BBCH 71 - 79	Frugivorous bird "blackcap"	Acute	1.64	12	10
BBCH 00 - 79	Small insectivorous bird "warbler"	Long-term	1.58	**1.83**	5
BBCH 71 - 79	Frugivorous bird "blackcap"	Long-term	0.61	**4.72**	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	39.31	**1.63**	10
All	Small herbivorous mammal	Long-term	11.02	**0.09**	5
Tier 1 (Mammals)					
BBCH 10 - 19	Small insectivorous mammal “shrew”	Acute	3,65	17,54	10
BBCH 10 - 19	Small herbivorous mammal “vole”	Acute	39,31	**1,63**	10
BBCH 10 - 19	Small omnivorous mammal “mouse”	Acute	4,94	12,94	10
BBCH 20 - 39	Small herbivorous mammal “vole”	Acute	32,74	**1,96**	10
BBCH 20 - 39	Small omnivorous mammal “mouse”	Acute	4,13	15,50	10
BBCH ≥ 20	Small insectivorous mammal “shrew”	Acute	2,59	24,69	10
BBCH ≥ 40	Small herbivorous mammal “vole”	Acute	19,63	**3,26**	10
BBCH ≥ 40	Small omnivorous mammal “mouse”	Acute	2,50	25,64	10
BBCH 71-79	Frugivorous mammal "dormouse"	Acute	9,312	**6,872**	10
BBCH 10 - 19	Small insectivorous mammal “shrew”	Long-term	1.14	**0.9**	5
BBCH 10 - 19	Small herbivorous mammal "vole	Long-term	11.02	**0.1**	5
BBCH 10 - 19	Small omnivorous mammal “mouse”	Long-term	1.19	**0.8**	5
BBCH 20 - 39	Small herbivorous mammal "vole	Long-term	9.16	**0.1**	5
BBCH 20 - 39	Small omnivorous mammal “mouse”	Long-term	0.99	**1.0**	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.48	**2.1**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	5.51	**0.2**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.58	**1.7**	5
BBCH 71-79	Frugivorous mammal "dormouse"	Long-term	2.46	**0.4**	5
Higher tier (Mammals): Please, refer to “leafy vegetables, higher tier (birds)” for details on the RUD used in the refined risk assessment.					

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10 - >40	Small herbivorous mammal "vole	Acute	46.49	**1.38**	10
BBCH 71-79	Frugivorous mammal "dormouse"	Acute	40.55	**1.58**	10
BBCH 10 - 19	Small insectivorous mammal “shrew”	Long-term	0.36	**2.78**	5
BBCH 10 - 19	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH 10 - 19	Small omnivorous mammal “mouse”	Long-term	0.17	5.92	5
BBCH 20 - 39	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH 20 - 39	Small omnivorous mammal “mouse”	Long-term	0.17	5.92	5
BBCH ≥ 20	Small insectivorous mammal “shrew”	Long-term	0.36	**2.78**	5
BBCH ≥ 40	Small herbivorous mammal "vole	Long-term	4.88	**0.21**	5
BBCH ≥ 40	Small omnivorous mammal “mouse”	Long-term	0.17	5.92	5
BBCH 71 - 79	Frugivorous mammal "dormouse"	Long-term	0.26	**3.90**	5

Risk from bioaccumulation and food chain behaviour [*indicate when not relevant* i.e *if Log kow≤3]*

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	5.223	**0.55**	5
Earthworm-eating birds (pore water approach)	Long-term	2.66	**1.08**	
Earthworm-eating mammals (dry soil approach)	Long-term	6.37	**0.45**	5
Earthworm-eating mammals (Pore water approach)	Long-term	7.29	**0.14**	5
Fish-eating birds	Long-term			5
Fish-eating mammals	Long-term			5

Higher tier: The refinement proposal includes the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues. When the dry soil approach was considered TER values below the trigger of 5 were still identified for brassicas, cereals and citrus. However, for the pore water approach, TER calculations for all intended uses were above the trigger of 5.

Risk from consumption of contaminated water

Scenarios	**Indicator or focal species**	**Time scale**	**PEC_{dw}xDWR**	**TER**	**Trigger**
Leaf scenario	Birds	acute	-	-	5

Puddle scenario, Screening step

1)Application rate (g a.s./ha)/relevant endpoint <50 (koc<500 L/kg), TER calculation not needed

2)Application rate (g a.s./ha)/relevant endpoint <3000 (koc≥500 L/kg), TER calculation not needed

No drinking water assessment is required for chlorpyrifos as the ratio of effective application rate to toxicological endpoint does not exceed the trigger of 3000. Therefore, a risk to terrestrial vertebrates by the uptake of chlorpyrifos via drinking water is not indicated. Please, refer to Vol 3 B.9 point B.9.2.3 for details.

Puddle scenario	Birds	acute	-	-	10
Puddle scenario	Mammals	acute	-	-	10
Puddle scenario	Birds	Long-term	-	-	5
Puddle scenario	Mammals	Long-term	-	-	5

FORMULATED PRODUCT: PYRINEX 25CS

OSR at 187.5 g a.s./ha x 1

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivorous bird	Acute	29.78	**1.79**	10
All	Small omnivorous bird	Long-term	6.44	**0.45**	5
Tier 1 (Birds)					
BBCH 30-39	Small insectivorous bird “dunnock”	Acute	1,39	28,3	10
BBCH 30-39	Small omnivorous bird “lark”	Acute	1,35	29,1	10
BBCH > 40	Small omnivorous bird “lark”	Acute	1,13	34,9	10
BBCH 30-39	Medium herbivorous/granivorous bird “pigeon”	Acute	0,45	87,2	10
BBCH > 40	Medium herbivorous/granivorous bird “pigeon”	Acute	0,38	104,6	10
30-99	Small insectivorous bird “dunnock”	Long-term	0.27	10.75	5
30-39	Small omnivorous bird “lark”	Long-term	0.33	8.79	5
>40	Small omnivorous bird “lark”	Long-term	0.27	10.75	5
30-39	medium herbivorous/granivorous bird “pigeon”	Long-term	0.11	26.39	5
>40	medium herbivorous/granivorous bird “pigeon”	Long-term	0.09	32.26	5
Higher tier (birds): *No data submitted.*					
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	22.2	2.88	10
All	Small herbivorous mammal	Long-term	4.80	0.20	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Mammals)					
>40	Small omnivorous mammal "mouse"	Acute	0.81	79.3	10
>40	Small herbivorous mammal "vole"	Acute	6.39	10.01	10
All season	Large herbivorous mammal "lagomorph"	Acute	6.58	**9.72**	10
30-39	Small omnivorous mammal "mouse"	Acute	0.98	65.31	10
>40	Small omnivorous mammal "mouse"	Long-term	0.19	5.30	5
>40	Small herbivorous mammal "vole"	Long-term	1.8	**0.56**	5
All season	Large herbivorous mammal "lagomorph"	Long-term	1.42	**0.70**	5
30-39	Small omnivorous mammal "mouse"	Long-term	0.23	**4.38**	5
Higher tier (Mammals): Refinement is based on a number of studies conducted by Dow Agro Sciences to establish the real residues on foliage (please, refer to Vol 1 Level 2 for details). RUD values and DT50 obtained in these studies have been used to refine the risk assessment. Moreover, two field studies have been presented with Pyrinex 25 CS for refinement. The results obtained by [redacted] (2008; CP 10.1.2.2/01) in cabbage indicate that brown hare is the only specie present in brassica fields and no Pyrinex application effects were observed for this species. Moreover, the study of [redacted] (2008; CP 10.1.2.2/02) in a meadow evaluates the effect of Pyrinex on vole population. **The results indicate that no differences in vole population were found between CPF treated and no treated fields. The AR of both studies covers the proposed application rate in the GAP.**					
All season	Hare (lagomorph)	Long-term	0,93	**1,07**	5
>40	Vole	Long-term	2,48	**0,40**	5
30-39	Mouse	Long-term	0,50	**1,98**	5
Risk from bioaccumulation and food chain behaviour					

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	0.407	7.1	5
Earthworm-eating birds (pore water approach)	Long-term	0.47	6.19	5
Earthworm-eating mammals (dry soil approach)	Long-term	0.50	**2.02**	5
Earthworm-eating mammals (pore water approach)	Long-term	0.57	**1.76**	5
Fish-eating birds	Long-term	0.218	13.23	5
Fish-eating mammals	Long-term	0.195	5.12	5
Higher tier : Refinement proposal include the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues.				
Earthworm-eating mammals (dry soil approach)	Long-term	0.074	13.48	5
Earthworm-eating mammals (pore water approach)	Long-term	0.008	125.5	5
Risk from consumption of contaminated water				

<table>
<tr><th>Scenarios</th><th>Indicator or focal species</th><th>Time scale</th><th>PEC_{dw}xDWR</th><th>TER</th><th>Trigger</th></tr>
<tr><td>Leaf scenario</td><td>Birds</td><td>acute</td><td></td><td></td><td>5</td></tr>
<tr><td colspan="6">Puddle scenario, Screening step
1)Application rate (g a.s./ha)/relevant endpoint <50 (koc<500 L/kg), TER calculation not needed
2)Application rate (g a.s./ha)/relevant endpoint <3000 (koc≥500 L/kg), TER calculation not needed

Birds
- 187.5/39.24 = 4.78 <3000 (koc≥500 L/kg), TER calculation not needed
- 187.5/2.88 = 65.1 <3000 (koc≥500 L/kg), TER calculation not needed
Mammals
- 187.5/64 = 3 <3000 (koc≥500 L/kg), TER calculation not needed
- 187.5/1 = 187.5 <3000 (koc≥500 L/kg), TER calculation not needed</td></tr>
<tr><td>Puddle scenario</td><td>Birds</td><td>acute</td><td>-</td><td>-</td><td>10</td></tr>
<tr><td>Puddle scenario</td><td>Mammals</td><td>acute</td><td>-</td><td>-</td><td>10</td></tr>
<tr><td>Puddle scenario</td><td>Birds</td><td>Long-term</td><td>-</td><td>-</td><td>5</td></tr>
<tr><td>Puddle scenario</td><td>Mammals</td><td>Long-term</td><td>-</td><td>-</td><td>5</td></tr>
</table>

FORMULATED PRODUCT: RIMI 101

All intended uses at 200 g a.s./ha x 1 (soil surface application)

<table>
<tr><th>Growth stage</th><th>Indicator or focal species</th><th>Time scale</th><th>DDD (mg/kg bw per day)</th><th>TER</th><th>Trigger</th></tr>
<tr><td colspan="6">Tier 1 (Birds)</td></tr>
<tr><td rowspan="10">Bare soil</td><td rowspan="2">Birds ingesting granules as a source of food</td><td>Acute</td><td>2920</td><td>0.013</td><td>10</td></tr>
<tr><td>Long-Term</td><td>1548</td><td>0.002</td><td>5</td></tr>
<tr><td rowspan="2">Birds ingesting granules with/as grit</td><td>Acute</td><td>Large granules 677
Small granules 40.87</td><td>0.058
1</td><td>10</td></tr>
<tr><td>Long-term</td><td>Large gran. 135
Small gran. 13.53</td><td>0.021
0.213</td><td>5</td></tr>
<tr><td rowspan="2">Birds ingesting granules when seeking seeds as food.</td><td>Acute</td><td>58.46</td><td>0.671</td><td>10</td></tr>
<tr><td>Long-term</td><td>30.98</td><td>0.093</td><td>5</td></tr>
<tr><td rowspan="2">Birds ingesting granules when eating soil-contaminate food</td><td>Acute</td><td>0.057</td><td>688</td><td>10</td></tr>
<tr><td>Long-term</td><td>0.00265</td><td>1089</td><td>5</td></tr>
<tr><td rowspan="2">Birds consuming other food items with residues from granular applications</td><td>Acute</td><td>2.1</td><td>19</td><td>10</td></tr>
<tr><td>Long-term</td><td>0.6</td><td>4.8</td><td>5</td></tr>
<tr><td colspan="6">Higher tier (birds):</td></tr>
<tr><td colspan="6">Tier 1 (Mammals)</td></tr>
<tr><td>Bare soil</td><td>Birds ingesting granules</td><td>Acute</td><td>2060</td><td>0.031</td><td>10</td></tr>
</table>

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
	as a source of food	Long-Term	1091	**0.00092**	5
	Birds ingesting granules when eating soil-contaminate food	Acute	0.0194	3928	10
		Long-term	0.000742	1347	10
	Birds consuming other food items with residues from granular applications	Acute	1.51	42.4	10
		Long-term	0.445	**2.25**	5
Higher tier (Mammals):					

All intended uses at 200 g a.s./ha x 1 (incorporated application)

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Birds)					
Bare soil	Birds ingesting granules as a source of food	Acute	29.2	**1.344**	10
		Long-Term	15.48	**0.186**	5
	Birds ingesting granules with/as grit	Acute	Large granules 17.01 Small granules 0.41	**2.31** 96	10
		Long-term	Large gran. 3.4 Small gran. 0.136	**0.849** 21	5
	Birds ingesting granules when seeking seeds as food.	Acute	1.21	**32**	10
		Long-term	0.64	**4.51**	5
	Birds ingesting granules when eating soil-contaminate food	Acute	0.00057	68842	10
		Long-term	0.000027	108868	5
	Birds consuming other food items with residues from granular applications	Acute	0.021	1869	10
		Long-term	0.006	481	5
Higher tier (birds): Please refer above (soil surface application). For details, please, refer to Vol 1, level 2 point 2.9.					
Tier 2 (birds)					
Bare soil	Birds ingesting granules as a source of food	Acute			10
		Long-Term			5
	Birds ingesting granules with/as grit	Acute	Large granules		10
		Long-term	Large gran.		5
	Birds ingesting granules when seeking seeds as food.	Acute			10
		Long-term			5
Tier 1 (Mammals)					
Bare soil	Birds ingesting granules as a source of food	Acute	20.6	**3.11**	10
		Long-Term	10.92	**0.092**	5
	Birds ingesting granules	Acute	0.000194	329896	10

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
	when eating soil-contaminate food	Long-term	0.00000742	134770	10
	Birds consuming other food items with residues from granular applications	Acute	1.51	42.4	10
		Long-term	0.445	**2.25**	5
Higher tier (Mammals): Please refer above (soil surface application). For details, please, refer to Vol 1, level 2 point 2.9.					
Bare soil	Birds ingesting granules as a source of food	Acute			10
		Long-Term			5
		Long-term	0.147	6.7	5

Risk from bioaccumulation and food chain behaviour-Tier I (incorporated and mechanical applications)

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	0.658	1.52	5
Earthworm-eating birds (pore water approach)	Long-term	0.3768	1.5	5
Earthworm-eating mammals (dry soil approach)	Long-term	0.658	1.52	5
Earthworm-eating mammals (pore water approach)	Long-term	0.6758	1.5	5
Fish-eating birds	Long-term	[1]		5
Fish-eating mammals	Long-term	[1]		5

Higher tier:
[1]Please refer to level 2

Risk from consumption of contaminated water (incorporated and mechanical applications)

Scenarios	**Indicator or focal species**	**Time scale**	**PEC_{dw}xDWR**	**TER**	**Trigger**
Leaf scenario	Birds	acute			5

Puddle scenario, Screening step

1)Application rate (g a.s./ha)/relevant endpoint <50 (koc<500 L/kg), TER calculation not needed

2)Application rate (g a.s./ha)/relevant endpoint <3000 (koc≥500 L/kg), TER calculation not needed

Birds

- 200/39.24 = 12.7 <3000 (koc≥500 L/kg), TER calculation not needed
- 500/2.88 = 173.6 <3000 (koc≥500 L/kg), TER calculation not needed

Mammals

- 500/64 = 7.8 <3000 (koc≥500 L/kg), TER calculation not needed
- 500/1 = 500 <3000 (koc≥500 L/kg), TER calculation not needed

Puddle scenario	Birds	acute	-	-	10
Puddle scenario	Mammals	acute	-	-	10
Puddle scenario	Birds	Long-term	-	-	5
Puddle scenario	Mammals	Long-term	-	-	5

FORMULATED PRODUCT: SAP 25CS

Oilseed rape at 187.5 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Screening Step (Birds)					
All	Small omnivororus bird	Acute	29.77	0.588	10
All	Small omnivororus bird	Long-term	6.44	0.4	5
Tier 1 (Birds)					
BBCH 10-19	Large herbivorous bird 'goose'	Acute	7.31	**2.39**	10
BBCH 10-19	medium herbivorous /granivorous bird 'pigein'	Acute	10.42	**1.68**	10
BBCH 10-19	Small insectivorous bird 'wagtail'	Acute	2.04	**8.56**	10
BBCH 10-29	Small omnivorous bird 'lark'	Acute	4.5	**3.89**	10
BBCH 20 -29	medium herbivorous /granivorous bird 'pigeon'	Acute	0.75	23.33	10
BBCH 20 -29	Small insectivorous bird 'wagtail'	Acute	1.44	12.12	10
BBCH 30-99	Small insectivorous bird “dunnock”	Acute	1.38	12.61	10
BBCH 30-39	Small omnivorous bird “lark”	Acute	1.35	12.96	10
BBCH >40	Small omnivorous bird “lark”	Acute	1.12	15.56	10
BBCH 30-39	Medium herbivorous/granivorous bird “pigeon”	Acute	0.45	38.89	10
BBCH >40	Medium herbivorous/granivorous bird “pigeon”	Acute	0.37	46.67	10
BBCH 10-19	Large herbivorous bird 'goose'	Long-term	1.58	**1.8**	5
BBCH 10-19	medium herbivorous /granivorous bird 'pigein'	Long-term	2.26	**1.3**	5
BBCH 10-19	Small insectivorous bird 'wagtail'	Long-term	0.59	**4.9**	5
BBCH 10-29	Small omnivorous bird 'lark'	Long-term	1.08	**2.7**	5
BBCH 20 -29	medium herbivorous /granivorous bird 'pigeon'	Long-term	0.35	8.3	5
BBCH 20 -29	Small insectivorous bird 'wagtail'	Long-term	0.28	10.4	5
BBCH 30-99	Small insectivorous bird “dunnock”	Long-term	0.27	10.7	5
BBCH 30-39	Small omnivorous bird “lark”	Long-term	0.33	8.8	5
BBCH >40	Small omnivorous bird “lark”	Long-term	0.26	11.07	5
BBCH 30-39	Medium herbivorous/granivorous bird “pigeon”	Long-term	0.11	26.3	5
BBCH >40	Medium herbivorous/granivorous bird “pigeon”	Long-term	0.08	36	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Higher tier (birds): residues refinement					
BBCH 10-19	Large herbivorous bird 'goose'	Acute	7.5	**2.3**	10
BBCH 10-19	medium herbivorous /granivorous bird 'pigeon'	Acute	10.8	**1.6**	10
BBCH 10-19	Small insectivorous bird 'wagtail'	Acute	1	17.3	10
BBCH 10-29	Small omnivorous bird 'lark'	Acute	1.5	11.9	10
BBCH 10-19	Large herbivorous bird 'goose'	Long-term	0.8	**3.8**	5
BBCH 10-19	medium herbivorous /granivorous bird 'pigein'	Long-term	1.1	**2.6**	5
BBCH 10-19	Small insectivorous bird 'wagtail'	Long-term	0.2	14.3	5
BBCH 10-29	Small omnivorous bird 'lark'	Long-term	11.9	**0.2**	5
Screening Step (Mammals)					
All	Small herbivorous mammal	Acute	22.2	2.9	10
All	Small herbivorous mammal	Long-term	4.8	0.21	5
Tier 1 (Mammals)					
BBCH 10 – 19	Small insectivorous mammal ‘shrew’	Acute	1.43	44.9	10
BBCH 10-29	Small omnivorous mammal ‘mouse’	Acute	3.23	19.8	10
BBCH ≥20	Small insectivorous mammal ‘shrew’	Acute	1.01	63.2	10
BBCH 30 – 39	Small omnivorous mammal ‘mouse’	Acute	0.98	65.6	10
BBCH ≥40	Small herbivorous mammal ‘vole’	Acute	3.39	10	10
BBCH ≥40	Small omnivorous mammal ‘mouse’	Acute	0.81	79.4	10
All season	Large herbivorous mammal’lagomorph’	Acute	2.68	**9.7**	10
BBCH 10 – 19	Small insectivorous mammal ‘shrew’	Long-term	0.42	**2.4**	5
BBCH 10-29	Small omnivorous mammal ‘mouse’	Long-term	0.78	**1.3**	5
BBCH ≥20	Small insectivorous mammal ‘shrew’	Long-term	0.19	5.3	5
BBCH 30 – 39	Small omnivorous mammal ‘mouse’	Long-term	0.23	**4.4**	5
BBCH ≥40	Small herbivorous mammal ‘vole’	Long-term	3.39	**0.6**	5
BBCH ≥40	Small omnivorous mammal ‘mouse’	Long-term	0.19	5.3	5
All season	Large herbivorous mammal’lagomorph’	Long-term	3.49	**0.7**	5
Higher tier (Mammals): residues refinement					
All season	Large herbivorous mammal’lagomorph’	Acute	4.4	14.7	10
BBCH 10 – 19	Small insectivorous mammal ‘shrew’	Long-term	0.141	7,14	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
BBCH 10-39	Small omnivorous mammal 'mouse'	Long-term	0.115	8.69	5
BBCH ≥40	Small herbivorous mammal 'vole'	Long-term	0.042	23.8	5
All season	Large herbivorous mammal'lagomorph'	Long-term	0.3	3.33	5

Risk from bioaccumulation and food chain behaviour [*indicate when not relevant* i.e *if Log kow≤3]*

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	1.22	**2.36**	5
Earthworm-eating birds (pore water approach)	Long-term	1.39	**2.06**	5
Earthworm-eating mammals (dry soil approach)	Long-term	1.49	**1.94**	5
Earthworm-eating mammals (pore water approach)	Long-term	1.71	**1.69**	5
Fish-eating birds	Long-term	0.21	10.29	5
Fish-eating mammals	Long-term	0.20	5.2	5

Higher tier : no studies submitted.

Birds: Refinement proposal include the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues.

Mammals: Refinement proposal include the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues.

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	0.183	15.8	5
Earthworm-eating birds (pore water approach)	Long-term	0.02	174.1	5
Earthworm-eating mammals (dry soil approach)	Long-term	0.22	**4.49**	5
Earthworm-eating mammals (pore water approach)	Long-term	0.024	41.84	5

Risk from consumption of contaminated water

Scenarios	**Indicator or focal species**	**Time scale**	**PEC_{dw}xDWR**	**TER**	**Trigger**
Leaf scenario	Birds	acute			5

Puddle scenario, Screening step					
1)Application rate (g a.s./ha)/relevant endpoint <50 (koc<500 L/kg), TER calculation not needed 2)Application rate (g a.s./ha)/relevant endpoint <3000 (koc≥500 L/kg), TER calculation not needed Birds - 187.5/17.5 = 10.7 <3000 (koc≥500 L/kg), TER calculation not needed - 187.5/2.88 = 65.1 <3000 (koc≥500 L/kg), TER calculation not needed Mammals - 187.5/64 = 3 <3000 (koc≥500 L/kg), TER calculation not needed - 187.5/1 = 187.5 <3000 (koc≥500 L/kg), TER calculation not needed					
Puddle scenario	Birds	acute	-	-	10
Puddle scenario	Mammals	acute	-	-	10
Puddle scenario	Birds	Long-term	-	-	5
Puddle scenario	Mammals	Long-term	-	-	5

FORMULATED PRODUCT: Chlorpirifos ethyl 5G

Maize at 500 g a.s./ha [x 1]

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Tier 1 (Birds)					
Bare soil	Birds ingesting granules as a source of food	Acute	na	na	10
		Long-Term	na	na	5
	Birds ingesting granules with/as grit	Acute	Start row 0.609 Mid row 0.252 End row 15.1 Mean 5.33	64.4 155.8 **2.6** **7.4**	10
		Long-term	Start row 0.202 Mid row 0.083 End row 5.001 Mean 1.76	14.3 34.6 **0.6** **1.6**	5
	Birds ingesting granules when seeking seeds as food.	Acute*	Start row 1.76 Mid row 0.74 End row 26.5	22.2 52.8 **1.48**	10
		Long-term	Start row 0.94 Mid row 0.39 End row 14.1	**3.1** 7.3 **0.2**	5
	Birds ingesting granules when eating soil-contaminate food	Acute	0.141	277.3	10
		Long-term	0.0066	434.7	5
	Birds consuming other food items with residues from granular applications	Acute	6.62	5.92	10
		Long-term	1.91	1.51	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger

Higher tier (birds): No studies submitted.

A WoE is presented to refine the risk. It is based on the following:

- The size of the granules. Chlorpyrifos-ethyl 5G granules are < 1mm.
- Agricultural practice. The area of the end of the row represents only around 1%.
- Two mitigation measures:
  - granules can be of the colour blue, that is the less attractive colour to birds
  - incorporation the end of the row granules, reducing the number of granule on top

Granules coloured in blue are assumed to be less attractive to birds which could also reduce the exposure of birds. The data from Avery et al. are not considered reliable for the risk assessment since they are based on 2 species living in North America only. However, the assumption that blue colour diet items are less attractive for birds had already been considered for the risk assessment for birds. In addition, Best 1996 also indicated in its review that blue granules did not seem to be the most consumed granules. Therefore, the potential lower attractivity of blue granules for birds could be also taken into account as an additional parameter.

Therefore, it is possible to conclude no unacceptable risk for birds ingesting granules when seeking seeds as food and birds ingesting granules as a grit based on the weight of evidence indicated above and only if the following mitigation measures are proposed:

- SPe 5 To protect birds mammals the product must be entirely incorporated in the soil; ensure that the product is also fully incorporated at the end of rows.
- SPe 6 To protect birds/wild mammals remove spillages.
- Granules can be of the colour blue, that it is less attractive to birds

Tier 1 (Mammals)

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Bare soil	Birds ingesting granules as a source of food	Acute	na	na	10
		Long-Term	na	na	5
	Birds ingesting granules when eating soil-contaminate food	Acute	0.0485	1320	10
		Long-term	0.001	755	10
	Birds consuming other food items with residues from granular applications	Acute	9.2	**4.26**	10
		Long-term	2.66	**1.1**	5

Higher tier (Mammals): No studies submitted.

Risk from bioaccumulation and food chain behaviour-Tier I

Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	5.444	**0.530**	5
Earthworm-eating birds (pore water approach)	Long-term	0.386	7	5
Earthworm-eating mammals (dry soil approach)	Long-term	6.636	**0.15**	5
Earthworm-eating mammals (pore water approach)	Long-term	0.470	**2**	5
Fish-eating birds	Long-term	0.218	13	5
Fish-eating mammals	Long-term	0.195	5.1	5

Growth stage	Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Higher tier: Birds: Refinement proposal includes the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues and a PT value of 0.8 based on the Appendix VIII (Basis for refinements in Southern zone for the risk assessment on birds and mammals of the use of PPP) of the Draft Working Document on the voluntary work-sharing of the Southern Zone Member States in the re-registration of Plant Protection Products following inclusion of an active substance in Annex I of Council Directive 91/414/EEC (4 December 2013). Mammals: Refinement proposal includes the use of the recommended BCF value of 1.26 (EFSA Journal 2011;9(1):1961) obtained for measured residues and the choice of wood mouse as focal species.					

Risk from bioaccumulation and food chain behaviour- Refinement				
Indicator or focal species	Time scale	DDD (mg/kg bw per day)	TER	Trigger
Earthworm-eating birds (dry soil approach)	Long-term	0.651	**4.432**	5
Earthworm-eating mammals (dry soil approach)	Long-term	0.33	**3.03**	5
Earthworm-eating mammals (pore water approach)	Long-term	0.00044	2272	5

Risk from consumption of contaminated water					
Scenarios	**Indicator or focal species**	**Time scale**	**PEC_{dw}xDWR**	**TER**	**Trigger**
Leaf scenario	Birds	acute			5
Puddle scenario, Screening step 1)Application rate (g a.s./ha)/relevant endpoint <50 (koc<500 L/kg), TER calculation not needed 2)Application rate (g a.s./ha)/relevant endpoint <3000 (koc≥500 L/kg), TER calculation not needed Birds - 500/39.24 = 12.7 <3000 (koc≥500 L/kg), TER calculation not needed - 500/2.88 = 173.6 <3000 (koc≥500 L/kg), TER calculation not needed Mammals - 500/64 = 7.8 <3000 (koc≥500 L/kg), TER calculation not needed - 500/1 = 500 <3000 (koc≥500 L/kg), TER calculation not needed					
Puddle scenario	Birds	acute	-	-	10
Puddle scenario	Mammals	acute	-	-	10
Puddle scenario	Birds	Long-term	-	-	5
Puddle scenario	Mammals	Long-term	-	-	5

Effects on aquatic organisms (Regulation (EU) N° 283/2013, Annex Part A, point 8.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.2

Group	**Test substance**	**Time-scale (Test type)**	**End point**	**Toxicity[1]**	
Laboratory tests					
Fish					
Onchorhynchus mykiis	Chlopyrifos	Acute 96 hr flow-through	Mortality, LC_{50}	25 µg a.s./$L_{(mm)}$	[redacted] 1988. (Study B.9.2.1/01 CA 8.2.1/1)
Onchorhynchus mykiis	Chlopyrifos (Dursban)	Acute 96 hr flow-through	Mortality, LC_{50}	8.0 µg a.s./$L_{(nm)}$	[redacted] 1982 (Study B.9.2.1/08 CA 8.2.1/8)
Pimephales promelas	Chlopyrifos (Dursban)	Acute 96 hr flow-through	Mortality, LC_{50}	203 µg a.s./$L_{(nm)}$	
Pimephales promelas	Chlorpyrifos Dursban 10CS	Acute 96 hr flow-through	Mortality, LC_{50}	140 µg a.s./$L_{(nm)}$ 120 µg a.s./$L_{(nm)}$	[redacted] 1982 (Study B.9.2.1/10 CA 8.2.1/10)
Lepomis macrochirus	TCP	Static, 96 h	Mortality, LC_{50}	12500 µg a.s./$L_{(mm)}$	[redacted] 1991b (B-9 CA Study 9.2.1/03)
Oncorhynchus mykiss	TCP	Static, 96 h	Mortality, LC_{50}	12600 µg a.s./$L_{(nom)}$	[redacted] 1991a (B-9 CA Study 9.2.1/04)
Menidia menidia	TCP	Flow-Through, 96 h	Mortality, LC_{50}	58500 µg TCP/L	[redacted] (B-9 CA Study 9.2.1/05)
Minnow pimephales promelas	3,6-DCP	Static, 96 h	Mortality, LC50	> 15000µg/$L_{(nom)}$)	[redacted] 2015 (B-9 CA Study 9.2.1/06)
Oncorhynchus mykiss	TMP	Static, 96 h	Mortality NOEC	756 µg a.i./L	[redacted] 2010a (B-9 CA Study B.9.2.1/07)
Menidia beryllina	Chlorpyrifos	early life-stage 28 d,	Mortality NOEC	0.75 µg a.s./$L_{(mm)}$	[redacted] 1985 (B-9 CA Study 9.2.2.1/04)
Menidia peninsulae			Mortality NOEC	0.38 µg a.s./$L_{(mm)}$	

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]	
Laboratory tests					
Leuresthes teniues	Chlorpyrifos	early life-stage, flow-through, 35 d,	Mortality NOEC	0.14 µg a.s./$L_{(mm)}$	[redacted] 1985 (B-9 CA Study 9.2.2.1/05)
Pimephales promelas	Chlorpyrifos Dursban CR	early life-stage, flow-through,32 d,	Mortality NOEC	1.6 µg a.s./$L_{(mm)}$ 2.2 µg a.s./$L_{(mm)}$	[redacted] 1982 (B-9 CA Study 9.2.2.1/01
Pimephales promelas	Chlorpyrifos technical	full life cycle, flow-through, 32 d,	Mortality NOEC	0.568 µg a.s./$L_{(mm)}$	[redacted] 1993 (B-9 CA Study 9.2.2.2/01)
Tilapia mossambica	Chlorpyrifos 20 EC (Coroban)		growth, survival or reproduction NOEC	5 µg/l	[redacted] 1986 (KCA 8.2.2.2)
Oncorhynchus mykiss	TCP	early life-stages, flow-through, 31 d,	Weight, Length, days to mean hatch	80.8 µg TCP/$L_{(nom)}$	[redacted] 1999 (B-9 CA Study 9.2.2.1/08)
Pimephales promelas	3,6-DCP	early life-stages, flow-through, 34 d,	Hatchability, Survival Growth NOEC	< 10000 µg/l	[redacted] 2016 (B-9 CA Study 9.2.2.1/09)
Pimephales promelas	TMP	early life-stages, flow-through, 34 d,	Lenght NOEC	400 µg/l	[redacted] 2017 (B-9 CA Study 9.2.2.1/10)
Aquatic invertebrates					
Daphnia magna	Chlorpyrifos 5G	48 h (semi-static)	Mortality, LC_{50}	29.7 µg prep./L (1.49 µg a.s./$L_{(nm)}$)	Borrmann K. 2009 (B-9 CA Study 9.3.1/01)
Daphnia magna	Chlopyrifos	48 h (static)	Mortality, LC_{50}	0.17 µg a.s./$L_{(nm)}$	McCarty, 1977 (B-9 CA study 9.2.4.1/01)
Daphnia magna	Chlopyrifos	48 h (flow-through)	Mortality, LC_{50}	0.10 µg a.s./$L_{(nm)}$	Burgess, 1988a (B.9 CA study 9.2.4.1/02)

Group	**Test substance**	**Time-scale (Test type)**	**End point**	**Toxicity**[1]	
Laboratory tests					
Daphnia magna	Dursban 5G	48 h (flow-through)	Mortality, LC_{50}	0.26 µg a.s./$L_{((mm)}$	Bell et al., 1995(CP 10.2.2)
Hyalella azteca	Chlopyrifos	96 h (semi-static)	LC50	0.138 µg a.s./$L_{(mm)}$	Brown etal 1997 (B-9 CA Study 9.2.4.2/06)
Mysidopsis bahia	Chlopyrifos	35 d (flow-through)	Mortality, NOEC	0.046 µg a.s./$L_{(mm)}$	Sved, 1993 (B-9 CA Study 9.2.5.3/01)
Daphnia magna	TCP	48 h (static)	Mortality,EC_{50}	10400 µg TCP/$L_{(mm)}$	Gorinsky et al., 1991c (B-9. CA Sutdy 9.2.4.1/06)
Daphnia magna	TMP	48 h (static)	Mortality, EC_{50}	4000 µg TMP/$L_{(nom)}$	Hamitou, 2010b (B-9 CA Study B.9.2.4.1/07)
Daphnia magna	TMP	Static, 48 h	Mortality, EC_{50}	>3450 µg TMP/$L_{(mm)}$	Kosak and Härtel (B-9 CA Study B.9.2.4.1/08)
Daphnia magna	3,6-DCP	48 h (static)	Mortality, EC_{50}	39000 µg/$L_{(mm)}$	Hoberg, 2015 (B-9 CA Study B.9.2.4.1/09)
Daphnia magna	Desethyl-chlorpyrifos	Static, 48 h	EC_{50}	1560 µg desethyl-chlorpyrifos/$L_{(nm)}$	Kuhl and Emnet, 2015 (B-9 CA Study 9.2.4.1/10)
Daphnia magna	TCP	semi-static, 21 d,	Reproduction, NOEC	29 µg /$L_{(mm)}$	Machado, 2003 (B-9 CA Study 9.2.5.1/01)
Daphnia magna	3,6-DCP	semi-static, 21 d	Reproduction,Length, NOEC	1500 µg /$L_{(mm)}$	Dinehart, S, 2016 (B-9 CA Study 9.2.5.1/04)
Daphnia magna	TMP	semi-static, 21 d	Reproduction, Weight NOEC	420 µg /$L_{(mm)}$	Goudie, O 2016 (B-9 CA Study 9.2.5.1/05)

Group	**Test substance**	**Time-scale (Test type)**	**End point**	**Toxicity[1]**	
Laboratory tests					
Sediment-dwelling organisms					
Chironomus riparius	3,6-DCP	28 d (static)	NOEC	33000 µg/L(nom)	Putt, 2005 (B-9 CA Study B.9.2.4.5.3/01)
Algae					
Scenedesmus subcapitata	Chlorpyrifos (Dursban F tech.)	96 h	E_bC_{50}	480 µg/L(mm)	Douglas et al., 1990 (B-9 CA Study B.9.2.6.1/01)
Selenastrum capricornutum	Dursban 5G	Static, 72 h	E_bC_{50} E_rC_{50}	460 µg/L(mm) > 540 µg/L(mm)	Bell et al., 1995 (B-9 CA Study B.9.2.6.1/02)
Pseudokirchneriella subcapitata	TCP	Static, 72	E_bC_{50} E_rC_{50}	610 µg /L (mm) 1110 µg /L (mm)	Kirk et al., 1999 (B-9 CA Study B.9.2.6.1/03)
Pseudokirchneriella subcapitata	TMP	Static, 72 h	E_yC_{50} E_yC_{10} E_rC_{50}	1400 µg/L(mm) 760 µg/L(mm) 3300 µg/L(mm)	Biester 2010 B-9 CA Study B.9.2.6.1/04)
Pseudokirchneriella subcapitata	TMP	Static 72-hour	E_yC_{50} E_rC_{50}	59 µg/L(mm) 2250 µg/L(mm)	Kosak and Härtel 2015 B-9 CA Study B.9.2.6.1/05)
Pseudokirchneriella subcapitata	Desethyl-Chlorpyrifos-methyl	Static, 72 h	E_yC_{50} E_rC_{50}	1950 µg/L(mm) 44100 µg/L(mm)	Kuhl. and Emnet, 2015 (B-9 CA Study B.9.2.6.1/06)
Anabaena flos-aquae	TCP	Static 120 h,	E_bC_{50}	1380 µg/L(mm)	Kirck et al., 2000 (B-9 CA Study B.9.2.6.2/01)
Navicula pelliculosa	TCP	Static, 72 h	E_rC_{50}	8900 µg/L(mm)	Sayers, 2003 (B-9 CA Study B.9.2.6.2/02)
Navicula pelliculosa	3,6-DCP	Static, 72 h	E_yC_{50} E_rC_{50}	9300 µg/L(mm) 12000 µg/L(mm)	Hoberg, 2006 (B-9 CA Study B.9.2.6.2/03)

<table>
<tr><th>Group</th><th>Test substance</th><th>Time-scale (Test type)</th><th>End point</th><th>Toxicity[1]</th><th></th></tr>
<tr><td colspan="6">Laboratory tests</td></tr>
<tr><td colspan="5">Plant</td><td></td></tr>
<tr><td>Lemna gibba</td><td>TCP</td><td>14 d, Static</td><td>EC_{50}</td><td>8750 µg/L(mm)</td><td>Kirk et al., 2000 (B-9 CA Study B.9.2.6.7/01)</td></tr>
<tr><td colspan="6">Microcosm / Mesocosm studies</td></tr>
<tr><td colspan="5">Further testing on aquatic organisms
For the current renewal of inclusion of Chlorpyrifos, the mesocosm data-set previously evaluated during Annex I inclusion together with new mesocosm studies have been (re)-evaluated according to the new EFSA Aquatic Guidance Document (EFSA PPR Panel, 2013; EFSA Journal 2013;11(7):3290).

A total of six different cosm studies were re-evaluated: Giddings JM. (1993), van den Brink et al. (1996), van Wingaarden (2002), Lopez-Mancisidor et al. (2008a), Lopez-Mancisidor et al. (2008b) and Daam et al. (2008).

The Minimum Detectable Differences in abundance data (MDDabu) values obtained in each mesocosm study were used to select the most reliable Effect Class and to derive the Regulatory Acceptable Concentration (RAC) on the bases of both the Ecological Threshold Option (ETO-RAC) and the Ecological Recovery Option (ERO-RAC)

From the six studies evaluated, only four of them :Giddings (1993), Van den Brink et al. (1996), Lopez-Mancisidor et al. (2008b) and Daam et al. (2008a) comply with the criteria (at least 8 taxa of potentially sensitive taxonomic groups with MDDabu values <100%) proposed by Brock et al. (2015). The other two studies were also used by RMS as supporting information

Adequate numbers of individuals of Cladocera, Copepoda, Ephemoroptera and Amphipoda have been found with enough statistical power to detect statistical significant adverse effects on taxa from these groups. They are the most sensitive taxonomic groups based on the evaluation of tier 1 studies

Adequate numbers of individuals of Cladocera, Copepoda, Ephemoroptera and Amphipoda have been found with enough statistical power to detect statistical significant adverse effects on taxa from these groups. They are the most sensitive taxonomic groups based on the evaluation of tier 1 studies.

The lowest NOECs obtained for the most sensitive species after the evaluation of the micro/mesocosm studies were selected by RMS to derive the Regulatory Acceptable Concentration (RAC)

The evaluation of the mesocosm data-set provides information on effects of chlorpyrifos products in the most sensitive species (including vulnerable species with long life cycle) which can be considered reliables by assessment of MDDabu values. The micro/mesocosm evaluated were conducted at different climatic conditions (including Mediterranean regions) and under several application patterns (including reapeted applications). Thus, the assignement of Assessment Factor was in accordance to the reliability and representativeness of the information available for understaning the effects of chlorpyrifos on aquatic systems.</td><td>ETO-RAC =0.03 µg/L (based on NOEC = 0.03 µg/L with AF = 1)
ERO-RAC = 0.05 µg/L (based on NOEC = 0.1 µg/L with AF = 2)</td></tr>
</table>

Group	Test substance	Time-scale (Test type)	End point	Toxicity[1]	
Laboratory tests					
Potential endocrine disrupting properties (Annex Part A, point 8.2.3) *[list evidence/indication on the potential for endocrine disrupting properties]*				Non specific effects observed associated to ED MoA	

Bioconcentration in fish (Annex Part A, point 8.2.2.3)

	Active substance	TCP	TMP	
$\log P_{O/W}$	4.7 -5.2	1.35-2.84	4.33-4.53	
Steady-state bioconcentration factor (BCF) (total wet weight/normalised to 5% lipid content)	Not estimated			
Uptake/depuration kinetics BCF (total wet weight)	1374± 136			
Annex VI Trigger for the bioconcentration factor	2000			
Clearance time (days) (CT_{50})	1.4 - 2.6			
(CT_{90})				
Level and nature of residues (%) in organisms after the 14 day depuration phase				
Higher tier study				
No submitted				

* based on total ^{14}C or on specific compounds

Toxicity/exposure ratios for the most sensitive aquatic organisms (Regulation (EU) N° 284/2013, Annex Part A, point 10.2)

PPP: EF-1551

$FOCUS_{sw}$ step 1-4 - TERs for formulated product EF-1551

$FOCUS_{sw}$ step 3-4 - TERs for chlorpyrifos – Citrus, spring application -

Citrus, spring appl.	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	70.640	**0.01**	**0.00**	**0.67**	**0.00**	**0.00**
R4_Stream	53.920	**0.01**	**0.00**	**0.87**	**0.00**	**0.00**

Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.328	1.78	**0.20**	143	**0.09**	**0.15**
R4_Stream	1.080	**0.54**	**0.06**	44	**0.03**	**0.05**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Citrus. summer application -

Citrus. summer appl.	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	70.660	**0.01**	**0.00**	**0.67**	**0.00**	**0.00**
R4_Stream	53.990	**0.01**	**0.00**	**0.87**	**0.00**	**0.00**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.328	1.78	**0.20**	143	**0.09**	**0.15**
R4_Stream	0.633	**0.92**	**0.10**	74	**0.05**	**0.08**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Pome/Stone fruit. early application -

Pome/Stone fruit. Early applic.	**PEC global max (µg L)**	**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	37.140	**0.02**	**0.00**	1.27	**0.00**	**0.00**
D4_Pond	2.256	**0.26**	**0.03**	20.83	**0.01**	**0.02**
D4_Stream	35.120	**0.02**	**0.00**	1.34	**0.00**	**0.00**
D5_Pond	2.256	**0.26**	**0.03**	20.83	**0.01**	**0.02**
D5_Stream	36.840	**0.02**	**0.00**	1.28	**0.00**	**0.00**
R1_Pond	2.256	**0.26**	**0.03**	20.83	**0.01**	**0.02**
R1_Stream	30.030	**0.02**	**0.00**	1.57	**0.00**	**0.00**
R2_Stream	39.790	**0.01**	**0.00**	1.18	**0.00**	**0.00**
R3_Stream	42.500	**0.01**	**0.00**	1.11	**0.00**	**0.00**
R4_Stream	30.040	**0.02**	**0.00**	1.56	**0.00**	**0.00**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	0.205	2.86	**0.32**	230	**0.15**	**0.24**
D4_Pond	0.023	26.00	2.89	2089	1.33	2.22
D4_Stream	0.211	2.77	**0.31**	222	**0.14**	**0.24**
D5_Pond	0.023	25.99	2.89	2088	1.33	2.22
D5_Stream	0.222	2.64	**0.29**	212	**0.14**	**0.23**
R1_Pond	0.023	26.00	2.89	2089	1.33	2.22
R1_Stream	0.181	3.24	**0.36**	260	**0.17**	**0.28**
R2_Stream	0.240	2.44	**0.27**	196	**0.13**	**0.21**
R3_Stream	0.256	2.29	**0.25**	184	**0.12**	**0.20**
R4_Stream	0.181	3.23	**0.36**	260	**0.17**	**0.28**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Pome/Stone fruit. mid-season application -

Pome/Stone fruit. Mid-season applic.	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	17.540	**0.03**	**0.00**	2.68	**0.00**	**0.00**
D4_Pond	0.786	**0.74**	**0.08**	59.77	**0.04**	**0.06**
D4_Stream	16.890	**0.03**	**0.00**	2.78	**0.00**	**0.00**
D5_Pond	0.787	**0.74**	**0.08**	59.74	**0.04**	**0.06**
D5_Stream	19.020	**0.03**	**0.00**	2.47	**0.00**	**0.00**
R1_Pond	0.786	**0.74**	**0.08**	59.79	**0.04**	**0.06**
R1_Stream	13.470	**0.04**	**0.00**	3.49	**0.00**	**0.00**
R2_Stream	18.050	**0.03**	**0.00**	2.60	**0.00**	**0.00**
R3_Stream	18.890	**0.03**	**0.00**	2.49	**0.00**	**0.00**
R4_Stream	13.190	**0.04**	**0.00**	3.56	**0.00**	**0.00**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	0.082	7.17	**0.80**	576	**0.37**	**0.61**
D4_Pond	0.011	51.77	5.75	4159	2.65	4.42
D4_Stream	0.091	6.46	**0.72**	519	**0.33**	**0.55**
D5_Pond	0.011	51.72	5.75	4156	2.65	4.42
D5_Stream	0.102	5.74	**0.64**	461	**0.29**	**0.49**
R1_Pond	0.011	51.72	5.75	4156	2.65	4.42
R1_Stream	0.072	8.10	**0.90**	650	**0.42**	**0.69**
R2_Stream	0.097	6.04	**0.67**	485	**0.31**	**0.52**
R3_Stream	0.101	5.77	**0.64**	464	**0.30**	**0.49**
R4_Stream	0.071	8.27	**0.92**	664	**0.42**	**0.71**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Pome/Stone fruit. late application -

Pome/Stone fruit. Latae applic.	**PEC global max (µg L)**	**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	17.580	**0.03**	**0.00**	2.67	**0.00**	**0.00**
D4_Pond	0.786	**0.74**	**0.08**	59.77	**0.04**	**0.06**
D4_Stream	16.990	**0.03**	**0.00**	2.77	**0.00**	**0.00**
D5_Pond	0.787	**0.74**	**0.08**	59.74	**0.04**	**0.06**
D5_Stream	19.030	**0.03**	**0.00**	2.47	**0.00**	**0.00**
R1_Pond	0.786	**0.74**	**0.08**	59.78	**0.04**	**0.06**
R1_Stream	13.490	**0.04**	**0.00**	3.48	**0.00**	**0.00**
R2_Stream	18.090	**0.03**	**0.00**	2.60	**0.00**	**0.00**
R3_Stream	19.020	**0.03**	**0.00**	2.47	**0.00**	**0.00**
R4_Stream	13.490	**0.04**	**0.00**	3.48	**0.00**	**0.00**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	0.082	7.15	**0.79**	575	**0.37**	**0.61**
D4_Pond	0.011	51.77	5.75	4159	2.65	4.42
D4_Stream	0.091	6.42	**0.71**	516	**0.33**	**0.55**
D5_Pond	0.011	51.72	5.75	4156	2.65	4.42
D5_Stream	0.102	5.73	**0.64**	460	**0.29**	**0.49**
R1_Pond	0.011	51.68	5.74	4152	2.65	4.42
R1_Stream	0.072	8.08	**0.90**	649	**0.41**	**0.69**
R2_Stream	0.097	6.03	**0.67**	484	**0.31**	**0.52**
R3_Stream	0.114	5.15	**0.57**	413	**0.26**	**0.44**
R4_Stream	0.072	8.08	**0.90**	650	**0.41**	**0.69**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Vines. early application -

Vines. Early applic.	**PEC global max (µg L)**	**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	2.671	**0.22**	**0.02**	17.60	**0.01**	**0.02**
R1_Pond	0.092	**6.35**	**0.71**	510.54	**0.33**	**0.54**
R1_Stream	1.968	**0.30**	**0.03**	23.88	**0.02**	**0.03**
R2_Stream	2.610	**0.22**	**0.02**	18.01	**0.01**	**0.02**
R3_Stream	2.785	**0.21**	**0.02**	16.88	**0.01**	**0.02**
R4_Stream	1.968	**0.30**	**0.03**	23.88	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.009	62.46	6.94	5018	3.20	5.34
R1_Pond	0.002	383.10	42.57	30779	19.65	32.74
R1_Stream	0.092	6.37	**0.71**	512	**0.33**	**0.54**
R2_Stream	0.066	8.80	**0.98**	707	**0.45**	**0.75**
R3_Stream	0.222	2.64	**0.29**	212	**0.14**	**0.23**
R4_Stream	0.178	3.29	**0.37**	264	**0.17**	**0.28**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Vines. mid-season application -

Vines. Mid-season applic.	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1**
FOCUS Step 3						
D6_Dich	8.205	**0.07**	**0.01**	5.73	**0.00**	**0.01**
R1_Pond	0.292	2.01	**0.22**	161.12	**0.10**	**0.17**
R1_Stream	6.003	**0.10**	**0.01**	7.83	**0.00**	**0.01**
R2_Stream	8.038	**0.07**	**0.01**	5.85	**0.00**	**0.01**
R3_Stream	8.394	**0.07**	**0.01**	5.60	**0.00**	**0.01**
R4_Stream	5.902	**0.10**	**0.01**	7.96	**0.01**	**0.01**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.031	18.68	2.08	1501	**0.96**	1.60
R1_Pond	0.005	125.43	13.94	10077	6.43	10.72
R1_Stream	0.084	6.98	**0.78**	561	**0.36**	0.60
R2_Stream	0.037	15.83	1.76	1272	**0.81**	1.35
R3_Stream	0.039	15.16	1.68	1218	**0.78**	1.30
R4_Stream	0.033	17.68	1.96	1421	**0.91**	1.51
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Vines. late application -

Vines. Late applic.	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	8.205	**0.07**	**0.01**	5.73	**0.00**	**0.01**
R1_Pond	0.292	2.00	**0.22**	161.07	**0.10**	**0.17**
R1_Stream	6.018	**0.10**	**0.01**	7.81	**0.00**	**0.01**
R2_Stream	8.067	**0.07**	**0.01**	5.83	**0.00**	**0.01**
R3_Stream	8.483	**0.07**	**0.01**	5.54	**0.00**	**0.01**
R4_Stream	6.017	**0.10**	**0.01**	7.81	**0.00**	**0.01**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.063	9.28	1.03	745	**0.48**	**0.79**
R1_Pond	0.005	125.03	13.89	10045	6.41	10.69
R1_Stream	0.048	12.19	1.35	979	**0.63**	1.04
R2_Stream	0.037	15.77	1.75	1267	**0.81**	1.35
R3_Stream	0.075	7.76	**0.86**	624	**0.40**	**0.66**
R4_Stream	0.080	7.27	**0.81**	584	**0.37**	**0.62**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Leafy vegetable. Early applic. 1[st] crop -

Leafy vegetable. Early applic. 1[st] crop	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	3.030	**0.19**	**0.02**	15.51	**0.01**	**0.02**
D4_Pond	0.104	5.60	**0.62**	450.19	**0.29**	**0.48**
D4_Stream	2.375	**0.25**	**0.03**	19.79	**0.01**	**0.02**
D6_Dich	2.965	**0.20**	**0.02**	15.85	**0.01**	**0.02**
R1_Pond	0.106	5.52	**0.61**	443.40	**0.28**	**0.47**
R1_Stream	1.997	**0.29**	**0.03**	23.54	**0.02**	**0.03**
R2_Stream	2.619	**0.22**	**0.02**	17.95	**0.01**	**0.02**
R3_Stream	2.806	**0.21**	**0.02**	16.75	**0.01**	**0.02**
R4_Stream	1.994	**0.29**	**0.03**	23.57	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	0.011	51.14	5.68	4108	2.62	4.37
D4_Pond	0.004	161.47	17.94	12973	8.28	13.80
D4_Stream	0.025	23.75	2.64	1908	**1.22**	2.03
D6_Dich	0.127	4.59	0.51	369	**0.24**	**0.39**
R1_Pond	0.019	31.37	3.49	2520	**1.61**	2.68
R1_Stream	0.175	3.34	**0.37**	268	**0.17**	**0.29**
R2_Stream	0.064	9.12	1.01	732	**0.47**	**0.78**
R3_Stream	0.293	2.00	**0.22**	160	**0.10**	**0.17**
R4_Stream	0.291	2.01	**0.22**	162	**0.10**	**0.17**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Leafy vegetable. Early applic. 2nd crop -

Leafy vegetable. Early applic. 2nd crop	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	3.034	**0.19**	**0.02**	15.49	**0.01**	**0.02**
R1_Pond	0.114	5.13	**0.57**	412.28	**0.26**	**0.44**
R1_Stream	2.004	**0.29**	**0.03**	23.45	**0.01**	**0.02**
R2_Stream	2.686	**0.22**	**0.02**	17.50	**0.01**	**0.02**
R3_Stream	2.816	**0.21**	**0.02**	16.69	**0.01**	**0.02**
R4_Stream	1.985	**0.29**	**0.03**	23.68	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.011	51.09	5.68	4105	2.62	4.37
R1_Pond	0.023	25.37	2.82	2038	**1.30**	2.17
R1_Stream	0.089	6.55	**0.73**	526	**0.34**	**0.56**
R2_Stream	0.017	34.47	3.83	2770	**1.77**	2.95
R3_Stream	0.190	3.08	**0.34**	248	**0.16**	**0.26**
R4_Stream	0.369	1.59	**0.18**	127	**0.08**	**0.14**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Leafy vegetable. Late applic. 1st crop -

Leafy vegetable. Late applic. 1st crop	**PEC global max (µg L)**	**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	3.032	**0.19**	**0.02**	15.50	**0.01**	**0.02**
D4_Pond	0.104	5.61	**0.62**	450.62	**0.29**	**0.48**
D4_Stream	2.159	**0.27**	**0.03**	21.77	**0.01**	**0.02**
D6_Dich	3.018	**0.19**	**0.02**	15.57	**0.01**	**0.02**
R1_Pond	0.167	3.50	**0.39**	281.44	**0.18**	**0.30**
R1_Stream	2.004	**0.29**	**0.03**	23.45	**0.01**	**0.02**
R2_Stream	2.686	**0.22**	**0.02**	17.50	**0.01**	**0.02**
R3_Stream	2.821	**0.21**	**0.02**	16.66	**0.01**	**0.02**
R4_Stream	1.959	**0.30**	**0.03**	23.99	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	0.011	51.14	5.68	4108	2.62	4.37
D4_Pond	0.002	268.72	29.86	21589	13.78	22.97
D4_Stream	0.011	54.57	6.06	4384	2.80	4.66
D6_Dich	0.623	0.94	**0.10**	75	**0.05**	**0.08**
R1_Pond	0.023	25.11	2.79	2017	1.29	2.15
R1_Stream	0.117	5.01	**0.56**	402	**0.26**	**0.43**
R2_Stream	0.034	17.09	1.90	1373	**0.88**	1.46
R3_Stream	0.145	4.04	**0.45**	325	**0.21**	**0.35**
R4_Stream	0.169	3.47	**0.39**	279	**0.18**	**0.30**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Leafy vegetable. Late applic. 2nd crop -

Leafy vegetable. Late applic. 2nd crop	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Dich	3.016	**0.19**	**0.02**	15.58	**0.01**	**0.02**
R1_Pond	0.111	5.29	**0.59**	425.34	**0.27**	**0.45**
R1_Stream	2.004	**0.29**	**0.03**	23.45	**0.01**	**0.02**
R2_Stream	2.655	**0.22**	**0.02**	17.70	**0.01**	**0.02**
R3_Stream	2.813	**0.21**	**0.02**	16.71	**0.01**	**0.02**
R4_Stream	2.003	**0.29**	**0.03**	23.46	**0.01**	**0.02**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Dich	0.011	51.41	5.71	4130	2.64	4.39
R1_Pond	0.082	7.15	**0.79**	575	**0.37**	**0.61**
R1_Stream	0.194	3.02	**0.34**	242	**0.15**	**0.26**
R2_Stream	0.029	20.14	2.24	1618	1.03	1.72
R3_Stream	0.128	4.56	**0.51**	366	**0.23**	**0.39**
R4_Stream	0.171	3.41	**0.38**	274	**0.18**	**0.29**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Winter cereals -

Winter cereals	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D1_Ditch	3.059	**0.19**	**0.02**	15.36	**0.01**	**0.02**
D1_Stream	2.610	**0.22**	**0.02**	18.01	**0.01**	**0.02**
D2_Pond	3.051	**0.19**	**0.02**	15.40	**0.01**	**0.02**
D2_Stream	2.524	**0.23**	**0.03**	18.62	**0.01**	**0.02**
D3_Dich	3.025	**0.19**	**0.02**	15.54	**0.01**	**0.02**
D4_Pond	0.104	5.60	**0.62**	450.19	**0.29**	**0.48**
D4_Stream	2.312	**0.25**	**0.03**	20.33	**0.01**	**0.02**
D5_Pond	0.104	5.60	**0.62**	450.19	**0.29**	**0.48**
D5_Stream	2.392	**0.24**	**0.03**	19.65	**0.01**	**0.02**
D6_Ditch	2.993	**0.20**	**0.02**	15.70	**0.01**	**0.02**
R1_Pond	0.104	5.60	**0.62**	450.19	**0.29**	**0.48**
R1_Stream	2.002	**0.29**	**0.03**	23.48	**0.01**	**0.02**
R3_Stream	2.823	**0.21**	**0.02**	16.65	**0.01**	**0.02**
R4_Stream	1.995	**0.29**	**0.03**	23.56	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D1_Ditch	0.012	50.69	5.63	4073	2.60	4.33
D1_Stream	0.013	45.14	5.02	3627	2.31	3.86
D2_Pond	0.012	50.78	5.64	4080	2.60	4.34
D2_Stream	0.013	46.69	5.19	3751	2.39	3.99
D3_Dich	0.011	51.23	5.69	4116	2.63	4.38
D4_Pond	0.002	268.60	29.84	21579	13.77	22.96
D4_Stream	0.011	50.96	5.66	4094	2.61	4.36
D5_Pond	0.002	265.07	29.45	21296	13.59	22.66
D5_Stream	0.012	49.24	5.47	3956	2.53	4.21
D6_Ditch	0.011	51.82	5.76	4163	2.66	4.43
R1_Pond	0.010	60.92	6.77	4895	3.12	5.21
R1_Stream	0.181	3.24	**0.36**	260	**0.17**	**0.28**
R3_Stream	0.136	4.31	**0.48**	346	**0.22**	**0.37**
R4_Stream	0.109	5.38	**0.60**	432	**0.28**	**0.46**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded

PPP: PIRINEX 250 CS

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Oilseed Rape, spring application -

Oilseed Rape spring		Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
	PEC global max (µg L)	**Geomean LC_{50} (n=4)**	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D1_Dich	1.197	**0.49**	**0.05**	39	**0.03**	**0.04**
D1_Stream	1.046	**0.56**	**0.06**	45	**0.03**	**0.05**
D3_Dich	1.183	**0.49**	**0.05**	40	**0.03**	**0.04**
D4_Pond	0.041	14.35	1.59	1153	**0.74**	**1.23**
D4_Stream	0.969	**0.60**	**0.07**	49	**0.03**	**0.05**
D5_Pond	0.041	14.35	1.59	1153	**0.74**	**1.23**
D5_Stream	0.939	**0.62**	**0.07**	50	**0.03**	**0.05**
R1_Pond	0.041	14.26	1.58	1146	**0.73**	**1.22**
R1_Stream	0.779	**0.75**	**0.08**	60	**0.04**	**0.06**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D1_Dich	0.004	136	15	10948	6.99	11.65
D1_Stream	0.005	113	13	9056	5.78	9.63
D3_Dich	0.004	138	15	11074	7.07	11.78
D4_Pond	0.001	657	73	52750	33.67	56.12
D4_Stream	0.005	122	14	9781	6.24	10.41
D5_Pond	0.001	653	73	52455	33.48	55.80
D5_Stream	0.005	126	14	10097	6.44	10.74
R1_Pond	0.005	129	14	10384	6.63	11.05
R1_Stream	0.058	10	1	811	**0.52**	**0.86**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Oilseed Rape. summer application -

Oilseed Rape summer		Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
	PEC global max (µg L)	Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D1_Dich	1.192	**0.49**	**0.05**	39	**0.03**	**0.04**
D1_Stream	0.991	**0.59**	**0.07**	47	**0.03**	**0.05**
D3_Dich	1.180	**0.50**	**0.06**	40	**0.03**	**0.04**
D4_Pond	0.041	14.36	1.60	1153	**0.74**	1.23
D4_Stream	0.882	**0.66**	**0.07**	53	**0.03**	**0.06**
D5_Pond	0.041	14.35	1.59	1153	**0.74**	1.23
D5_Stream	0.943	**0.62**	**0.07**	50	**0.03**	**0.05**
R1_Pond	0.041	14.35	1.59	1153	**0.74**	1.23
R1_Stream	0.777	**0.75**	**0.08**	60	**0.04**	**0.06**
R3_Stream	1.102	**0.53**	**0.06**	43	**0.03**	**0.05**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D1_Dich	0.004	137	15	10992	7.02	11.69
D1_Stream	0.005	119	13	9561	6.10	10.17
D3_Dich	0.004	138	15	11106	7.09	11.81
D4_Pond	0.001	657	73	52809	33.71	56.18
D4_Stream	0.004	134	15	10743	6.86	11.43
D5_Pond	0.001	652	72	52397	33.44	55.74
D5_Stream	0.005	125	14	10045	6.41	10.69
R1_Pond	0.002	277	31	22275	14.22	23.70
R1_Stream	0.022	26	3	2100	1.34	2.23
R3_Stream	0.035	17	2	1362	**0.87**	1.45
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

PPP: RIMI 101

FOCUS$_{sw}$ step 3 - TERs for chlorpyrifos – Maize -

Maize	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	1.0E-06	585000	65000	47000000	30000	50000
D4_Pond	3.7E-05	15811	1757	1270270	330	549
D4_Stream	3.7E-04	1581	176	127027	33	56
D5_Pond	1.1E-05	53182	5909	4272727	1154	1923
D5_Stream	1.7E-04	3362	374	270115	75	125
D6_Ditch	1.4E-04	4301	478	345588	81	135
R1_Pond	1.0E-06	585000	65000	47000000	30000	50000
R1_Stream	1.0E-06	585000	65000	47000000	30000	50000
R2_Stream	1.0E-06	585000	65000	47000000	30000	50000
R3_Stream	1.0E-06	585000	65000	47000000	30000	50000
R4_Stream	1.0E-06	585000	65000	47000000	30000	50000
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

FOCUS$_{sw}$ step 3 - TERs for chlorpyrifos – Potato -

Potato	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	1.0E-06	585000	65000	47000000	30000	50000
D4_Pond	1.1E-03	552	61	44340	28	47
D4_Stream	8.3E-04	705	78	56627	36	60
D6_Stream	1.6E-04	3589	399	288344	184	307
D6_Ditch	1.8E-03	321	36	25810	16	27
R1_Pond	1.0E-06	585000	65000	47000000	30000	50000
R1_Stream	1.0E-06	585000	65000	47000000	30000	50000
R2_Stream	1.0E-06	585000	65000	47000000	30000	50000
R3_Stream	1.0E-06	585000	65000	47000000	30000	50000
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Onion -

Onion	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	1.0E-06	585000	65000	47000000	30000	50000
D4_Pond	1.5E-03	380	42	30559	20	33
D4_Stream	1.1E-02	56	6	4472	2.85	4.76
D6 1st_Stream	3.2E-03	182	20	14642	9.35	15.58
D6 2nd_Stream	1.8E-01	3.34	**0.37**	269	**0.17**	**0.29**
R1_Pond	6.9E-02	8.49	**0.94**	682	**0.44**	**0.73**
R1_Stream	7.4E-01	0.79	**0.09**	64	**0.04**	**0.07**
R2_Stream	2.8E-01	2.08	**0.23**	167	**0.11**	**0.18**
R3_Stream	7.7E-01	0.76	**0.08**	61	**0.04**	**0.06**
R4_Stream	1.7E+00	0.35	**0.04**	28	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D3_Dich	1.0E-06	585000	65000	47000000	30000	50000
D4_Pond	1.5E-03	380	42	30559	20	33
D4_Stream	1.1E-02	56	6	4472	2.85	4.76
D6 1st_Stream	3.2E-03	182	20	14642	9.35	15.58
D6 2nd_Stream	1.8E-01	3.34	**0.37**	269	**0.17**	**0.29**
R1_Pond	1.4E-02	42.21	4.69	3391	2.16	3.61
R1_Stream	1.7E-01	3.36	**0.37**	270	**0.17**	**0.29**
R2_Stream	6.5E-02	9.00	1.00	723	**0.46**	**0.77**
R3_Stream	1.8E-01	3.18	**0.35**	255	**0.16**	**0.27**
R4_Stream	4.0E-01	1.46	**0.16**	117	**0.07**	**0.12**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating safe use cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Melon -

Melon	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Stream	0.002	286.34	31.82	23005.38	14.68	24.47
R2_Stream	0.316	1.85	**0.21**	148.78	**0.09**	**0.16**
R3_Stream	1.054	**0.56**	**0.06**	44.59	**0.03**	**0.05**
R4_Stream	1.546	**0.38**	**0.04**	30.40	**0.02**	**0.03**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D6_Stream	-	-	-	-	**-**	**-**
R2_Stream	0.075	7.78	0.86	625	**0.40**	**0.66**
R3_Stream	0.249	2.35	**0.26**	189	**0.12**	**0.20**
R4_Stream	0.368	1.59	**0.18**	128	**0.08**	**0.14**
Endpoint/AF = **RAC**		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating safe use cannot be excluded

FOCUS$_{sw}$ step 3 - TERs for chlorpyrifos – Cotton -

Cotton	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D6_Stream	2.0E-03	288.04	32.00	23141	14.77	24.62
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

PPP: Chlorpyrifos-ethyl 5G

FOCUS$_{sw}$ step 3 - TERs for chlorpyrifos – Maize -

Maize	PEC global max (µg L)	Fish acute	Fish chronic	Algae	Aquatic invertebrates Micro / Mesocosm	
		Geomean LC_{50} (n=4)	Geomean NOEC (n=5)	Geomean EC_{10} (n=2)	NOEC-ETO	NOEC-ERO
Endpoint		**58,5 µg/L**	**0,65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D3_Dich	1.0E-06	585000	65000	47000000	30000	50000
D4_Pond	9.1E-05	6429	714	516484	330	549
D4_Stream	9.0E-04	652	72	52397	33	56
D5_Pond	2.6E-05	22500	2500	1807692	1154	1923
D5_Stream	4.0E-04	1466	163	117794	75	125
D6_Ditch	3.7E-04	1581	176	127027	81	135
R1_Pond	1.0E-06	585000	65000	47000000	30000	50000
R1_Stream	1.0E-06	585000	65000	47000000	30000	50000
R2_Stream	1.0E-06	585000	65000	47000000	30000	50000
R3_Stream	1.0E-06	585000	65000	47000000	30000	50000
R4_Stream	1.0E-06	585000	65000	47000000	30000	50000
Endpoint/AF = RAC		LC_{50}/100 = 0. 585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

PPP: SAP 250 CS

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Oilseed Rape, spring application -

Oilseed Rape spring		**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
	PEC global max (µg L)	**Geomean LC_{50} (n=4)**	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D1_Dich	1.197	**0.49**	**0.05**	39	**0.03**	**0.04**
D1_Stream	1.046	**0.56**	**0.06**	45	**0.03**	**0.05**
D3_Dich	1.183	**0.49**	**0.05**	40	**0.03**	**0.04**
D4_Pond	0.041	14.35	1.59	1153	**0.74**	**1.23**
D4_Stream	0.969	**0.60**	**0.07**	49	**0.03**	**0.05**
D5_Pond	0.041	14.35	1.59	1153	**0.74**	**1.23**
D5_Stream	0.939	**0.62**	**0.07**	50	**0.03**	**0.05**
R1_Pond	0.041	14.26	1.58	1146	**0.73**	**1.22**
R1_Stream	0.779	**0.75**	**0.08**	60	**0.04**	**0.06**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D1_Dich	0.004	136	15	10948	6.99	11.65
D1_Stream	0.005	113	13	9056	5.78	9.63
D3_Dich	0.004	138	15	11074	7.07	11.78
D4_Pond	0.001	657	73	52750	33.67	56.12
D4_Stream	0.005	122	14	9781	6.24	10.41
D5_Pond	0.001	653	73	52455	33.48	55.80
D5_Stream	0.005	126	14	10097	6.44	10.74
R1_Pond	0.005	129	14	10384	6.63	11.05
R1_Stream	0.058	10	1	811	**0.52**	**0.86**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

FOCUS$_{sw}$ step 3-4 - TERs for chlorpyrifos – Oilseed Rape. summer application -

Oilseed Rape summer		**Fish acute**	**Fish chronic**	**Algae**	**Aquatic invertebrates Micro / Mesocosm**	
	PEC global max (µg L)	**Geomean LC_{50} (n=4)**	**Geomean NOEC (n=5)**	**Geomean EC_{10} (n=2)**	**NOEC-ETO**	**NOEC-ERO**
Endpoint		**58.5 µg/L**	**0.65 µg/L**	**470 µg/L**	**0.03 µg/L**	**0.1 µg/L**
FOCUS Step 3						
D1_Dich	1.192	**0.49**	**0.05**	39	**0.03**	**0.04**
D1_Stream	0.991	**0.59**	**0.07**	47	**0.03**	**0.05**
D3_Dich	1.180	**0.50**	**0.06**	40	**0.03**	**0.04**
D4_Pond	0.041	14.36	1.60	1153	**0.74**	1.23
D4_Stream	0.882	**0.66**	**0.07**	53	**0.03**	**0.06**
D5_Pond	0.041	14.35	1.59	1153	**0.74**	1.23
D5_Stream	0.943	**0.62**	**0.07**	50	**0.03**	**0.05**
R1_Pond	0.041	14.35	1.59	1153	**0.74**	1.23
R1_Stream	0.777	**0.75**	**0.08**	60	**0.04**	**0.06**
R3_Stream	1.102	**0.53**	**0.06**	43	**0.03**	**0.05**
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050
FOCUS Step 4						
D1_Dich	0.004	137	15	10992	7.02	11.69
D1_Stream	0.005	119	13	9561	6.10	10.17
D3_Dich	0.004	138	15	11106	7.09	11.81
D4_Pond	0.001	657	73	52809	33.71	56.18
D4_Stream	0.004	134	15	10743	6.86	11.43
D5_Pond	0.001	652	72	52397	33.44	55.74
D5_Stream	0.005	125	14	10045	6.41	10.69
R1_Pond	0.002	277	31	22275	14.22	23.70
R1_Stream	0.022	26	3	2100	1.34	2.23
R3_Stream	0.035	17	2	1362	**0.87**	1.45
Endpoint/AF = RAC		LC_{50}/100 = 0.585	NOEC/10 = 0.065	EC_{10}/10 = 47.0	NOEC/1 = 0.03	NOEC/2 = 0.050

Values below 1 (corresponding to PECs below RAC) are in **bold** indicating risk cannot be excluded.

Effects on bees (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.1 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.1)*

* This section does reflect the new EFSA Guidance Document on bees which has not yet been noted by the Standing Committee on Plants, Animals, Food and Feed.

Species	**Test substance**	**Time scale/type of endpoint**	**End point**	**toxicity**
Apis mellifera	Dursban F (Chlorpyrifos 97.4% purity)	Acute	Oral toxicity (LD_{50})	0.35 µg a.i./bee
Apis mellifera	EF 1042 (DURSBAN 480) (480 g chlorpyrifos/L)	Acute	Oral toxicity (LD_{50})	**0.15 µg a.i./bee**
Apis mellifera	EF 747 (DURSBAN 4) (480 g chlorpyrifos/L)	Acute	Oral toxicity (LD_{50})	0.29 µg/bee
Apis mellifera	Chlorpyrifos 480 EC (480 g chlorpyrifos/L)	Acute	Oral toxicity (LD_{50})	0.336 µg a.i./bee
Apis mellifera	SAP250 CSI (250 g chlorpyrifos-ethyl/L, CS)	Acute	Oral toxicity (LD_{50})	0.25 µg a.i./bee
Apis mellifera	TCP (metabolite)	Acute	Oral toxicity (LD_{50})	80.7 µg a.s./bee
Apis mellifera	Dursban F (Chlorpyrifos 97.4% purity)	Acute	Contact toxicity (LD_{50})	**0.068 µg a.i./bee**
Apis mellifera	EF 1042 (DURSBAN 480) (480 g chlorpyrifos/L)	Acute	Contact toxicity (LD_{50})	0.10 µg a.i./bee
Apis mellifera	EF 747 (DURSBAN 4) (480 g chlorpyrifos/L)	Acute	Contact toxicity (LD_{50})	0.03 L/ha
Apis mellifera	Chlorpyrifos 480 EC (480 g chlorpyrifos/L)	Acute	Contact toxicity (LD_{50})	0.178 µg a.i./bee
Apis mellifera	SAP250 CSI (250 g chlorpyrifos-ethyl/L, CS)	Acute	Contact toxicity (LD_{50})	0.725 µg a.i./bee

Apis mellifera	TCP (metabolite)	Acute	Contact toxicity (LD_{50})	37.9 µg a.s./bee
Apis mellifera	Chlorpyrifos technical (98% w/w chlorpyrifos)	Chronic	10 d-LC50	**0.002 µg a.s./bee/day**
Apis mellifera	Lorsban 4E (480 g chlorpyrifos/L)	Bee brood development	LD_{50} oral larvae	0.051 µg a.i./bee
Apis mellifera	Chlorpyrifos Technical (98% w/w)	Bee brood development	NOED larvae	**0.018 µg a.s./larva**
Apis mellifera	Chlorpyrifos (97.6%)	Bee brood development	LD_{50} oral larvae	0.021 µg a.i./bee
Apis mellifera	Chlorpyrifos technical (98% w/w chlorpyrifos)	Sub-lethal effects (behavioural and reproductive)	NOEC hypopharyngeal glands	**0.0156 µg a.s./mL/bee**

Potential for accumulative toxicity: *yes/no*
Semi-field test (Cage and tunnel test) Four semi-field studies were accepted to assess the risk of chlorpyrifos on bees: Honeybees exposed to aged residues of chlorpyrifos (DURSBAN 75 WG (EF-1315) (750 g chlorpyrifos/kg, WG)), applied to *Phacelia* at 1000 g a.s./ha **in the absence of the bees**, resulted in reduced foraging activity in aged residues up to 14 days, but did not result in increased mortality. Chlorpyrifos (DURSBAN 75 WG (EF-1315) (750 g chlorpyrifos/kg, WG)) applied to *Phacelia* at 1000 g a.s./ha **during bee flight** caused significant levels of mortality compared to the control 1 day after exposure and reduced foraging throughout the whole post-exposure period (3 days post treatment). In another study, chlorpyrifos (DURSBAN 75 WG (EF-1315) (750 g chlorpyrifos/kg, WG)) applied to oilseed rape **during flowering but after daily bee-flight** at 0.5 kg product/ha (375 g a.s./ha) was of low risk to honeybees. No statistically significant biologically relevant endpoints were determined for the bee brood (brood development, adult bee mortality, colony strength and residues levels) when treated **with chlorpyrifos-methyl** (GF-1684; 225 g chlorpyrifos-methyl/L) **during bee flight** at an application rate of 353 g a.i./ha compared to the control.
Field tests One single field study was accepted to assess the risk of chlorpyrifos on bees: A study conducted in different apple orchards in UK treated with chlorpyrifos (EF 1551 -480 g

chlorpyrifos/L-) monitoring pollinators activity in different scenarios (crops, weeds, field margins…) shows great differences in the abundance of flower-visiting insect species between the different orchards. Thus, **no clear conclusions can be stated on the adverse effects of chlorpyrifos on pollinator populations.** Comparisons between the treated and the control plots were made outside the apple blossom time.

Risk assessment for:

Brassicas (EU South and Central) at 1x 480 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	< 50	0.0	42
		weeds	< 50	**7058.8**	42
		field margin	< 50	**197.6**	42
	ETRacute adult oral	treated crop	10 - 49	**24.32**	0.2
		weeds	10 - 49	**11.84**	0.2
		field margin	10 - 49	0.11	0.2
		adjacent crop	10 - 49	0.08	0.2
		next crop	10 - 49	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 49	**1002.24**	0.03
		weeds	10 - 49	**501.12**	0.03
		field margin	10 - 49	**4.61**	0.03
		adjacent crop	10 - 49	**3.31**	0.03
		next crop	10 - 49	**93.31**	0.03
	ETRlarvae	treated crop	10 - 49	**99.73**	0.2
		weeds	10 - 49	**49.87**	0.2
		field margin	10 - 49	**0.46**	0.2
		adjacent crop	10 - 49	**0.33**	0.2
		next crop	10 - 49	**9.07**	0.2
	ETRhpg	treated crop	10 - 49	**84.18**	1
		weeds	10 - 49	**46.52**	1
		field margin	10 - 49	0.43	1
		adjacent crop	10 - 49	0.28	1
		next crop	10 - 49	**6.42**	1

Artichoke (EU South) at 1x 480 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	< 50	0.0	42
		treated crop	≥ 50	0.0	42
		weeds	< 50	**7058.8**	42
		weeds	≥ 50	**2117.6**	42
		field margin	< 50	**197.6**	42

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
		field margin	≥ 50	**197.6**	42
	ETRacute adult oral	treated crop	10 - 49	**24.32**	0.2
		treated crop	50 - 69	**24.32**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 49	**11.84**	0.2
		weeds	50 - 69	**3.55**	0.2
		weeds	≥ 70	**3.55**	0.2
		field margin	10 - 49	0.11	0.2
		field margin	50 - 69	0.11	0.2
		field margin	≥ 70	0.11	0.2
		adjacent crop	10 - 49	0.08	0.2
		adjacent crop	50 - 69	0.08	0.2
		adjacent crop	≥ 70	0.08	0.2
		next crop	10 - 49	**2.24**	0.2
		next crop	50 - 69	**2.24**	0.2
		next crop	≥ 70	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 49	**1002.24**	0.03
		treated crop	50 - 69	**1002.24**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	10 - 49	**501.12**	0.03
		weeds	50 - 69	**150.34**	0.03
		weeds	≥ 70	**150.34**	0.03
		field margin	10 - 49	**4.61**	0.03
		field margin	50 - 69	**4.61**	0.03
		field margin	≥ 70	**4.61**	0.03
		adjacent crop	10 - 49	**3.31**	0.03
		adjacent crop	50 - 69	**3.31**	0.03
		adjacent crop	≥ 70	**3.31**	0.03
		next crop	10 - 49	**93.31**	0.03
		next crop	50 - 69	**93.31**	0.03
		next crop	≥ 70	**93.31**	0.03
	ETRlarvae	treated crop	10 - 49	**99.73**	0.2
		treated crop	50 - 69	**99.73**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 49	**49.87**	0.2
		weeds	50 - 69	**14.96**	0.2
		weeds	≥ 70	**14.96**	0.2
		field margin	10 - 49	**0.46**	0.2
		field margin	50 - 69	**0.46**	0.2
		field margin	≥ 70	**0.46**	0.2
		adjacent crop	10 - 49	**0.33**	0.2

		adjacent crop	50 - 69	**0.33**	0.2
		adjacent crop	≥ 70	**0.33**	0.2
		next crop	10 - 49	**9.07**	0.2
		next crop	50 - 69	**9.07**	0.2
		next crop	≥ 70	**9.07**	0.2
	ETRhpg	treated crop	10 - 49	**84.18**	1
		treated crop	50 - 69	**84.18**	1
		treated crop	≥ 70	0.00	1
		weeds	10 - 49	**46.52**	1
		weeds	50 - 69	**13.96**	1
		weeds	≥ 70	**13.96**	1
		field margin	10 - 49	0.43	1
		field margin	50 - 69	0.43	1
		field margin	≥ 70	0.43	1
		adjacent crop	10 - 49	0.28	1
		adjacent crop	50 - 69	0.28	1
		adjacent crop	≥ 70	0.28	1
		next crop	10 - 49	**6.42**	1
		next crop	50 - 69	**6.42**	1
		next crop	≥ 70	**6.42**	1

Cereals (EU South and Central) at 1x 480 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	< 30	0.0	42
		treated crop	30 - 39	0.0	42
		treated crop	≥ 40	0.0	42
		weeds	< 30	**7058.8**	42
		weeds	30 - 39	**3529.4**	42
		weeds	≥ 40	**2117.6**	42
		field margin	< 30	**197.6**	42
		field margin	30 - 39	**197.6**	42
		field margin	≥ 40	**197.6**	42
	ETRacute adult oral	treated crop	10 - 29	**2.94**	0.2
		treated crop	30 - 39	**2.94**	0.2
		treated crop	40 - 69	**2.94**	0.2
		weeds	10 - 29	**11.84**	0.2
		weeds	30 - 39	**5.92**	0.2
		weeds	40 - 69	**3.55**	0.2
		field margin	10 - 29	0.11	0.2
		field margin	30 - 39	0.11	0.2

		field margin	40 - 69	0.11	0.2
		adjacent crop	10 - 29	0.08	0.2
		adjacent crop	30 - 39	0.08	0.2
		adjacent crop	40 - 69	0.08	0.2
		next crop	10 - 29	**2.24**	0.2
		next crop	30 - 39	**2.24**	0.2
		next crop	40 - 69	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 29	**158.98**	0.03
		treated crop	30 - 39	**158.98**	0.03
		treated crop	40 - 69	**158.98**	0.03
		weeds	10 - 29	**501.12**	0.03
		weeds	30 - 39	**250.56**	0.03
		weeds	40 - 69	**150.34**	0.03
		field margin	10 - 29	**4.61**	0.03
		field margin	30 - 39	**4.61**	0.03
		field margin	40 - 69	**4.61**	0.03
		adjacent crop	10 - 29	**3.31**	0.03
		adjacent crop	30 - 39	**3.31**	0.03
		adjacent crop	40 - 69	**3.31**	0.03
		next crop	10 - 29	**93.31**	0.03
		next crop	30 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
	ETRlarvae	treated crop	10 - 29	**3.40**	0.2
		treated crop	30 - 39	**3.40**	0.2
		treated crop	40 - 69	**3.40**	0.2
		weeds	10 - 29	**49.87**	0.2
		weeds	30 - 39	**24.93**	0.2
		weeds	40 - 69	**14.96**	0.2
		field margin	10 - 29	**0.46**	0.2
		field margin	30 - 39	**0.46**	0.2
		field margin	40 - 69	**0.46**	0.2
		adjacent crop	10 - 29	**0.33**	0.2
		adjacent crop	30 - 39	**0.33**	0.2
		adjacent crop	40 - 69	**0.33**	0.2
		next crop	10 - 29	**9.07**	0.2
		next crop	30 - 39	**9.07**	0.2
		next crop	40 - 69	**9.07**	0.2
	ETRhpg	treated crop	10 - 29	**20.38**	1
		treated crop	30 - 39	**20.38**	1
		treated crop	40 - 69	**20.38**	1
		weeds	10 - 29	**46.52**	1
		weeds	30 - 39	**23.26**	1
		weeds	40 - 69	**13.96**	1

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
		field margin	10 - 29	0.43	1
		field margin	30 - 39	0.43	1
		field margin	40 - 69	0.43	1
		adjacent crop	10 - 29	0.28	1
		adjacent crop	30 - 39	0.28	1
		adjacent crop	40 - 69	0.28	1
		next crop	10 - 29	**6.42**	1
		next crop	30 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1

Grapevines (EU South and Central) at 1x 360 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
EF-1551	HQcontact	treated crop	10 - 19	0.0	85
		treated crop	20 - 39	0.0	85
		treated crop	≥ 40	0.0	85
		weeds	10 - 19	**3176.5**	42
		weeds	20 - 39	**2647.1**	42
		weeds	≥ 40	**1588.2**	42
		field margin	10 - 19	**142.9**	42
		field margin	20 - 39	**423.5**	42
		field margin	≥ 40	**423.5**	42
	ETRacute adult oral	treated crop	10 - 19	**25.44**	0.2
		treated crop	20 - 39	**25.44**	0.2
		treated crop	40 - 69	**25.44**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**5.33**	0.2
		weeds	20 - 39	**4.44**	0.2
		weeds	40 - 69	**2.66**	0.2
		weeds	≥ 70	**2.66**	0.2
		field margin	10 - 19	0.08	0.2
		field margin	20 - 39	**0.24**	0.2
		field margin	40 - 69	**0.24**	0.2
		field margin	≥ 70	**0.24**	0.2
		adjacent crop	10 - 19	0.09	0.2
		adjacent crop	20 - 39	**0.26**	0.2
		adjacent crop	40 - 69	**0.26**	0.2
		adjacent crop	≥ 70	**0.26**	0.2
		next crop	10 - 19	**1.68**	0.2

		next crop	20 - 39	**1.68**	0.2
		next crop	40 - 69	**1.68**	0.2
		next crop	≥ 70	**1.68**	0.2
	ETRchronic adult oral	treated crop	10 - 19	**1062.72**	0.03
		treated crop	20 - 39	**1062.72**	0.03
		treated crop	40 - 69	**1062.72**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	10 - 19	**225.50**	0.03
		weeds	20 - 39	**187.92**	0.03
		weeds	40 - 69	**112.75**	0.03
		weeds	≥ 70	**112.75**	0.03
		field margin	10 - 19	**3.38**	0.03
		field margin	20 - 39	**10.15**	0.03
		field margin	40 - 69	**10.15**	0.03
		field margin	≥ 70	**10.15**	0.03
		adjacent crop	10 - 19	**3.53**	0.03
		adjacent crop	20 - 39	**10.75**	0.03
		adjacent crop	40 - 69	**10.75**	0.03
		adjacent crop	≥ 70	**10.75**	0.03
		next crop	10 - 19	**69.98**	0.03
		next crop	20 - 39	**69.98**	0.03
		next crop	40 - 69	**69.98**	0.03
		next crop	≥ 70	**69.98**	0.03
	ETRlarvae	treated crop	10 - 19	**103.70**	0.2
		treated crop	20 - 39	**103.70**	0.2
		treated crop	40 - 69	**103.70**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**22.44**	0.2
		weeds	20 - 39	**18.70**	0.2
		weeds	40 - 69	**11.22**	0.2
		weeds	≥ 70	**11.22**	0.2
		field margin	10 - 19	**0.34**	0.2
		field margin	20 - 39	**1.01**	0.2
		field margin	40 - 69	**1.01**	0.2
		field margin	≥ 70	**1.01**	0.2
		adjacent crop	10 - 19	**0.35**	0.2
		adjacent crop	20 - 39	**0.35**	0.2
		adjacent crop	40 - 69	**1.07**	0.2
		adjacent crop	≥ 70	**1.07**	0.2
		next crop	10 - 19	**6.80**	0.2
		next crop	20 - 39	**6.80**	0.2
		next crop	40 - 69	**6.80**	0.2
		next crop	≥ 70	**6.80**	0.2

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
	ETRhpg	treated crop	10 - 19	**71.45**	1
		treated crop	20 - 39	**71.45**	1
		treated crop	40 - 69	**71.45**	1
		treated crop	≥ 70	0.00	1
		weeds	10 - 19	**20.94**	1
		weeds	20 - 39	**17.45**	1
		weeds	40 - 69	**10.47**	1
		weeds	≥ 70	**10.47**	1
		field margin	10 - 19	0.31	1
		field margin	20 - 39	0.94	1
		field margin	40 - 69	0.94	1
		field margin	≥ 70	0.94	1
		adjacent crop	10 - 19	0.30	1
		adjacent crop	20 - 39	0.90	1
		adjacent crop	40 - 69	0.90	1
		adjacent crop	≥ 70	0.90	1
		next crop	10 - 19	**4.82**	1
		next crop	20 - 39	**4.82**	1
		next crop	40 - 69	**4.82**	1
		next crop	≥ 70	**4.82**	1

Dessert pome and Stone fruits (EU South and Central) at 1x 480 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
EF-1551	HQcontact	treated crop	10 - 19	0.0	85
		treated crop	20 - 39	0.0	85
		treated crop	≥ 40	0.0	85
		weeds	10 - 19	**5647.1**	42
		weeds	20 - 39	**4235.3**	42
		weeds	≥ 40	**2117.6**	42
		field margin	10 - 19	**2061.2**	42
		field margin	20 - 39	**2061.2**	42
		field margin	≥ 40	**2061.2**	42
	ETRacute adult oral	treated crop	10 - 19	**33.92**	0.2
		treated crop	20 - 39	**33.92**	0.2
		treated crop	40 - 69	**33.92**	0.2
		weeds	10 - 19	**9.47**	0.2
		weeds	20 - 39	**7.10**	0.2
		weeds	40 - 69	**3.55**	0.2

		field margin	10 - 19	**1.15**	0.2
		field margin	20 - 39	**1.15**	0.2
		field margin	40 - 69	**1.15**	0.2
		adjacent crop	10 - 19	**1.61**	0.2
		adjacent crop	20 - 39	**1.61**	0.2
		adjacent crop	40 - 69	**1.61**	0.2
		next crop	10 - 19	**2.24**	0.2
		next crop	20 - 39	**2.24**	0.2
		next crop	40 - 69	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 19	**1416.96**	0.03
		treated crop	20 - 39	**1416.96**	0.03
		treated crop	40 - 69	**1416.96**	0.03
		weeds	10 - 19	**400.90**	0.03
		weeds	20 - 39	**300.67**	0.03
		weeds	40 - 69	**150.34**	0.03
		field margin	10 - 19	**48.61**	0.03
		field margin	20 - 39	**48.61**	0.03
		field margin	40 - 69	**48.61**	0.03
		adjacent crop	10 - 19	**66.15**	0.03
		adjacent crop	20 - 39	**66.15**	0.03
		adjacent crop	40 - 69	**66.15**	0.03
		next crop	10 - 19	**93.31**	0.03
		next crop	20 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
	ETRlarvae	treated crop	10 - 19	**138.27**	0.2
		treated crop	20 - 39	**138.27**	0.2
		treated crop	40 - 69	**138.27**	0.2
		weeds	10 - 19	**39.89**	0.2
		weeds	20 - 39	**29.92**	0.2
		weeds	40 - 69	**14.96**	0.2
		field margin	10 - 19	**4.84**	0.2
		field margin	20 - 39	**4.84**	0.2
		field margin	40 - 69	**4.84**	0.2
		adjacent crop	10 - 19	**6.58**	0.2
		adjacent crop	20 - 39	**6.58**	0.2
		adjacent crop	40 - 69	**6.58**	0.2
		next crop	10 - 19	**9.07**	0.2
		next crop	20 - 39	**9.07**	0.2
		next crop	40 - 69	**9.07**	0.2
	ETRhpg	treated crop	10 - 19	**95.26**	1
		treated crop	20 - 39	**95.26**	1
		treated crop	40 - 69	**95.26**	1
		weeds	10 - 19	**37.22**	1

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
		weeds	20 - 39	**27.91**	1
		weeds	40 - 69	**13.96**	1
		field margin	10 - 19	**4.51**	1
		field margin	20 - 39	**4.51**	1
		field margin	40 - 69	**4.51**	1
		adjacent crop	10 - 19	**5.56**	1
		adjacent crop	20 - 39	**5.56**	1
		adjacent crop	40 - 69	**5.56**	1
		next crop	10 - 19	**6.42**	1
		next crop	20 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1

Cider/Perry pome (EU Central) at 1x 480 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	10 - 19	**7058.8**	85
		treated crop	20 - 39	**7058.8**	85
		treated crop	≥ 40	**7058.8**	85
		weeds	10 - 19	**5647.1**	42
		weeds	20 - 39	**4235.3**	42
		weeds	≥ 40	**2117.6**	42
		field margin	10 - 19	**1108.2**	42
		field margin	20 - 39	**1108.2**	42
		field margin	≥ 40	**1108.2**	42
	ETRacute adult oral	treated crop	10 - 19	**33.92**	0.2
		treated crop	20 - 39	**33.92**	0.2
		treated crop	40 - 69	**33.92**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**9.47**	0.2
		weeds	20 - 39	**7.10**	0.2
		weeds	40 - 69	**3.55**	0.2
		weeds	≥ 70	**3.55**	0.2
		field margin	10 - 19	**0.62**	0.2
		field margin	20 - 39	**0.62**	0.2
		field margin	40 - 69	**0.62**	0.2
		field margin	≥ 70	**0.62**	0.2
		adjacent crop	10 - 19	**0.75**	0.2
		adjacent crop	20 - 39	**0.75**	0.2
		adjacent crop	40 - 69	**0.75**	0.2

		adjacent crop	≥ 70	**0.75**	0.2
		next crop	10 - 19	**2.24**	0.2
		next crop	20 - 39	**2.24**	0.2
		next crop	40 - 69	**2.24**	0.2
		next crop	≥ 70	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 19	**1416.96**	0.03
		treated crop	20 - 39	**1416.96**	0.03
		treated crop	40 - 69	**1416.96**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	10 - 19	**400.90**	0.03
		weeds	20 - 39	**300.67**	0.03
		weeds	40 - 69	**150.34**	0.03
		weeds	≥ 70	**150.34**	0.03
		field margin	10 - 19	**26.06**	0.03
		field margin	20 - 39	**26.06**	0.03
		field margin	40 - 69	**26.06**	0.03
		field margin	≥ 70	**26.06**	0.03
		adjacent crop	10 - 19	**31.07**	0.03
		adjacent crop	20 - 39	**31.07**	0.03
		adjacent crop	40 - 69	**31.07**	0.03
		adjacent crop	≥ 70	**31.07**	0.03
		next crop	10 - 19	**93.31**	0.03
		next crop	20 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
		next crop	≥ 70	**93.31**	0.03
	ETRlarvae	treated crop	10 - 19	**138.27**	0.2
		treated crop	20 - 39	**138.27**	0.2
		treated crop	40 - 69	**138.27**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**39.89**	0.2
		weeds	20 - 39	**29.92**	0.2
		weeds	40 - 69	**14.96**	0.2
		weeds	≥ 70	**14.96**	0.2
		field margin	10 - 19	**2.59**	0.2
		field margin	20 - 39	**2.59**	0.2
		field margin	40 - 69	**2.59**	0.2
		field margin	≥ 70	**2.59**	0.2
		adjacent crop	10 - 19	**3.09**	0.2
		adjacent crop	20 - 39	**3.09**	0.2
		adjacent crop	40 - 69	**3.09**	0.2
		adjacent crop	≥ 70	**3.09**	0.2
		next crop	10 - 19	**9.07**	0.2
		next crop	20 - 39	**9.07**	0.2

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
		next crop	40 - 69	**9.07**	0.2
		next crop	≥ 70	**9.07**	0.2
	ETRhpg	treated crop	10 - 19	**95.26**	1
		treated crop	20 - 39	**95.26**	1
		treated crop	40 - 69	**95.26**	1
		treated crop	≥ 70	0.00	1
		weeds	10 - 19	**37.22**	1
		weeds	20 - 39	**27.91**	1
		weeds	40 - 69	**13.96**	1
		weeds	≥ 70	**13.96**	1
		field margin	10 - 19	**2.42**	1
		field margin	20 - 39	**2.42**	1
		field margin	40 - 69	**2.42**	1
		field margin	≥ 70	**2.42**	1
		adjacent crop	10 - 19	**2.61**	1
		adjacent crop	20 - 39	**2.61**	1
		adjacent crop	40 - 69	**2.61**	1
		adjacent crop	≥ 70	**2.61**	1
		next crop	10 - 19	**6.42**	1
		next crop	20 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1
		next crop	≥ 70	**6.42**	1

Strawberry (EU Central) at 1x 480 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
EF-1551	HQcontact	treated crop	< 40	0.0	42
		treated crop	≥ 40	0.0	42
		weeds	< 40	**7058.8**	42
		weeds	≥ 40	**2823.5**	42
		field margin	< 40	**197.6**	42
		field margin	≥ 40	**197.6**	42
	ETRacute adult oral	treated crop	≥ 70	0.00	0.2
		treated crop	10 - 39	**24.32**	0.2
		treated crop	40 - 69	**24.32**	0.2
		weeds	≥ 70	**4.74**	0.2
		weeds	10 - 39	**11.84**	0.2
		weeds	40 - 69	**4.74**	0.2
		field margin	≥ 70	0.11	0.2

		field margin	10 - 39	0.11	0.2
		field margin	40 - 69	0.11	0.2
		adjacent crop	≥ 70	0.08	0.2
		adjacent crop	10 - 39	0.08	0.2
		adjacent crop	40 - 69	0.08	0.2
		next crop	≥ 70	**2.24**	0.2
		next crop	10 - 39	**2.24**	0.2
		next crop	40 - 69	**2.24**	0.2
	ETRchronic adult oral	treated crop	≥ 70	0.00	0.03
		treated crop	10 - 39	**1002.24**	0.03
		treated crop	40 - 69	**1002.24**	0.03
		weeds	≥ 70	**200.45**	0.03
		weeds	10 - 39	**501.12**	0.03
		weeds	40 - 69	**200.45**	0.03
		field margin	≥ 70	**4.61**	0.03
		field margin	10 - 39	**4.61**	0.03
		field margin	40 - 69	**4.61**	0.03
		adjacent crop	≥ 70	**3.31**	0.03
		adjacent crop	10 - 39	**3.31**	0.03
		adjacent crop	40 - 69	**3.31**	0.03
		next crop	≥ 70	**93.31**	0.03
		next crop	10 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
	ETRlarvae	treated crop	≥ 70	0.00	0.2
		treated crop	10 - 39	**99.73**	0.2
		treated crop	40 - 69	**99.73**	0.2
		weeds	≥ 70	**19.95**	0.2
		weeds	10 - 39	**49.87**	0.2
		weeds	40 - 69	**19.95**	0.2
		field margin	≥ 70	**0.46**	0.2
		field margin	10 - 39	**0.46**	0.2
		field margin	40 - 69	**0.46**	0.2
		adjacent crop	≥ 70	**0.33**	0.2
		adjacent crop	10 - 39	**0.33**	0.2
		adjacent crop	40 - 69	**0.33**	0.2
		next crop	≥ 70	**9.07**	0.2
		next crop	10 - 39	**9.07**	0.2
		next crop	40 - 69	**9.07**	0.2
	ETRhpg	treated crop	≥ 70	0.00	1
		treated crop	10 - 39	**84.18**	1
		treated crop	40 - 69	**84.18**	1
		weeds	≥ 70	**18.61**	1
		weeds	10 - 39	**46.52**	1

		weeds	40 - 69	**18.61**	1
		field margin	≥ 70	0.43	1
		field margin	10 - 39	0.43	1
		field margin	40 - 69	0.43	1
		adjacent crop	≥ 70	0.28	1
		adjacent crop	10 - 39	0.28	1
		adjacent crop	40 - 69	0.28	1
		next crop	≥ 70	**6.42**	1
		next crop	10 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1

Raspberry (EU Central) at 1x 480 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	10 - 19	0.0	85
		treated crop	20 - 39	0.0	85
		treated crop	≥ 40	0.0	85
		weeds	10 - 19	**4235.3**	42
		weeds	20 - 39	**3529.4**	42
		weeds	≥ 40	**2117.6**	42
		field margin	10 - 19	**197.6**	42
		field margin	20 - 39	**197.6**	42
		field margin	≥ 40	**197.6**	42
	ETRacute adult oral	treated crop	10 - 19	**33.92**	0.2
		treated crop	20 - 39	**33.92**	0.2
		treated crop	40 - 69	**33.92**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**7.10**	0.2
		weeds	20 - 39	**5.92**	0.2
		weeds	40 - 69	**3.55**	0.2
		weeds	≥ 70	**3.55**	0.2
		field margin	10 - 19	**0.32**	0.2
		field margin	20 - 39	**0.32**	0.2
		field margin	40 - 69	**0.32**	0.2
		field margin	≥ 70	**0.32**	0.2
		adjacent crop	10 - 19	**0.35**	0.2
		adjacent crop	20 - 39	**0.35**	0.2
		adjacent crop	40 - 69	**0.35**	0.2
		adjacent crop	≥ 70	**0.35**	0.2
		next crop	10 - 19	**2.24**	0.2
		next crop	20 - 39	**2.24**	0.2

		next crop	40 - 69	**2.24**	0.2
		next crop	≥ 70	**2.24**	0.2
	ETRchronic adult oral	treated crop	10 - 19	**1416.96**	0.03
		treated crop	20 - 39	**1416.96**	0.03
		treated crop	40 - 69	**1416.96**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	10 - 19	**300.67**	0.03
		weeds	20 - 39	**250.56**	0.03
		weeds	40 - 69	**150.34**	0.03
		weeds	≥ 70	**150.34**	0.03
		field margin	10 - 19	**13.53**	0.03
		field margin	20 - 39	**13.53**	0.03
		field margin	40 - 69	**13.53**	0.03
		field margin	≥ 70	**13.53**	0.03
		adjacent crop	10 - 19	**14.33**	0.03
		adjacent crop	20 - 39	**14.33**	0.03
		adjacent crop	40 - 69	**14.33**	0.03
		adjacent crop	≥ 70	**14.33**	0.03
		next crop	10 - 19	**93.31**	0.03
		next crop	20 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
		next crop	≥ 70	**93.31**	0.03
	ETRlarvae	treated crop	10 - 19	**138.27**	0.2
		treated crop	20 - 39	**138.27**	0.2
		treated crop	40 - 69	**138.27**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**29.92**	0.2
		weeds	20 - 39	**24.93**	0.2
		weeds	40 - 69	**14.96**	0.2
		weeds	≥ 70	**14.96**	0.2
		field margin	10 - 19	**1.35**	0.2
		field margin	20 - 39	**1.35**	0.2
		field margin	40 - 69	**1.35**	0.2
		field margin	≥ 70	**1.35**	0.2
		adjacent crop	10 - 19	**1.43**	0.2
		adjacent crop	20 - 39	**1.43**	0.2
		adjacent crop	40 - 69	**1.43**	0.2
		adjacent crop	≥ 70	**1.43**	0.2
		next crop	10 - 19	**9.07**	0.2
		next crop	20 - 39	**9.07**	0.2
		next crop	40 - 69	**9.07**	0.2
		next crop	≥ 70	**9.07**	0.2
	ETRhpg	treated crop	10 - 19	**95.26**	1

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*) ETR	trigger
		treated crop	20 - 39	**95.26**	1
		treated crop	40 - 69	**95.26**	1
		treated crop	≥ 70	0.00	1
		weeds	10 - 19	**27.91**	1
		weeds	20 - 39	**23.26**	1
		weeds	40 - 69	**13.96**	1
		weeds	≥ 70	**13.96**	1
		field margin	10 - 19	**1.26**	1
		field margin	20 - 39	**1.26**	1
		field margin	40 - 69	**1.26**	1
		field margin	≥ 70	**1.26**	1
		adjacent crop	10 - 19	**1.20**	1
		adjacent crop	20 - 39	**1.20**	1
		adjacent crop	40 - 69	**1.20**	1
		adjacent crop	≥ 70	**1.20**	1
		next crop	10 - 19	**6.42**	1
		next crop	20 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1
		next crop	≥ 70	**6.42**	1

Fresh and Canning/Puree solanaceous vegetables (EU South and Central) at 1x 360 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*) ETR	trigger
EF-1551	HQcontact	treated crop	< 50	**5294.1**	42
		treated crop	≥ 50	**5294.1**	42
		weeds	< 50	**5294.1**	42
		weeds	≥ 50	**1588.2**	42
		field margin	< 50	**148.2**	42
		field margin	≥ 50	**148.2**	42
	ETRacute adult oral	treated crop	< 10	0.03	0.2
		treated crop	10 - 49	**2.21**	0.2
		treated crop	50 - 69	**2.21**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	< 10	**8.88**	0.2
		weeds	10 - 49	**8.88**	0.2
		weeds	50 - 69	**2.66**	0.2
		weeds	≥ 70	**2.66**	0.2
		field margin	< 10	0.08	0.2
		field margin	10 - 49	0.08	0.2

		field margin	50 - 69	0.08	0.2
		field margin	≥ 70	0.08	0.2
		adjacent crop	< 10	0.06	0.2
		adjacent crop	10 - 49	0.06	0.2
		adjacent crop	50 - 69	0.06	0.2
		adjacent crop	≥ 70	0.06	0.2
		next crop	< 10	**1.68**	0.2
		next crop	10 - 49	**1.68**	0.2
		next crop	50 - 69	**1.68**	0.2
		next crop	≥ 70	**1.68**	0.2
	ETRchronic adult oral	treated crop	< 10	**1.56**	0.03
		treated crop	10 - 49	**119.23**	0.03
		treated crop	50 - 69	**119.23**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	< 10	**375.84**	0.03
		weeds	10 - 49	**375.84**	0.03
		weeds	50 - 69	**112.75**	0.03
		weeds	≥ 70	**112.75**	0.03
		field margin	< 10	**3.46**	0.03
		field margin	10 - 49	**3.46**	0.03
		field margin	50 - 69	**3.46**	0.03
		field margin	≥ 70	**3.46**	0.03
		adjacent crop	< 10	**2.48**	0.03
		adjacent crop	10 - 49	**2.48**	0.03
		adjacent crop	50 - 69	**2.48**	0.03
		adjacent crop	≥ 70	**2.48**	0.03
		next crop	< 10	**69.98**	0.03
		next crop	10 - 49	**69.98**	0.03
		next crop	50 - 69	**69.98**	0.03
		next crop	≥ 70	**69.98**	0.03
	ETRlarvae	treated crop	< 10	0.03	0.2
		treated crop	10 - 49	**2.55**	0.2
		treated crop	50 - 69	**2.55**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	< 10	**37.40**	0.2
		weeds	10 - 49	**37.40**	0.2
		weeds	50 - 69	**11.22**	0.2
		weeds	≥ 70	**11.22**	0.2
		field margin	< 10	**0.34**	0.2
		field margin	10 - 49	**0.34**	0.2
		field margin	50 - 69	**0.34**	0.2
		field margin	≥ 70	**0.34**	0.2
		adjacent crop	< 10	**0.25**	0.2

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	**trigger**
		adjacent crop	10 - 49	**0.25**	0.2
		adjacent crop	50 - 69	**0.25**	0.2
		adjacent crop	≥ 70	**0.25**	0.2
		next crop	< 10	**6.80**	0.2
		next crop	10 - 49	**6.80**	0.2
		next crop	50 - 69	**6.80**	0.2
		next crop	≥ 70	**6.80**	0.2
	ETRhpg	treated crop	< 10	0.20	1
		treated crop	10 - 49	**15.29**	1
		treated crop	50 - 69	**15.29**	1
		treated crop	≥ 70	0.00	1
		weeds	< 10	**34.89**	1
		weeds	10 - 49	**34.89**	1
		weeds	50 - 69	**10.47**	1
		weeds	≥ 70	**10.47**	1
		field margin	< 10	0.32	1
		field margin	10 - 49	0.32	1
		field margin	50 - 69	0.32	1
		field margin	≥ 70	0.32	1
		adjacent crop	< 10	0.21	1
		adjacent crop	10 - 49	0.21	1
		adjacent crop	50 - 69	0.21	1
		adjacent crop	≥ 70	0.21	1
		next crop	< 10	**4.82**	1
		next crop	10 - 49	**4.82**	1
		next crop	50 - 69	**4.82**	1
		next crop	≥ 70	**4.82**	1

Citrus (EU South) at 1x 1920 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	10 - 19	0.0	85
		treated crop	20 - 39	0.0	85
		treated crop	≥ 40	0.0	85
		weeds	10 - 19	**22588.2**	42
		weeds	20 - 39	**16941.2**	42
		weeds	≥ 40	**8470.6**	42
		field margin	10 - 19	**4432.9**	42
		field margin	20 - 39	**4432.9**	42

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
		field margin	≥ 40	**4432.9**	42
	ETRacute adult oral	treated crop	10 - 19	**135.68**	0.2
		treated crop	20 - 39	**135.68**	0.2
		treated crop	40 - 69	**135.68**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**37.89**	0.2
		weeds	20 - 39	**28.42**	0.2
		weeds	40 - 69	**14.21**	0.2
		weeds	≥ 70	**14.21**	0.2
		field margin	10 - 19	**2.46**	0.2
		field margin	20 - 39	**2.46**	0.2
		field margin	40 - 69	**2.46**	0.2
		field margin	≥ 70	**2.46**	0.2
		adjacent crop	10 - 19	**3.02**	0.2
		adjacent crop	20 - 39	**3.02**	0.2
		adjacent crop	40 - 69	**3.02**	0.2
		adjacent crop	≥ 70	**3.02**	0.2
		next crop	10 - 19	**8.96**	0.2
		next crop	20 - 39	**8.96**	0.2
		next crop	40 - 69	**8.96**	0.2
		next crop	≥ 70	**8.96**	0.2
	ETRchronic adult oral	treated crop	10 - 19	**5667.84**	0.03
		treated crop	20 - 39	**5667.84**	0.03
		treated crop	40 - 69	**5667.84**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	10 - 19	**1603.58**	0.03
		weeds	20 - 39	**1202.69**	0.03
		weeds	40 - 69	**601.34**	0.03
		weeds	≥ 70	**601.34**	0.03
		field margin	10 - 19	**104.23**	0.03
		field margin	20 - 39	**104.23**	0.03
		field margin	40 - 69	**104.23**	0.03
		field margin	≥ 70	**104.23**	0.03
		adjacent crop	10 - 19	**124.28**	0.03
		adjacent crop	20 - 39	**124.28**	0.03
		adjacent crop	40 - 69	**124.28**	0.03
		adjacent crop	≥ 70	**124.28**	0.03
		next crop	10 - 19	**373.25**	0.03
		next crop	20 - 39	**373.25**	0.03
		next crop	40 - 69	**373.25**	0.03
		next crop	≥ 70	**373.25**	0.03

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	**trigger**
	ETRlarvae	treated crop	10 - 19	**553.07**	0.2
		treated crop	20 - 39	**553.07**	0.2
		treated crop	40 - 69	**553.07**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	10 - 19	**159.57**	0.2
		weeds	20 - 39	**119.68**	0.2
		weeds	40 - 69	**59.84**	0.2
		weeds	≥ 70	**59.84**	0.2
		field margin	10 - 19	**10.37**	0.2
		field margin	20 - 39	**10.37**	0.2
		field margin	40 - 69	**10.37**	0.2
		field margin	≥ 70	**10.37**	0.2
		adjacent crop	10 - 19	**12.37**	0.2
		adjacent crop	20 - 39	**12.37**	0.2
		adjacent crop	40 - 69	**12.37**	0.2
		adjacent crop	≥ 70	**12.37**	0.2
		next crop	10 - 19	**36.27**	0.2
		next crop	20 - 39	**36.27**	0.2
		next crop	40 - 69	**36.27**	0.2
		next crop	≥ 70	**36.27**	0.2
	ETRhpg	treated crop	10 - 19	**381.05**	1
		treated crop	20 - 39	**381.05**	1
		treated crop	40 - 69	**381.05**	1
		treated crop	≥ 70	0.00	1
		weeds	10 - 19	**148.87**	1
		weeds	20 - 39	**111.66**	1
		weeds	40 - 69	**55.83**	1
		weeds	≥ 70	**55.83**	1
		field margin	10 - 19	**9.68**	1
		field margin	20 - 39	**9.68**	1
		field margin	40 - 69	**9.68**	1
		field margin	≥ 70	**9.68**	1
		adjacent crop	10 - 19	**10.44**	1
		adjacent crop	20 - 39	**10.44**	1
		adjacent crop	40 - 69	**10.44**	1
		adjacent crop	≥ 70	**10.44**	1
		next crop	10 - 19	**25.70**	1
		next crop	20 - 39	**25.70**	1
		next crop	40 - 69	**25.70**	1
		next crop	≥ 70	**25.70**	1

Oilseed rape (EU South and Central) at 1x 480 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	**trigger**
EF-1551	HQcontact	treated crop	30 - 39	0.0	42
		treated crop	≥ 40	0.0	42
		weeds	30 - 39	**2117.6**	42
		weeds	≥ 40	**1764.7**	42
		field margin	30 - 39	**197.6**	42
		field margin	≥ 40	**197.6**	42
	ETRacute adult oral	treated crop	30 - 39	**24.32**	0.2
		treated crop	40 - 69	**24.32**	0.2
		weeds	30 - 39	**3.55**	0.2
		weeds	40 - 69	**2.96**	0.2
		field margin	30 - 39	0.11	0.2
		field margin	40 - 69	0.11	0.2
		adjacent crop	30 - 39	0.08	0.2
		adjacent crop	40 - 69	0.08	0.2
		next crop	30 - 39	**2.24**	0.2
		next crop	40 - 69	**2.24**	0.2
	ETRchronic adult oral	treated crop	30 - 39	**1002.24**	0.03
		treated crop	40 - 69	**1002.24**	0.03
		weeds	30 - 39	**150.34**	0.03
		weeds	40 - 69	**125.28**	0.03
		field margin	30 - 39	**4.61**	0.03
		field margin	40 - 69	**4.61**	0.03
		adjacent crop	30 - 39	**3.31**	0.03
		adjacent crop	40 - 69	**3.31**	0.03
		next crop	30 - 39	**93.31**	0.03
		next crop	40 - 69	**93.31**	0.03
	ETRlarvae	treated crop	30 - 39	**99.73**	0.2
		treated crop	40 - 69	**99.73**	0.2
		weeds	30 - 39	**14.96**	0.2
		weeds	40 - 69	**12.47**	0.2
		field margin	30 - 39	**0.46**	0.2
		field margin	40 - 69	**0.46**	0.2
		adjacent crop	30 - 39	**0.33**	0.2
		adjacent crop	40 - 69	**0.33**	0.2
		next crop	30 - 39	**9.07**	0.2
		next crop	40 - 69	**9.07**	0.2
	ETRhpg	treated crop	30 - 39	**84.18**	1
		treated crop	40 - 69	**84.18**	1

		weeds	30 - 39	**13.96**	1
		weeds	40 - 69	**11.63**	1
		field margin	30 - 39	0.43	1
		field margin	40 - 69	0.43	1
		adjacent crop	30 - 39	0.28	1
		adjacent crop	40 - 69	0.28	1
		next crop	30 - 39	**6.42**	1
		next crop	40 - 69	**6.42**	1

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha (2D)

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
Pyrinex 250 CS / SAP250CSI	HQcontact	treated crop	< 30	0.0	42
		treated crop	30 - 39	0.0	42
		treated crop	≥ 40	0.0	42
		weeds	< 30	**2757.4**	42
		weeds	30 - 39	**827.2**	42
		weeds	≥ 40	**689.3**	42
		field margin	< 30	**77.2**	42
		field margin	30 - 39	**77.2**	42
		field margin	≥ 40	**77.2**	42
	ETRacute adult oral	treated crop	10 - 29	**9.50**	0.2
		treated crop	30 - 39	**9.50**	0.2
		treated crop	40 - 69	**9.50**	0.2
		weeds	10 - 29	**4.63**	0.2
		weeds	30 - 39	**1.39**	0.2
		weeds	40 - 69	**1.16**	0.2
		field margin	10 - 29	0.04	0.2
		field margin	30 - 39	0.04	0.2
		field margin	40 - 69	0.04	0.2
		adjacent crop	10 - 29	0.03	0.2
		adjacent crop	30 - 39	0.03	0.2
		adjacent crop	40 - 69	0.03	0.2
		next crop	10 - 29	**0.88**	0.2
		next crop	30 - 39	**0.88**	0.2
		next crop	40 - 69	**0.88**	0.2
	ETRchronic adult oral	treated crop	10 - 29	**391.50**	0.03
		treated crop	30 - 39	**391.50**	0.03
		treated crop	40 - 69	**391.50**	0.03
		weeds	10 - 29	**195.75**	0.03
		weeds	30 - 39	**58.73**	0.03

		weeds	40 - 69	**48.94**	0.03
		field margin	10 - 29	**1.80**	0.03
		field margin	30 - 39	**1.80**	0.03
		field margin	40 - 69	**1.80**	0.03
		adjacent crop	10 - 29	**1.29**	0.03
		adjacent crop	30 - 39	**1.29**	0.03
		adjacent crop	40 - 69	**1.29**	0.03
		next crop	10 - 29	**36.45**	0.03
		next crop	30 - 39	**36.45**	0.03
		next crop	40 - 69	**36.45**	0.03
	ETRlarvae	treated crop	10 - 29	**38.96**	0.2
		treated crop	30 - 39	**38.96**	0.2
		treated crop	40 - 69	**38.96**	0.2
		weeds	10 - 29	**19.48**	0.2
		weeds	30 - 39	**5.84**	0.2
		weeds	40 - 69	**4.87**	0.2
		field margin	10 - 29	0.18	0.2
		field margin	30 - 39	0.18	0.2
		field margin	40 - 69	0.18	0.2
		adjacent crop	10 - 29	0.13	0.2
		adjacent crop	30 - 39	0.13	0.2
		adjacent crop	40 - 69	0.13	0.2
		next crop	10 - 29	**3.54**	0.2
		next crop	30 - 39	**3.54**	0.2
		next crop	40 - 69	**3.54**	0.2
	ETRhpg	treated crop	10 - 29	**32.88**	1
		treated crop	30 - 39	**32.88**	1
		treated crop	40 - 69	**32.88**	1
		weeds	10 - 29	**18.17**	1
		weeds	30 - 39	**5.45**	1
		weeds	40 - 69	**4.54**	1
		field margin	10 - 29	0.17	1
		field margin	30 - 39	0.17	1
		field margin	40 - 69	0.17	1
		adjacent crop	10 - 29	0.11	1
		adjacent crop	30 - 39	0.11	1
		adjacent crop	40 - 69	0.11	1
		next crop	10 - 29	**2.51**	1
		next crop	30 - 39	**2.51**	1
		next crop	40 - 69	**2.51**	1

Bulb vegetables (EU South) at 1x 200 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
RIMI101	HQcontact	treated crop	< 40	0.0	42
		weeds	< 40	**2941.2**	42
		field margin	< 40	**82.4**	42
	ETRacute adult oral	treated crop	< 10	**0.93**	0.2
		treated crop	10 - 39	**3.04**	0.2
		weeds	< 10	**1.48**	0.2
		weeds	10 - 39	**1.48**	0.2
		field margin	< 10	**0.47**	0.2
		field margin	10 - 39	**0.47**	0.2
		adjacent crop	< 10	**0.46**	0.2
		adjacent crop	10 - 39	**0.46**	0.2
		next crop	< 10	**0.93**	0.2
		next crop	10 - 39	**0.93**	0.2
	ETRchronic adult oral	treated crop	< 10	**54.00**	0.03
		treated crop	10 - 39	**174.00**	0.03
		weeds	< 10	**87.00**	0.03
		weeds	10 - 39	**87.00**	0.03
		field margin	< 10	**27.84**	0.03
		field margin	10 - 39	**27.84**	0.03
		adjacent crop	< 10	**26.10**	0.03
		adjacent crop	10 - 39	**26.10**	0.03
		next crop	< 10	**54.00**	0.03
		next crop	10 - 39	**54.00**	0.03
	ETRlarvae	treated crop	< 10	**4.44**	0.2
		treated crop	10 - 39	**14.67**	0.2
		weeds	< 10	**7.33**	0.2
		weeds	10 - 39	**7.33**	0.2
		field margin	< 10	**2.35**	0.2
		field margin	10 - 39	**2.35**	0.2
		adjacent crop	< 10	**2.20**	0.2
		adjacent crop	10 - 39	**2.20**	0.2
		next crop	< 10	**4.44**	0.2
		next crop	10 - 39	**4.44**	0.2
	ETRhpg	treated crop	< 10	**3.72**	1
		treated crop	10 - 39	**14.62**	1
		weeds	< 10	**8.08**	1
		weeds	10 - 39	**8.08**	1
		field margin	< 10	**2.58**	1
		field margin	10 - 39	**2.58**	1
		adjacent crop	< 10	**2.19**	1

		adjacent crop	10 - 39	**2.19**	1
		next crop	< 10	**3.72**	1
		next crop	10 - 39	**3.72**	1

Potato (EU South) at 1x 200 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
RIMI101	HQcontact	treated crop	< 40	0.0	42
		weeds	< 40	**2941.2**	42
		field margin	< 40	**82.4**	42
	ETRacute adult oral	treated crop	< 10	0.02	0.2
		weeds	< 10	**1.48**	0.2
		field margin	< 10	**0.47**	0.2
		adjacent crop	< 10	**0.46**	0.2
		next crop	< 10	**0.93**	0.2
	ETRchronic adult oral	treated crop	< 10	**1.20**	0.03
		weeds	< 10	**87.00**	0.03
		field margin	< 10	**27.84**	0.03
		adjacent crop	< 10	**26.10**	0.03
		next crop	< 10	**54.00**	0.03
	ETRlarvae	treated crop	< 10	0.02	0.2
		weeds	< 10	**7.33**	0.2
		field margin	< 10	**2.35**	0.2
		adjacent crop	< 10	**2.20**	0.2
		next crop	< 10	**4.44**	0.2
	ETRhpg	treated crop	< 10	0.15	1
		weeds	< 10	**8.08**	1
		field margin	< 10	**2.58**	1
		adjacent crop	< 10	**2.19**	1
		next crop	< 10	**3.72**	1

Cotton (EU South) at 1x 200 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*)	
				ETR	trigger
RIMI101	HQcontact	treated crop	< 10	N/A	N/A
		weeds	< 10	N/A	N/A
		field margin	< 10	**282.4**	14
	ETRacute adult oral	treated crop	< 10	**0.93**	0.2
		weeds	< 10	**1.48**	0.2
		field margin	< 10	**0.47**	0.2

		adjacent crop	< 10	**0.46**	0.2
		next crop	< 10	**0.93**	0.2
	ETRchronic adult oral	treated crop	< 10	**54.00**	0.03
		weeds	< 10	**87.00**	0.03
		field margin	< 10	**27.84**	0.03
		adjacent crop	< 10	**26.10**	0.03
		next crop	< 10	**54.00**	0.03
	ETRlarvae	treated crop	< 10	**4.44**	0.2
		weeds	< 10	**7.33**	0.2
		field margin	< 10	**2.35**	0.2
		adjacent crop	< 10	**2.20**	0.2
		next crop	< 10	**4.44**	0.2
	ETRhpg	treated crop	< 10	**3.72**	1
		weeds	< 10	**8.08**	1
		field margin	< 10	**2.58**	1
		adjacent crop	< 10	**2.19**	1
		next crop	< 10	**3.72**	1

N/A: Not applicable

Cucurbits non-edible peel (EU South) at 1x 200 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
RIMI101	HQcontact	treated crop	< 10	N/A	N/A
		treated crop	10 - 49	**294.1**	14
		treated crop	≥ 50	**294.1**	14
		weeds	< 10	N/A	N/A
		weeds	10 - 49	**294.1**	14
		weeds	≥ 50	**88.2**	14
		field margin	< 10	**282.4**	14
		field margin	10 - 49	**282.4**	14
		field margin	≥ 50	**282.4**	14
	ETRacute adult oral	treated crop	< 10	**0.93**	0.2
		treated crop	10 - 49	**3.04**	0.2
		treated crop	50 - 69	**3.04**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	< 10	**1.48**	0.2
		weeds	10 - 49	**1.48**	0.2
		weeds	50 - 69	**0.44**	0.2
		weeds	≥ 70	**0.44**	0.2
		field margin	< 10	**0.47**	0.2
		field margin	10 - 49	**0.47**	0.2
		field margin	50 - 69	**0.47**	0.2

		field margin	≥ 70	**0.47**	0.2
		adjacent crop	< 10	**0.46**	0.2
		adjacent crop	10 - 49	**0.46**	0.2
		adjacent crop	50 - 69	**0.46**	0.2
		adjacent crop	≥ 70	**0.46**	0.2
		next crop	< 10	**0.93**	0.2
		next crop	10 - 49	**0.93**	0.2
		next crop	50 - 69	**0.93**	0.2
		next crop	≥ 70	**0.93**	0.2
	ETRchronic adult oral	treated crop	< 10	**54.00**	0.03
		treated crop	10 - 49	**174.00**	0.03
		treated crop	50 - 69	**174.00**	0.03
		treated crop	≥ 70	0.00	0.03
		weeds	< 10	**87.00**	0.03
		weeds	10 - 49	**87.00**	0.03
		weeds	50 - 69	**26.10**	0.03
		weeds	≥ 70	**26.10**	0.03
		field margin	< 10	**27.84**	0.03
		field margin	10 - 49	**27.84**	0.03
		field margin	50 - 69	**27.84**	0.03
		field margin	≥ 70	**27.84**	0.03
		adjacent crop	< 10	**26.10**	0.03
		adjacent crop	10 - 49	**26.10**	0.03
		adjacent crop	50 - 69	**26.10**	0.03
		adjacent crop	≥ 70	**26.10**	0.03
		next crop	< 10	**54.00**	0.03
		next crop	10 - 49	**54.00**	0.03
		next crop	50 - 69	**54.00**	0.03
		next crop	≥ 70	**54.00**	0.03
	ETRlarvae	treated crop	< 10	**4.44**	0.2
		treated crop	10 - 49	**14.67**	0.2
		treated crop	50 - 69	**14.67**	0.2
		treated crop	≥ 70	0.00	0.2
		weeds	< 10	**7.33**	0.2
		weeds	10 - 49	**7.33**	0.2
		weeds	50 - 69	**2.20**	0.2
		weeds	≥ 70	**2.20**	0.2
		field margin	< 10	**2.35**	0.2
		field margin	10 - 49	**2.35**	0.2
		field margin	50 - 69	**2.35**	0.2
		field margin	≥ 70	**2.35**	0.2
		adjacent crop	< 10	**2.20**	0.2
		adjacent crop	10 - 49	**2.20**	0.2

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*) ETR	trigger
		adjacent crop	50 - 69	**2.20**	0.2
		adjacent crop	≥ 70	**2.20**	0.2
		next crop	< 10	**4.44**	0.2
		next crop	10 - 49	**4.44**	0.2
		next crop	50 - 69	**4.44**	0.2
		next crop	≥ 70	**4.44**	0.2
	ETRhpg	treated crop	< 10	**3.72**	1
		treated crop	10 - 49	**14.62**	1
		treated crop	50 - 69	**14.62**	1
		treated crop	≥ 70	0.00	1
		weeds	< 10	**8.08**	1
		weeds	10 - 49	**8.08**	1
		weeds	50 - 69	**2.42**	1
		weeds	≥ 70	**2.42**	1
		field margin	< 10	**2.58**	1
		field margin	10 - 49	**2.58**	1
		field margin	50 - 69	**2.58**	1
		field margin	≥ 70	**2.58**	1
		adjacent crop	< 10	**2.19**	1
		adjacent crop	10 - 49	**2.19**	1
		adjacent crop	50 - 69	**2.19**	1
		adjacent crop	≥ 70	**2.19**	1
		next crop	< 10	**3.72**	1
		next crop	10 - 49	**3.72**	1
		next crop	50 - 69	**3.72**	1
		next crop	≥ 70	**3.72**	1

N/A: Not applicable

Maize (EU South) at 1x 200 g a.s./ha

Test substance	Risk quotient	scenario	BBCH	Honeybee (*Apis mellifera*) ETR	trigger
RIMI101	HQcontact	treated crop	< 10	N/A	N/A
		weeds	< 10	N/A	N/A
		field margin	< 10	**282.4**	14
	ETRacute adult oral	treated crop	< 10	0.02	0.2
		weeds	< 10	**1.48**	0.2
		field margin	< 10	**0.47**	0.2
		adjacent crop	< 10	**0.46**	0.2
		next crop	< 10	**0.93**	0.2
	ETRchronic	treated crop	< 10	**1.20**	0.03

	adult oral	weeds	< 10	**87.00**	0.03
		field margin	< 10	**27.84**	0.03
		adjacent crop	< 10	**26.10**	0.03
		next crop	< 10	**54.00**	0.03
	ETRlarvae	treated crop	< 10	0.02	0.2
		weeds	< 10	**7.33**	0.2
		field margin	< 10	**2.35**	0.2
		adjacent crop	< 10	**2.20**	0.2
		next crop	< 10	**4.44**	0.2
	ETRhpg	treated crop	< 10	0.15	1
		weeds	< 10	**8.08**	1
		field margin	< 10	**2.58**	1
		adjacent crop	< 10	**2.19**	1
		next crop	< 10	**3.72**	1

N/A: Not applicable

Maize (EU South) at 1x 500 g a.s./ha

Test substance	**Risk quotient**	**scenario**	**BBCH**	**Honeybee (*Apis mellifera*)**	
				ETR	**trigger**
Chlorpyrifos 5G	HQcontact	treated crop	< 10	N/A	N/A
		weeds	< 10	N/A	N/A
		field margin	< 10	**705.9**	14
	ETRacute adult oral	treated crop	< 10	0.04	0.2
		weeds	< 10	**3.70**	0.2
		field margin	< 10	**1.18**	0.2
		adjacent crop	< 10	**1.14**	0.2
		next crop	< 10	**2.33**	0.2
	ETRchronic adult oral	treated crop	< 10	**3.00**	0.03
		weeds	< 10	**217.50**	0.03
		field margin	< 10	**69.60**	0.03
		adjacent crop	< 10	**65.25**	0.03
		next crop	< 10	**135.00**	0.03
	ETRlarvae	treated crop	< 10	0.06	0.2
		weeds	< 10	**18.33**	0.2
		field margin	< 10	**5.87**	0.2
		adjacent crop	< 10	**5.50**	0.2
		next crop	< 10	**11.11**	0.2
	ETRhpg	treated crop	< 10	0.38	1
		weeds	< 10	**20.19**	1
		field margin	< 10	**6.46**	1
		adjacent crop	< 10	**5.48**	1
		next crop	< 10	**9.29**	1

N/A: Not applicable

First tier for guttation (independent of the crop and application rate)

1st tier for guttation

	water cons. (µL)	**ETR**	Trigger	Risk indicator
acute	11.4	0.08	0.2	OK
chronic	11.4	**3.232**	0.03	!
larvae	111	**4.66**	0.2	!
HPG	11.4	0.4	1	OK

Effects on other arthropod species (Regulation (EU) N° 283/2013, Annex Part A, point 8.3.2 and Regulation (EU) N° 284/2013 Annex Part A, point 10.3.2)

Laboratory tests with standard sensitive species

Species	Test Substance	End point	Toxicity
Typhlodromus pyri (Acari: Phytoseiidae)	Chlorpyrifos, DURSBAN 480 (EF-1042)	Mortality, LR_{50} (24 h)	1986 ppm (397.2 g a.s./ha)
Aphidius colemani (Hymenoptera: Braconidae)	Chlorpyrifos, DURSBAN 480 (EF-1042)	Mortality, LR_{50} (24 h)	< 1 ppm (< 0.2 g a.s./ha)
Additional species			
Coccinella septempunctata (Coleoptera: Coccinellidae)	Chlorpyrifos, DURSBAN 480 (EF-1042)	Mortality, LR_{50} (48 h)	33.4 ppm (6.68 ga.s./ha)
Poecilus cupreus (Coleoptera: Carabidae)	Chlorpyrifos, DURSBAN 480 (EF-1042)	Mortality, LR_{50} (48 h)	224 ppm
Acyrthosiphon kondoi (Homoptera: Aphididae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	0.87 ppm
Acyrthosiphon pisum (Homoptera: Aphididae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	0.38 ppm
Austromicromus tasmaniae (Neuroptera: Hemerobiidae) Adult Larva	Chlorpyrifos	Mortality, LR_{50} (48 h)	0.55 ppm (adult) 2.1 ppm (larva)
Coccinella undecimpunctata (Coleoptera: Coccinellidae)	Chlorpyrifos	Mortality, LR_{50} (48 h)	1.9 ppm

Species	Test Substance	End point	Toxicity
Coccinella repanda (Coleoptera: Coccinellidae) Adult Larva	Chlorpyrifos	Mortality, LR_{50} Adult (48 h) Larva (48 h)	360 ppm (adult) 85 ppm (larva)
Harmonia octomaculata (Coleoptera: Coccinellidae)	Chlorpyrifos	Mortality, LR_{50} (48 h)	1444 ppm
Simulium vitattum (Diptera: Simuliidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	8.6 ppm (larva)
Hydropsyche spp. *Chematopsyche* spp. (Trichoptera: Hydropsychidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	1 ppm (larva)
Heptageniidae (Ephemeroptera: Heptageniidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	3.2 ppm (nymph)
Enallagma spp. *Ischmura* spp. (Odonata: Coenagrionidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	0.91 ppm (nymph)
Hydrophilus spp. (Coleoptera: Hydrophilidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	20 ppm (adult)
Ostrinia nubilalis (Lepidoptera: Crambidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	24 ppm (larva)
Musca domestica (Diptera: Muscidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	60 ppm (larva)
Hyppodamia convergens (Coleoptera: Coccinellidae)	Chlorpyrifos	Mortality, LR_{50} (24 h)	18 ppm (adult)
Chilocorus nigritus (Coleoptera: Coccinellidae)	Chlorpyrifos Coroban 20 EC	Mortality	> 96% (18 h)
Bracon brevicornis (Hymenoptera: Braconidae)	Chlorpyrifos Coroban 20 EC	Mortality, LR_{50}	3.21 ppm
Chelonus blackburni (Hymenoptera: Braconidae)	Chlorpyrifos Coroban 20 EC	Mortality, LR_{50}	3.62 ppm
Cryptolaemus montrouzieri (Coleoptera: Coccinellidae)	Chlorpyrifos Coroban 20 EC	Mortality, LR_{50}	> 10,000 ppm
Poecilus versicolor (Coleoptera: Carabidae)	Chlorpyrifos DURSBAN 480	Mortality	100% after: L1 larvae: 8 d L2 larvae: 12 d L3 larvae: 16 d
Poecilus lepidus (Coleoptera: Carabidae)	Chlorpyrifos DURSBAN 480	Mortality	100% after: L1 larvae: 8 d

First tier risk assessment for:

Brassicas (EU South and Central) and Artichoke (EU South) at 1x 480 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	1.208	Early	0.033	2
				Late	0.097	
EF1551	*Aphidius colemani*	< 0.2	**> 2400**	Early	**> 66.5**	
				Late	**> 192.5**	

[1] In accordance with Appendix VI of ESCORT II, the distances assumed to calculate the drift rate are 1 m for early and 3 m for late applications.

Cereals (EU South and Central) at 1x 480 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	1.208	n.a.	0.033	2
EF1551	*Aphidius colemani*	< 0.2	**> 2400**	n.a.	**> 66.5**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 1 m.

Grapevines (EU South and Central) at 1x 360 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	0.906	Early	0.024	2
				Late	0.073	
EF1551	*Aphidius colemani*	< 0.2	**> 1800**	Early	**> 48.6**	
				Late	**> 144.36**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 3 m for both early and late applications.

Dessert pome (EU South and Central), Cider/Perry pome (EU Central) and Stone fruits (EU South and Central) at 1x 480 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	1.208	Early	0.353	2
				Late	0.190	
EF1551	*Aphidius colemani*	< 0.2	**> 2400**	Early	**> 700.8**	
				Late	**> 377.52**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 3 m.

Raspberry and Strawberry (EU Central) at 1x 480 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	1.208	Early	0.033	2
				Late	0.097	
EF1551	*Aphidius colemani*	< 0.2	**> 2400**	Early	**> 66.5**	
				Late	**> 192.5**	

[1] In accordance with Appendix VI of ESCORT II, the distances assumed to calculate the drift rate are 1 m for early and 3 m for late applications.

Fresh and Canning/Puree solanaceous vegetables (EU South and Central) at 1x 360 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	0.906	Early	0.025	2
				Late	0.073	
EF1551	*Aphidius colemani*	< 0.2	**> 1800**	Early	**> 49.86**	
				Late	**> 144.36**	

[1] In accordance with Appendix VI of ESCORT II, the distances assumed to calculate the drift rate are 1 m for early and 3 m for late applications.

Citrus (EU South) at 1x 1920 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	**4.834**	Early	1.412	2
				Late	0.76	
EF1551	*Aphidius colemani*	< 0.2	**> 9600**	Early	**> 2803.2**	
				Late	**> 1510.08**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 3 m.

Oilseed rape (EU South and Central) at 1x 480 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
EF1551	*Typhlodromus pyri*	397.2	1.208	n.a.	0.033	2
EF1551	*Aphidius colemani*	< 0.2	**> 2400**	n.a.	**> 66.5**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 1 m.

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
Pyrinex 250 CS	*Typhlodromus pyri*	397.2	0.472	n.a.	0.013	2

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
Pyrinex 250 CS	*Aphidius colemani*	< 0.2	**> 937.5**	n.a.	**> 25.97**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 1 m.

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha

Test substance	Species	Effect (LR_{50} g/ha)	HQ in-field	Growth stage	HQ off-field[1]	Trigger
SAP 250 CSI	*Typhlodromus pyri*	397.2	0.472	n.a.	0.013	2
SAP 250 CSI	*Aphidius colemani*	< 0.2	**> 937.5**	n.a.	**> 25.97**	

[1] In accordance with Appendix VI of ESCORT II, the distance assumed to calculate the drift rate is 1 m.

Extended laboratory tests, aged residue tests

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
Typhlodromus pyri (Acari: Phytoseiidae)	proto-nymphs	Dursban 4 EC, Initial residues on bean leaf disc	0 DAT	48 and 317.3	Mortality (7 DAT), Reproduction (7-14 DAT)	No effects
Typhlodromus pyri (Acari: Phytoseiidae)	proto-nymphs	EF1551, Initial residues on bean leaf disc	0 DAT	25, 50, 100, 200, 400 and 800	Mortality (7 DAT)	**LR_{50}: 134.7 g a.s./ha**
Aphidius rhopalosiphi (Hym.: Braconidae)	adults	Dursban 4 EC, Initial & aged residues on barley seedlings	0, 7 DAT	48 and 317.3	Mortality (48 h), Reproduction (24 h)	0 DAT M: 100% (both doses) 7 DAT M: < 3% (worst case) R: No effects
Aphidius rhopalosiphi (Hym.: Braconidae)	adults	EF 1551, Initial residues on barley seedlings	0 DAT	0.1, 0.2, 0.4, 0.8, 1.6 and 3.2	Mortality (48 h)	**LR_{50}: 0.57 g a.s./ha**
Aphidius colemani (Hym.: Braconidae)	adults	Dursban 4 EC, Initial & aged	0, 1, 3, 5, 8, 11 and	120 and 480	Mortality (24 h), Adult	120 g a.s./ha: 0 DAT M 100%

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
		residues on wheat leaf	14 DAT		Emergence (8 DAT)	1 DAT M 100% 3 DAT M 100% 5 DAT M 78% 8 DAT M 0% 11 DAT M 0% AE 83% 480 g a.s./ha: 0 DAT M 100% 1 DAT M 100% 3 DAT M 100% 5 DAT M 100% 8 DAT M 94% 11 DAT M 80% 14 DAT M 10% AE 45%
Chrysoperla carnea (Neur.: Chrysopidae)	larvae	EF1551, Initial residues on bean leaf	0 DAT	5, 10, 20, 40 and 80	Mortality (5 DAT)	**LR_{50}: 15.46 g a.s./ha**
Aleochara bilineata (Col.: Staphylinidae)	adults	EF1551, Initial & aged residues sprayed on soil	0, 7 DAT	0 DAT: 5, 10, 20, 40, 80 and 160 7 DAT: 100, 200, 300, 400, 500 and	Mortality (6 DAT)	0 DAT **LR_{50}: 36.86 g a.s./ha** 7 DAT LR_{50}: 122.95 g

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
				600		a.s./ha
Aleochara bilineata (Col.: Staphylinidae)	adults	Dursban, Initial residues sprayed on soil	0 DAT	960	Parasitism (8 weeks after treatment)	100% reduction
Coccinella septempunctata (Col.: Coccinellidae)	adults	Dursban 4 EC, Initial & aged residues on wheat plants	0, 1, 2, 5, 9 and 13 DAT	120 and 480	Mortality (48 h)	120 g a.s./ha: 0 DAT M 28% 1 DAT M 3% 480 g a.s./ha: 0 DAT M 98% 1 DAT M 24% 2 DAT M 13% 5 DAT M 8%
Pardosa spp. (Araneae: Lycosidae)	n.e.	Dursban 4 EC, Initial & aged residues sprayed on soil	0, 2 DAT	120 and 480	Mortality (48 h)	120 g a.s./ha: 0 DAT M 10% 2 DAT M 0% 480 g a.s./ha: 0 DAT M 55% 2 DAT M 15%
Bembidion lampros (Col.: Carabidae)	adults	Dursban 4 EC, Initial & aged residues sprayed on soil	0, 2, 5 and 9 DAT	120 and 480	Mortality (48 h)	120 g a.s./ha: 0 DAT M 100% 2 DAT M 55% 5 DAT M 15% 480 g a.s./ha:

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						0 DAT M 100% 2 DAT M 100% 5 DAT M 75% 9 DAT M 100%
Aphidius rhopalosiphi (Hym.: Braconidae)	adults	Pyrinex 25 CS, Initial & aged residues on bean plants	0, 7, 14, 28, 56 and 73 DAT	2x 500 1x 960 1x 2400	Mortality (48 h), Reproduction (24 h)	0 DAT M: 100% (all doses) 7 DAT M: 100% (all) 14 DAT M: 100% (all) 28 DAT M: 100% (all) 56 DAT 2x 500 g a.s./ha M: 100% 1x 960 g a.s./ha M: 73.3% R: 31.05% of reduction 1x 2400 g a.s./ha M: 100% 73 DAT 2x 500 g a.s./ha M: 56.88% R: 31.73% of reduction 1x 960 g a.s./ha M: 36.19%

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						R: 5.68% of reduction 1x 2400 g a.s./ha M: 32.78% R: 30.4% of reduction
Typhlodromus pyri (Acari: Phytoseiidae)	proto-nymphs	SAP 250 CSI, Aged residues on bean plants	1, 14 and 21 DAT	130.33, 315.38, 589.88 and 750	Mortality (7 DAE) Reproduction (7-14 DAE)	1 DAT 130.33 g a.s./ha M: 9% R: 10.72% of reduction 315.38 g a.s./ha M: 16% R: 11.69% of reduction 589.88 g a.s./ha M: 15% R: 0.80% of reduction 750 g a.s./ha M: 16% R: 0.83% of reduction 14 DAT 130.33 g a.s./ha M: 12% R: 0.27% of reduction 315.38 g a.s./ha M: 11% R: 0.23% of reduction 589.88 g a.s./ha M: 13% R: -3.18% of reduction

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						750 g a.s./ha M: 14% R: -6.75% of reduction 21 DAT 130.33 g a.s./ha M: 14% R: 0.57% of reduction 315.38 g a.s./ha M: 9% R: 4.47% of reduction 589.88 g a.s./ha M: 9% R: 11.3% of reduction 750 g a.s./ha M: 15% R: -0.54% of reduction
Aphidius rhopalosiphi (Hym.: Braconidae)	adults	SAP 250 CSI, Aged residues on bean plants	1, 14, 21, 28 and 42 DAT	130.33, 315.38, 589.88 and 750	Mortality (48 h), Reproduction (24 h)	1 DAT M: 100% (all doses) 14 DAT 130.33 g a.s./ha M: 87.5% 315.38 g a.s./ha M: 85% 589.88 g a.s./ha M: 100% 750 g a.s./ha M: 100% 21 DAT 130.33 g

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						a.s./ha M: 35% R: -26.42% of reduction 315.38 g a.s./ha M: 65% 589.88 g a.s./ha M: 80% 750 g a.s./ha M: 100% 28 DAT 315.38 g a.s./ha M: 35% R: -7.14% of reduction 589.88 g a.s./ha M: 92.5% 750 g a.s./ha M: 100% 42 DAT 589.88 g a.s./ha M: 25% R: 2.29% of reduction 750 g a.s./ha M: 32.5% R: -16.73% of reduction
Chrysoperla carnea (Neuroptera: Chrysopidae)	larvae	SAP 250 CSI, Aged residues on bean plants	1, 14, 21 and 28 DAT	5.2, 130.33 and 750	Mortality (21-22 DAE) Reproduction (24h)	1 DAT 5.2 g a.s./ha M: 13.33% R: 52.56% of reduction 130.33 g a.s./ha M: 86.67%

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						750 g a.s./ha M: 100% 14 DAT 5.2 g a.s./ha M: 10% R: 7.64% of reduction 130.33 g a.s./ha M: 16.67% R: 31.23% of reduction 750 g a.s./ha M: 71.43% 21 DAT 5.2 g a.s./ha M: 6.67% R: 14.99% of reduction 130.33 g a.s./ha M: 10% R: -1.09% of reduction 750 g a.s./ha M: 35.71% R: 1.09% of reduction 28 DAT 750 g a.s./ha M: 27.59% R: 21.24% of reduction
Coccinella septempunctata (Col.: Coccinellidae)	larvae	SAP 250 CSI, Aged residues on bean plants	1, 14, 21 and 28 DAT	5.2, 130.33 and 750	Mortality (12-20 DAE) Reproduction (24h)	1 DAT 5.2 g a.s./ha M: 20.51% R: -38.49% of reduction 130.33 g a.s./ha

Species	Life stage	Test substance, substrate	Time scale	Dose (g a.s./ha)[1,2]	End point	% effect[3]
Extended laboratory tests						
						M: 100% 750 g a.s./ha M: 100% 14 DAT 5.2 g a.s./ha M: 7.69% R: -62.54% of reduction 130.33 g a.s./ha M: 17.5% R: 13.63% of reduction 750 g a.s./ha M: 85% 21 DAT 5.2 g a.s./ha M: 7.5% R: -17.33% of reduction 130.33 g a.s./ha M: 25.64% R: -7.94% of reduction 750 g a.s./ha M: 66.67% 28 DAT 750 g a.s./ha M: 17.50% R: 26.08% of reduction

[1] indicate whether initial or aged residues
[2] for preparations indicate whether dose is expressed in units of a.s. or preparation
[3] indicate if positive percentages relate to adverse effects or not

Risk assessment based on extended laboratory tests (with a correction factor CF = 5) for:

Brassicas (EU South and Central) and Artichoke (EU South) at 1x 480 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**480**	6.65
Aphidius rhopalosiphi	0.57	**480**	**66.48**
Chrysoperla carnea	15.46	**480**	6.65
Aleochara bilineata	36.86	**480**	**66.48**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Cereals (EU South and Central) at 1x 480 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**480**	6.65
Aphidius rhopalosiphi	0.57	**480**	**66.48**
Chrysoperla carnea	15.46	**480**	6.65
Aleochara bilineata	36.86	**480**	**66.48**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Grapevines (EU South and Central) at 1x 360 g a.s./ha (3D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**360**	14.44
Aphidius rhopalosiphi	0.57	**360**	**144.36**
Chrysoperla carnea	15.46	**360**	14.44
Aleochara bilineata	36.86	**360**	**144.36**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 3 m (vineyards). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Dessert pome (EU South and Central), Cider/Perry pome (EU Central) and Stone fruits (EU South and Central) at 1x 480 g a.s./ha (3D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**480**	70.07
Aphidius rhopalosiphi	0.57	**480**	**700.8**
Chrysoperla carnea	15.46	**480**	**70.08**
Aleochara bilineata	36.86	**480**	**700.8**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 3 m (orchards). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Raspberry and Strawberry (EU Central) at 1x 480 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**480**	6.65
Aphidius rhopalosiphi	0.57	**480**	**66.48**
Chrysoperla carnea	15.46	**480**	6.65

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Aleochara bilineata	36.86	**480**	**66.48**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Fresh and Canning/Puree solanaceous vegetables (EU South and Central) at 1x 360 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**360**	4.99
Aphidius rhopalosiphi	0.57	**360**	**49.86**
Chrysoperla carnea	15.46	**360**	4.99
Aleochara bilineata	36.86	**360**	**49.86**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Citrus (EU South) at 1x 1920 g a.s./ha (3D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**1920**	**280.32**
Aphidius rhopalosiphi	0.57	**1920**	**2803.2**
Chrysoperla carnea	15.46	**1920**	**280.32**
Aleochara bilineata	36.86	**1920**	**2803.2**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 3 m (orchards). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Oilseed rape (EU South and Central) at 1x 480 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**480**	6.65
Aphidius rhopalosiphi	0.57	**480**	**66.48**
Chrysoperla carnea	15.46	**480**	6.65
Aleochara bilineata	36.86	**480**	**66.48**

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha (2D)

Species	ER_{50} (g/ha)	In-field rate (g/ha)	Off-field rate[1] (g/ha)
Typhlodromus pyri	134.7	**187.5**	2.60
Aphidius rhopalosiphi	0.57	**187.5**	**25.97**
Chrysoperla carnea	15.46	**187.5**	2.60
Aleochara bilineata	36.86	**187.5**	25.97

[1] In accordance with ESCORT II, the distance assumed to calculate the off-field rate is 1 m (arable crops). VDF = 10 for *T. pyri* and *C. carnea*; VDF = 1 for *A. rhopalosiphi* and *A. bilineata*.

Semi-field tests

EF1551

Only one semi-field study was accepted as an indication of the potential of recovery after an initial impact on arthropod populations. Chlorpyrifos applied **at 480 g a.s./ha** in **wheat fields** (cereal) caused 100 and 91% mortalities of the carabid species *Bembidion obscurellum* and *Bembidion quadrimaculatum* in direct contact tests in two consecutive years. The residual toxicity of chlorpyrifos was also similar in both years one week after spraying (82 and 78%, respectively). The study also states that high residual toxicity impede recovery of carabids adult populations by immigration and account for significant reductions in pitfall catches of both species 3 to 16 days after chlorpyrifos applications. Pitfall catches 17 to 47 days after spraying were consistently, though not significantly, lower in plots treated with chlorpyrifos compared with control plots.

Chlorpyrifos 5G

Any of the three semi-field studies (with soil from a treated maize field) that were presented to conduct the risk assessment was considered valid for the evaluation.

Field studies

EF1551

Seven NTAs field studies were accepted to assess the in-field and off-field arthropod populations and community recovery after different scenarios of chlorpyrifos applications in several crops, among which **there are no data to conduct the in-field risk assessment for the intended uses in brassicas and artichoke, grapevine, raspberry, strawberry, oilseed rape and vegetables**.

For these studies, as a general acceptability criterion **for in-field effects, the potential for re-colonisation after a toxic effect should usually be demonstrated within one year**. Where significant off-field effects are detected, the duration of effect and the range of taxa affected should also be taken into consideration. **For off-crop risk assessment, no effect or only transient effects are considered acceptable** (de Jong et al. 2010)**, and therefore measuring recovery is not applicable**.

- Cereals (intended use at 1x 480 g a.s./ha)

SW France: NTAs full arthropod fauna in field and off-crop field study in **sorghum** (B.9.3.2.4/07).

Full rates (in-field): 1x 960 and 2x 740 g a.s./ha.

Community responses for taxa collected by pitfall traps and photo-electors were observed immediately after application(s) up to the end of the season (ca. 4 months later) in both full rate chlorpyrifos treatments. Responses determined in the next spring indicated recovery of the arthropod community in both chlorpyrifos treatments.

However, no recovery within one year could be demonstrated for the ground beetle populations of the genus *Carabus* sp. at the 1x 960 full rate, and Lycosidae, Collembola and Isopoda populations were still smaller than those of the control by the next spring.

Drift rate (off-crop): 2x 5g a.s./ha.

This rate did not induce adverse community responses, but caused some population adverse effects that were statistically detectable for the Coccinellidae larvae, some hunting spiders, Collembola, and Orthoptera.

UK: NTAs full arthropod fauna in-field study in **cereal** (B.9.3.2.4/12-13).

Full rates (in-field): 1x 480 g a.s./ha in summer and 1x 720 g a.s./ha in autumn

The type and range of species affected and recovery period observed was dependant on the timing of application and the ecological recovery and dispersal rates of the affected taxa. In the worst case scenario, the potential recovery time was observed at 8-9 months for the application in autumn (720 g a.s./ha).

However, for the summer application (480 g a.s./ha), many more species would have been active on the ground surface and on the crop during the summer months and would have been exposed. In this case, no full recovery at the end of the sampling period was showed for two Collembolan species, *Lepidocyrtus cyaneus* and *Sminthurus viridis*, even though by that time both species were showing similar population change patterns than the control.

UK: NTAs epigeal arthropod fauna in-field study in **grassland** (B.9.3.2.4/03).

Full rate (in-field): 1x 720 g a.s./ha.

The studies should preferably be performed on the intended crop (cereals), but it can be considered that there is great similarity in the epigeal arthropod fauna of grasslands and cereals.

Chlorpyrifos at 720 g as/ha (as Dursban 4 EC) is of initial high toxicity to grassland spring populations of carabid and staphylinid beetles and linyphiid spiders.

Other than Aleocharinae (Coleoptera: Staphylinidae), all predatory taxa seem to have recovered fully by the following spring. Recovery of carabid populations is probably mediated through adult immigration from control plots and not from surrounding areas.

All groups had recovered by the following spring, with the exception of Collembola, for which no full recovery is observed.

- Dessert pome, Cider/Perry pome and Stone fruits (intended use at 1x 480 g a.s./ha)

NW France: NTAs full arthropod fauna in-field and off-field study in **apple** (B.9.3.2.4/08).

Full rates (in-field): 1x and 2x 960 g a.s./ha.

Both chlorpyrifos full rate treatments either of 1 x 960 g as/ha or 2x 960 g as/ha induced adverse community effects that for the 2x 960g a.s./ha rate lasted until the end of the first sampling season. Samples collected in the following spring indicated that recovery processes seemed to have continued, and populations were no longer different from the control at the onset of the next growing season, with the exception of the predatory beetles of the family Staphylinidae whose populations showed no clear recovery within one year.

Drift rate (off-crop): 2x 162 g a.s./ha.

The arthropod community was significantly affected by the chlorpyrifos drift rate of 2x 162 g a.s/ha. The populations of Psocoptera, some parasitic wasps (Ceraphonoidea) and the beetle family Coccinellidae showed statistically significant adverse effects.

- Citrus (intended at 1x 1920 g a.s./ha)

Spain: NTAs full arthropod fauna in-field study in **citrus** (B.9.3.2.4/10).

Full rates (in-field): 1x and 2x 2400 g a.s./ha.

For the 1x 2400 rate, the leaf dwelling mite community was observed to have recovered 2 months after application and the canopy dwelling arthropod community within 6 months. Populations of most hunting spiders were however affected for a longer period. Recovery within one year could not be probed for the coleopteran family Latridiidae and populations of the hunting spider families Zodariidae, Gnaphosidae and Clubionidae were still smaller than those from the control at the end of the sampling period.

For the 2x 2400 rate, no clear leaf community recovery was observed one year after the application and at the end of the first sampling season no clear canopy dwelling community recovery was demonstrated. At the end of the sampling period, the arthropod populations of Dermaptera and the hunting spiders Zodariidae, Gnaphosidae and Clubionidae had not recovered to biologically acceptable levels. At that time, the groups of spiders Heteropodidae (= Sparassidae), *Xysticus* sp. (Thomisidae) and Salticidae were still statistically significantly reduced compared to the control; hence it was not possible to confirm full recovery for these spiders one year after application.

- Applicable for any of the intended uses (off-crop effects)

NW France: NTAs full arthropod fauna off-field study in **pasture** (B.9.3.2.4/09).

Drift rate (off-crop): 1, 5, 10, 25 and 100 g a.s./ha.

At 1, 5 and 10 g a.s./ha chlorpyrifos did not influence the arthropod community in a true off-crop habitat. Less than 5% of the individual arthropod populations prevailing in grasslands showed statistically significantly adverse effects. For Staphylinidae, Scelionidae and Formicidae these effects were consistent over time, though not significantly, at 5 g a.s./ha.

At 25 g a.s./ha chlorpyrifos caused statistically significant but non persistent reductions to 4% of the arthropod taxa examined. This rate led to an adverse community response which was statistically detectable on one sampling moment.

A rate of 100 g a.s./ha induced a statistically significant community response. For several taxa, no recovery occurred within the selected sampling period of one month.

SW France: NTAs full arthropod fauna off-field study in **pasture** (B.9.3.2.4/11).

Drift rate (off-crop): 1, 5, 10, 25 and 100 g a.s./ha.

At 1, 5 and 10 g a.s./ha chlorpyrifos had no detectable effect on the arthropod community. Slight effects were recorded at 10 g a.s./ha for individual arthropod populations (being statistically different for Scelionidae parasitoids).

At the 25 g a.s./ha rate statistically response on the arthropod community was detected on one sampling moment. At the population level, a statistically significant reduction was detected for several arthropod taxa, which showed a tendency towards recovery within one month after application.

At 100 g a.s./ha chlorpyrifos induced a statistically significant, dose-related, population and community response.

<u>Pyrinex 250 CS</u>

Three NTAs field studies were accepted to assess the in-field and off-field arthropod populations and community recovery after different scenarios of chlorpyrifos applications in several crops, among which **there are no data to conduct the risk assessment for the intended use in oilseed rape** (at 187.5 g a.s./ha).

SW France: NTAs full arthropod fauna in-field and off-field study in **apple** (B.9.3.2.4/01)

Full rate (in-field): 2x 500 g a.s./ha.

For the in-field rate application of Pyrinex 25 CS (two applications at 500 g a.s./ha), effects were observed for a wide range of non-target arthropods. For some groups (e.g. larval Coccinellidae, other larval Coleoptera, Chalcidoidea, Psocoptera), the natural decline of populations during the season (as indicated by the control data) meant that within-season population recovery could not be demonstrated with confidence. Additional samples taken early in the 2008 growing season demonstrated the potential for population recovery by some of these groups. However, recovery could not be probed for Dictynidae spiders nor Reduviidae bugs.

Drift rates (off-crop): 2x 78.65 g a.s./ha and 2x 18 g a.s./ha.

In the 15.73% drift rate treatment (two applications at 78.65 g a.s./ha), treatment-related effects were observed for four taxonomic groups. These effects were still significant 149 days after treatment for Psocoptera and Reduviidae bugs and 122 days after treatment for the hunting spider's family Thomisidae.

In the 3.6% drift treatment (two applications at 18 g a.s./ha), effects were negligible. However, treatment-related effects were observed for three taxonomic groups, being for Psocoptera and Reduviidae bugs still significant 149 days after treatment.

SE Fance: Study of the *Kampimodromus aberrans* (Acari: Phytoseiidae) populations in **vineyard** (B.9.3.2.4/02)

Full rate (in-field): 1x 500 g a.s./ha

Pyrinex ME showed no toxic effects on *Kampimodromus aberrans* phytoseiid mite populations. It seems to be not so much because this insecticide is selective, but rather because *K. aberrans* could have developed resistance to chlorpyrifos (Tirello, P., Pozzebon, A. & Duso, C. *Exp. Appl. Acarol.* 2012). It is not possible to say since previous pesticide field history is not reported.

SE France: Study of the *Typhlodromus pyri* (Acari: Phytoseiidae) populations in **vineyard** (B.9.3.2.4/04)

Full rate (in-field): 2x 500 g a.s./ha

Pyrinex ME can be classified as moderately harmful (effects between 50 and 75% compared to the toxic standard) for the mite *T. pyri* until 8 days after the second application, harmful (>75% effect) 15 days after the second application, slightly harmful (effects between 25 and 50%) 22 days after the second application and harmless (<25% effect) 58 days after the second application. RIMI 101 RB No NTAs field studies were accepted (only one was presented in pepper under protected conditions) to assess the in-field and off-field arthropod populations and community recovery for this formulation. Thus, **there are no data to conduct the risk assessment for the intended uses in maize, potato, bulb vegetables, cotton and cucurbits at 1x 200 g a.s./ha**. With the exception of the drift rates, almost every study has been conducted at rates clearly above those of the intended uses (in only one study in cereals in UK the actual rate at 480 g a.s./ha was tested), showing effects that won't allow for the recovery of several arthropod groups or communities living in a specific crop. For rates below those of the intended uses (drift rates), clear and significant effects have also been detected. Thus, recovery at the intended rates cannot be demonstrated. Overall these field studies demonstrate a tendency to a continuous decline in different arthropod populations and a community imbalance when the non-selective insecticide chlorpyrifos is used repeatedly.
Additional specific test

Effects on non-target soil meso- and macro fauna; effects on soil nitrogen transformation (Regulation (EU) N° 283/2013, Annex Part A, points 8.4, 8.5, and Regulation (EU) N° 284/2013 Annex Part A, points 10.4, 10.5)

Test organism	Test substance[1]	Time scale	End point[2]
Earthworms			
Eisenia foetida	Technical chlorpyrifos 98%; incorporated in soil, 10% OM	Chronic 28-d; 56-d	28-d NOEC mortality = 492 mg chlorpyrifos/kg soil (456-531) 56-d NOEC reproduction = 0.15 mg chlorpyrifos/kg soil **56-d NOECcorr reproduction = 0.075 mg chlorpyrifos/kg soil**
Eisenia foetida	Dursban 480 EC (480 g chlorpyrifos/L); incorporated in soil	Chronic 28-d; 56-d	28-d NOEC mortality = 26.7 mg chlorpyrifos/kg soil 56-d NOEC reproduction = 12.7 mg chlorpyrifos/kg soil 56-d NOECcorr = 6.35 mg chlorpyrifos/kg soil

Eisenia foetida	RIMI 102 (10 g chlorpyrifos/Kg); incorporated in soil, 10% OM	Chronic 56-d	56-d NOEC reproduction = 5.32 mg chlorpyrifos/kg dry soil 56-d NOECcorr = 2.66 mg chlorpyrifos/kg soil
Eisenia foetida	TCP; incorporated in soil, 10% OM	Chronic 28-d; 56-d	28-d NOEC mortality = 10 mg TCP/kg soil **56-d NOEC reproduction = 2.20 mg TCP/kg soil**
Eisenia foetida	TMP; incorporated in soil, 10% OM	Chronic 56-d	56-d NOEC reproduction = 42.86 mg TMP/kg soil 56-d EC10, EC20, EC50 > 42.86 mg TMP/kg soil **56-d NOECcorr reproduction = 21.43 mg TMP/kg soil**
Eisenia foetida	DCP; incorporated in soil, 10% OM	Chronic 28-d; 56-d	28-d NOEC mortality = 5 mg DCP/kg soil 56-d EC10 reproduction = 1.75 mg DCP/kg soil (0.85-2.35) 56-d EC20 reproduction = 3 mg DCP/kg soil (2.16 - 3.73) **56-d NOEC reproduction = 1.25 mg DCP/kg soil**
Eisenia foetida	NMTCP; mixed through soil, 10 % OM	Chronic 28-d; 56-d	56-d NOEC reproduction = 25 mg NMTCP/kg soil. EC10 = 45.7 mg NMTCP/kg soil. EC20 = 89.6 mg NMTCP/kg soil. **56-d NOECcorr reproduction = 12.5 mg NMTCP/kg soil**
Other soil macro-organisms			
Folsomia candida	Technical chlorpyrifos 98%; incorporated in soil, 5% OM	Chronic 28-d	28-d NOEC mortality = 0.077 mg test item/kg soil (0.075 mg chlorpyrifos/kg soil) 28-d NOEC reproduction = 0.024 mg test item/kg soil (0.024 mg chlorpyrifos/kg soil)

			28-d NOECcorr reproduction = 0.012 mg chlorpyrifos/kg soil
Folsomia candida	TCP; incorporated in soil, 5% OM	Chronic 28-d	28-d NOEC reproduction = 50 mg TCP/kg soil [highest test concentration]
Folsomia candida	TCP; incorporated in soil, 5% OM	Chronic 28-d	**28-d NOEC reproduction = 16 mg TCP/kg soil**
Hypoaspis aculeifer	Technical chlorpyrifos 99%; incorporated in soil, 5% OM	Chronic 14-d	14-d NOEC mortality and reproduction = 3.2 mg chlorpyrifos/kg soil 14-d NOECcorr = 1.6 mg chlorpyrifos/kg soil
Hypoaspis aculeifer	Technical chlorpyrifos 98%; incorporated in soil, 5% OM	Chronic 14-d	14-d NOEC mortality = 8 mg test item/kg soil (7.84 mg chlorpyrifos/kg soil) 14-d NOEC reproduction = 1 mg test item/kg soil (0.98 mg chlorpyrifos/kg soil) **14-d NOECcorr reproduction = 0.49 mg chlorpyrifos/kg soil**
Hypoaspis aculeifer	TCP; incorporated in soil, 5% OM	Chronic 14-d	**14-d NOEC reproduction = 50 mg TCP/kg soil** [highest test concentration]
Hypoaspis aculeifer	TCP; incorporated in soil, 5% OM	Chronic 14-d	14-d NOEC reproduction = 64 mg TCP/kg soil

[1] To indicate whether the test substance was oversprayed/to indicate the organic content of the test soil (e.g. 5 % or 10 %).
[2] corrected due to log Pow >2.0 (e.g. NOECcorr)

EF1551

Three field studies were submitted and accepted to assess the effects of chlorpyrifos on soil organisms' populations, among which **there are no data to conduct the risk assessment for the intended uses in brassicas and artichoke, citrus, grapevine, raspberry, strawberry, oilseed rape and vegetables**.

For these studies, as a general acceptability criterion **for the effects on non-target soil meso- and macro fauna, the potential for recovery after a toxic event should usually be demonstrated within one year**.

- Cereals (intended use at 1x 480 g a.s./ha)

Two field studies have been submitted in which chlorpyrifos was used as a toxic reference applied at 1152 and 720 g a.s./ha, respectively (Please see Study B.9.7.2.2/01 and Study B.9.7.2.2/02 in the EF1551 dossier –CP 10.4.2.2/1 and CP 10.4.2.2/2-). These two studies, previously evaluated and considered valid at EU level in the context of the main test materials, sulfoxaflor and oxyfluorfen, respectively, were conducted in plots of permanent **grassland**, which is considered a model habitat for field testing on soil organisms due to their high abundances. As expected for an active substance used as toxic reference, pronounced effects on the soil fauna were observed.

Germany: In the **Study B.9.7.2.2/01 (CP 10.4.2.2/1)**, community composition and abundance of selected soil living invertebrates were monitored over the period of one year. The study was conducted on a permanent grassland field site near Pforzheim, Southern Germany. In this study soil living invertebrate populations were exposed to the toxic reference test item Dursban 2 (4 L product/ha; 1152 g a.s./ha). Soil micro-arthropod communities were assessed for their species composition and abundance prior to application and at approximately 1, 6 and 12 months after application. The extraction of the arthropods was based on ISO 23611-2. The data were analysed with pair-wise and multivariate statistics. In the second sampling time (37 DAA), chlorpyrifos achieved a statistically significant reduction for the abundances of the family Entomobrydae (Arthropleona), for the order Symphypleona and for the family Sminthuridae (Symphypleona). In addition, the multivariate analysis showed a statistically significant change in community composition compared to the control 37 days after application. **At the end of the sampling period, full recovery observed by recovery on at least two consecutive sampling instances cannot be concluded for the collembolan family Brachystomellidae**.

UK: In the **Study B.9.7.2.2/02 (CP 10.4.2.2/2)**, the trial took place in permanent grassland in southern England from summer 2007 through to summer 2008. Dursban 480 EC (480 g a.s./L) was applied at 1.5 L/ha (as a toxic reference treatment). One plot was remained untreated as control. Invertebrates active on the soil surface (epigeal species) were sampled from the plots using pitfall traps and those in the soil (eudaphic species) were sampled using soil cores and 'litter-bags'. PRC analysis of chlorpyrifos at 720 g a.s/ha indicated statistically significant reductions in the soil arthropod meso-community at two consecutive time points following application. Less than 50 % effect was observed 10 months after application by soil core sampling and 7 months after application by litterbag sampling although in many cases the recovery was not observed on at least two consecutive sampling instances. It is also noted that for total soil mites a 41.3% decrease respect to the control is observed at 195 DAA in litter bag samples and a 16.9 % decrease respect to the control is still observed after 309 DAA. Thus, **no full recovery can be concluded for soil mites**.

Furthermore, the following uncertainties are identified in both studies: Chlorpyrifos was used as a toxic reference and it was not the main substance investigated in the field experiment; the application rate used do not cover the worst case application rate proposed in the GAP (for citrus) and no residues of chlorpyrifos were measured in the treated soils and according to EU regulation 283/2013 higher tier studies shall be supported by chemical analysis to verify exposure has occurred at an appropriate level.

- Dessert pome, Cider/Perry pome and Stone fruits (intended use at 1x 480 g a.s./ha)

UK: A 2-year field monitoring study has been conducted on the soil fauna of three treated commercial cider apple orchards in UK. The aim of this study was to assess the diversity and abundance of the soil community in a perennial cropping system which is treated with chlorpyrifos every year. Chlorpyrifos was applied every year once before flowering (480 g a.s./ha) and once after flowering (960 g a.s./ha). Also, three untreated traditional non-commercial orchards were sampled as reference sites. Community composition and abundance of soil living invertebrates were monitored over the period of two years (April 2013 – March 2015). The conclusions of the third study (**Study B.9.7.2.2/03 -CP 10.4.2.2-3-**; Chlorpyrifos specific field study in cider apple orchards) are the following:

Soil-surface active arthropods (monitored by pitfall trapping):

For the pitfall trapping data, the PRC analysis revealed that 6 soil arthropod taxa were not favoured by the conventional farming system: Katiannidae, Orchesellinae, Tomoceridae, Sminthuridae, Dicyrtomyidae, and Uropodina. Only the collembolan family Hypogastruridae was favoured by the conventional farming system. For the other 13 taxa no clear response was detected (i.e. the conventional and organic orchards were similar). The data provide an indication that **the chlorpyrifos application had a detrimental effect on the soil arthropods (eg. collembolan family Katiannidae)**.

Euedaphic arthropods (monitored by soil cores which were heat-extracted)

For the soil core data, the PRC analysis revealed that 7 soil arthropod taxa were not favoured by the conventional farming system: Katiannidae, Uropodina, Entomobryidae, Isotomidae, Neelidae, Mesostigmata and Sminthurididae. For the other 11 taxa no clear response was detected (i.e. the conventional and organic orchards were similar).

Enchytraeid earthworms (monitored by soil cores which were wet-extracted):

Statistically significant differences between the organic and conventional orchards were detected at three sampling occasions. In each case, the recorded significant differences were between the tree rows of the conventionally managed orchards and the organic orchards.

The Enchytraeidae populations in the tree rows of conventional (treated) orchards were clearly lower than those of the organic orchards (though not statistically significant) during the whole experiment. However, no clear density comparisons have been made between conventional and organic orchards for this specific scenario.

Moreover, the following uncertainties were identified: The application rate proposed in the study do not cover the worst-case application rate proposed in the GAP (citrus); Chlorpyrifos is applied to apple cider orchards, and thus some uncertainties are identified in extrapolating the results to other crops at lower BBCH with no interception (eg. Solanaceus vegetables at BBCH 11).

<u>SAP 250CSI and Chlorpyrifos 5G</u>

One field study was accepted to assess the non-target soil meso- and macro fauna populations and community recovery after the chlorpyrifos application in maize. Thus, **there are no data to conduct the risk assessment for the intended use in oilseed rape (at 187.5 g a.s./ha)**.

- Maize (intended use at 1x 500 g a.s./ha)

UK: A higher tier study with the formulated product Chlorpyrifos-ethyl 5G was performed to determine the effect of a field application on populations of collembolans, soil mites and earthworms (See **Study B.9.7.1.2/01 in the SAPEC 5G dossier -KCP 10.4.1.2-**). This study was designed to determine the effect of a single commercial field application of 15 kg product/ha of Chlorpyrifos 5G on populations of collembolans, soil mites and earthworms in comparison to a blank granule control. The results 7 DAA indicate that there was no effect on the survival of *Folsomia candida* or *Hypoaspis aculeifer* in either the mid-point or in-furrow locations of the Chlorpyrifos 5G treated plots.

However, chlorpyrifos 5 G is a granulated formulation containing chlorpyrifos and therefore, some uncertainties are identified from the extrapolation of the results obtained in a field study with a granulated formulation to a spray application (SAP250CSI). Both formulated products are not comparable in application rate, type of application or method of application. Moreover, residues in soil were measured at 7, 28, 56, 112 and 280 DAA. Initial measured residues (0 DAA) and more intermediate sampling points (e.g. 2, 4, 10, 14, 21 DAA) would have been helpful to establish residues decline. Furthermore, effects were measured at day 7 and 28. Higher effect were observed in *Folsomia candida* at day 28 that those observed at day 7. Intermediate measures (day 14 and 21) would have clarified the observed effects.

Nitrogen transformation	a.s. preparation		% effect at day xx at mg a.s./kg d.w.soil (mg a.s/ha) *[In line with the OECD test guideline the endpoint should be based on nitrogen transformation rate and not nitrogen levels*]
	metabolite 1		

Toxicity/exposure ratios for soil organisms

Formulated product: EF-1551

Brassicas (EU South and Central) and Artichoke (EU South) at 1x 480 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.480	**0.156**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.287	7.665	5
	TMP	Chronic	$PEC_{plateau}$ = 0.162	132.28	5
	DCP	Chronic	$PEC_{plateau}$ = 0.151	8.278	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.480	**0.025**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.287	55.75	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.480	**1.021**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.287	174.22	5

[1]indicate which PEC soil was used (e.g. plateau PEC)

Cereals (EU South and Central) at 1x 480 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.640	**0.117**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.383	5.744	5
	TMP	Chronic	$PEC_{plateau}$ = 0.216	99.21	5
	DCP	Chronic	$PEC_{plateau}$ = 0.040	31.25	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.640	**0.019**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.383	41.77	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.640	**0.766**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.383	130.55	5

Grapevines (EU South and Central) at 1x 360 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.192	**0.39**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.115	19.13	5
	TMP	Chronic	$PEC_{plateau}$ = 0.065	329.7	5

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
	DCP	Chronic	$PEC_{plateau}$ = 0.060	20.83	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.192	**0.063**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.115	139.13	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.192	**2.55**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.115	434.8	5

Raspberry (EU Central), Dessert pome (EU South and Central), Cider/Perry pome (EU Central) and Stone fruits (EU South and Central) at 1x 480 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.256	**0.293**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.153	14.38	5
	TMP	Chronic	$PEC_{plateau}$ = 0.086	249.2	5
	DCP	Chronic	$PEC_{plateau}$ = 0.080	15.63	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.256	**0.047**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.153	104.57	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.256	**1.914**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.153	326.8	5

Strawberry (EU South and Central) at 1x 480 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.320	**0.234**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.191	11.52	5
	TMP	Chronic	$PEC_{plateau}$ = 0.108	198.4	5
	DCP	Chronic	$PEC_{plateau}$ = 0.100	12.5	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.320	**0.038**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.191	83.77	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.320	**1.531**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.191	261.78	5

Fresh and Canning/Puree solanaceous vegetables (EU South and Central) at 1x 360 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.240	**0.312**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.144	15.28	5
	TMP	Chronic	$PEC_{plateau}$ = 0.081	264.57	5
	DCP	Chronic	$PEC_{plateau}$ = 0.075	16.66	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.240	**0.05**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.144	111.11	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.240	**2.042**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.144	347.2	5

Citrus (EU South) at 1x 1920 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.512	**0.146**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.306	7.19	5
	TMP	Chronic	$PEC_{plateau}$ = 0.173	123.87	5
	DCP	Chronic	$PEC_{plateau}$ = 0.161	7.76	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.512	**0.023**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.306	52.29	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.512	**0.957**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.306	163.40	5

Oilseed rape (EU South and Central) at 1x 480 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.128	**0.586**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.077	28.57	5
	TMP	Chronic	$PEC_{plateau}$ = 0.043	498.37	5
	DCP	Chronic	$PEC_{plateau}$ = 0.040	31.25	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.128	**0.094**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.077	207.79	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.128	**3.828**	5

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
	TCP	Chronic	$PEC_{plateau}$ = 0.077	649.35	5

Formulated product: Pyrinex 250 CS

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.050	**1.5**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.030	73.33	5
	TMP	Chronic	$PEC_{plateau}$ = 0.017	1260.6	5
	DCP	Chronic	$PEC_{plateau}$ = 0.016	78.125	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.050	**0.24**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.030	533.33	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.050	9.8	5
	TCP	Chronic	$PEC_{plateau}$ = 0.030	1666.6	5

Formulated product: RIMI 101

All intended use (Maize, Potato, Bulb vegetables, Cotton and Cucurbits non-edible peel) (EU South) at 1x 200 g a.s./ha _ **Soil surface**

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.267	**0.28**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.160	13.75	5
	TMP	Chronic	$PEC_{plateau}$ = 0.090	238.11	5
	DCP	Chronic	$PEC_{plateau}$ = 0.084	14.88	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.267	**0.045**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.160	100	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.267	**1.835**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.160	312.5	5

All intended use (Maize, Potato, Bulb vegetables, Cotton and Cucurbits non-edible peel) (EU South) at 1x 200 g a.s./ha _ **Incorporated application**

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.067	**1.12**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.066	33.33	5
	TMP	Chronic	$PEC_{plateau}$ = 0.022	974.09	5
	DCP	Chronic	$PEC_{plateau}$ = 0.021	59.52	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.067	**0.179**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.066	242.42	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.067	7.31	5
	TCP	Chronic	$PEC_{plateau}$ = 0.066	757.57	5

Formulated product: SAP250 CSI

Oilseed rape (EU South and Central) at 1x 187.5 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.150	**0.15**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.090	24.44	5
	TMP	Chronic	$PEC_{plateau}$ = 0.022	974.09	5
	DCP	Chronic	$PEC_{plateau}$ = 0.047	26.59	5
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.150	**0.08**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.090	177.77	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.150	**3.26**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.090	555.55	5

Formulated product: SAPEC Chlorpyrifos 5G

Maize (EU South) at 1x 500 g a.s./ha

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Earthworms					
Eisenia foetida	Chlorpyrifos	Chronic	PEC_{soil} = 0.667	**0.112**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.399	5.51	5
	TMP	Chronic	$PEC_{plateau}$ = 0.070	306.14	5
	DCP	Chronic	$PEC_{plateau}$ = 0.209	5.98	5

Test organism	Test substance	Time scale	Soil PEC[1]	TER	Trigger
Other soil macro-organisms					
Folsomia candida	Chlorpyrifos	Chronic	PEC_{soil} = 0.667	**0.018**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.399	40.10	5
Hypoaspis aculeifer	Chlorpyrifos	Chronic	PEC_{soil} = 0.667	**0.735**	5
	TCP	Chronic	$PEC_{plateau}$ = 0.399	125.31	5

Effects on terrestrial non target higher plants (Regulation (EU) N° 283/2013, Annex Part A, point 8.6 and Regulation (EU) N° 284/2013 Annex Part A, point 10.6)

Screening data

Not required for herbicides or plant growth regulators as ER_{50} tests should be provided

Formulated product EF-1551

Group	Crop	Worst-case PER (g a.s./ha)	ER_{50} (g a.s./ha)	TER	Trigger
Field crop	Brassica	13	>2400	>184.62	5
	Cereals	13	>2400	>184.62	
	Oilseed rape	13	>2400	>184.62	
	Strawberry	13	>2400	>184.62	
	Artichoke	13	>2400	>184.62	
Fruit crop	Pome fruit (early)	140	>2400	>17.14	
	Stone fruit (early)	140	>2400	>17.14	
	Citrus (early)	561	>2400	***>4.28***	
Grape vine	Grapes (wine, late)	29	>2400	>82.76	
Vegetables, ornamentals, small fruits	Raspberry (early)	38	>2400	>63.16	
	Tomato, pepper, eggplant (early)	29	>2400	>82.76	

NB. TER values in ***bold*** are below the trigger of 5

Formulated product SAP250CS

Crop	Appl. Rate (g as/ha)	Distance	Drift (%)	PER (g as/ha)	Toxicity (g as/ha)	TER
OSR	187.5	1 m	2.77	5	1008	201

bold letters: below Annex VI trigger of 5 (TER_{LT})

For the formulated products Pyrine 250CS, RIMI101 and SAPEC 5G, please refer to level 2.

Effects on biological methods for sewage treatment (Regulation (EU) N° 283/2013, Annex Part A, point 8.8)

Test type/organism	end point

Activated sludge	
Pseudomonas sp	

Monitoring data (Regulation (EU) N° 283/2013, Annex Part A, point 8.9 and Regulation (EU) N° 284/2013, Annex Part A, point 10.8)

Available monitoring data concerning adverse effect of the a.s.: no data submitted Available monitoring data concerning effect of the PPP: No data submitted.

Definition of the residue for monitoring (Regulation (EU) N° 283/2013, Annex Part A, point 7.4.2) Ecotoxicologically relevant compounds[1]

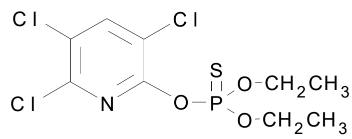
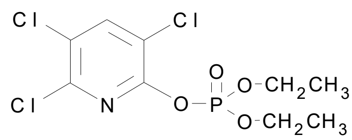
Compartment	
soil	Chlorpyrifos
water	Chlorpyrifos
sediment	Chlorpyrifos
groundwater	Chlorpyrifos

[1] metabolites are considered relevant when, based on the risk assessment, they pose a risk comparable or higher than the parent

Classification and labelling with regard to ecotoxicological data (Regulation (EU) N° 283/2013, Annex Part A, Section 10)

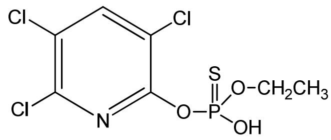
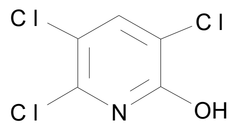
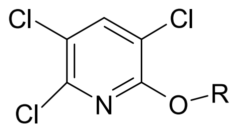
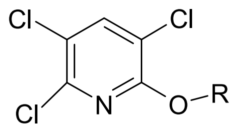
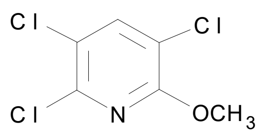
Substance	Chlorpyrifos
Harmonised classification according to Regulation (EC) No 1272/2008 and its Adaptations to Technical Process [Table 3.1 of Annex VI of Regulation (EC) No 1272/2008 as amended][12]:	Aquatic Acute 1 (M == 10000) Aquatic Chronic 1 (M == 1000)
Peer review proposal[13] for harmonised classification according to Regulation (EC) No 1272/2008:	

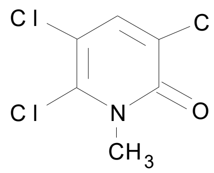
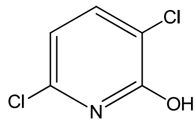
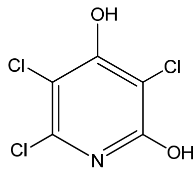
Used compounds code(s)

Code Number (Synonyms)	Description	Compound found in:	Structure
Chlorpyrifos (E-ISO, BSI, ANSI, ESA, BAN), Chlorpyriphos (F-ISO, JMAF), Chlorpyriphos-ethyl (France) DOWCO 179, ENT 27 311, OMS 971, [Makhteshim-Agan 7908000] EC 220-864-4, CAS 2921-88-2, CIPAC 221, CODEX 017	O,O-Diethyl-O-(3,5,6-trichloro-2-pyridyl)phosphoro-thioate [IUPAC] O,O-Diethyl-O-(3,5,6-trichloro-2-pyridinyl)phosphoro-thioate [CAS]	Serum of humans (poisoning suspects) Crops (Citrus, Cabbage, Peas, Radish)	 $C_9H_{11}Cl_3NO_3PS$
Chlorpyrifos oxon, Oxygen analog, X152320 CAS 5598-15-2	O,O-Diethyl-O-(3,5,6-trichloro-2-pyridyl) phosphate [IUPAC] O,O-Diethyl-O-(3,5,6-trichloro-2-pyridinyl) phosphate [CAS]	Rat, Air photolysis	 $C_9H_{11}Cl_3NO_4P$

[12] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. OJ L 353, 31.12.2008, 1-1355.

[13] It should be noted that harmonised classification and labelling is formally proposed and decided in accordance with Regulation (EC) No 1272/2008. Proposals for classification made in the context of the evaluation procedure under Regulation (EC) No 1107/2009 are not formal proposals.

Desethyl chlorpyrifos (DES) (MonoEt)	*O*-ethyl *O*-(3,5,6-trichloro-2-pyridyl)phosphoro-thioate	Hydrolysis, Pseudo processing (high pH / temp hydrolysis)	 $C_7H_7Cl_3NO_3PS$
Trichloropyridinol (TCP), (TCPy) EC 229-405-2 CAS 6515-38-4	3,5,6-trichloro-2-pyridinol [IUPAC and CAS], 3,5,6-trichloro-2-pyridone, 3,5,6-trichloro-2(1H)-pyridone, 3,5,6-trichloro-2(1H)-pyridinone	Urine, blood Rat Crop (Citrus, Tomato, Cabbage, Peas, Radish) Livestock (goat, laying hen) Fish Soil (sterile, aerobic, anaerobic, and photolysis) Water (hydrolysis, photolysis, and surface water mineralization) Water/sediment systems	 $C_5H_2Cl_3NO$
*	Sugar conjugates of TCP (no chemical names were established for any of these metabolites)	Crop (Citrus, Cabbage, Tomato,Peas, Rashish)	 (Where R represents sugar conjugates (e.g., glucose and/or glucose plus other natural products).)
*	Conjugates of TCP (no chemical names were established for any of these metabolites)	Rat, Livestock (goat, laying hen) Fish	 (Where R represents conjugates (probably glucuronic acid and sulphate)
Trichloromethoxy-pyridine (TMP) (2,3,5-trichloro-6-methoxypyridine) CAS 31557-34-3	3,5,6-trichloro-2-methoxypyridine [IUPAC and CAS]	Soil (aerobic and photolysis)	 $C_6H_4Cl_3NO$

N-methyl pyridinone, N-methyl (N-methyl-3,5,6-trichloro-2(1H)-pyridinone) (MTCP), X131419 CAS None	3,5,6-Trichloro-2(N-methyl)-pyridone [IUPAC] 3,5,6-Trichloro-2(N-methyl)-pyridinone [CAS]	Soil (minor-aerobic and anaerobic)	 $C_6H_4Cl_3NO$
3,6-dichloro-2-pyridinol (3,6-DCP)	3,6-dichloro-2-pyridinol	Soil (anaerobic)	 $C_5H_3Cl_2NO$
Diethylthio-phosphate (DETP)		Rat. Urine (and serum) of humans (poisoning suspects)	
Diethyl phosphate (DEP)		Rat, Urine (and serum) of humans (poisoning suspects)	
Hydroxy-TCP	3,5,6-trichloro-4-hydroxy-2-pyridinol	Crop (Peas, observed as conjugate)	 $C_5H_3Cl_3NO_2$

* The compound code / trivial name in bold is the name used in the list of endpoints.